



Advanced Energy

909 Capability Drive, Suite 2100

Raleigh, NC 27606-3870

919 857-9000 | www.advancedenergy.org

Truck Stop Electrification Demonstration: Lifetime Usage Summary of Shorepower Pedestals at Big Boys Truck Stop

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This document was prepared by Advanced Energy.

Primary Author

Staci Haggis

Background

In 2008, Shorepower, LLC was awarded a Clean Fuel Advanced Technology (CFAT) grant for the installation of a truck stop electrification (TSE) project at the Big Boys truck stop in Kenly, North Carolina. The TSE installation includes six Shorepower power pedestals. Each pedestal serves four parking spaces for a total of 24 electrified parking spaces. Two of the six pedestals provide 120/208 VAC electric power at 20/30 amps to run onboard heating, air conditioning, cab amenities and the truck block heater. The remaining four pedestals provide 120 VAC power at 20 amps. The Shorepower pedestals went online in late October 2009.

Progress Energy and Advanced Energy have worked as project partners on this installation, performing public relations and technology monitoring services, respectively. The project was due to end in November 2009; however, the CFAT program was extended through 2010. As such, Advanced Energy continued monitoring the Shorepower pedestals through 2010. Advanced Energy submits quarterly reports to Progress Energy summarizing the estimated fuel savings, estimated emission reductions and, if available, power usage associated with use of the power pedestals. This report summarizes lifetime usage of the Shorepower pedestals and is the final report for the project.

Lifetime Usage

Table 1 shows Shorepower pedestal lifetime usage data.

Table 1. Shorepower Pedestal Lifetime Usage			
Row Index	Start Date/Time	End Date/Time	Minutes of Use
1	11/8/2009 19:08	11/9/2009 3:08	480
2	11/8/2009 19:10	11/8/2009 19:27	17
3	11/28/2009 15:23	11/29/2009 5:23	840
4	11/29/2009 10:17	11/29/2009 20:17	600
5	12/6/2009 12:58	12/6/2009 22:58	600
6	12/24/2009 20:20	12/24/2009 20:25	5
7	12/29/2009 17:55	12/30/2009 3:55	600
8	1/14/2010 15:45	1/14/2010 16:14	29
9	1/14/2010 16:15	1/15/2010 10:15	1080
10	1/15/2010 15:28	1/15/2010 18:34	185
11	1/15/2010 15:38	1/16/2010 6:38	900
12	1/15/2010 18:03	1/16/2010 4:03	600
13	3/2/2010 15:28	3/2/2010 18:38	190
14	3/4/2010 21:23	3/4/2010 22:23	60
15	4/10/2010 14:11	4/11/2010 2:11	720
16	4/26/2010 17:07	4/27/2010 5:07	720
17	4/27/2010 15:40	4/28/2010 3:40	720

Table 1. Shorepower Pedestal Lifetime Usage			
Row Index	Start Date/Time	End Date/Time	Minutes of Use
18	5/4/2010 11:32	5/5/2010 2:32	900
19	5/27/2010 11:10	5/27/2010 13:14	120
20	6/19/2010 20:11	6/21/2010 14:11	2520
21	6/21/2010 8:02	6/21/2010 16:02	480
22	6/21/2010 15:19	6/22/2010 2:19	660
23	6/23/2010 8:52	6/23/2010 17:52	540
24	6/24/2010 8:05	6/24/2010 16:05	480
25	6/25/2010 6:24	6/25/2010 16:24	600
26	6/26/2010 8:56	6/26/2010 17:56	540
27	7/5/2010 13:53	7/6/2010 2:53	780
28	8/23/2010 12:41	8/24/2010 2:33	832
29	9/5/2010 17:17	9/6/2010 7:17	840
30	9/25/2010 6:42	9/25/2010 16:42	600
31	10/11/2010 15:22	10/12/2010 3:22	720
32	10/12/2010 4:29	10/12/2010 7:29	180
33	11/16/2010 14:47	11/16/2010 22:47	480
34	11/27/2010 9:30	11/27/2010 22:30	780
35	12/2/2010 19:08	12/3/2010 5:08	600
<i>Total Minutes of Use:</i>			20998
<i>Total Hours of Use:</i>			350

Usage of the pedestals continues to be limited. The units were used only five times in the fourth quarter for a total of approximately 46 hours. This is an increase over usage in the third quarter, however, perhaps due to colder temperatures. Overall, the pedestals have been used 35 times since going online in late October 2009, for a total of approximately 350 hours. If you assume one gallon of diesel fuel consumed for each hour of idlingⁱ, use of the Shorepower pedestals has saved approximately 350 gallons of diesel fuel. This equates to emission reductions of approximately:

- 104 pounds of NOx emissions
- 1.7 pounds of PM_{2.5}/PM₁₀ emissions and
- 6,860 pounds of CO₂-equivalent greenhouse gas emissions^{ii,iii,iv}

Table 2 shows pedestal lifetime power usage data in kilowatt-hours (kWh), as provided by Shorepower. Shorepower obtains this data from Big Boys' utility bills. The data provided shows that the Shorepower pedestals have used a total of 794 kWh since going online. Comparing that with pedestal time of use, the average power consumption per hour over the lifetime of the units is 2.3 kilowatts (kW).

Table 2. Shorepower Pedestal Lifetime kWh Usage	
Date Range	kWh
Nov 6 - Dec 8, 2009	61
Dec 8 - Jan 11, 2010	65
Jan 11 - Feb 8, 2010	76
Feb 8 - Mar 10, 2010	44
Mar 10 - Apr 12, 2010	53
Apr 12 - May 10, 2010	67
May 10 - Jun 9, 2010	38
Jun 9 - Jul 12	201
Jul 12 - Aug 10	35
Aug 10 - Sep 10	55
Sep 10 - Oct 12	0
Oct 12 - Nov 9	36
Nov 9 - Nov 15	6
Nov 15 - Dec 9	57
<i>Total kWh:</i>	<i>794</i>

There are no plans to continue monitoring the Shorepower units at Big Boys in 2011. As such, this concludes monitoring of the TSE project.

ⁱ Environmental Protection Agency, *What You Should Know About Truck Idling*, April 2002, http://www.epa.gov/ne/eco/diesel/pdfs/Diesel_Factsheet_Truck_Idling.pdf

ⁱⁱ Environmental Protection Agency, *Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions in State Implementation Plans and Transportation Conformity (EPA420-B-04-001)*, January 2004, <http://www.epa.gov/smartway/documents/420b04001.pdf>

ⁱⁱⁱ Department of Energy, Petroleum Reduction Planning Tool, last updated 11/16/2010, <https://www.afdc.energy.gov/afdc/prep/index.php>

^{iv} Environmental Protection Agency, *Greenhouse Gas Equivalency Calculator*, last updated 3/23/2010, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>