

November 30, 2010

The Honorable Steven Chu
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Secretary Chu:

On behalf of the Midwestern Governors Association, I submit the following comments in response to the U.S. Department of Energy's (DOE's) draft version of its *2010 Hydrogen and Fuel Cell Program Plan*. Thank you for the opportunity to comment on this well conceived document.

Many Midwestern states have robust hydrogen and fuel cell industries—some manufacturing the fuel cells themselves, some participating in the supply chain, others heavily involved in fuel cell and hydrogen research and development, and still others have enormous hydrogen production potential from renewable and low-carbon energy sources. Thus, the Midwest has a strong stake and interest in the direction the DOE proposes to take its hydrogen and fuel cell program in the coming years.

The MGA would like to highlight a few areas in DOE's proposed document where we hope you will reconsider your approach:

Hydrogen Storage. The draft document continues to emphasize the lack of an adequate hydrogen storage technology, stating that "advanced storage systems will be required," and that compressed hydrogen storage tanks "are heavier and take up more space than conventional fuel tanks." While the latter is true, we would propose that this is not the appropriate metric by which to compare vehicle and fuel options. The standard should be the *total space for all equipment*, not a component-by-component comparison with existing technology. For example, unlike conventional vehicles, fuel cell electric vehicles (FCEVs) do not require a bulky transmission or a catalytic converter. Indeed, the total on-board volume for a hydrogen tank, the fuel cell system and a peak power battery on a FCEV will be less than the space occupied by even an advanced lithium-Ion battery pack on a battery electric vehicle (BEV). Since it seems unlikely that the DOE will require a significant reduction in battery volume before pursuing BEVs, the proposed plan could, instead, use "total volume for all equipment" as the performance metric.

Vehicle Range. The proposal does not seem to acknowledge that DOE lab engineers have validated that the Toyota Highlander FCEV (which Toyota calls the FCHVadv) has achieved a range of 431 miles under on-road conditions. Instead, the draft document quotes a maximum FCEV range of 254 miles from the National Renewable Energy Lab's "learning demonstration" program. The MGA would like to understand the rationale for using the lower number.

Hydrogen Infrastructure. The proposed plan acknowledges that six companies (Daimler, GM, Honda, Hyundai, Proterra and Toyota) have announced plans to commercialize FCEVs before 2015, and that other countries are planning aggressive hydrogen infrastructure and FCEV deployments. This includes Japan's plans to deploy 1,000 hydrogen fueling stations and 2 million FCEVs by 2020 and Germany's plans to deploy 1,000 hydrogen fueling stations by 2017.

The draft document also states that DOE will monitor and coordinate hydrogen infrastructure activities in the field. Then, the plan goes on to say that "...large-scale establishment of hydrogen infrastructure will involve a partnership with industry and other agencies such as DOT [U.S. Department of Transportation], and will occur beyond the scope of the RD&D [research, development and deployment] program." Additional clarification on what this means in practice would be greatly beneficial.

Establishing a robust hydrogen refueling infrastructure will require a partnership that includes industry and other state and federal agencies. However, the MGA hopes the sentiment expressed above does *not* mean that DOE will stop using its hydrogen and fuel cell program to continue partial funding of hydrogen infrastructure in a thoughtful and coordinate way. This will be essential to making continued progress toward commercializing FCEVs, especially as automakers prepare to manufacture significant numbers of fuel cell electric vehicles by 2015.

As you may know, McKinsey & Company has released a comprehensive report for the European Union (EU) on fuel cell electric vehicles. Among their conclusions are the following:

1. FCEVs are ready for commercialization now; and that battery-electric vehicles will be limited to short range, small vehicles, while FCEVs can achieve the same range and performance as today's medium and large internal combustion engine vehicles.
2. FCEVs will eventually cost less than BEVs in terms of total operating costs;
3. Installing a EU-wide electrical charging network will cost more (500 billion Euros) over the next 40 years than installing a hydrogen infrastructure (100 billion Euros over the same time period.): The report notes, "A dedicated hydrogen infrastructure is therefore justified and doable."
4. While the McKinsey & Company analysis focuses on Europe, the technology and cost assessment is applicable worldwide –and the policy conclusions are relevant to the U.S., especially since our country has an even greater percentage of medium and heavy-duty vehicles and we drive longer distances.
5. Long lead times make it "a matter of urgency" that governments adopt programs to support vehicle sales and infrastructure in the early years.

Again, while McKinsey & Company's findings are tailored to Europe, we believe the federal government should take the same clear-eyed look at the costs and benefits of each of the most promising vehicle-fuel combinations and pursue them in tandem for a set period of time and then let the market decide which are the best options for particular market segments.

Where fuel cell electric vehicles and hydrogen are concerned, this would mean investing in hydrogen infrastructure in key locations to prove out the commercial readiness of fuel cell electric vehicles.

In October of 2009, Midwestern governors adopted their *Midwestern Energy Infrastructure Accord* (Infrastructure Accord). In addition to other agreements, the Infrastructure Accord calls for the deployment of low-carbon refueling infrastructure across the region that would include biofuels, electricity, hydrogen and potentially other fuels. The MGA would like to have the DOE as a partner in making this infrastructure a reality in order to reduce our dependence on overseas oil and the geopolitical entanglements and high costs it imposes. A copy of the document can be found at <http://www.midwesterngovernors.org/Publications/InfrastructureAccord.pdf>.

Thank you for your consideration of our comments regarding DOE's *Hydrogen and Fuel Cell Program Plan*. Midwestern governors look forward to working with you and your staff as you work to finalize the document. I hope our submitted comments will be of assistance and I look forward to hearing from you and your staff shortly on how we can work together on our similar interests. Should you require any further assistance, please contact me at jheier@csg.org or 202-624-5460.

Sincerely,



Jesse Heier
Washington Director
Midwestern Governors Association