Plug Power Inc. Safe Harbor Statement

This communication contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, including but not limited to statements regarding our prospects for growth. We believe that it is important to communicate our future expectations to our investors. However, there may be events in the future that we are not able to accurately predict or control and that may cause our actual results to differ materially from the expectations we describe in our forward-looking statements, including, without limitation, the risk that the anticipated synergies of the Cellex Power Products, Inc. and General Hydrogen Corp. (now amalgamated as Plug Power Canada Inc.) acquisitions are not realized; the risk that unit orders will not ship, be installed and/or convert to revenue, in whole or in part; Plug Power’s ability to develop commercially viable on-site energy products; the cost and timing of developing Plug Power’s on-site energy products; market acceptance of Plug Power’s on-site energy products; Plug Power’s ability to manufacture on-site energy products on a large-scale commercial basis; competitive factors, such as price competition and competition from other traditional and alternative energy companies; the cost and availability of components and parts for Plug Power’s on-site energy products; Plug Power’s ability to establish relationships with third parties with respect to product development, manufacturing, distribution and servicing and the supply of key product components; Plug Power’s ability to protect its Intellectual Property; Plug Power’s ability to lower the cost of its on-site energy products and demonstrate their reliability; the cost of complying with current and future governmental regulations; the impact of deregulation and restructuring of the electric utility industry on demand for Plug Power’s on-site energy products; and other risks and uncertainties discussed under “Item IA—Risk Factors” in Plug Power’s annual report on Form 10-K for the fiscal year ended December 31, 2007, filed with the Securities and Exchange Commission (“SEC”) on March 17, 2008, and the reports Plug Power files from time to time with the SEC. Plug Power does not intend to and undertakes no duty to update the information contained in this communication.
OVERVIEW

Timeline
- Project start date August 2007
- Scheduled end date July 2010

Budget
- Total project funding $8.5 M
  - DOE share $4.25 M
  - Plug Power share $4.25 M
- Funding received in FY07 $46 K
- Funding for FY08 $2.34 M
- Funding requested for FY09-10 $1.6 M
- $250 K added to fund intergovernmental demo with KeySpan in 2008

Barriers
- System efficiency
- System & fuel cell stack direct material cost
- System & fuel cell stack durability

Subcontractors
- Construction Engineering Research Laboratory (CERL)
- Ballard Power Systems (in negotiation)
- KeySpan
OBJECTIVES

❖ To design and produce an advanced prototype PEM fuel cell system with the following features
  • 5 kW net electric output
  • Flex fuel capable – LPG, NG, Ethanol
  • Reduce material and production cost and increase durability
  • Increase electrical efficiency over the current alpha design
  • Increase total efficiency by incorporating combined heat and power (CHP) capability

❖ To show a path to meet long term DoE objectives
  • 40% system electrical efficiency
  • 40,000 hour system / fuel cell stack life
  • $750/ kW integrated system cost (w/ reformer)
APPROACH

- Concept Development (Task 1) - 30% complete
  - Product requirements
  - Technology selection- ethanol evaluation
  - Prototype component and subsystem testing
  - Concept development
    • Go/ No Go  - Concept design review

- System Definition (Task 2) - Work not started
  • System Specifications & requirements flow down
  • Module & component design
  • Module and component latitude testing
  • Go/ No Go  - System interface review

✓ Progress made
APPROACH – CONT.

- System Integration (Task 3) - *Work not started*
  - Prototype system design
  - System design review
  - Prototype system build
  - Integrated system testing
  - System validation testing
  - Go/ No Go – Field readiness review

- Prototype Field Demonstration (Task 4) - *Work not started*
  - Site installation planning
  - Installation and commissioning
  - Field operations and support
  - KeySpan demonstration
  - Decommissioning

- Project Closeout (Task 5) - *Work not started*
  - Post demonstration testing
  - DOE final report
TECHNICAL ACCOMPLISHMENTS
PRODUCT REQUIREMENTS (TASK 1.1)

- Operating environment – Exterior, prime power / intermittent operation, stand alone / grid connected
- 5 kW – net electric output, 48 or 24 VDC / 120 or 230 VAC via aux inverter, LPG / NG or ethanol fuel

- Continuous run applications offer best financial return compared to traditional grid support
- Start / stop cycling PEM fuel cells w/ carbon supported catalysts shorten stack life
A gap analysis was conducted using the GenSys alpha system design as a baseline to develop the scope of work required to advance the design toward the end product goals.

Potential design improvements were listed for each module of the current design and each were evaluated individually on its ability to improve reliability, reduce material cost and improve overall system efficiency. A total of 325 items were evaluated.

The final down selected list included a total of 113 items which became program tasks.

Initiatives are projected to:
- Significantly improve reliability
- Reduce system material cost by approximately 25%
- Increase system efficiency by 4 - 5%
TECHNICAL ACCOMPLISHMENTS
TECHNOLOGY SELECTION (TASK 1.2)

- Total DMC reduction projection:
  - Baseline cost @ Q100 of 100%
  - Estimated DMC based on new design @ Q10K → 40% of baseline (reduction of 2.5X)

- Is this realistic?
  - Functional analyses of sub-systems reveal much room for cost improvement
  - Historical Volume-based Cost Curves support 15% to 25% reductions based on volume and tooling
  - Previous DFMA studies have identified ~10% to 15% savings
  - Alternate Stack: Incorporating an updated stack technology will reduce DMC, warranty and service costs. (Estimated at ~20%)

- Currently Identified Potential Reductions (~80% of Goal)
- Further Reductions Required to meet DMC Target (~20% of Goal)

This is a realistic DMC reduction plan
TECHNICAL ACCOMPLISHMENTS
TECHNOLOGY SELECTION (TASK 1.2)

Alpha Design
DMC Baseline: 100%

STEP 1
25% DMC Reduction
Current DoE Program
• 75% of baseline DMC
• Enclosure optimization (8%)
• Stack Modifications (9%)
• Reduction in part count (5%)
• Purchasing impact (3%)

STEP 2
25% DMC Reduction
• 56% of Baseline
• RPM & PGM Integration (4%)
• BOP and Controls Integration (5%)
• Volume based impact (13%)

STEP 3
15% DMC Reduction
• 47% of Baseline
• RPM & PGM Tooling (6%)
• BOP Tooling (4%)
• Volume based impact (5%)

STEP 4
16% DMC Reduction
• 40% of Baseline DMC
  • Integration (3%)
  • Off-shore volume manufacturing (13%)

• RPM & PGM Tooling & Integration

• RPM & PGM Integration (4%)
• BOP and Controls Integration (5%)
• Volume based impact (13%)
TECHNICAL ACCOMPLISHMENTS
TECHNOLOGY SELECTION (TASK 1.2)

- ASPEN simulation used to predict optimum reformer operating parameters
- Lab tests used to verify analysis

- Stable operation with ethanol fuel was achieved
- ATR outlet composition similar to operation with LPG
- Unable to reach desired operating set points without hardware changes to reformer
TECHNICAL ACCOMPLISHMENTS

TECHNOLOGY SELECTION (TASK 1.2)

- Using the results of the simulation and data from lab tests the cost of energy was compared between ethanol and other fuels.

- Cost per kWhr of ethanol generated electricity is higher than LPG.

- Higher cost is driven by the need for laboratory grade ethanol for compatibility with reforming catalysts.

- Cost advantages exist if automotive fuel grade ethanol could be used however, alternate denaturants would be needed.
Five stack technologies from Plug Power and other industry suppliers were evaluated and compared to the baseline GenSys alpha stack.

Three leading candidates underwent a detailed assessment and system modeling to determine the final choice.

Evaluation criteria:
- Material cost
- Projected life
- Resulting system efficiency
- Service (warranty) cost
- Development effort required

Selected stack will reduce long term DMC by 10%, improve system efficiency slightly and reduce potential warranty costs by 40%.
TECHNICAL ACCOMPLISHMENTS
PROTOTYPE SUB-SYSTEM TESTING (TASK 1.3)

- Internal goal is to minimize hardware change to reformer to allow for ethanol as feedstock
- Only fuel injection added for fuel conditioning prior to ATR reactor

- An ethanol pump and fuel injection system were successfully added to the GenSys fuel conditioning system
- Operating set points updated via control software
- ATR heat exchanger design fixed (same part as NG / LPG)
- Current design is approx. 2X oversized to reach desired ethanol operating point
FUTURE WORK

- **FY2008**
  - Complete prototype component testing of fuel cell stack
  - Conclude concept development activities & exit concept design review phase gate
  - Finalize system specifications and module flow downs
  - Complete prototype system design
  - Pass integrated system design review and exit phase 1 of program

- **FY2009**
  - Build prototype system
  - Perform system level problem identification & design verification tests
  - Conduct field readiness review
  - Complete site planning and system installation
  - Commission prototype system & commence field operation and support

- **FY2010**
  - Complete field operation and support
  - Decommission system
  - Post demonstration testing
  - Project close out
SUMMARY

- Product requirements have been identified and technologies selected to form a system capable of supporting a viable business case for a commercial product.
- Cost model and reduction strategy created that when executed will close the gap between present state and DOE target.
- System modeling & simulation supported by laboratory testing have shown acceptable system performance when operating on ethanol fuel stock.
- Tasks required to optimize operation on ethanol have been identified for future consideration once reforming ethanol becomes economically viable.
- The project has progressed technically to a point where system definition, design and development is possible and will culminate in a field ready prototype in early 2009.
PLUG POWER. PLUG WILL.