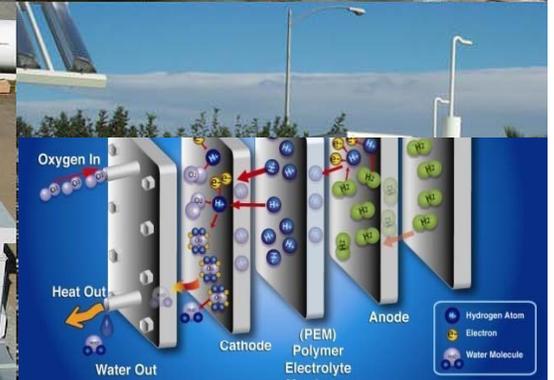


FUEL CELL TECHNOLOGIES PROGRAM

DOD-DOE Workshop: Shipboard APUs

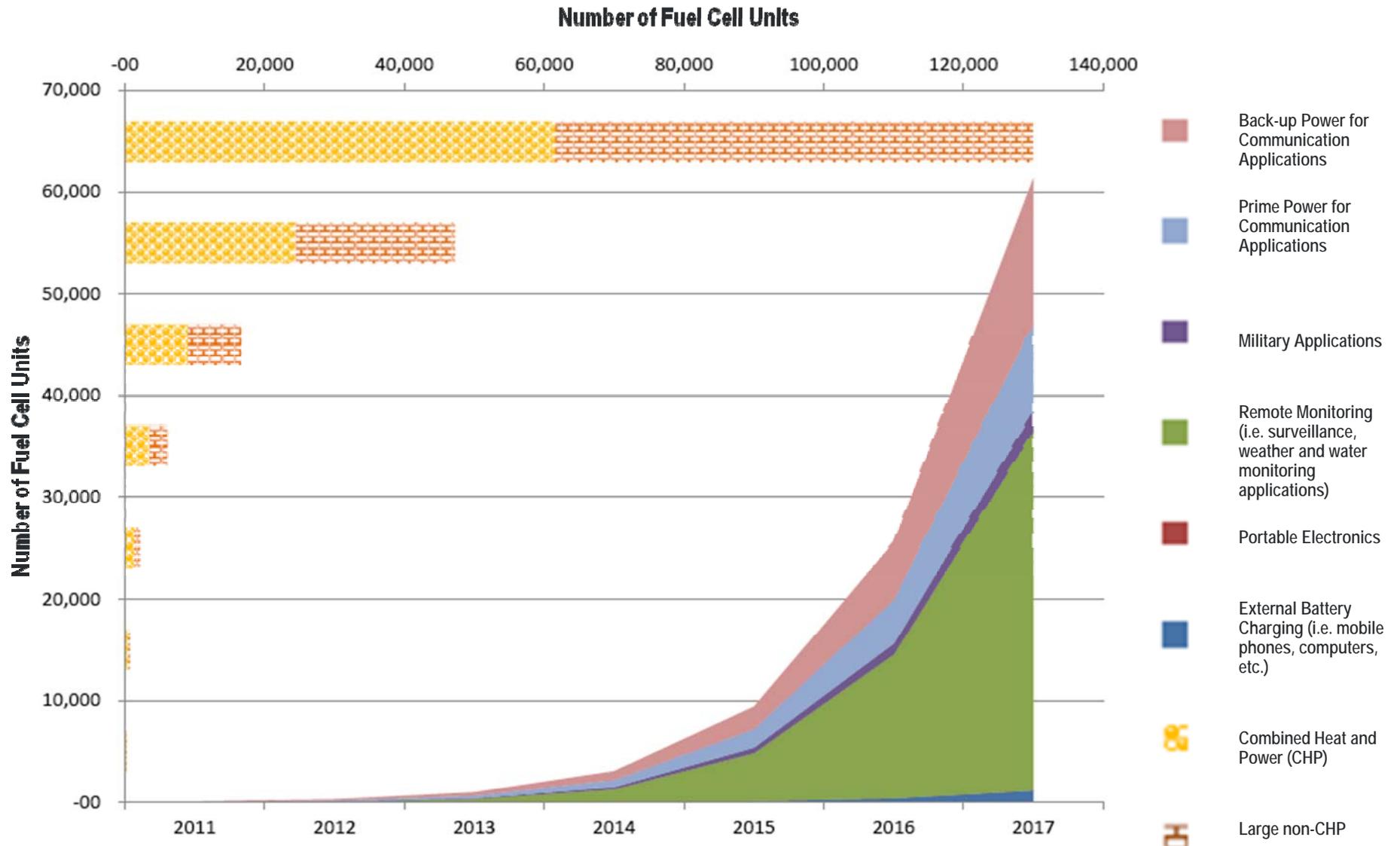


Fuel Cell Commercial Outlook

March 29, 2011

Pete Devlin
U.S. Department of Energy
Fuel Cell Technologies Program
Market Transformation and
Intergovernmental Coordination
Manager

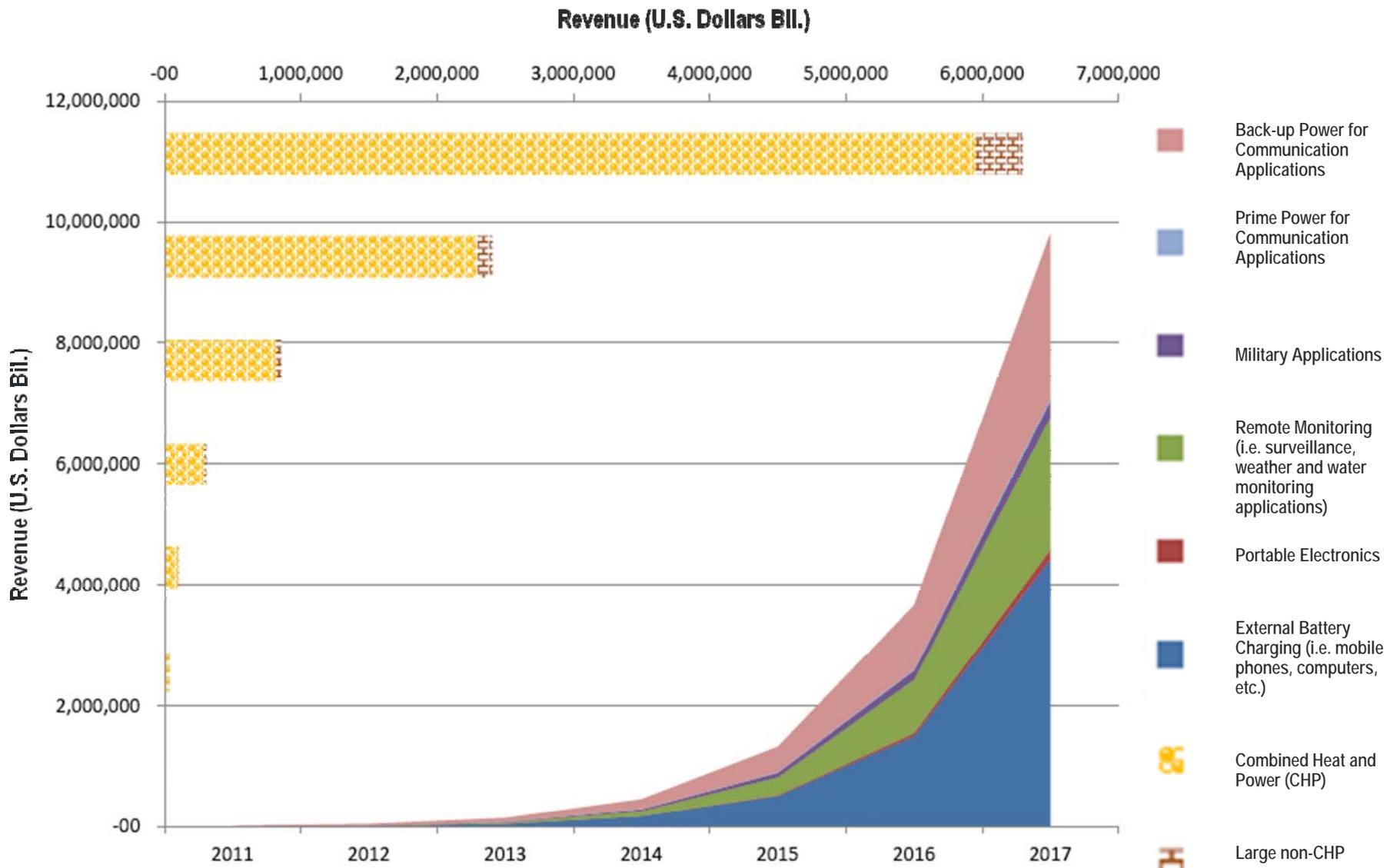
Near Term Market Growth – Unit Shipments



Assumes Non-Transport Applications

Source: 2011 Pike Research

Near Term Market Growth - Revenue

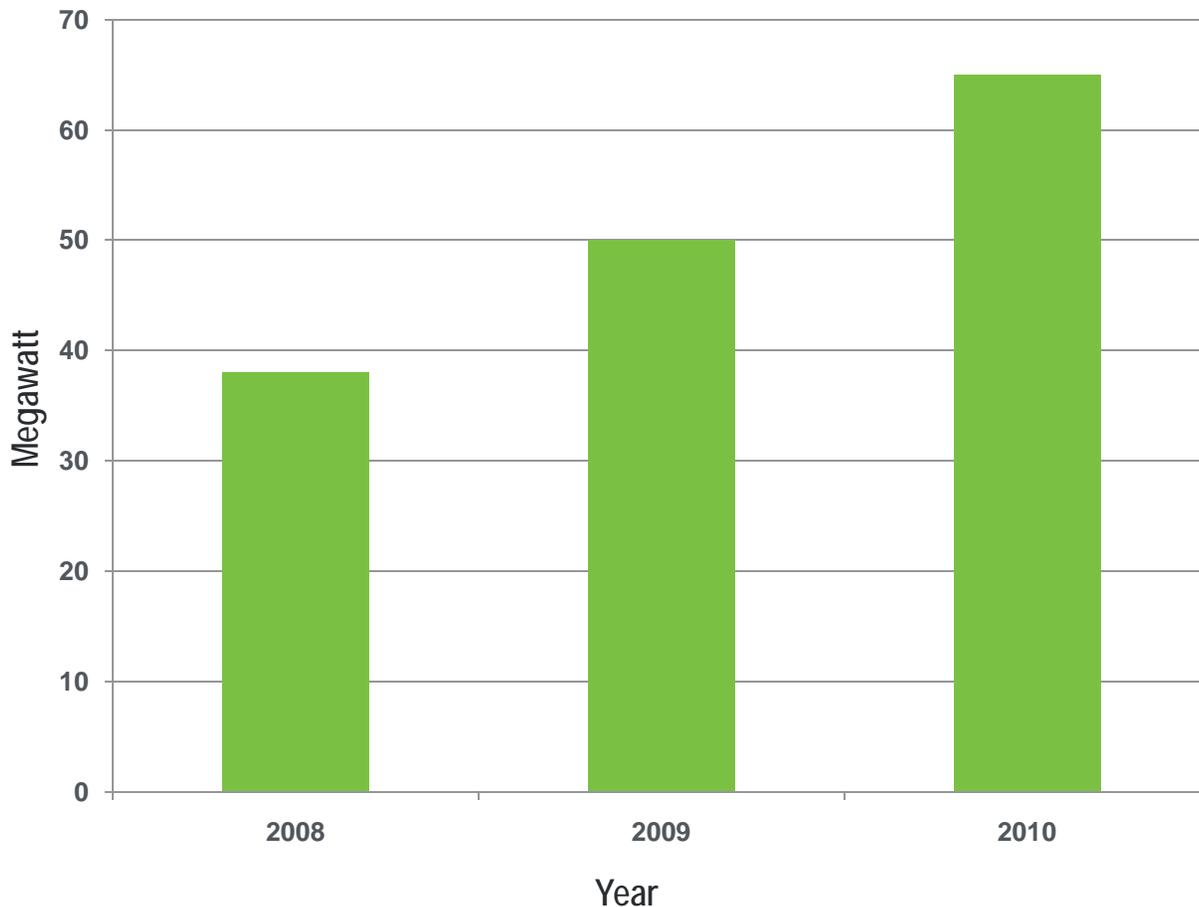


Assumes Non-Transport Applications

Source: 2011 Pike Research

Stationary Fuel Cells Shipped Worldwide

Total Megawatts Shipped Worldwide for Stationary Fuel Cells*



Verizon Call Center - Garden City, NY

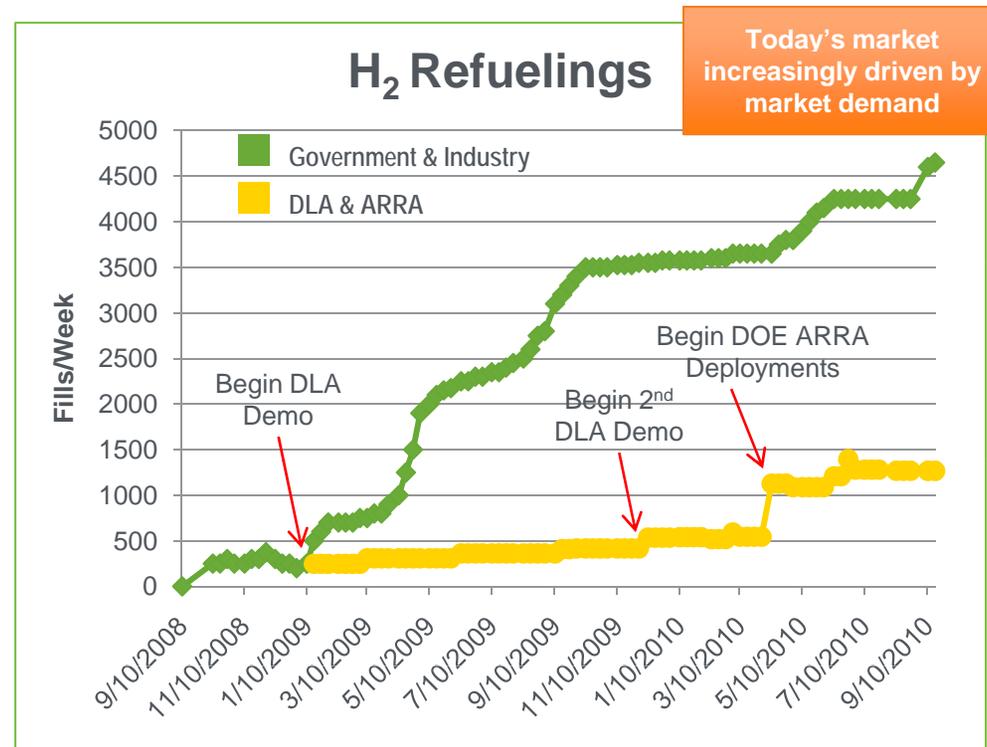
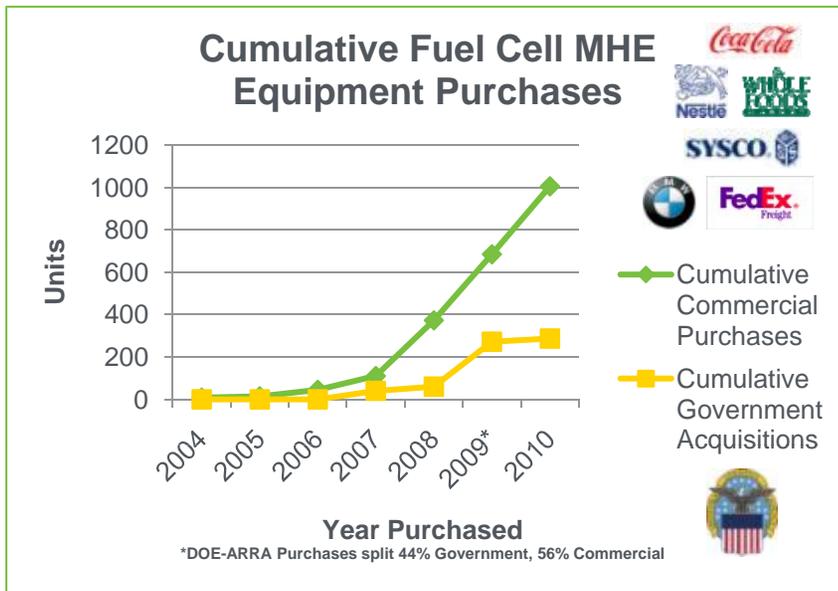


7 Fuel Cells installed in 2005:

- Electrical power
- Backup power
- Exhaust recovered for cooling and heating

Source: 2011 Pike Research **Preliminary Analysis**

Government Assistance as a Catalyst for Industry Adoption



Fuel Cell MHE Market Example

- Early Procurement (2007-2009)
 - DLA began early fuel cell powered forklift procurements, 99 units
 - Multiple OEMs across sites in PA, GA, CA, and WA (Army)
- DOE-ARRA-funded Projects (2009)
 - Received over 50% cost share from industry
- Fully Integrated Fuel Cell Forklifts (2011)
 - Two forklift OEMs have announced plans to design a new class of forklifts around fuel cells

YR	Commercial Purchases	Cumulative Commercial Purchases	Government Acquisitions	Cumulative Government Acquisitions
2004	8	8	0	0
2005	6	14	0	0
2006	31	45	0	0
2007	65	110	40	40
2008	263	373	20	60
2009*	312	685	212	272
2010	321	1006	15	287

- Δ shipboard Δ PII using

in the TRL 7-9 range

- International maritime applications are enormous (market size of 27.4M container ships in 2009 and potential for 37.3M in 2014*)
- Worldwide air emissions and fossil energy consumption reduction opportunities



*Source: <http://www.worldshipping.org/about-the-industry/containers/global-container-fleet>