

Subject: IEP feedback #2 – RMI Scenarios do not factor in rapidly expanding Hydrogen economy

Dear NJBPU,

Rocky Mountain Institute (RMI) provided rough order of magnitude scenario model baselines to NJBPU. On the RMI presentation webinar, I asked RMI why was hydrogen missing from the scenarios. RMI directed me to page 24 (Figure 1 to the right) showing the introduction of hydrogen around 2047. This is the only slide that RMI has in its entire Integrated Energy Plan (IEP) presentation referring to Hydrogen use. This substantially contradicts what is occurring right now around the world in regards to Hydrogen being one of the leading focus points for creating a clean energy infrastructure and reducing CO2 emissions.

RMI explained on the call that hydrogen is not cost effective. Again, this doesn't match what is occurring in industry, countries, The International Energy Agency (IEA) and actual conversions to hydrogen that are currently underway in 1. Australia, 2. Canada, 3. China, 4. France, 5. Germany, 6. Japan, 7. Norway, 8. South Korea, 9. United Kingdom and 10. California (see latest updates sourced from <https://www.greentechmedia.com/articles/read/10-countries-moving-towards-a-green-hydrogen-economy>).

Both China and California have Fuel-Cell electric vehicles (FCEV) on the road now and both have established targets of 1,000,000 FCEVs on the road by 2030 and 1,000 hydrogen gas stations by 2030. Other updates from countries such as Japan and South Korea are fast tracking hydrogen gas stations and vehicles **by 2020** since Japan and South Korea are the leading automotive manufacturers of hydrogen vehicles being sold around the world.

Several other notes. 1. [Nikola Motor](#) is initiating production in the US of FCEV trucks **starting 2020**. 2. Numerous companies are developing Photoelectrochemical (PEC) hydrogen solutions (sunlight+water to hydrogen conversion). [Hypersolar](#) is one of the leading companies that has 2 generations of solutions and preparing manufacturing of the solution. 3. [Plug Power presentation](#) demonstrates how **Battery Electric Vehicles (BEV) are substantially more costly to operate over time** (see appendix) than FCEV.

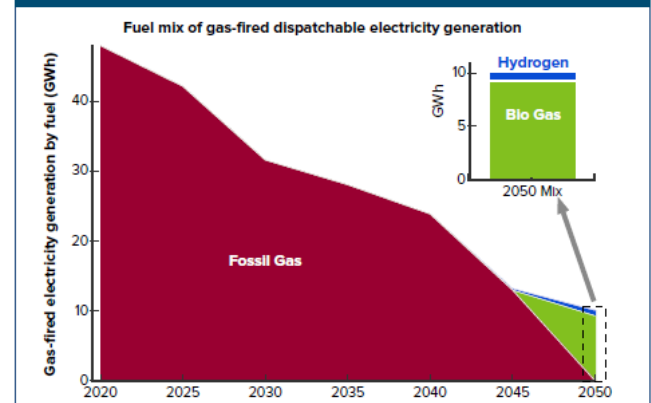
The idea that recharging of BEV cars will go down to 10 minutes is not realistic. Investing into BEV as the main vehicle by 2050 isn't practical considering people (stakeholders) will have to wait at the electric gas station more than 2 hours for each refill. I inquired with RMI 2 months ago since they submitted a comment to NJBPU for the Draft EMP. I wanted to let them know that their hydrogen research doesn't take into consideration what is currently occurring around the world. The IEP presentation also demonstrates a lack of knowledge regarding current studies, costs and consensus around the world targeting hydrogen implementation as a key ingredient for clean energy.

The IEP presented on November 1, 2019, doesn't reflect recent studies nor consistent with how other countries and states are reducing CO2 emissions and approaching clean energy. ***Please do not use the RMI IEP to guide the EMP since the scenarios are flawed and do not leverage what the rest of the world is pursuing.***

Please request Governor Murphy to create the Energy Master Plan Transformation Program (EMTP) Office Please make the IEP a 5-year project track in the EMTP program that ends 2025 so that NJBPU and all of the other agencies can come up to speed with what other countries, states and companies are doing around the world that will enable NJ to quickly and most cost effectively reduce CO2 emissions over 30 years. This is a **30-year project**, rushing the IEP today from RMI's outdated models will cost more to New Jersey residents 10 years from now. ***Please take the time to do this right***, we don't need the wrong answer today or this year.

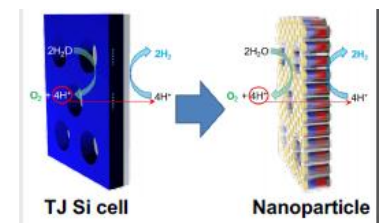
Figure 1 from RMI IEP Page 24 shows hydrogen as afterthought

Electricity generation from gas capacity falls steadily due to adoption of in- and out-of-state renewable energy resources.



- In the 2040s, options for clean firm energy include
 - long duration storage
 - turbines fueled using biogas and/or synthetic gas
 - H₂-powered generators.
- Least Cost scenario selects biofuel and hydrogen burned in conventional turbines

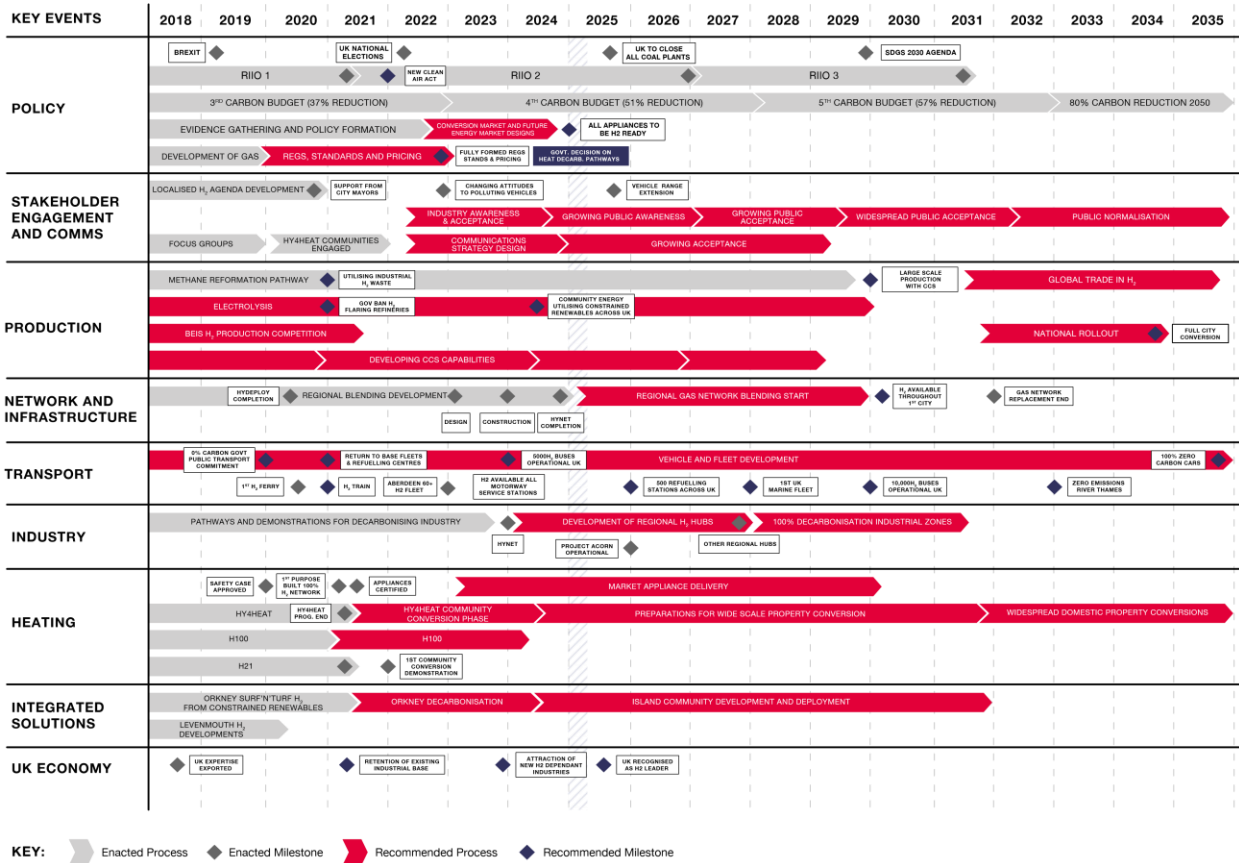
Figure 2 Hypersolar PEC Technology



Appendix

Sample Hydrogen Roadmap by ARUP (June 2019) found on California's Fuel-cell Partnership website (cafcp.org)

source: https://cafcp.org/sites/default/files/Establishing-a-Hydrogen-Economy_Future-of-Energy-2035.pdf



4 This road map summarises the key activities and outcomes which could occur on the journey to a vibrant hydrogen economy by 2035.

Scalable Hydrogen Fueling for Transit Applications by Plug Power (August 2019) found on California's Fuel-cell Partnership website (cafcp.org).

source: <https://cafcp.org/sites/default/files/H2-Infrastructure-Scalability-Aug-2019.pdf>

Conventional Wisdom of Electrical Infrastructure

Reality of Hydrogen Infrastructure

