

Testimony of

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before

Transportation Committee

March 11, 2009

regarding

Senate Bill No. 1094

An Act Concerning Hydrogen Refueling Stations

*The Connecticut Center for Advanced Technology, Inc. ("CCAT") offers this testimony in support of Senate Bill 1094 - An Act Concerning Hydrogen Refueling Stations.*

The Connecticut Center for Advanced Technology, Inc. (CCAT) is a nonprofit corporation that provides services and resources to entrepreneurs and businesses and, through collaboration with industry, academia, and government, helps companies innovate and compete in the global market. CCAT implements programs that improve the economic competitiveness of the region through solutions that lower energy costs and increase long-term energy reliability. CCAT undertakes energy planning, and promotes renewable energy, including advanced technologies and sustainable fuels such as hydrogen. CCAT, in partnership with the Department of Economic and Community Development (DECD), the Department of Transportation, the Connecticut Hydrogen-Fuel Cell Coalition, and the Renewable Energy Investment Fund, developed the state's Plan for Fuel Cell Economic Development (Hydrogen Roadmap). This Hydrogen Roadmap was accepted by DECD and submitted to the General Assembly on February 4, 2008.

*The establishment of a program to identify locations and provide hydrogen refueling along the Merritt Parkway and other state highways is consistent with the goals for Connecticut identified in the state's Hydrogen Roadmap.*

The state's Hydrogen Roadmap identified the following goals:

- Attract automobile and bus companies to demonstrate and deploy hydrogen-fueled vehicles in Connecticut;
- Accelerate commercial readiness and commercial deployment of hydrogen-fueled vehicles with emphasis on fuel cell vehicles in Connecticut;
- Reduce controlled pollutant and greenhouse gas (GHG) emissions, reduce noise, and increase energy security and efficiency;

- Retain and expand jobs associated with production of vehicles, fueling stations and infrastructure products including component sub-assemblies, original equipment manufacturing and long term product support; and
- Position Connecticut to capture federal and other grant funding for research, development, demonstration and deployment of hydrogen infrastructure and fuel cell vehicles.

*The development of hydrogen refueling stations will promote the development and use of fuel cell vehicles and hydrogen consistent with state and federal policy.*

On February 2, 2009, Governor Rell issued Executive Order 23 that requires the Commissioner of the Department of Transportation, in consultation with the Commissioners of Economic and Community Development and Administrative Services, to develop a plan to implement a green transportation corridor along Connecticut's major state highways, including the use and distribution of alternative energy sources such as hydrogen. In addition, the U.S. Department of Transportation (USDOT) has issued a plan for development and demonstration of fuel cell buses.<sup>1</sup> This plan has established a goal to have ten percent of transit bus purchases be hydrogen fuel cell buses in 2015.<sup>2</sup>

The establishment of a hydrogen refueling program for Connecticut would complement efforts by vehicle manufacturers, fuel cell manufacturers and hydrogen equipment infrastructure manufacturers to develop and demonstrate the functional, cost, durability and reliability capabilities of hydrogen infrastructure and hydrogen-fueled vehicles.

The advantages of hydrogen-fueled vehicles are many:

- no emissions of controlled pollutants such as nitrous oxide, carbon monoxide, hydrocarbon gases or particulates;

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<sup>1</sup> U.S. Department of Transportation. 2005, "Research, Development, Demonstration and Deployment Roadmap for Hydrogen Vehicles & Infrastructure to Support a Transition to a Hydrogen Economy"

<sup>2</sup> Sisson, Barbara A. "Hydrogen and Fuel Cell Bus Initiative, Paving the Way Nationally and Internationally", U.S. Department of Transportation, Federal Transit Administration

- substantial (30 to 50 percent) reduction in GHG emissions on a well-to-wheel basis compared to conventional gasoline or gasoline-hybrid vehicles when the hydrogen is produced by conventional methods from natural gas;
- no GHG emissions on a well-to-wheel basis when the hydrogen is produced from renewable or nuclear energy sources or when generation from hydrocarbon sources is accompanied by carbon capture and sequestration;
- ability to fuel vehicles with indigenous energy sources which reduces dependence on imported energy and adds to energy security;
- quiet operation; and
- operation with well-to-wheel efficiencies that are 300 percent higher than conventional vehicles and 50 to 70 percent higher than current gasoline-hybrid vehicles.<sup>3,4</sup>

*Connecticut companies are currently involved with the development, demonstration, and commercialization of products and services for hydrogen fueled transportation.*

Connecticut hydrogen companies have expertise covering the entire range of hydrogen generation and distribution. These products include: electrolysis systems to convert water to hydrogen fuel; fuel reformers for on-board conversion of conventional fuels to hydrogen fuel; combined heat, power, and hydrogen production; and the infrastructure to produce and deliver hydrogen for transportation use. In addition to these original equipment manufacturers, over 40 Connecticut companies are involved with the production of components or provision of services in this field.

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<sup>3</sup> “Challenges for Sustainable Mobility and Development of Fuel Cell Vehicles”, Masatami Takimoto, Executive Vice President, Toyota Motor Corporation, January 26, 2006. Presentation at the 2<sup>nd</sup> International Hydrogen & Fuel Cell Expo Technical Conference Tokyo, Japan

<sup>4</sup> “Twenty Hydrogen Myths”, Amory B. Lovins, Rocky Mountain Institute, June 20, 2003

## *Conclusion*

The Connecticut Center for Advanced Technology is supportive of this Bill that would establish a hydrogen refueling stations along the Merritt Parkway and other state highways to serve fleets and transit district vehicles powered with hydrogen. Hydrogen refueling stations would provide a renewable fuel to improve energy efficiency, reduce consumption of imported oil, improve environmental performance, and enhance near-term and long-term economic development. The development of hydrogen refueling stations would also provide the infrastructure needed to attract additional automobile and bus companies to demonstrate and deploy hydrogen-fueled vehicles in Connecticut. The use of hydrogen-fueled vehicles would accelerate the commercial deployment of hydrogen technology and provide jobs and economic benefits to the state of Connecticut.

Having developed the Hydrogen Roadmap on behalf of the state, CCAT is uniquely qualified and well staffed with the technical expertise to identify appropriate locations for hydrogen fueling at appropriate pressures and volumes needed to support hydrogen-fueled vehicles. CCAT looks forward to working with the Connecticut Department of Transportation, the hydrogen and fuel cell industry, and other interested stakeholders to expeditiously deploy hydrogen refueling stations in the state.

CCAT will make itself available to the Committee and legislature upon request to provide or clarify information in the state's Plan for Fuel Cell Economic Development or to assist in the refinement of this legislation. CCAT would be pleased to be considered a resource to assist in the development of a hydrogen refueling program.

Respectfully submitted,

CONNECTICUT CENTER FOR ADVANCED TECHNOLOGY, INC.

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