DOE Hydrogen and Fuel Cells Program Record		
Record #: 13007	**Date: 09/05/2013**	
Title: Industry Deployed Fuel Cell Backup Power (BuP)		
Originators: Pete Devlin, Jim Alkire, Sara Dillich, Dimitrios Papageorgopoulos		
Approved by: Rick Farmer and Sunita Satyapal	**Date:** 09/09/13	

Item:

Table 1: Number of fuel cells deployments (current and planned) for applications in backup power.

	DOE Funded[1] (ARRA) as of 5/2013	DOE Funded (Appropriations)[2, 3] as of 9/1/2013	DOE Total	Industry Funded or on Order (Globally)[4-9] From 2009 – Record Date	DOE and Industry Total From 2009 – Record Date
Number of Backup Power Deployments (current & planned)	820	83	903	3,593	4,496

The funding of 903 Department of Energy (DOE) fuel cell backup power systems has led to over 3,500 industry installations and on-order backup power units with no DOE funding.

Data/Assumptions/Calculations:

The manufacturers providing the fuel cells for the deployments (current and planned) mentioned in Table 1 above are:

Altergy	Ballard / Ida Tech
Hydrogenics	ReliOn, Inc.

Total DOE American Recovery and Reinvestment Act (ARRA) investment for these fuel cell projects is $18.5M, with an industry cost share of $30.8M.[i] While publicly available sales

[i] ARRA funding supported deployments in backup power for: ReliOn with deployments at AT&T and PG&E sites, Sprint Nextel with deployments at Sprint sites, and Plug Power with deployments at Warner Robins Air Force Base and Fort Irwin. Funds included units as well as other aspects of the project such as installation, pre-testing, data collection, analysis, maintenance, and reporting.

information for backup power fuel cell sales is difficult to obtain, industry reports of sales activity in recent years show signs of substantial growth in sales activity.

In August 2011, Ballard Power Systems purchased IdaTech Power Systems and in April 2013 they announced the shipment of their 500th methanol-fueled telecom backup power system.[10] Also in 2011, ReliOn announced that is has deployed more than 3.9 MW of its fuel cell systems at approximately 1,350 customer sites globally and Altergy Systems' Freedom Product achieved 5 million operational hours in telecommunications and other applications worldwide.[11]

Based on fuel cell manufacturers' feedback, it was determined that their purchase orders for deployments were considered either directly or indirectly due to results of the DOE Fuel Cell Technologies (FCT) Office. This includes fuel cell R&D, Market Transformation and American Recovery and Reinvestment Act deployment funding. In some instances, companies increased the number of purchases beyond those with DOE funds assistance. In other instances, the fuel cell manufacturers were able to show the business case using data collected from DOE projects and obtained purchase orders with no DOE funding.

Reference(s):

Information based on public documentation of deployments and orders in addition to composite data products (CDPs) and fuel cell system assignments by the National Renewable Energy Laboratory (NREL) based on DOE-funded projects.

1. "Early Fuel Cell Market Deployments: ARRA and Combined (IAA, DLA, ARRA)", National Renewable Energy Laboratory, May 2013: http://www.nrel.gov/hydrogen/cfm/pdfs/arra_deployment_cdps_q12013_4web.pdf

2. State of the States: Fuel Cells in America 2012. Fuel Cells 2000, September 2012: http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/state_of_the_states_2012.pdf

3. "FAA Rolls out Fuel Cells for Backup Power", Radio Resource Media Group, April 28, 2010: http://www.radioresourcemag.com/onlyonline.cfm?OnlyOnlineID=168

4. "Altergy Awarded Largest Fuel Cell Order in Telecom History", Altergy Systems announced an order totaling 1,965 fuel cell systems to be deployed for backup power for wireless cell towers, March 1, 2012: http://www.altergy.com/announcements/largest_fuelcell_order_in_history.asp

5. "PEM Fuel Cell Systems Providing Backup Power to Commercial Cellular Towers and an Electric Utility Communications Network", presented by ReliOn at the DOE FCT Office's Annual Merit Review on May 16, 2012: http://www.hydrogen.energy.gov/pdfs/review12/h2ra006_maxwell_2012_p.pdf

6. "Altergy's Freedom Power Systems To Power Major Telecom Network Upgrade", Altergy Systems announced the deployment of more than 1000 systems for wireless

telecom, August 2012:
http://www.altergy.com/announcements/telecom_network_upgrade.asp

7. "Ballard Signs Supply Agreement With Azure Hydrogen For Backup Power Systems in China", Ballard supplies Azure Hydrogen in China with 120 direct hydrogen systems and 100 methanol-fuelled systems, July 26, 2013: http://www.ballard.com/about-ballard/newsroom/news-releases/news07261301.aspx

8. "Ballard Fuel Cell Systems Prove 100% Reliable, Providing Backup Power During Hurricane Sandy", Ballard deploys 17 units in the Bahamas, November 6, 2012: http://www.ballard.com/about-ballard/newsroom/news-releases/news11061201.aspx

9. "Broad Deployment of Ballard ElectraGen™ Fuel Cell Systems By CALA Region Telecom Providers", Ballard deploys 272 methanol-fueled systems, May 2, 2013: http://www.ballard.com/about-ballard/newsroom/news-releases/news05021301.aspx

10. "Ballard ships 500th ElectraGen-ME methanol fuel cell system for telecom backup", Green Car congress, April 13, 2013: http://www.greencarcongress.com/2013/04/ballard-20130413.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+greencarcongress%2FTrBK+(Green+Car+Congress)

11. Fuel Cell Technologies 2011 Market Report: http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/2011_market_report.pdf