The Road to Clean Hydrogen: Getting the Rules Right

America cannot reach our climate or economic goals without clean, domestic hydrogen. Proposals for additionality, deliverability/regionality, and hourly matching are inconsistent with Congress' intent via the Inflation Reduction Act to quickly scale the clean hydrogen economy. They would also undercut our economic and emissions goals. America needs clean hydrogen. And clean hydrogen needs the full extent of the production tax credit (PTC).

Additionality could halt the deployment of clean hydrogen and undercut economic and emission goals.

Across the country, new renewable energy projects face long wait times for permitting and interconnection. Additionality would mean that clean hydrogen projects incentivized by IRA wouldn't be able to get off the ground until their renewable counterparts were permitted and connected to the grid.

- The rapid increase in the number of interconnection requests has caused increasing waiting times for new renewable capacity to be connected to the grid.
- In 2022, projects took an average of 5+ years to progress from interconnection request to commercial operations.
- Delayed clean hydrogen would undercut our economic goals:
    - ~40% fewer jobs created by hydrogen deployment by 2035.
    - A 45% drop in investment in the clean hydrogen economy by 2032.
- Delayed clean hydrogen would undercut our emissions goals:
    - ~60% reduction in clean hydrogen demand by transportation and hard-to-decarbonize sectors in 2040.
    - ~50% drop in PM2.5 (a local criteria pollutant with significant negative health effects) and greenhouse gas (GHG) emissions abatement potential if the transportation sector's demand for clean hydrogen fuel is delayed from additionality.

Deliverability/regionality would constrain where clean hydrogen projects would be cost-competitive with fossil fuels.

A strict deliverability/ regionality requirement would significantly increase the cost of hydrogen, especially in regions without substantial renewable generation. This would disadvantage manufacturers in hard-to-abate industries in certain regions of the country that need clean hydrogen to achieve deep decarbonization.

- A strict deliverability/ regionality requirement could drive up the cost of a clean hydrogen production plant by an average of ~25-40% of the IRA's PTC value.
    - For regions with more solar resources but relatively low wind generation, the impact on cost could be large enough to erode more than 50% of PTC's value.

- Across the economy by 2040, requiring strict local geographic matching could translate into lost abatement potential of ~460 million tons of CO_2-equivalent emissions, concentrated in the transportation and industrial sectors.
- A strict local geographic matching requirement could also cause the economy to miss out on up to $8 billion in investment value and 340,000 jobs.

Hourly matching would not be feasible in many locations and would add significant delays and costs.

Hourly matching is not widely available today across America's different electricity grids. Requiring hourly matching and then waiting for it to be feasible would further disadvantage clean hydrogen relative to fossil fuels and suppress demand.

- Hourly time matching requirements could increase the cost of clean hydrogen by up to 75% of the PTC's value.
- Across the economy by 2040, an hourly time matching requirement for clean hydrogen could translate into lost abatement potential of ~540 million tons of CO_2-equivalent emissions, concentrated in the transportation and industrial sectors.
- An hourly time matching requirement could cause the economy to miss out on up to $8 billion in investment value and 505,000 jobs.

Implementing strict deliverability/regionality and hourly time matching requirements together would have intensely negative and compounding effects.

Practically, meeting both of these requirements would require oversized renewable buildout and electrolyzer capacity, plus the introduction of energy storage. This would dramatically slow the ability of clean hydrogen projects to get off the ground and drastically increase costs.

- By 2025, this could increase the cost of clean hydrogen production by more than $3/kg, essentially undoing the benefit of the production tax credit in the near-term (2025-28).
- Even in the long term (2030), the impact of these requirements could increase the cost by ~60-100% of the production tax credit value.
- This massive cost increase would have the following economic impacts by 2035:
    - A loss of more than 515,000 potential U.S. jobs in a globally competitive industry of the future.
    - $8 billion less investment in the clean hydrogen economy (from $12 to $4 billion).
- And the following emissions impact by 2040:
    - Nearly 4 million tons of lost clean hydrogen demand, concentrated in the transportation and industry sectors, which corresponds to millions of tons of lost GHG abatement potential.