

Webinar: Power-to-X: Concepts and Implications for Market Participants and Independent System Operators	
Question	Answer
Any thoughts on the flexible load represented by electrolyzers vs not so flexible with ammonia generation! How do we leverage that flexibility?	Electrolyzers seem to be pretty flexible. Paired with hydrogen/nitrogen storage, green ammonia production would be pretty flexible too as far as being able to turn down the electrolyzer and air separation unit without choking off the ammonia synthesis
Flexibility with no extra supply isn't so valuable. Should we require long term supply contracts for offering reliability payments/credits to flexible loads? (edited)	I'm not sure I agree with the premise. More demand should mean more revenue in the market to incentivize more capacity. Markets for PPAs are liquid enough that the equilibrium should be more supply to meet more demand without an explicit requirement
What is your opinion on very de-centralized grid like solar panel on every roof top and supported by in house batteries, in relation to your topic today?	Generally skeptical of the value of rooftop solar, particularly as so much utility scale solar is built, reducing the ELCC of solar generally.
Given that renewables plants can ramp up (assuming headroom available) and down very rapidly, does that assist in P2X plants?	Doesn't hurt
What is ERCOT's attitude towards PUN? Do ERCOT like the concept? Or they do not want this concept to come true?	Great question! ERCOT's attitude toward PUNs is that they existed before ERCOT, so they had to figure out how to accommodate them/integrate them into the ERCOT system. They aren't so amenable to the idea, however, of a bunch of new PUNs being developed and integrated into their system. They generally want full control/insight into the whatever generation/storage is connected to the system rather than it being a behind the meter black box
How should states be thinking about these kinds of loads? recommendations for collaboration between PUCs, state economic development offices, etc?	I mainly recommend that states continue to pursue a degree of deregulation in their electricity markets.
Why is it power to x and not energy to x?	Because the point is to "electrify everything" because we have a pretty good sense of how to decarbonize power generation.
To produce green hydrogen from green ammonia, can you use a percentage of the green hydrogen produced to provide heat to the ammonia cracker?	I don't see why not
Can a P2X project of sufficient size that is transmission connected purchase electricity directly from the RTO/ISO with no intervening retailer?	Practically speaking, I think it would have to be its own retailer in that situation, which would only be allowed in a deregulated retail market.

Part of the argument for P2X is making useful outputs from excess renewables how does that affect the modelling and energy cost curves?	I'm not sure I follow. There is supply and demand and they have different price points. The economic equilibrium is where these curves intersect