Austin Energy "Hydrogen-Capable" Gas Plant: Not Climate-Friendly, Healthy or Safe

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Background

The Austin Energy (AE) Resource, Generation and Climate Protection Plan includes a commitment to being carbon-free by 2035. And yet, AE is recommending adding gas-burning generation, branding this fossil fuel expansion as "hydrogen capable," and claiming it aligns with eliminating greenhouse gas (GHG) emissions. Staff assume the plant(s) will eventually switch to burning "green" or "pink" hydrogen, but acknowledge the switch may not happen. Problems would remain even if it did.

Using More Methane "Natural Gas"

Austin Energy plans to operate the proposed power plant with methane gas, increasing GHG emissions, for years before the hypothetical transition to hydrogen. Methane, the primary component of natural gas, is a potent GHG – 86 times more powerful than carbon dioxide when released into the atmosphere[1] – and its combustion releases carbon dioxide, making it a major contributor to climate change. Transitioning to green hydrogen depends on developing production and transportation infrastructure, which is highly uncertain and expensive.[2] The city risks being tied to natural gas for an extended period.

Green Hydrogen

Green hydrogen is produced by renewable energy-powered electrolysis. Only about 2% of hydrogen is made this way, with the rest produced from fossil fuels.[3] Ensuring that "green hydrogen" results in minimal greenhouse gas emissions is complicated. Production must take place behind a renewable energy installation or closely time-matched with renewable energy production; otherwise, emissions could increase if electricity made with fossil fuels is used. Renewable energy used to produce green hydrogen must be new resources, to avoid cannibalizing energy that is currently decarbonizing the grid.[4]

Climate Impact of Hydrogen Leakage

Hydrogen molecules are the smallest in existence and are prone to leakage. With a global warming impact over a decade of 100 times that of carbon dioxide[5] and 37 times greater over 20 years, high leakage could significantly limit emissions reductions.[6] Repurposing infrastructure built for natural gas can lead to increased leakage.[7]

Uncertainty of Cost

Future costs of green hydrogen production are very uncertain, but current information indicates that it won't be cost-competitive with other local clean energy options for many years, if ever. The cost of residential solar ranges from $117 to $282 per MWh, while predictions for gas plants with only a 25% hydrogen blend would range from $203 to $221 per MWh.[8] Currently, the costs per unit of hydrogen produced with renewables is close to $5/kg.[9] It is highly likely that hydrogen costs will stay above $3/kg through 2050[10], compared to current natural gas prices of $.98 to $2.94/kg.[11] Hydrogen is so expensive because it is inefficient. When burned for electricity production, total efficiency is only about 30%, meaning about 70% of the renewable energy used to produce it is lost in the production and burning.[12]

Local Air Pollution & Public Health Safety Risks

Burning methane or hydrogen emits air pollutants, including sulfur dioxide, nitrogen oxides (contributing to ground-level ozone), and particulate matter. Health impacts include inflammation of airways, reduced lung function, and asthma.[13] AE's new gas plant(s) would most likely be located at either the Decker Creek Power Station or Sand Hill Energy Center in East Austin and would disproportionately affect lower-income and communities of color.[14] The Austin area already exceeds the EPA limit on ozone pollution. We need to reduce pollution sources, not add to them. Hydrogen is highly flammable, increasing the risk of explosion in pipelines.[15]

Water Usage

Using electrolysis, creating 1 kilogram of hydrogen requires nearly 9 liters of water.[16] Producing green hydrogen to run a 500-megawatt power plant half of the time would consume as much water as between 11,000 and over 21,000 average Texas residents each day[17,18.]

The plant would also need water for cooling, water treatment and disposal,[19] adding stress to the water supply in water-scarce Central Texas.

Aligning with City of Austin Priorities

Metric	"Hydrogen-Capable" Gas Plant	Local Solar + Batteries + Efficiency + Demand Response
Meets Austin Climate Goals	No – increase fossil fuel use for years; unknown impact w/ hydrogen	Yes – carbon-free
Improves Local Air Quality	No – adds to local air pollution	Yes – emissions-free
Affordable	Unknown – not commercially available yet; cost will fluctuate	Yes – mature technologies commercially available; fixed costs to operate
Water Conservation	No – high water use for producing hydrogen via electrolysis	Yes – minimal water use for cleaning solar panels
Creates Local Green Jobs	No – AE doesn't intend to produce hydrogen locally	Yes – installation of local solar, batteries, and energy efficiency upgrades
Safe for Use in Community	No – explosion risks at pipelines, storage facilities, and power plants	Yes

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