



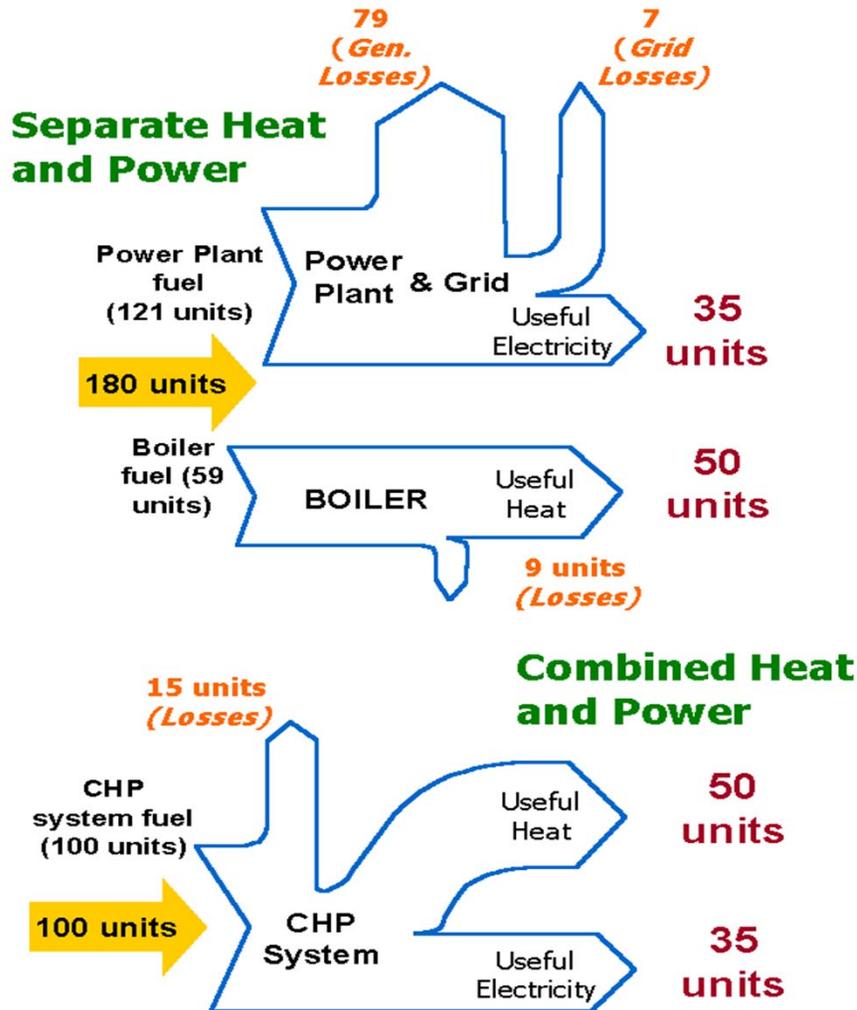
Fuel Cell Economic Development for Integrated Resource Planning

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September 22, 2011





Introduction



Conventional grid power and boilers system
~ 47% efficient

Combined heat and power system ~85% efficient

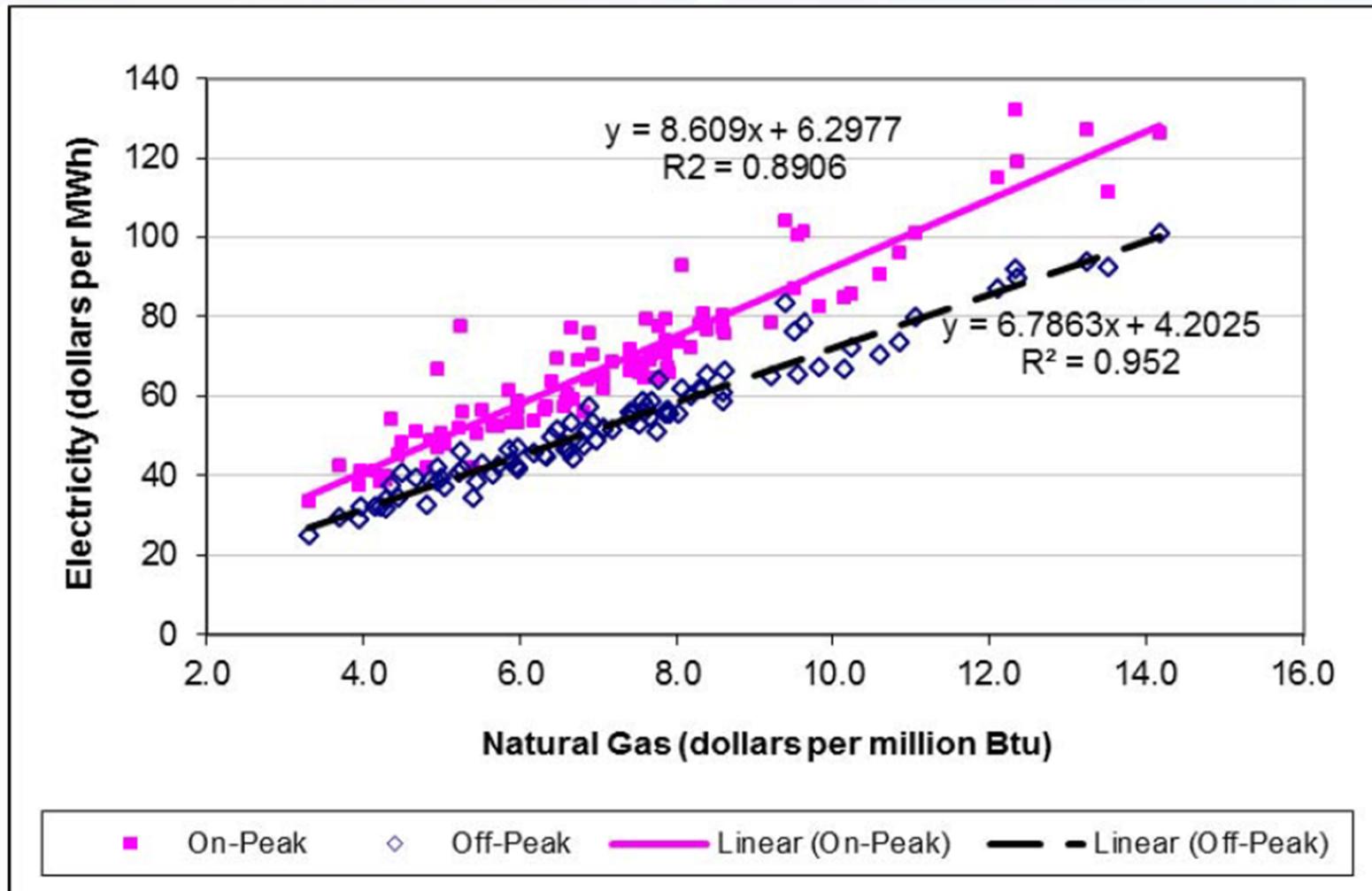


Value

- Industrial CHP
 - High electrical efficiency
 - Decreased costs and improved competitiveness
 - Increased environmental performance
 - Improved on-site reliability
 - High capacity factor for resource availability
 - Streamlined siting process

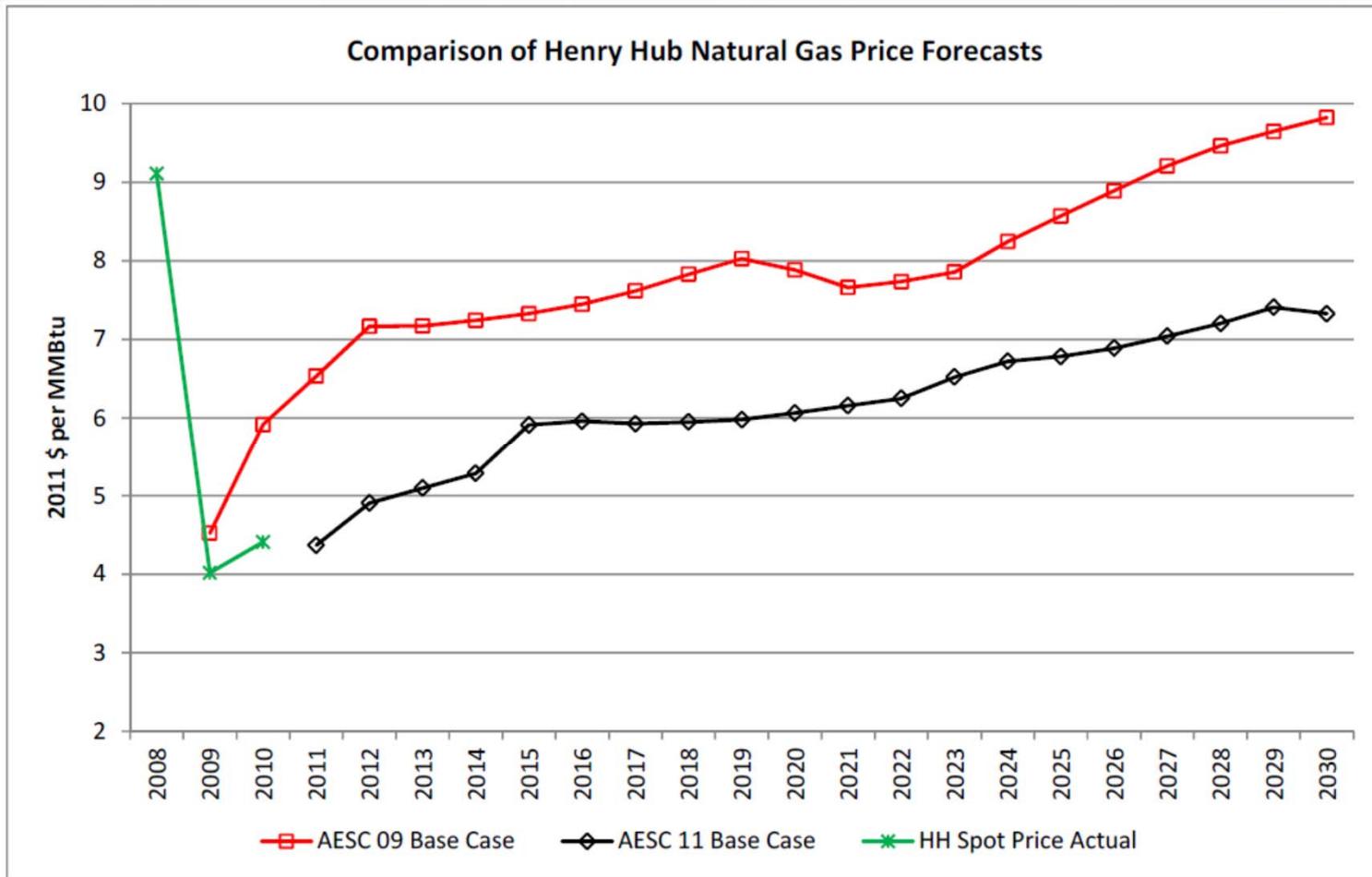


Electricity Prices Tied to Natural Gas Prices





Natural Gas Cost Trends

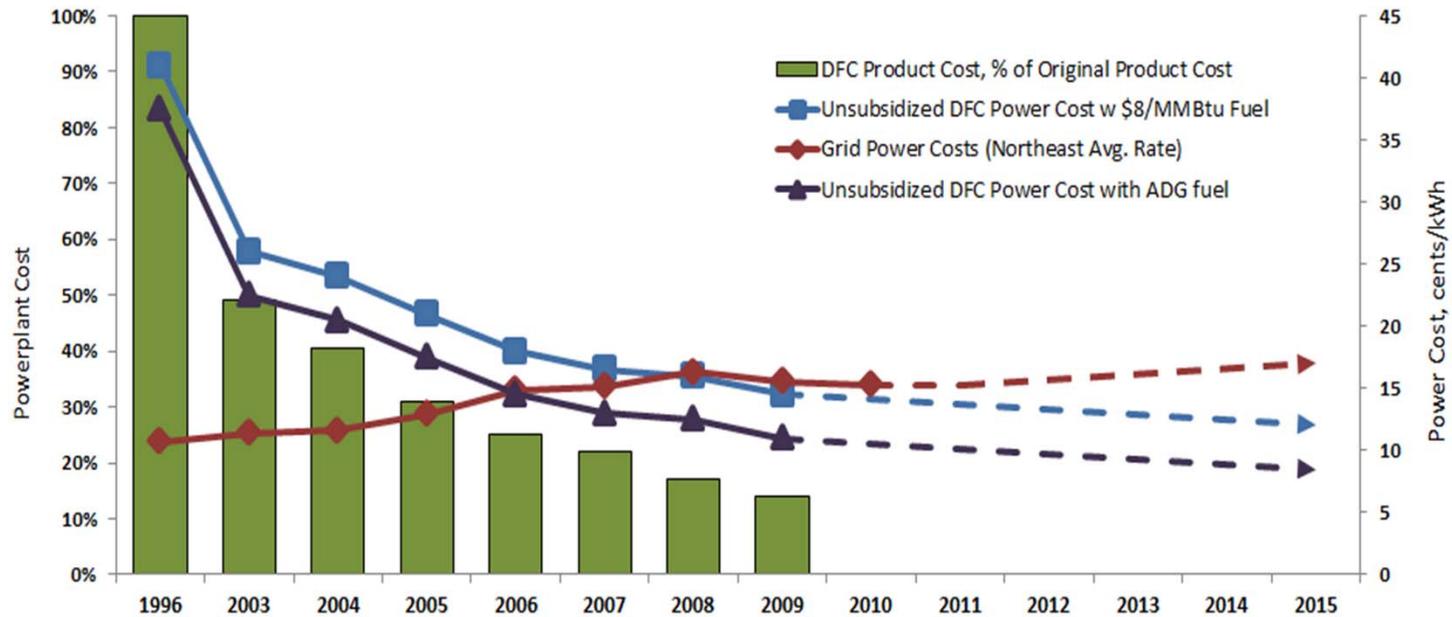


Source: 2011 New England Avoided Energy Cost Study



Fuel Cell Prices Are Declining

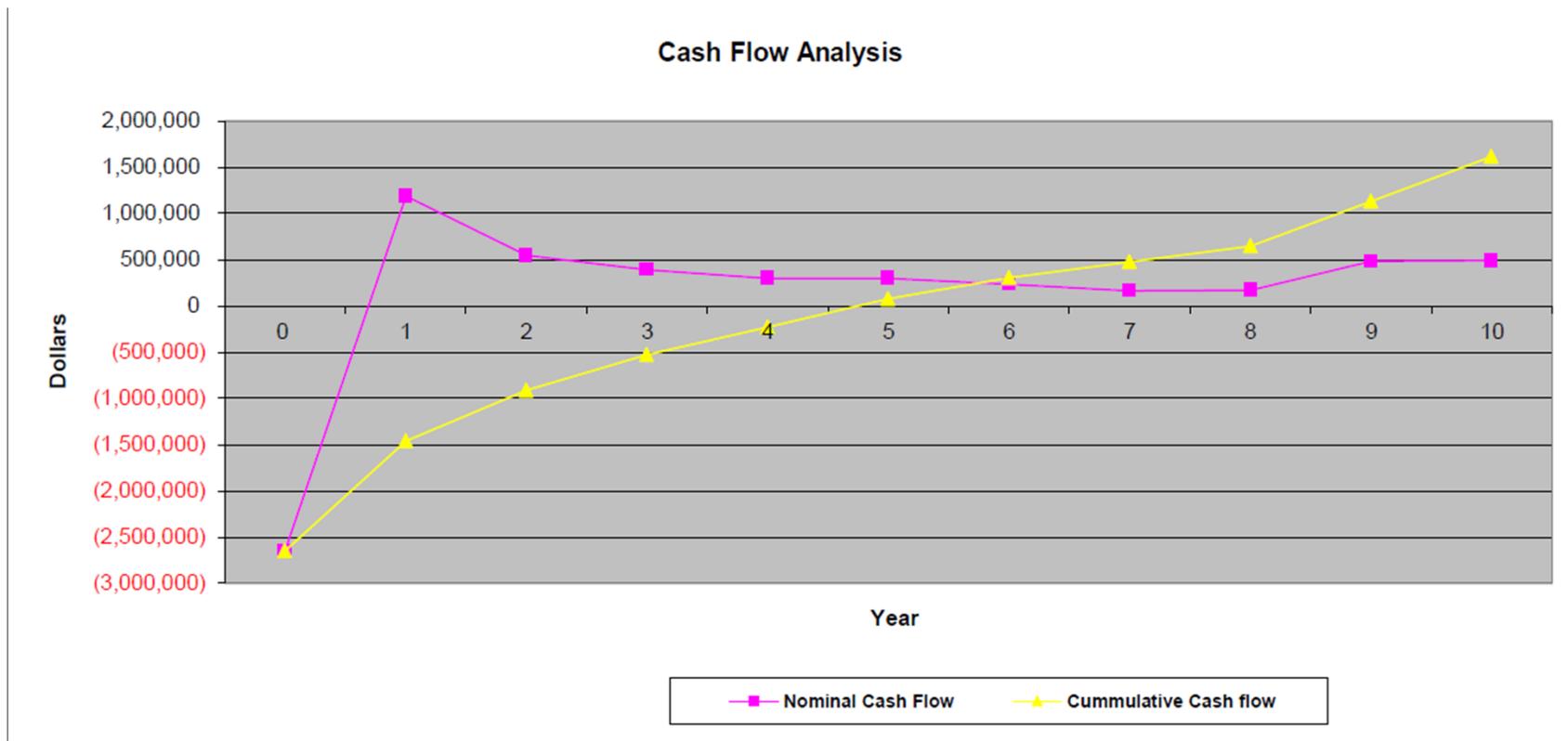
FuelCell Energy MCFC





Fuel Cell Financial Payback

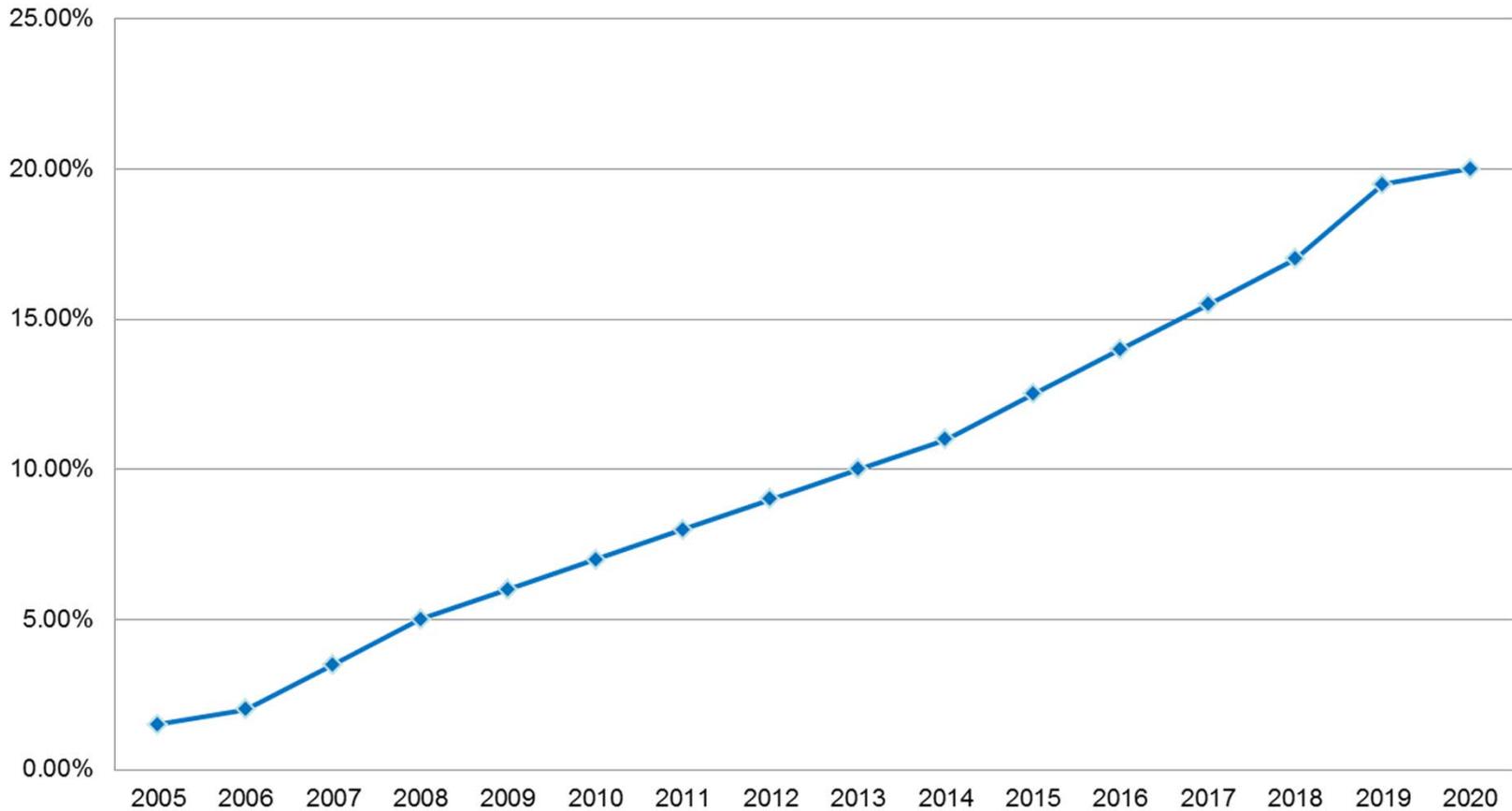
Cost: \$5500 to \$8000 per kW





Driver: Growth in Renewables

Connecticut Class 1 RPS



Source: CT Public Utilities Regulatory Authority (PURA)



Driver (Results): Job Creation

- Employment – 2,529 workers:
 - 1,074 direct employees
 - 633 indirectly employed
 - 822 induced
- Connecticut industry profile:
 - Eight original equipment manufacturers
 - 510 additional companies in supply chain



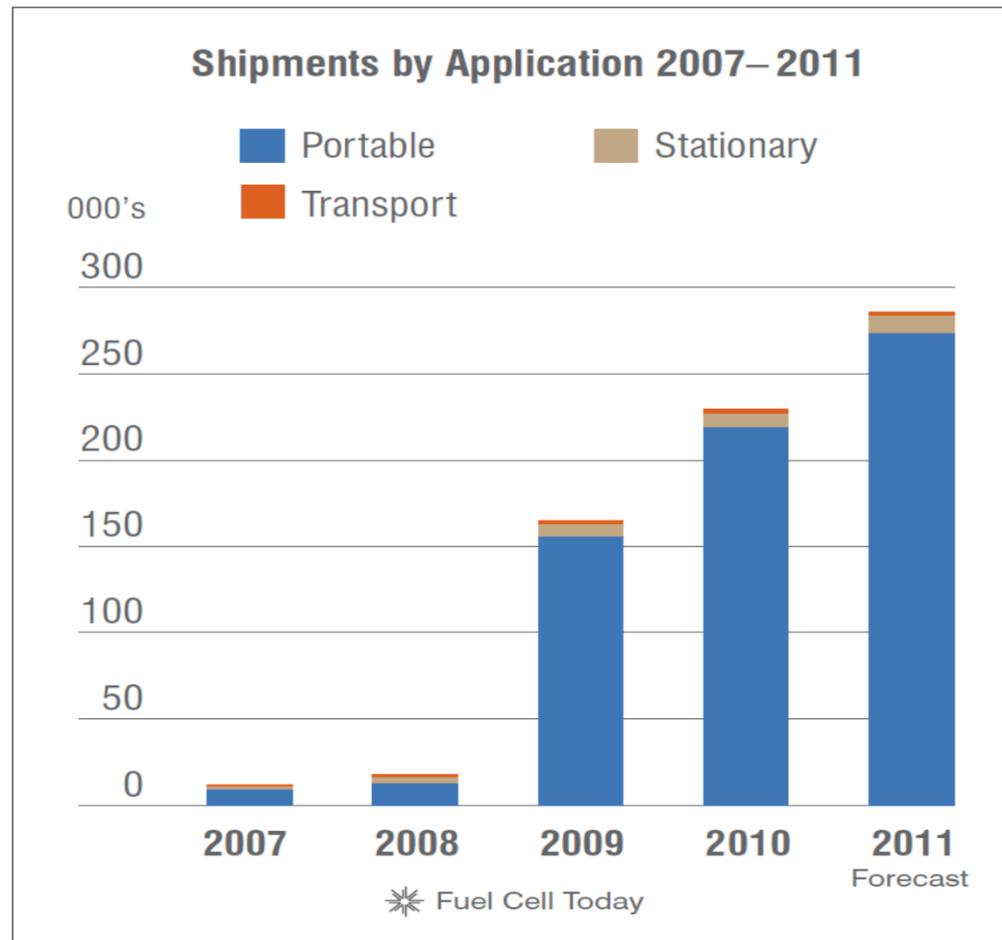
Driver (Results): Economic Development

- Almost \$500 million in revenues & investment
 - \$250 million – direct
 - \$122 million – indirect
 - \$120 million – induced
- Between \$22.7 and \$27.8 million in tax revenues



Results: Market Deployment

Fuel Cell Shipments





Market Targets

- Potential host sites:
 - Education
 - Food sales
 - Inpatient healthcare
 - Lodging
 - Public order & safety
 - Energy intensive industries (corrugation, metal finishing, etc.)
 - Federal facilities
 - Wireless communication towers
 - Wastewater treatment plants
 - Landfills
 - Airports (with military)
 - Military

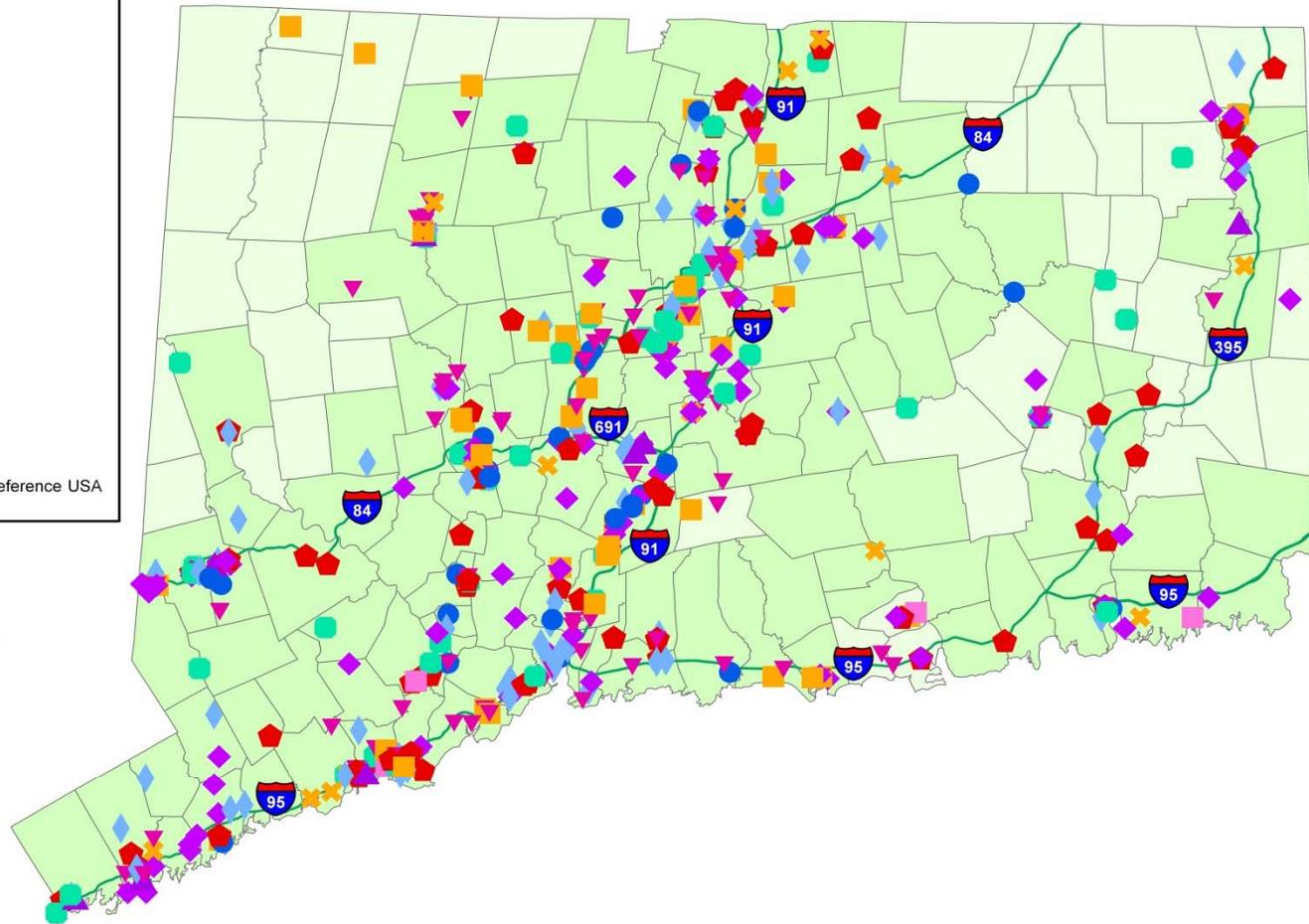
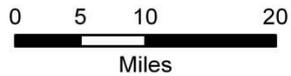
Potential Hydrogen and Fuel Cell Applications Connecticut: Energy Intensive Industries



Legend

- Alumina & Aluminum
- Iron & Steel
- ▲ Petroleum Refining
- ◆ Pulp & Paper
- Wood Products
- ◆ Food Manufacturer
- ▼ Motor Vehicle Parts Manufacturer
- ◆ Chemical Manufacturer
- ✱ Metal Casting
- Ship Building/Repair
- Interstate
- Areas Served by Natural Gas
- Town Boundary

The sites in this map were selected from the Reference USA databases.



Disclaimer:
Information presented in this map is for planning purposes only. Verification of potential sites and their energy consumption has not been undertaken on a site-specific basis. No representation as to the accuracy of the data depicted is implied.

Sources:
Mass. Office of Geographic Information
U.S. Census Bureau
Reference USA
Northeast Gas Association

Map: CT.EI
August 18, 2011

Potential Hydrogen and Fuel Cell Applications

Connecticut: Inpatient Healthcare



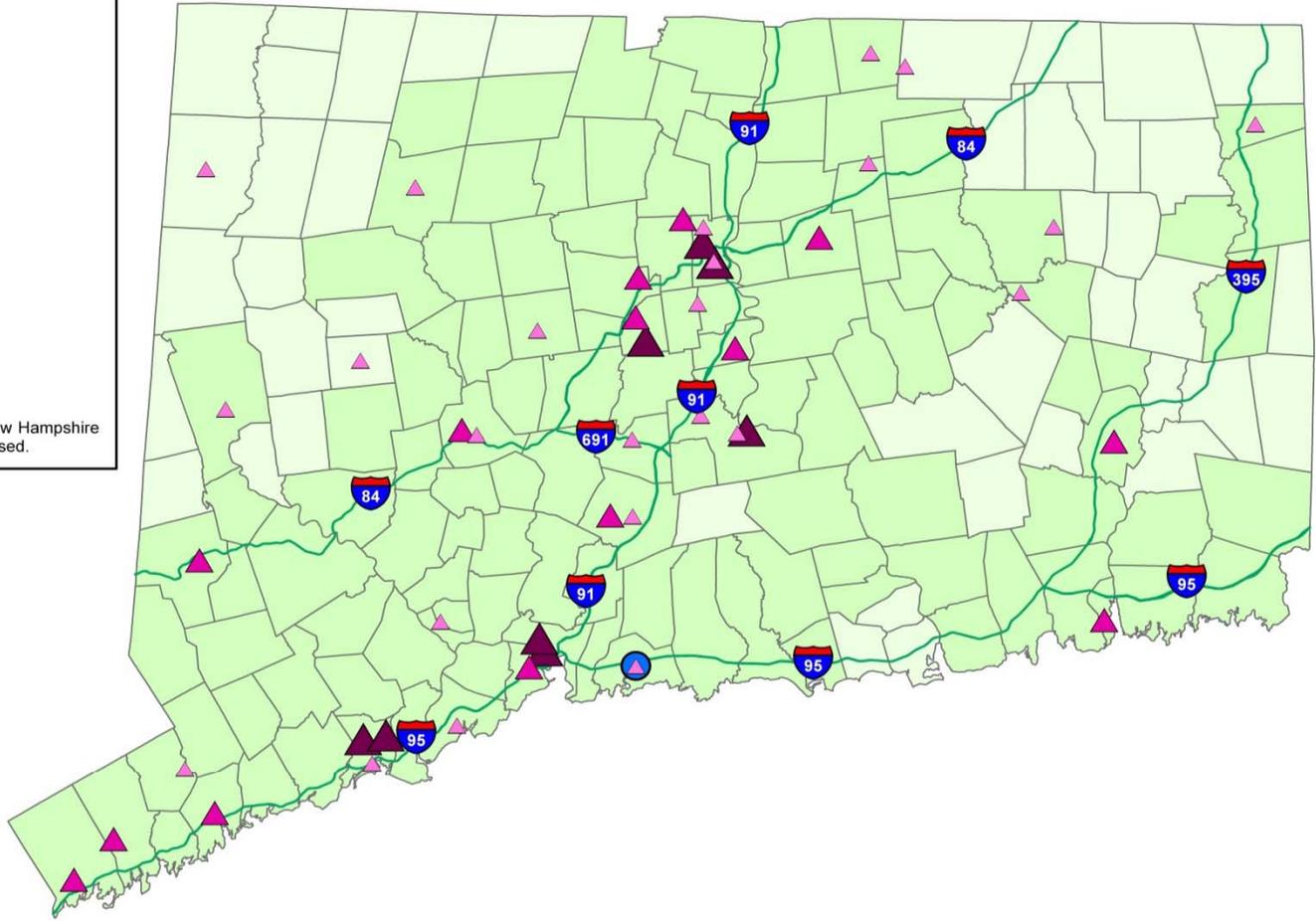
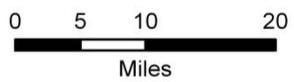
Legend

Hospitals (By Bed Count)

- 0 - 150
- 150 - 400
- 400 - 825
- Has A Fuel Cell

- Interstate
- Areas Served by Natural Gas
- Town Boundary

The sites in this map were selected from the New Hampshire Hostial Association website. All locations were used.



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Sources:
 Mass. Office of Geographic Information
 U.S. Census Bureau
<http://www.altiusdirectory.com/Health/>
 Northeast Gas Association

Map: CT.IH
 Sept. 09, 2011

Potential Hydrogen and Fuel Cell Applications

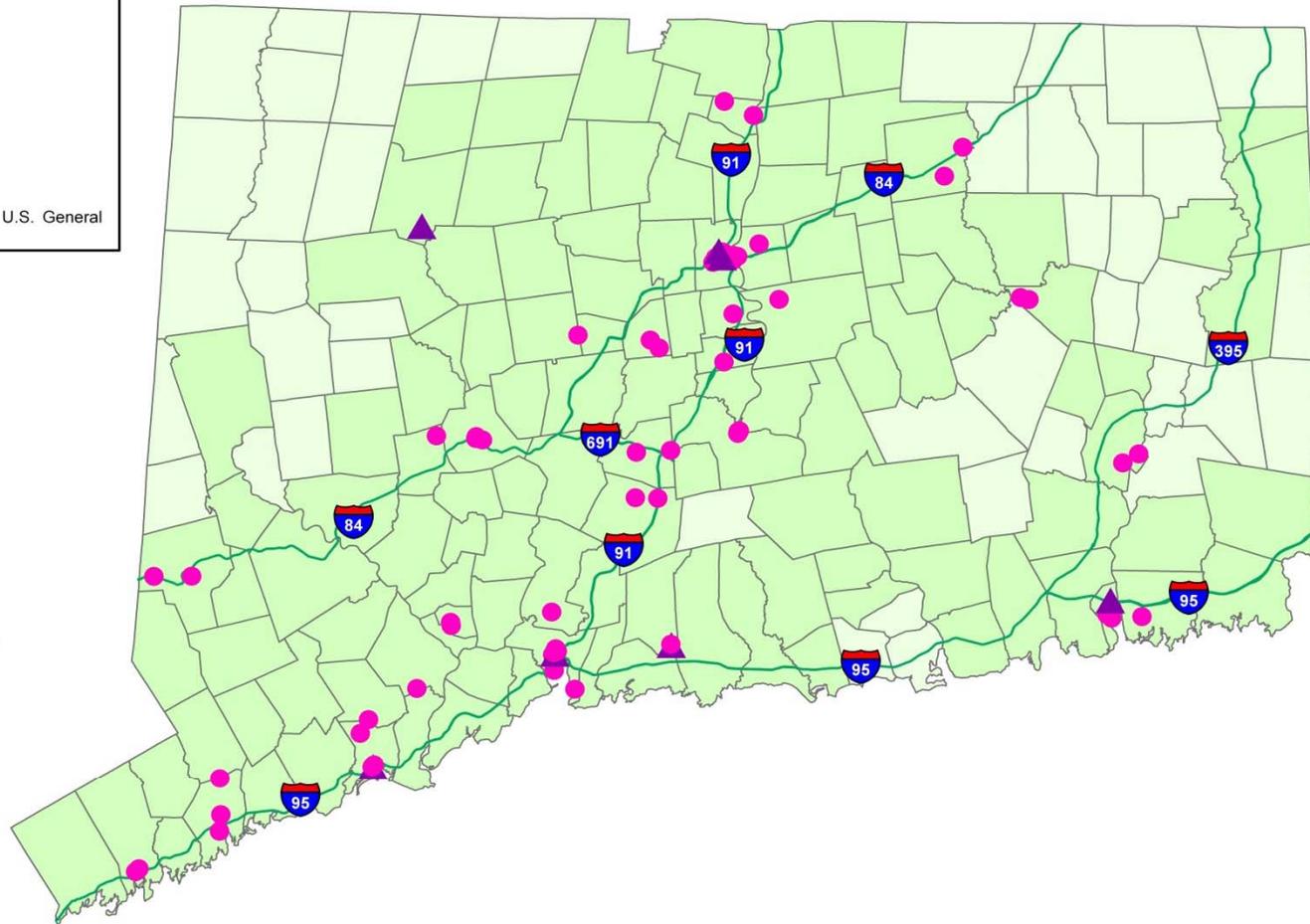
Connecticut: Federal Government Operated Buildings



Legend

- ▲ Owned
- Leased
- Interstate
- Areas Served by Natural Gas
- Town Boundary

The sites in this map were selected from the U.S. General Services Administration database.



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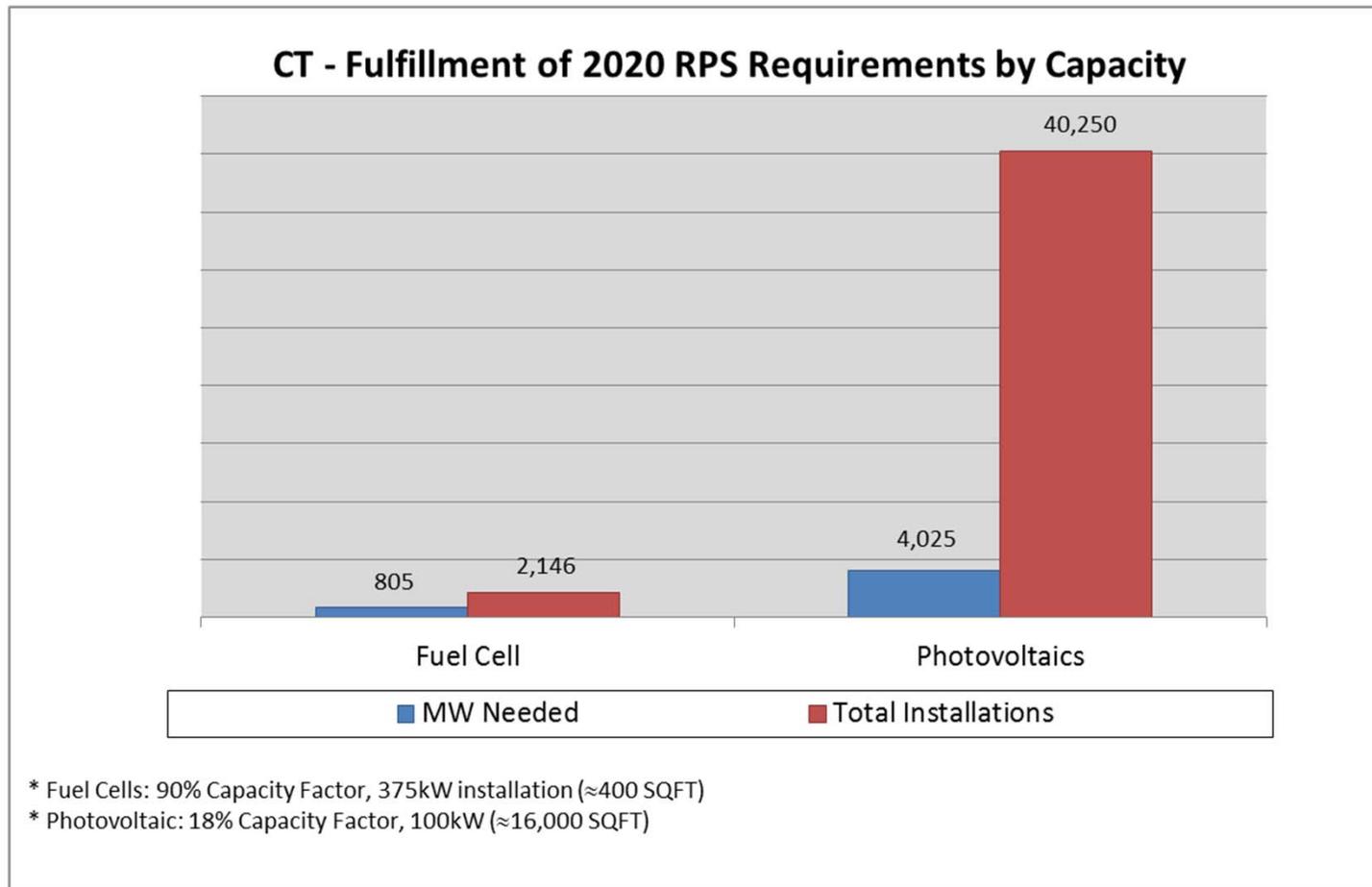
Sources:
Mass. Office of Geographic Information
U.S. Census Bureau
U.S. General Services Administration
Northeast Gas Association

Map: CT.GB
August 18, 2011



Comparative Analysis

Meeting Connecticut RPS





Available Incentives

- State incentives:
 - Capital grant (being phased out)
 - Renewable Energy Credits
 - LREC performance incentive program (2012)
- Federal incentives
 - Federal investment tax credits
 - U.S. Treasury grants in lieu of tax credits (through 2011)
 - Accelerated depreciation (MACRS)



Summary

- Increased efficiency
- Lower energy costs and volatility
- Improved business competitiveness
- Increased manufacturing and employment
- Implementation of public policy
- Improved power reliability and security