

**Danish-American Collaboration on Fuel Cells and Hydrogen  
Final Report to  
The Danish Partnership for Hydrogen and Fuel Cells  
Submitted by  
The Breakthrough Technologies Institute  
Washington, DC  
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**Summary**

Breakthrough Technologies Institute, Inc. (BTI) and The Danish Partnership for Hydrogen and Fuel Cells (Partnership) entered into an agreement in March 2011, designed to educate the members of the Partnership and other Danish companies on commercial and pre-commercial activities and opportunities in the United States. BTI also agreed to help Danish companies identify pathways to successful activity in the U.S., and to suggest techniques to overcome challenges the companies might face. Finally, BTI agreed to introduce Danish companies to potential collaborators in the U.S. Activity under this agreement commenced in March 2011, and continued through the balance of 2011.

BTI prepared a comprehensive report, *Fuel Cell Collaboration in the United States*, along with numerous appendices, and offered suggestions for a web portal to make the information universally accessible. BTI also facilitated meetings during the 2011 Fuel Cell Seminar and Exposition, including a meeting with the manager of the U.S. Department of Energy's fuel cell program and her senior staff.

A planned study tour to other U.S. cities was postponed indefinitely at the request of the Partnership. Study tour expenses were not included in the project budget, but there were savings in labor hours totaling \$4,752.99. (See page 6.) BTI will establish a customer account and hold these funds until the fourth quarter of 2012 when we will prepare a detailed update of the U.S. fuel cell research budget and review the entire report, making updates where appropriate.

**Project Discussion**

Denmark has strong technological competencies in the field of hydrogen and fuel cells. The Danish Partnership for Hydrogen and Fuel Cells supports development of Danish-based hydrogen and fuel cell technologies that have domestic and international commercial applications. The Partnership also seeks opportunities that will assist Denmark in assuming a leading role in the global hydrogen and fuel cell technology field.

The Partnership and BTI, a U.S. based nonprofit organization familiar with the U.S. fuel cell and hydrogen industries, launched a project in March 2011 designed ultimately to identify potential collaborators among U.S. stakeholders in industry and government, in areas of research, development, demonstration, pre-commercial or commercial activities.

The program outcomes included a **written report** on potential collaboration opportunities, limitations, means of access to U.S. companies and government agencies; an **on-line portal** linked to BTI's own fuel website, [www.fuelcells.org](http://www.fuelcells.org); and **outreach** to selected companies and government agencies via personal contact and meetings in the United States with focus on hydrogen and fuel cell opportunities. A **final report** identifies accomplishments, lessons learned and next steps.

A. Report: *Fuel Cell Collaboration in the United States*

1. Detailed Planning and Review

- a. BTI staff met with the Partnership staff and members to develop a detailed study outline.
- b. BTI developed and conducted a written survey for Partnership members, and used the collated results in targeting the study to areas most relevant to the members.
- c. BTI staff met with Partnership staff to review the plans in May, at the fuel cell conference in Vancouver.

2. Research, Writing and Report Preparation

- a. Based on the outcome of the planning process, BTI developed a written report and analysis of potential collaboration opportunities, limitations, and means of access to U.S. companies and government agencies.
- b. The report presented major federal and state programs and policies related to fuel cells and hydrogen, including incentives, R&D, renewable energy portfolio requirements and similar regulatory concessions, grants, financial incentives and tax policies.
- c. The report included an analysis of current and future prospects for these programs, including political, budgetary, and other risks the programs may face in the near term.
- d. BTI assessed applications and incentives with significant opportunities for Partnership members, and provided a list of U.S. companies, research institutions and universities, and public sector agencies that could be approached for collaboration, joint research, product development and market access for Danish companies.
- e. BTI identified U.S. federal and critical state programs that might provide financial or nonfinancial incentives and participate in public-private partnerships, and identified requirements or restrictions to non-U.S. entities' participating in U.S. programs.
- f. Numerous appendices discussed aspects of the report in greater detail.

3. Presentation and Assessment

- a. BTI Staff presented a draft in June to Partnership staff and used the feedback to improve the final version.
- b. BTI Staff presented the final report to a meeting of the Partnership in Copenhagen, and suggested areas where regular updating might be of particular value.
- c. BTI also asked for guidance on next steps, including direct discussions with potential U.S. government financing agencies and research and commercial partners.

## On-Line Information

1. BTI outlined a web-based information portal for the Partnership designed to provide flexible and easily updatable access to the information contained in the report.
2. After discussion, the Partnership assumed responsibility for hosting the portal.

### B. Outreach Activities

1. Adhering to the Partnership's recommendation, it was determined to arrange meetings at the Fuel Cell Seminar in November 2011 rather than engage in a multi-city tour.
2. BTI set up a networking activity for Danish companies on the eve of the Seminar and set up and attended a luncheon for the Partnership with the program manager of the U.S. Department of Energy fuel cell program and her senior staff. The primary topic was the rigor of U.S. contracting requirements for research institutions.
3. BTI made other connections informally for Partnership members.

### C. Final Report

1. BTI prepared this final report with lessons learned and proposed next steps.

## Conclusions and Lessons Learned

BTI believes that - despite U.S. budget pressures - opportunities remain in RD&D, product development, and in the marketplace. Both private and government markets exist today for products that improve performance of incumbent technologies, increase durability, facilitate commercialization, and reduce costs. It was the sense of the Partnership, however, that declining U.S. research budgets would narrow opportunities for collaboration at least in the short term.

BTI believes the best short-term opportunities are in the areas of:

- fuel cell cost reduction strategies;
- cost reduction or innovative deployment and financing for hydrogen fueling technologies;
- multi-fuel reforming for military and civilian markets;
- low-cost renewable hydrogen generation;
- RD&D focused on SOFCs, an interest area of the U.S. Department of Energy;
- portable power, especially U.S. Department of Defense applications; and
- micro-CHP cost reduction.

BTI recommends that Danish companies interested in entering the U.S. marketplace pursue U.S. visibility and networking opportunities. Federal and state government officials are generally open to networking and it is important to be seen as active in the U.S. industry. Methods of increasing visibility include responding to federal Requests for Information and Funding Opportunity Announcements; meeting with the private sector; joining organizations that offer opportunities to meet and interact with government, business and academia; and participating in industry webinars, conferences and workshops.

Ideally Danish companies would develop one or more vendor or subcontractor relationships with a U.S. university or a company that knows the markets and can provide access. Partnering reduces barriers for non-U.S. companies in competing for federal or state funding opportunities. A physical U.S. presence is a key factor in winning government contracts.

## Next Steps

BTI has identified several opportunities for future collaboration with the Danish Partnership:

1. *Regular updates*

BTI can provide regular (quarterly, semi-annual, annual) updates and analysis of the programmatic and industry impact of federal budget and spending decisions and identify potential financing opportunities from federal and non-federal sources.

2. *Introductions and relationship building*

BTI has extensive contacts within the hydrogen and fuel cell industry (U.S. and worldwide), as well as with state and local government officials. BTI can facilitate targeted one-on-one introductions and meetings for the members of the Danish Partnership. BTI could help companies team with U.S. organizations bidding for federal or state projects and funding, fostering collaborations by arranging introductions and meetings. Partnering with a U.S.-based entity would improve the odds of attaining federal project funding and would raise the profile of Danish Partnership members within the U.S. government.

3. *Raise the profile of the Partnership and Danish companies via media and opinion leader outreach.*

BTI can help raise the profile of the Danish Partnership and Danish companies in the U.S. , via case studies, articles and press releases and collaboration on reports. BTI has contacts in print and internet media, a newsletter of 12,000 circulation and access to opinion leaders. BTI also can represent the Danish Partnership at U.S. conferences. BTI staff can speak at conferences about the Partnership, its competencies and activities, or could staff a booth presenting information about Partnership members. BTI can represent the Danish Partnership as a member of the U.S. Fuel Cell and Hydrogen Energy Association (FCHEA) should the Partnership choose to join.

4. *Staff exchange.*

BTI can host Partnership staff or one or more members during an extended working visit in the U.S. This would present the Partnership an opportunity to learn, in a concentrated way, about the U.S. fuel cell and hydrogen industry. BTI can facilitate introductions, meetings and phone conferences with federal and state government officials; with members of hydrogen and fuel cell partnerships; with research centers and universities; and with hydrogen, fuel cell and component manufacturers. The visitors would operate from BTI's office space.

BTI would benefit from a similar exchange for one of its staff, who could develop a detailed understanding of the Partnership and its members, governmental policies and practices, and the Danish hopes and desires for leadership in fuel cells and hydrogen.

5. *BTI can be a federal or state contractor or sub-contractor or facilitate relationships.*

As a U.S. nonprofit organization, BTI can bid as a main contractor or sub-contractor on a federal government contract, in partnership with one or more Danish companies.

6. *BTI can become a "home base" for Danish companies wishing to establish a U.S. presence.*

Companies pursuing business opportunities in the U.S. could establish a legal U.S. presence using BTI's capability and office space.

We believe the work done to date has had value for both BTI and the Partnership and look forward to a continuing relationship as Danish industry pursues its leadership role in fuel cells and hydrogen.

## Financial Report

The project carried an \$80,000 budget including \$10,000 in expenses and approximately \$70,000 for staff. The budget did not include funds for travel to the Seminar or other U.S. cities. BTI reallocated a small portion of the staff budget to cover expenses at the Seminar. Approximately \$4,750 remains unspent, the result of the decision to forego a multi-city tour.

BTI and the Partnership have agreed that these funds will be held on account at BTI to finance an update of the U.S. fuel cell research budget. A decision on the FY 2013 fiscal year budget will be made in the 4<sup>th</sup> Quarter of 2012. We have agreed that the target for an update will be December 31, 2012, with a deadline of no later than January 15, 2013.

<b>Project Costs</b>			
	<b>Actual</b>		<b>Budget</b>
	<b>Hours</b>	<b>Total</b>	<b>Total</b>
Bill Vincent	97	\$ 10,670.00	
Elizabeth Delmont	47	\$ 1,323.52	
Jennifer A Gangi	68.5	\$ 4,026.43	
Ryan W Skukowski	146	\$ 5,590.34	
Sandra E. Curtin	241.75	\$ 11,616.09	
Robert Rose	139	\$ 30,580.00	
<b>Total labor cost</b>	<b>726.25</b>	<b>\$ 63,806.38</b>	\$ 70,021.00
<b>Travel Expense</b>			
	<b>Air Fare</b>	\$ 6,181.51	
	<b>Hotels</b>	\$ 2,752.16	
	<b>Meals &amp; Ent</b>	\$ 1,648.77	
	<b>Parking Fees</b>	\$ 225.07	
	<b>Taxi Cab &amp; Trains</b>	\$ 633.12	
<b>Total Travel Expense*</b>		<b>\$ 11,440.63</b>	\$ 10,000.00
<b>TOTAL EXPENSES</b>		<b>\$ 74,587.01</b>	
<b>Contract Total</b>		<b>\$ 80,000.00</b>	
<b>Balance to be held on account</b>		<b>\$ 4,752.99</b>	

\*A small portion of money budgeted for labor was reallocated to cover expenses of travel to the Fuel Cell Seminar.