



December 6 , 2019

Transportation Climate Initiative

RE: TCI Regional Policy Design Stakeholder Input

Dear TCI Leadership Team:

Air Liquide appreciates the efforts of the TCI Leadership Team in providing the opportunity for input on the “Framework for a Draft Regional Proposal” issued earlier this year. Air Liquide is a leader in the production of hydrogen for transportation purposes, and specifically for light, medium and heavy duty fuel-cell electric vehicles. In the past year, Air Liquide has announced plans to spend more than \$200 million in production, supply, distribution, and technologies to advance this market in North America. Air Liquide continues to invest in the North East to develop a hydrogen fueling network. Air Liquide and its affiliated companies operate hundreds of facilities and employ nearly 20,000 people in the US.

The TCI program has the potential to be among the most impactful US policy actions to address carbon dioxide and other greenhouse gas emissions that stem from the transportation sector. In it’s deployment, we encourage a technology neutral approach to drive the best outcomes; one in which hydrogen infrastructure and zero-emission fuel cell vehicles (FCVs) will be provided the opportunity to best enable the overall program goals. In the TCI Memorandum of Understanding (MOU) and in the various state and regional plans that are developed and implemented across the Northeast and Mid-Atlantic states, such a balanced approach will help insure that all market sectors, all citizens, and all regions will benefit from the program. Hydrogen infrastructure and FCVs will be critical components to addressing the future environmental and economic needs of the Northeast and Mid-Atlantic states.

Hydrogen is an ideal transportation fuel and, when used in a fuel cell, is able to produce clean, quiet, efficient electricity while emitting only water from its exhaust. This technology is enabling a global electric vehicle transformation and compliments battery electric vehicles when range, quick refueling, and capacity, and vehicle size are important. Across light duty, medium duty, heavy duty, transit, on road, off road, air and rail, we see opportunities for fuel cell technologies to enable a transition to zero emission in some of the applications that will be most challenging to electrify. Fuel cells can be utilized for cars, taxis, buses, medium and heavy duty trucks, trains, and the generation of electric power to provide backup and resiliency to the grid.

Hydrogen is a proven solution that is ready to be scaled up to address today’s challenges of vehicle electrification and integration into a more-and-more renewable grid. In California, Japan, Germany, Korea, China, France and other regions, we are experiencing the fuel cell vehicle transition from technology demonstrations to market adoption with thousands of vehicles on the road in normal, daily service, utilizing networks of hydrogen stations that provide drivers with a quick, clean convenient refueling experience, similar to that with today’s gasoline or diesel fuel. Leveraging the experiences and lessons learned in these global markets, we encourage the TCI participants to consider hydrogen and fuel cell vehicles as a technology ready for scaling up.

Large scale introduction of hydrogen into the energy market enables both green transportation while simultaneously enabling further penetration of renewable wind and solar on the grid. As we plan for the future of hydrogen, in order to maximize its societal benefits, we must be investing in renewable pathways, leveraging

electrolysis from a greening electrical grid and using biomethane from landfills, water treatment, and agriculture waste in our existing hydrogen production networks. Hydrogen provides a truly unique energy solution from the green grid as it serves as a storage technology that simultaneously enables a zero emission transportation sector. Most importantly, it can do this at both a cost per unit energy stored and at an overall scale that is competitive or better than other available options.

The introduction of fuel cell powered cars for light duty vehicles enables the most rapid, large scale market penetration because of the size of the market and number of vehicles. With our partner Toyota, **Air Liquide is developing the first network of H2 stations in the Northeast US** with a commitment to open stations in the early adopting metro areas. We are simultaneously developing the production and distribution networks to supply these stations. Overall, this represents among the largest private investments to advance this technology, globally. The introduction of vehicles to this market requires sufficient regional coverage and redundancy to insure customer satisfaction and we are working with the vehicle OEMs to plan station openings, network expansions, and vehicle introductions to insure a successful rollout. Expansion of the network into the mid atlantic is a clear next step and we look forward to working with the TCI states to advance this planning.

Hydrogen fuel cell vehicles can only be successfully introduced in the numbers needed to meet state targets if there is infrastructure in hydrogen production and distribution as well as station networks to support the vehicles. We look forward to continuing our work in the region and with the support of state legislative bodies, anticipate a successful pathway through this exciting transition.

As the leader in entering this market, **we ask the TCI Leadership Team to continue to prioritize hydrogen in your energy and transportation planning by giving FCEVs an equal playing field to BEVs and other technologies in policy and investment considerations.** Most importantly, we encourage you to consider policies and incentives that enable market growth and penetration through private investment to ensure the societal outcomes in environment, health and economy that comes with large scale implementation.

Thank you for the opportunity to present this information. If there are any topics for further discussion, please do not hesitate to contact me or my colleagues. We are at your disposal. If I can further support this committee as an industry representative or spokesman, please let me know

Best Regards,

A handwritten signature in black ink, appearing to read 'David P. Edwards', with a long horizontal flourish extending to the right.

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