

SB 414 – Assessment of Hydrogen Applications

SENATOR BEN ALLEN

Fact Sheet

SUMMARY

Hydrogen is one tool the state can use to meet decarbonization goals. To guide policymakers on the best and highest uses of this tool, SB 414 directs the California Air Resources Board, California Energy Commission, and California Public Utilities Commission to assess specified hydrogen applications by evaluating the energy efficiency, cost, and greenhouse gas (GHG) emissions-reduction potential compared to alternatives such as electrification. The assessment would evaluate health, safety, and environmental risks associated with hydrogen use and include a ranked prioritization of hydrogen applications.

BACKGROUND

Cutting the state's GHG emissions at a pace that scientists have determined necessary requires a rapid shift to a decarbonized economy. To succeed, the state will need to strategically direct available tools and technologies toward certain sectors based on where and when those tools can be the most effective.

If deployed deliberately, hydrogen can help effectuate a swift transition of energy, manufacturing, and transportation sectors. Production of renewable hydrogen will require significant clean energy resources. Production, storage, transportation, and use will require extensive new infrastructure. Prioritizing applications where hydrogen is the most effective decarbonization tool will more efficiently facilitate the clean energy transition.

Industrial and chemical processes that already use hydrogen derived from fossil fuels (such as fertilizer production) and processes that require high heat (such as steel fabrication) may be good candidates for using hydrogen made without fossil fuels. Some other applications may be more efficiently decarbonized by other means. For example, on average, a hydrogen fuel cell car requires three to four times more energy than a battery electric car. Using clean energy to produce hydrogen and then using the hydrogen to generate electricity may be inefficient when alternatives exist.

As the production, transportation, storage, and use of hydrogen in the state scales up, a number of concerns and

questions must be considered regarding potential health, safety, environmental, and climate risks. Leakage concerns are particularly relevant because hydrogen acts as an indirect GHG when released into the atmosphere. Burning hydrogen (such as for heating, cooking, or generating electricity) releases oxides of nitrogen (NOx), which is a health hazard and global warming contributor. Hydrogen is also highly flammable and susceptible to combustion at low concentrations.

Policymakers must have a clear understanding of where and when this technology can best be deployed to maximize decarbonization benefits and minimize potential negative impacts.

SOLUTION

SB 414 aims to complement other hydrogen assessments in statute and make readily available important information regarding hydrogen use. The bill requires an evaluation of different potential hydrogen applications including light-, medium-, and heavy-duty vehicles; off-road equipment; maritime shipping and aviation vessels; industrial processes; household and commercial appliances; and electricity generation. Based on each application, the evaluation would assess the potential GHG emissions reduction, cost, and energy efficiency of using hydrogen compared to alternatives such as electrification, as well as associated health, safety, environmental, and climate risks.

The assessment would enable comparisons between hydrogen use and alternative options on an application-by-application basis. Informed by the results of this assessment, a prioritization list would indicate where hydrogen use can be most effective in helping the state meet its climate goals.

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