



Comments on Transportation and Climate Initiative Framework for a Draft Regional Proposal

February 27, 2019

The Fuel Cell and Hydrogen Energy Association (FCHEA) appreciates the opportunity to provide comment on the “Draft Memorandum of Understanding of the Transportation and Climate Initiative” issued on December 17, 2019. FCHEA represents leading companies and organizations that are advancing innovative, clean, safe, and reliable energy technologies. FCHEA’s membership includes the full global supply chain of the fuel cell and hydrogen technology landscape.

FCHEA supports TCI’s intent to invest in projects that will address the mounting issue of carbon dioxide and other greenhouse gas emissions that stem from the transportation sector and hopes that hydrogen infrastructure and zero-emission fuel cell vehicles (FCVs) will be incorporated into the final TCI programs developed by the states and jurisdictions active in this process. Hydrogen infrastructure and FCVs will be critical components to addressing the future environmental and economic needs of the Northeast and Mid-Atlantic states.

Fuel cell vehicles (FCVs) are electric vehicles. Rather than storing electricity from the grid in a battery, FCVs combine oxygen from the air with hydrogen fuel to generate electricity on board the vehicle to power an electric motor, with the only tailpipe emission being water vapor. FCVs are the only zero-emissions vehicle (ZEV) platform now, or for the foreseeable future, that replicates today’s drivers experience of being able to travel 300-400 miles on a tank of hydrogen fuel and refuel in 3-5 minutes. In other words, fuel cell vehicles offer Northeast and Mid-Atlantic drivers the option of zero emissions with zero compromise.

In just the few short years of availability, today there are more than 8,000 light-duty FCVs operating in California offered by Toyota, Honda, and Hyundai, with more automakers planning to enter the marketplace in the near-future. Across the country, fuel cells are being used in more than 30,000 forklifts, dozens of buses, and several demonstrations of Class 8 trucks. Due to the scalability of fuel cells, several hard-to-decarbonize markets such as medium- and heavy-duty vehicles, aviation, and maritime applications are looking to fuel cells as a zero-emission alternative for their power needs. To enable deep-decarbonization and emission reduction across the entire transportation sector, it is critical that hydrogen and fuel cells are included among policy options.

The Executive Summary for a U.S.-focused report by McKinsey & Company was recently published that discusses a variety of ways that hydrogen can help decarbonize the transportation sector and other markets in the United States over the coming decade. This report, Road Map to a US Hydrogen Economy, details a number of key findings that TCI should consider:

- By 2030, the hydrogen industry has the capability of generating \$140 billion for the U.S. economy and providing 700,000 American jobs.
- By 2050, the hydrogen industry has the capability of reducing 16% of the CO₂ and 36% of NO_x emissions in the United States and account for 14% of the country’s total energy demand.
- By 2030, the fuel cell industry has the capability of reaching 1,200,000 FCV sales, 4,300 hydrogen fueling stations, and \$8 billion in annual investments in the United States.

- On a total cost of ownership (TCO) basis, FCVs could break even between 2025 and 2030 with the cost of internal combustion engine (ICE) vehicles in applications requiring high uptime and fast fueling, and they already cost less than battery electric vehicles (BEVs) as forklifts and in fast charge applications above 60 kW.
- The U.S. has a large long-haul trucking industry compared with other markets, with about 180 billion miles travelled per year. On average, Americans drive more than 12,000 miles per year per vehicle – nearly twice as far as people in other developed countries. Buyers’ vehicle choices reflect this need for long-distance capability, as sport utility vehicles (SUVs) and crossover vehicles have a projected sales growth of 1 percent per year in the next decade, while a 1 percent decline is projected for passenger cars. Such long distances and preferences for large vehicles favor FCVs over BEVs.

The Executive Summary of the report is available online at www.ushydrogenstudy.org and the full report will be made available in early 2020. We urge the TCI to take strong consideration of this report as it develops its policies for the coming years.

FCVs can play an integral role in achieving the goal of zero-emission electrified transportation. Many of the states signing onto the Draft TCI MOU are also signatories to the ZEV MOU, collectively agreeing to commit to at least 3.3 million ZEVs on their roadways by 2025. Several of the states have also adopted California’s emissions standards requiring automakers to sell ZEVs.

The California Air Resources Board, the agency charged with oversight of the state’s ZEV program, has stated that “successful market launch and continued growth of both FCVs and California’s hydrogen fueling network are essential for the State to meet zero-emission vehicle goals set forth in Governor Brown’s Executive Order B-16-2012 as well as greenhouse gas reduction, air quality improvement, and petroleum reduction goals set forth in state and federal laws and programs.”¹ To this end, California has provided robust policy, regulatory, and financial support for the deployment of FCVs and related hydrogen refueling infrastructure. This policy and regulatory action can be taken as a model for TCI states and jurisdictions as plans are developed to expand electrified and zero-emission vehicle adoption.

Hydrogen is an environmentally friendly fuel. Hydrogen-powered fuel cell vehicles generate zero carbon, NO_x, SO_x, or particulate matter emissions from the tailpipe. On a well-to-wheels basis, no matter the source of hydrogen, FCVs dramatically reduce emissions compared to combustion vehicles and are on par in reductions with BEVs.² When hydrogen is generated from renewable or low-carbon sources – such as wind, solar, biomethane, or natural gas with carbon capture and sequestration – carbon emissions are nearly eliminated. A June 2019 report by the International Energy Agency (IEA), [The Future of Hydrogen](https://www.iea.org/reports/the-future-of-hydrogen), details that due to the declining cost of renewable electricity, producing renewable hydrogen could fall by 30% by 2030.³ The IEA report also provides a wealth of data and assumptions that could help inform TCI modeling.⁴

Just as the electric utility grid adopts more renewable power generation to become cleaner, so too is hydrogen production. In fact, in September 2018 the Hydrogen Council, a global CEO coalition of fuel cell and hydrogen companies, announced an ambitious goal of fully decarbonizing hydrogen fuel for

¹ https://ww2.arb.ca.gov/sites/default/files/2018-12/ab8_report_2016.pdf

² http://www.fchea.org/s/FCHEA_FCvs-Compromise_Factsheet_WEB.PDF

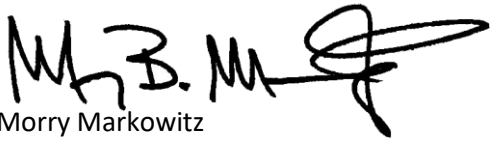
³ <https://www.iea.org/reports/the-future-of-hydrogen>

⁴ <https://www.iea.org/reports/the-future-of-hydrogen/data-and-assumptions#abstract>

transport by 2030.⁵ This goal would set the stage for a significant environmental impact and put hydrogen-fueled transport on a much faster path to zero-carbon intensity than the one charted by utilities for the grid. However, accomplishing this task will require the collaboration of local and state governments. By supporting FCV deployment, TCI can significantly reduce the transportation sector's environmental impact and reduce local air pollution.

FCHEA and its members are available as a resource to TCI officials. As TCI continues to develop and state and regional plans become realized, we stand ready to provide information to assist in the incorporation of this valuable technology. Should you have any questions or wish to discuss further, I can be reached at any time by email at mmarkowitz@fchea.org or by phone at 202-261-1331.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. B. Markowitz', with a large, stylized flourish extending to the right.

Morry Markowitz

President

Fuel Cell and Hydrogen Energy Association

⁵ <http://hydrogencouncil.com/our-2030-goal/>