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Plug Power Comments

Please see attached comments of Brenor Brophy on behalf of Plug Power.

Additional submitted attachment is included below.



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VIA ELECTRONIC SUBMISSION

Commissioner Siva Gunda, Vice Chair
California Energy Commission (CEC)
715 P Street
Sacramento, California 95814

Re: Plug Power's Comments on 22-IEPR-05 — 2022 Emerging Topics

Dear Vice Chair Gunda:

Plug Power Inc. ("Plug") respectfully submits the following comments to the California Energy Commission ("CEC") 2022 Integrated Energy Policy Report Update ("2022 IEPR Update"). Plug is thankful for the opportunity to have presented at the recent IEPR Workshop on our California green-hydrogen project and the role of hydrogen in California's clean energy future.

As the leading provider of turnkey green hydrogen solutions, Plug's footprint in the State of California (the "State") is substantial and growing, with over 3,000 commercially operating fuel cells deployed within the State. Plug successfully pioneered the first commercially viable market for fuel cells (in material handling with approximately 60,000 fuel cells operating in the field) and has a rapidly expanding footprint in medium- and heavy-duty mobility applications, electrolyzers, and stationary power. Plug is also a leading provider of green hydrogen, made through electrolysis and powered by renewable energy. We are creating a green hydrogen generation network across the country, with plans to produce 500 tons per day by 2025 and 1000 tons per day by 2030. Within this network, Plug's 30-ton per day electrolytic hydrogen facility in Fresno County will provide key supply for the State. A robust, self-sustaining green hydrogen economy is vital to any comprehensive energy strategy, and Plug is excited to be part of California's green hydrogen future.

1. California hydrogen policy has global reach. Early market success will ensure a self-sustaining green hydrogen economy.

California's leadership in the development of a sustainable hydrogen economy is globally recognized. Policies adopted by the State reach far beyond its borders, as many other regions and countries look to California's vision while developing their respective hydrogen strategies. Plug is a leading provider of green, electrolytic hydrogen and is fully committed to a green hydrogen future. We are supportive of California's focus on green, renewable hydrogen and are confident that the near-term hydrogen policy decisions will be key drivers of scaling green hydrogen production and end-use within the State.

As manufacturing and production achieve scale, green hydrogen technologies will achieve cost parity, in many ways, following a similar cost reduction trajectory to wind and solar energy. Early markets that enable manufacturing scale-up will be key enablers for expedient cost reduction. In turn, this will unlock new market segments, ensure self-sustaining growth, drive private investment, and independently advance decarbonization goals. Early markets where hydrogen can be delivered at or close to cost parity with competing fossil fuels are ideal. Prioritization of these markets will enable the fastest scaling of technology and cost reductions. Today, the first market meeting this criterion is mobility, in particular, displacement of diesel in freight and logistics applications. Plug successfully pioneered the first commercially viable market for fuel cells – in material handling. Our early success in material handling has driven cost reductions, advancements, and growth into new markets and products. Favorable policies have been impactful to our early success. California policy must prioritize early markets, to create a self-sustaining, functional hydrogen economy.

Plug suggests the following key policy actions to create a sustainable hydrogen economy:

- *Ensure Robust Market for Zero Emission Vehicles:* California should send clear signals to vehicle manufacturers that there will be robust markets for zero-emission vehicles (“ZEV”) in all segments; and further, set clear standards for vehicles.
- *Technology Neutral:* The State should maintain a technology-neutral approach to ZEV technology that allows the market to determine which solutions are best suited for specific use cases.
- *Refueling Buildout with Heavy-Duty Focus:* The State should support infrastructure buildout for ZEV refueling, and in particular, heavy-duty refueling stations.
- *Low Carbon Fuel Standard (“LCFS”):* The State should continue support for the LCFS with continued declines in carbon intensity targets.

Furthermore, California energy policy should align with the State’s effort to become a green hydrogen hub under the federal bi-partisan Infrastructure Law. In November 2021, President Biden signed the bi-partisan Infrastructure Investment and Jobs Act (“IIJA”) into law. The IIJA creates several clean hydrogen programs, including \$8 billion for the formation of Regional Clean Hydrogen Hubs. This program is a landmark opportunity for the State to solidify its position as a climate and clean energy leader. Governments across the world are rapidly enacting policies to attract and scale green hydrogen technologies – it is not a question of “if” but “where” these hubs will take hold. California is uniquely positioned to leverage the Regional Clean Hydrogen hub program. The State has already taken key steps to advance this effort. However, it is imperative that State policy align with the effort to become a hydrogen hub. This alignment will help secure federal funds, advance the State’s clean energy goals, create thousands of good-paying jobs, and ensure the State remains an epicenter of the clean energy economy.

2. Energy policy must incent hydrogen production pathways with the greatest environmental justice benefits and reductions in greenhouse gases and criteria pollutants.

California policy must prioritize hydrogen generation with the greatest long-term environmental benefits. Policy must be carefully designed and not shortsighted, particularly regarding hydrogen generation utilizing any fossil fuel feedstock. Hydrogen policies will trigger infrastructure investments that could last for decades. The investment of public resources in energy infrastructure must align with our long-term path towards ambitious, yet necessary decarbonization goals. Consequently, the State should apply rigorous and transparent standards to all hydrogen production pathways. Consistency with emerging federal frameworks will also be beneficial to properly structuring the hydrogen economy within the State. Plug is supportive of the lifecycle analysis framework in the clean hydrogen production tax credit passed by the United States House of Representatives, which calculates carbon intensity through the point of production under the GREET model. Hydrogen production dependent on fossil fuel feedstocks must account for the full burden of methane emissions in the natural gas supply chain and the full carbon intensity. Furthermore, policies must address the comprehensive environmental burden of a technology – not just greenhouse gases, but also the particulate emissions and criteria pollutants which cause disproportionate adverse impacts on historically disadvantaged communities. Technologies that rely on combustion or gasification (even if carbon neutral or negative) must be held to the most rigorous air emission standards.

3. Efficient deployment of renewable energy is key to our green hydrogen future, but the State should also facilitate green hydrogen imports.

Ultimately, the future is electric. Furthermore, hydrogen will enable electrification to reach all areas of the economy, particularly hard-to-decarbonize sectors. California must accelerate deployment of renewable energy – especially wind and solar, which can achieve the scale needed to match current fossil fuel energy use. The global solar industry recently passed the milestone of 1 TW of installations since its inception in the 1970's. Within the next decade, the industry will have its first 1 TW year – that is 1 TW installed globally in a single year. For comparison, about 8 TW of renewable energy could serve the primary energy use of the entire United States. It is not a question of whether renewable energy can replace fossil fuels, but rather, how quickly California can drive this transition.

California should adopt policies to reduce the barriers and costs for constructing large scale renewable energy projects suitable for hydrogen production. These projects will be vital to meeting California's clean energy and climate goals, particularly in hard-to-decarbonize sectors. Regional obstacles, lengthy permitting, and their related costs, can often disincentive renewable deployment within the State. These challenges, if unchecked, could potentially derail the State's climate and clean energy goals. California should also adopt policies that enable wind development, both onshore and offshore. Wind and solar are complementary. Combining these resources will incent green hydrogen production within the State.

Despite abundant renewable resources, California policy should also facilitate hydrogen imports. California's high population, land costs, and potential future hydrogen demand cumulatively necessitate importing hydrogen from other regions. The State should look favorably on hydrogen imports, while still applying the highest standards of carbon intensity lifecycle assessment, irrespective of location.

4. Green Hydrogen is a necessary complement to increased electrification and the deployment of renewable electricity.

Plug is supportive of increased electrification paired with a renewable and resilient grid. However, full grid decarbonization and resiliency cannot be achieved by electrification alone. Building electrification, by itself, will double the grid peak load and potentially have an unintended outcome of increased reliance on diesel backup generators. Firm and dispatchable zero-emission distributed energy resources, such as hydrogen fuel cells, are a necessary complement to electrification. Additionally, longer and more intense wildfire and drought seasons have resulted in an increased reliance on diesel backup generators. These dirty, long-lived assets are a significant source of greenhouse gas and air pollution. Diesel generators release particulate matter, volatile organic compounds, and nitrous oxides, the combination of which creates smog, exacerbates respiratory illness, and accelerates climate change. Furthermore, many diesel backup diesel generators are sited in disadvantaged communities that disproportionately suffer adverse environmental and health impacts. Replacing backup diesel generators with stationary hydrogen fuel cells will add flexible, firm distributed energy resources to California's energy portfolio. Furthermore, these commercially available, zero emission solutions will achieve health and environmental benefits for disadvantaged communities, through the reduction of diesel particulate matter. Addressing climate-driven grid challenges is a monumental task; however, it is also a tremendous opportunity to invest in a more equitable, zero-emission future. Distributed energy resources can ensure grid resiliency and advance the State's clean energy, climate, and environmental justice goals.

Green hydrogen will also be a vital tool to increased electrification in a renewable electricity landscape. Today, we have three parallel energy delivery networks: the electric grid, pipelines, and roads. Our electric grid is enormously expensive; transmission and distribution charges are significantly higher than generation charges; and unfortunately, electricity costs are some of the highest in the United States. Buildout of the transmission and distribution system will be critical to our electrification and renewable deployment goals. Green hydrogen offers the ability to deliver renewable energy through those parallel pipeline and road networks. Ultimately, this will enable gigawatt-scale hydrogen production projects too large to interconnect to the grid. These projects can only deliver their hydrogen through a pipeline network, with last-mile distribution by gaseous and liquid delivery over the roads. Policy makers must address the transition of our existing gas pipeline network to pure hydrogen. Much work needs to be done to advance these issues. At a minimum, near-term policy must preserve pipeline rights-of-way and easements, to ensure these assets are available to carry hydrogen in the future.

Again, Plug is thankful for the opportunity to offer these comments and is available any time to discuss further. We are appreciative of California's continued policy leadership and excited to be a part its green hydrogen future.

Sincerely,



Brenor Brophy
Vice Project, Project Development
Plug Power Inc.