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STATE OF CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of: 2023 Integrated Energy Policy Report - Hydrogen.	Docket No. 23-IEPR-06

COMMENTS OF DIAMOND GENERATING LLC ON THE IEPR COMMISSIONER WORKSHOP ON THE POTENTIAL GROWTH OF HYDROGEN

I. INTRODUCTION

Diamond Generating LLC ("Diamond") offers these comments on the September 8, 2023 Integrated Energy Policy Report Lead Commissioner Workshop on the Potential Growth of Hydrogen. In these comments, Diamond provides insight on how renewable hydrogen can be used to help decarbonize the electric generation sector. In particular, the California Energy Commission's ("CEC") study and analysis of the potential growth of hydrogen and its role in decarbonizing the electric sector, as required by Senate Bill ("SB") 1075 (Skinner, Chapter 363, Statutes of 2022), should address the paced integration of hydrogen into the state's resource mix. During California's transition to a renewable and decarbonized retail electric supply, a hydrogen fuel integration approach can provide a pathway for decarbonizing existing resources needed for reliability, thereby helping the state reach economies of scale for hydrogen fuel combustion.

II. COMMENTS

A. Diamond is Actively Planning for California's Clean Energy Future

Diamond owns and operates fast-starting, flexible, peaking capacity facilities that provide much needed reliability insurance to the California grid. Diamond is actively preparing for investments in technologies that are responsive to California's decarbonization goals while still

providing much needed capacity in the near- to mid-term that is available during the periods of greatest system need. These strategies can provide reliable capacity to grid operators in the near term, while preparing for the transition needed to attain the SB 100 goals. Decarbonization strategies under consideration by Diamond include the integration of alternative, low-carbon fuels, such as renewable hydrogen, and the addition of on-site long-duration energy storage ("LDES"). Adding LDES allows Diamond's peaker facilities to retain and expand their firm capacity attributes in the near-term while pursuing technologies responsive to the state's decarbonization objectives.

B. Hydrogen's Role in Decarbonizing California's Electric Generation Sector Should be Considered as Part of a Gradual Transition to Incorporating Zero-Carbon Fuels

The CEC's assessment of the potential growth for hydrogen should consider how existing combustion resources can evolve to meet California's clean energy and climate goals. As compared to inverter-based resources, conventional, rotating resources provide system inertia and higher reliability attributes. Diamond is concerned that much of the discussion about studying and modeling hydrogen fuel for existing facilities does not consider decarbonization strategies that could be more cost-effectively implemented in stages over time at existing locations (e.g., transition to a zero-carbon resource over a 10-year period). As recognized in the 2021 SB 100 Joint Agency Report, 75 percent of the flexible capacity of the grid is currently attributed to natural gas power plants, and these plants continue to be needed to maintain grid reliability as more renewable power enters the system.[1] Modeling conducted for the 2021 SB 100 Joint Agency Report largely retained the state's natural gas capacity. Existing peakers are capable of continuing to provide flexible, firm power needed for reliability in the near- and

[1] 2021 SB 100 Joint Agency Report at p. 40.

medium-term while the state waits for long lead-time ("LLT") resources and other firm capacity technologies to reach commercial viability and operation. During this transition period, existing peakers will be part of the reliability solution and, if the state sends the appropriate procurement signals, these resources can also be part of the decarbonization strategy.

In order to continue to provide this needed capacity, Diamond's peakers must have a pathway to adopt renewable and zero-carbon technologies. In particular, *blending* of hydrogen fuels, as opposed to employing assumptions that a fully hydrogen-fueled resource will timely replace natural gas-fueled capacity, should be the anticipated course for studying the potential for and cost of hydrogen use at existing combustion generators. Blending of renewable hydrogen at existing combustion resources is a necessary first step towards greater integration of this zero-carbon fuel and the technologies that will facilitate it. A measured approach to the integration of alternative low-greenhouse gas fuels is pragmatic as there is not currently, nor projected in the near- to mid-term, a reliable supply or delivery mechanism for renewable hydrogen that would allow conventional utility-scale generation to switch to 100% use of this fuel. Furthermore, incremental steps for renewable hydrogen use at existing sites will put California on track to improving costs, advancing technologies, and expanding hydrogen transportation and storage options.

The U.S. Environmental Protection Agency's ("U.S. EPA") recent analysis of the potential for hydrogen fuel in certain fossil-fueled electric generation resources reaches the same conclusion.[2] While the U.S. EPA's proposed rule would not impose an emission guideline for Diamond's California peakers, it concludes that the potential for certain planned and existing

[2] Proposed Rule: *New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Mission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule,* 88 Fed. Reg. 33240 (May 23, 2023) (amending 40 CFR Part 60).

fossil-fueled resources to incorporate renewable hydrogen begins at 30 percent in the year 2032. This analysis takes into account the expected availability of renewable hydrogen and the reasonable costs for moving to this fuel. Development of this important option for electric reliability in California will be impeded if combustion resources are only assessed as an all-hydrogen or all-fossil fuel resource and not acknowledged as being able to transition from one fuel source to the other. Such a position will preclude development of an important and emerging strategy for reliably decarbonizing California's electric supply.

Diamond has performed modeling as part of the California Public Utilities Commission's ("CPUC") Integrated Resource Planning ("IRP") rulemaking that shows peaking facilities using a 30 percent renewable hydrogen blend are selected when included in the RESOLVE model as a candidate resource.[3] The model's assessment of reliability and cost saving results in the selection of these blended fuel peakers while still meeting the RESOVLE model's greenhouse gas ("GHG") emission levels in 2035. Selection of peakers blending renewable hydrogen further avoids over-selection of other firm capacity resources that have uncertain development timelines and are subject to ongoing transmission interconnection delays and other supply-chain risks facing greenfield development.

Another issue relevant to the potential, and eventual, deployment, development, and use of hydrogen, is how investments in the equipment and fuel can be recovered. Currently, there are few or no market mechanisms for peaker plants to recover the costs of reconfiguring their physical operations to blend, or convert completely, to hydrogen. A procurement framework that

[3] This modelling is included with the *Opening Comments of Diamond Generating Corporation to Administrative Law Judge's Ruling Seeking Comments on the Proposed Preferred System Plan*, CPUC Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes, R. 20-05-003, Sept. 27, 2021, available at https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=410467248.

permits procurement of energy from decarbonizing combustion turbines may be necessary to allow these assets to invest in renewable hydrogen technologies.

In the interest of maintaining electric reliability and more affordably transitioning to California's clean energy future, the State will need to support measures that allow existing resources providing firm, flexible capacity to pursue strategies that reduce their GHG emissions.

C. The Costs of Hydrogen Should be Considered Relative to the Buildout of New Firm Resources and Infrastructure Needed to Serve These Resources

Diamond appreciates the CEC's preliminary analysis of the co-located equipment and costs estimated for the transport, storage, and use of hydrogen at existing natural gas power plants. These comments do not address all of the factors feeding into the initial analysis. However, Diamond does note that the owners and operators of gas plants may be pursuing strategies for the integration of hydrogen that are not currently reflected in the CEC's preliminary analysis of hydrogen use at existing facilities, and there is room for innovation in the transport and storage of hydrogen fuel. Furthermore, the costs of incorporating renewable hydrogen fuel at existing facilities should be viewed relative to the costs associated with the build out of entirely new renewable and zero-carbon *firm* resources, including the transmission infrastructure required to deliver the capacity from new firm resources.[4]

In order for California to best utilize its existing electric infrastructure, reduce costly build-out of the transmission system, and support reliability, the state should strive to optimize the full deliverability potential available from existing generation resources' interconnections. In

[4] For purposes of this comment, Diamond considers new firm resources to be those resources eligible for the CPUC's LLT category of resources ordered for procurement in the IRP proceeding. (See CPUC decisions 21-06-035 and 23-02-040.) LLT resources are: (1) long-duration energy storage able to deliver at maximum capacity for at least eight hours from a single resource or generation capacity that has no on-site emissions; or (2) eligible under the requirements of the renewables portfolio standard program, has at least an 80 percent capacity factor, is not use limited or weather dependent, and cannot be storage projects.

particular, Diamond's peaker facilities are located at key points on the transmission or distribution system where capacity needs to be maintained, and costs associated with decarbonizing these facilities need to be viewed in light of the reliability value of such assets.

Maintaining the existing deliverability network has affordability benefits as costly transmission build-out and system upgrades can be reduced, or not further exacerbated by maintaining capacity at these sites. Ensuring existing interconnections are able to continue to deliver electricity is also unaccompanied by the interconnection delays faced by new generation projects, and land use controversies and legal hurdles associated with transmission build-out can be avoided to some extent. The development risks associated with the clean, firm resource build-out can be better managed by maintaining, and optimizing, the capacity potential at existing combustion resource interconnections.

III. CONCLUSION

Diamond appreciates the opportunity to provide these comments and looks forward to continuing the dialog with the CEC and other agencies involved in planning California's transition to a renewable and decarbonized energy future.

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Respectfully submitted,

/s/

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