

National Hydrogen Association

The National Hydrogen Association applauds the leadership New York State is taking in the development, implementation, and periodic review of a sensible comprehensive energy plan. This will enable the State to determine its future energy needs and facilitate a deliberate, efficient, and cost-effective means of meeting those needs. While the Draft Scope of the 2009 New York State Energy Plan does provide for a focus on many important energy issues, the plan has left out a very important element for the future of New York and the rest of the nation's energy needs: hydrogen.

Hydrogen can be made from a wide variety of feedstocks including water and biomass to coal, or using electricity to electrolyze water, steam reform natural gas, or thermal energy from nuclear power or even solar sources. It can be 100% domestically produced, has almost no emissions at its end uses, and promises considerably greater energy efficiency in vehicle and stationary power applications, particularly when used in fuel cells. Its uses are almost limitless; it can be used in any energy market, including fueling transportation vehicles, powering residential or commercial buildings, charging portable power applications and possibly more significant hydrogen can improve the utilization of renewable energy resources. By producing hydrogen from renewable resources, it can be used to store excess energy during off-peak times for later use. Early market adoption for hydrogen has begun in materials handling equipment, like fork lift trucks in large warehouse and manufacturing centers, and in stationary, backup and consumer portable electrical power.

The next stage of commercial use is likely in municipal bus and delivery van fleets, and then to light duty vehicles beginning in fleets. Early use will likely occur in urban areas where services demands are most highly concentrated. Unlike biofuels, federal tax incentives for fueling infrastructure and fuel use have not been made available, but are under consideration by the Congress and in several states (there are investment tax credits for fuel cells).

New York State has previously funded hydrogen research and demonstration projects through NYSERDA and NYPA, and a "Hydrogen Energy Roadmap" was developed by the state in conjunction with the National Hydrogen Association in 2004. Great strides are being made such as the hydrogen fueling station soon to be installed at the Albany airport, the hydrogen from hydropower demonstration projects at Niagara Falls, or the 4.8 MW of power hydrogen fuel cells will be providing at the rebuilt World Trade Center, or the biogas fuel cells in Central Park. While these first steps show New York's leadership in the energy sector, continued funding is needed in order reach the full potential that hydrogen provides.

Hydrogen has been manufactured for decades by the millions of tons as an industrial chemical-used in upgrading crude oils in petroleum refineries, and in making fertilizers, metal refinishing, and in scientific and space application, but greater strides must be taken. In a search for long term, sustainable alternatives to a hydrocarbon-based energy economy, hydrogen (H₂) offers many opportunities. Transforming both supply and demand for energy, a Hydrogen Economy (H₂E) is a family of advanced technologies that need to be deployed in concert to realize their many strategic, environmental, efficiency and economic benefits. H₂ used in fuel cells to make electricity is free of pollutants and carbon dioxide. Direct combustion of hydrogen and blends with biofuels in internal combustion engines (ICEs), for instance, lowers emissions and helps build technical and supply bridges to more advanced configurations. To replace half of the light duty vehicle fleet in the U.S. by 2050, for instance, with electric drive hydrogen fuel cell vehicles (FCVs) would require dedicated domestic production of about 50 million tons per year (Mt/yr) of H₂, compared to the 43 Mt/yr now used worldwide. This could result in eliminating over 2/3 of

today's petroleum imports to the U.S., and a sizable share of U.S. carbon emissions. In the absence of large scale demand and supply, these policies help mobilize private capital today, based on the concept that as markets grow, economies of scale will emerge and drive down the cost of alternative fuels-eventually bringing along newer, superior fuels (like cellulosic ethanol or hydrogen) and overcoming the need for subsidies and market intervention. Timing and intensity of government action is critical to shaping and building enduring markets.

The National Hydrogen Association and its 110 members, many of which have large interests in New York including New York Power Authority, General Motors, BP, Chevron, Shell, Praxair, Linde, HydroGen LLC, Plug Power, American Wind Power & Hydrogen and more encourage the New York Energy Planning Board to include hydrogen within the scope of its energy plans. The NHA Board of Directors is comprised of over twenty of the nation's companies including oil and energy, industrial gas, utilities, and nine companies on our Board of Directors are currently involved with hydrogen projects in New York State based on NYSERDA funding. Our members are prepared to provide detailed information about the needs of hydrogen R&D, commercialization pathways and its importance to New York to the Energy Planning Board if the Board is so inclined. We will be available at your convenience.