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ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

Written Comments for the July 27, 2022 Meeting of the Nevada Joint Interim Standing Committee on Growth and Infrastructure

Environmental Defense Fund (EDF) appreciates the opportunity to submit the following comments on concerns and priorities regarding hydrogen development in Nevada. EDF sees hydrogen as a potential climate solution in hard-to-decarbonize sectors - but only if leaks are accounted for and prevented.

Hydrogen production and deployment has the potential to be an important climate strategy in Nevada and around the United States. However, scaling up the use of hydrogen to decarbonize heavy-duty transportation, aviation, shipping, or certain industrial applications requires careful consideration of hydrogen's environmental and climate impacts, which recent EDF research finds have historically been underestimated. Before states begin to rely too heavily on hydrogen to meet their climate goals, it is essential to understand **how and where** hydrogen is best suited for use, and how it can itself contribute to climate change if implemented poorly and without sufficient safeguards.

There is emerging consensus among the scientific community on hydrogen's warming impact as a powerful short-lived indirect greenhouse gas. Hydrogen itself, as a leak-prone gas, has its own potent (and often overlooked) warming effect. Based on the latest science, the actual warming power of hydrogen in the atmosphere is two- to six times higher than standard estimates, depending on the timeframe. Hydrogen should be measured using both a global warming potential (GWP) 20 and GWP100 in order to accurately capture the impact of hydrogen emissions (including leakage and venting) in the near- and long-term. When considering near-term climate impacts, EDF research shows that climate benefits from hydrogen usage can be severely diminished for moderate to high emissions rates (around 5 to 10%). Minimizing or eliminating hydrogen leakage is absolutely critical to the success of hydrogen as part of the solution to climate change.

Furthermore, hydrogen is not an inherently 'climate-neutral' source of energy; its effects on the climate, positive or negative, depend on where and how it is produced. Hydrogen produced by fossil fuels without carbon capture and storage (CCS), sometimes known as 'gray' hydrogen, is not a climate solution and should not be considered in Nevada's plans for hydrogen development.

EDF's findings point out that carbon dioxide is not the only important climate pollutant produced through the hydrogen generation process, especially when not produced with renewable energy. In the case of hydrogen produced through feedstocks paired with CCS ('blue' hydrogen), methane can also be released at significant levels in addition to hydrogen emissions, contributing to the overall climate warming effects of fossil fuel-based hydrogen.

Specifically, methane leakage from producing hydrogen using natural gas and CCS technologies is of significant concern; the climate effects of methane leakage are often underestimated in hydrogen assessments, and methane is a powerful greenhouse gas with high global warming potential. The level of climate harm only increases if there is embedded carbon in the lifecycle analysis of hydrogen.

Across all methods of hydrogen production, leak monitoring and minimization is of utmost importance and should be of primary concern for any hydrogen buildout in Nevada. Given the risks of a rapid, large-scale buildout of hydrogen production, hydrogen should be prioritized only for hard-to-decarbonize industrial sectors such as steel and cement manufacturing, or as an alternative fuel for shipping and aviation. Zero carbon hydrogen could help be a part of the transition to a clean energy future, but Nevada must ensure that its buildout will not add to the climate crisis by failing to recognize and monitor its role as an indirect greenhouse gas.

As the hydrogen industry is in its infancy, Nevada has an opportunity to ensure that the accelerating investment in hydrogen projects yields the climate benefits being sought in the near term, and thereby avoid needing to make major retrofits down the road or even abandon large capital investments that do not turn out to be climate solutions. To truly be among the strategies to address climate change, hydrogen production must be approached with robust monitoring and leading technology to catch and prevent any leakage, rely only on renewable generation, be applied only for hard-to-decarbonize end uses, and with stringent measures in place to account for and prevent the leakage risk not only of hydrogen itself.

To summarize:

- Plans for or modeling of future hydrogen infrastructure must include robust leak detection and monitoring to prevent or swiftly repair leaks of any size.
- Hydrogen projects must include strategies to prevent leakage, including minimizing transportation.
- To be a climate solution, hydrogen projects must account for the full climate impact of upstream emissions as well as of the hydrogen itself as an indirect, short-lived greenhouse gas. In-depth lifecycle analyses should be conducted into the emissions from, among other strategies, hydrogen production.
- Hydrogen should be measured using both a global warming potential (GWP) 20 and GWP100 in order to accurately capture the impact of hydrogen emissions (including leakage and venting) in the near- and long-term.
- Nevada should assume only hydrogen produced through renewable energy to avoid potentially significant upstream emissions.
- Hydrogen should only be considered a climate solution for hard-to-decarbonize sectors, not applications which can easily be electrified, including light-duty vehicles.

Respectfully submitted,

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