

Retail Hydrogen Price Factors

There are many factors that go into the final consumer price for hydrogen fuel at the nozzle. These factors are most often associated with the costs of production, distribution, and station operations, yet additional factors can also apply. Altogether these factors lead to the final retail price.

Components that impact hydrogen price at the pump:

- Production – the cost of production is impacted by the availability and cost of feedstock used to produce the hydrogen, and method of producing such as electrolysis, steam methane reforming, pyrolysis, etc. Wholesale hydrogen markup and processing the hydrogen into final form for delivery (e.g., gaseous or liquid) are additional factors to consider. The number of hydrogen producers in given a region will also impact price, and economies of scale will help decrease price in the future with the current demand relatively low.
- Distribution – transporting the hydrogen from the production site to end user can occur via trucks, rail, maritime or pipeline. The amount of fuel to be delivered and distance covered will impact the final price.
- Station Development and Operations – at the dispensing station both capital expenditures (CapEx: cost of physical equipment, real estate) and operational expenditures (OpEx: maintenance, labor, day-to-day expenses) impact final hydrogen prices.
- Additional Factors – taxes, fees, supplier markups, and other factors can also contribute to the final hydrogen price along the process. Incentives and subsidies, such as tax credits or support programs (e.g. the Low Carbon Fuel Standard) can offset other costs and potentially lower final hydrogen prices.

Additional detail regarding the current economic condition of retail hydrogen stations:

- **Cost of H₂:** the cost to procure hydrogen has gone up due to inflation, labor indexes, and natural gas pricing. These factors are all beyond a station operator's control.
- **LCFS credits:** the value of LCFS credits has a significant impact on station economics. In 2022, the market value of these credits has dropped from ~\$200/credit to ~\$70/credit and has yet to recover. Station developers rely on these credits to improve the business case of the early retail hydrogen market.
- **Length of impact:** these market forces have been building for years, yet many operators elected to maintain prices for extended periods of time even as station economics became challenged. Eventually, this strategy was unsustainable and hydrogen pricing had to reflect market realities.

The above factors all impact and lead to the final price of hydrogen at the pump, with each individual station and hydrogen provider(s) having different pathways and decisions along the way. Currently, the hydrogen refueling market is not as transparent as traditional fuels markets as the transition is underway from a strictly business-to-business market to one more retail oriented.