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True North Renewable Energy and Ã˜rsted Comments on Draft 2021 SB 100 Report

Additional submitted attachment is included below.

December 18, 2020

California Energy Commission
California Air Resources Board
California Public Utilities Commission

Docket No. 19-SB-100
SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future

Re: Comments on Draft SB 100 Report

True North Renewable Energy and Ørsted appreciate the opportunity to provide these comments in response to the Draft 2021 SB 100 Report ("Draft Report"). We'd also like to thank the joint agencies for conducting a thorough and transparent process over the past 16 months, thoughtfully considering our comments, along with hundreds of others, and for the significant level of work and effort that clearly went into developing this Draft Report and detailing initial findings and next steps on the State's path to 100 percent clean energy.

Over the course of eight workshops, you've heard from our companies and several other commenters about the promising and necessary role that green electrolytic hydrogen will play in decarbonizing the power sector. We appreciate its inclusion in this report, including recognition that green electrolytic hydrogen and other renewable gases including biomethane are "gaining breakthroughs and cost reductions" (pg. 68) and that green electrolytic hydrogen can support cost effective implementation of SB 100 and improve the economic efficiency of renewable energy investments (pg. 113).

We also appreciate your commitment to further analyses around reliability, resiliency, land use, and other issues – which we expect will only reinforce the role green electrolytic hydrogen will play in optimizing California's clean energy grid. We encourage you also to explore scenarios that minimize greenhouse gas emissions and achieve zero carbon emissions across the power sector in its entirety, by converting legacy natural gas power plants to run on green electrolytic hydrogen.

The initial modeling scenarios show that cost-effective green electrolytic hydrogen could anchor an optimal and low-cost portfolio of SB 100-compliant scenarios. The scenario with generic, firm zero carbon resources (eg, green electrolytic hydrogen) leads to the best outcomes, including lower costs, lower gas retention and emissions, significantly lower build rates, higher utilization of assets, and lower levels of wasted energy through curtailment. Existing power plant and transmission infrastructure can be converted to generate zero carbon power using green hydrogen, which would preserve existing power plant jobs and support a just transition, create new jobs in a flourishing green hydrogen sector, and align with the Garamendi Principles referenced in the Draft Report.

These findings are echoed in a number of other studies, as well. One shows that green electrolytic hydrogen is key to achieving 100 percent zero carbon energy in the U.S. by 2035 without increasing customer costs.[1] Every scenario that LADWP has developed for complying with SB 100 and maintaining grid reliability includes green hydrogen, including an "LA Leads" scenario that uses green electrolytic hydrogen to displace all fossil natural gas and achieve a 100 percent zero-carbon electricity system for Los Angeles by 2035.[2] Another study shows how utilizing green electrolytic hydrogen in existing power plants can significantly reduce costs, greenhouse gas emissions, and land use associated with SB 100.[3] And E3 highlights its role in achieving a zero carbon electricity sector in initial carbon neutrality scenarios developed for CARB,[4] and in a separate report finds that power plants using green electrolytic hydrogen could be profitable in the Southern California market as soon as 2025.[5]

Key to achieving these optimal outcomes is for the joint agencies, individually and collectively, to take immediate steps to support market growth that will lead to rapid cost reductions for green electrolytic hydrogen and other potential firm, zero carbon resources. We appreciate the commitment in this report to support these technologies through the EPIC program (pg. 143) and encourage the CEC to do so by funding green electrolytic hydrogen projects across a number of applications. We encourage the CPUC to prioritize green electrolytic hydrogen and other zero-carbon resources to provide resource adequacy, including for more than 24 hours, through pilot programs or broader market signals, as well as developing a relatively small but meaningful blending standard for green electrolytic hydrogen in the natural gas pipeline. We encourage CARB to develop a strategic plan for this pivotal technology in its upcoming Scoping Plan – as several countries are doing who want to capture economic benefits by leading on this strategic technology – and to work through its climate programs to deploy green electrolytic hydrogen to decarbonize transportation, industry and the gas system. We encourage the joint agencies individually and collectively – and much sooner than 2025 – to incorporate green electrolytic hydrogen into all energy planning and modeling efforts moving forward and to work with CAISO to put curtailed power to use to produce green electrolytic hydrogen to further decarbonize the power sector or other sectors of the economy. And we hope that you will make this a key focus area during your first annual joint agency SB 100 workshop next year.

Indeed, with strong market support, costs will fall rapidly. This is the finding of a growing number of studies. Similar to E3's findings, for example, a study by the Hydrogen Council with

[1] https://energyinnovation.org/wp-content/uploads/2020/09/Pathways-to-100-Zero-Carbon-Power-by-2035-Without-Increasing-Customer-Costs.pdf

[2] For example, see: https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=OPLADWPCCB726105&RevisionSelectionMethod=LatestReleased

[3] https://www.pathto100.org/wp-content/uploads/2020/03/path-to-100-renewables-for-california.pdf

[4] E3 (2020) Achieving Carbon Neutrality in California: PATHWAYS Scenarios Developed for the California Air Resources Board, Energy+Environmental Economics, Inc., August. https://ww2.arb.ca.gov/sites/default/files/2020-08/e3_cn_draft_report_aug2020.pdf

[5] E3 (2020) Hydrogen Opportunities in a Low-Carbon Future: An Assessment of Long-Term Market Potential in the Western United States, Energy+Environmental Economics, Inc., June. https://www.ethree.com/wp-content/uploads/2020/07/E3_MHPS_Hydrogen-in-the-West-Report_Final_June2020.pdf

McKinsey finds that hydrogen in the power sector could be cost-effective in the 2025-2030 timeframe.[6] And an assessment by Bloomberg New Energy Finance (BNEF) estimates that over the long-term, "a carbon price of $32/tCO2 would be enough to drive fuel switching from natural gas to hydrogen, and generate clean, dispatchable power at a competitive price."[7]

But cost reductions won't happen on their own, without integrated policy support.[8] Of particular note, we appreciate that the Draft Report recognizes that – in addition to the power sector – hydrogen can help decarbonize transportation, especially heavy-duty vehicles, and industry. The Draft Report notes that growth of hydrogen demand in these sectors will assist in achieving scale in the electricity sector (pg. 114). While that may be true to some extent, we think the Draft Report actually has it backwards. Deploying green electrolytic hydrogen in the power and gas sectors will drive down costs and support lower cost, lower emissions hydrogen in the transportation sector. The utility markets are bigger and more concentrated, allowing for greater economies of scale and reliable returns to more quickly finance more projects and bring the technology down the learning curve much faster.

It's a small nuance, but important to recognize that State's policies are interlinked, and integrated planning to support green electrolytic hydrogen in all sectors will only accelerate deep decarbonization across the state in its entirety, at low cost. If the State wants to achieve the Governor's Zero Emission Vehicle Executive Order, for example, and do so cost effectively in a way that utilizes green hydrogen instead of fossil hydrogen – especially to decarbonize heavy-duty and off-road vehicles – it would be well served to quickly support the widespread deployment of green hydrogen in the power sector and other sectors, as well.

[6] https://hydrogencouncil.com/en/path-to- hydrogen-competitiveness-a-cost-perspective/
[7] https://data.bloomberglp.com/professional/sites/24/BNEF-Hydrogen-Economy-Outlook-Key-Messages-30-Mar-2020.pdf (pg. 7)
[8] IRENA (2020) Green Hydrogen: A Guide to Policymaking, International Renewable Energy Agency, Abu Dhabi. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Nov/IRENA_Green_hydrogen_policy_2020.pdf