Stored Energy – Reality Check: Audience Questions

The panelists received more audience questions than could be answered. The following is a list of questions that were generated. A few were answered at the event (these are asterisked and responses can be seen on the session video); some were answered by panelists after the event (in bold); and others are to be answered.

1. How can the utility make the best use of distributed, customer-invested energy storage to provide peak shaving and ancillary services? *

   Stan: I think the utility needs to consider different power distribution models that include community based generation, island-able microgrids, battery and gas energy storage and dispatchable power, so that grids could be tailored for actual peak demand, power spikes and let them manage the “smaller, bite-sized grids” rather than one huge web.

2. Is there an affordable option for off-grid energy storage? *

   Stan: There are a lot of good battery systems available now, the key is designing the system to meet your actual needs. You need to not only have the kWhs available for your daily needs, you need to be able to cover surges caused by motors and other heavy-draw appliances. This is where HECO could expand their business model to design, install and maintain simpler and smaller grids.

3. Does it make sense to encourage customer storage? *

   Stan: Not always. Apartment buildings and other high density areas may not lend themselves to individual storage. If you have space for sufficient renewable generation (small wind and solar) you will need storage when the intermittent production is not available, but you need to be able to produce power (or buy it when it’s cheap, if the rate schedule allows) if you plan to store it.

4. Luke, have you looked at newer technology solutions for cost-effective upgrades that you could increase reliability & quality of power? *

5. What about water heater thermal and ice storage? *

   Stan: These technologies work well if the utility rate structure rewards the customer for storing “Non-Peak” power and using it at peak times. If your power always costs the same it doesn’t seem to make much sense. Installing solar water heating as a way of avoiding grid power to heat water is a good technique to save energy, but not such a good idea if you’re just storing energy that always costs the same.
6. If hydrogen is the superior storage mechanism, why don’t we see more already installed? *

Stan: In the book “Lives per Gallon” by Terry Tamminen, he calculated that oil companies are subsidized by U.S. taxpayer federal dollars to the tune of between $65B-$113B per year, and the power companies (many using clean renewable hydroelectric power) have invested trillions of dollars in infrastructure (already paid for and written off in corporate taxes). Hydrogen infrastructure is starting at ZERO, and is actually still becoming competitive as technology makes it cheaper and better in spite of lack of tax breaks and capital investment costs staring the industry in the face. Hydrogen is quickly approaching the tipping point where it will make the most sense. An example I use when I show people my hydrogen plant at Joint Base Pearl Harbor – Hickam is: This plant is the same size as a typical gas station, and it is the oil field, oil pipeline, oil tanker, oil refinery and tanker truck that brings the gas to the gas station, all in a couple thousand square feet of space. If all you did was eliminate the transportation cost of oil to gasoline, hydrogen makes more sense. Infrastructure costs have been a big hurdle, but it’s turning into a small speed bump. Hydrogen makes sense.

7. What kinds of battery are most used right now in the market?

8. Luke- will you go back on the grid?

Luke: Yes. I’m in a unique situation, in that I’m about 500’ from the nearest utility line – with a small river in the way. So, part of the reason that I went off-grid was that we would have had to spend a significant amount of money to get connected. Hopefully within the next eighteen months we’ll invest in bringing water and electricity over.

9. Are you encouraging individual home storage?

Stan: For single family residences and planned communities, YES!

10. For Stan - how would you reconcile methane storage and climate risk (methane being more potent than CO2)?

Stan: I don’t particularly, especially for Hawaii where we import all but 12 % of the methane (CNG or Propane) we use here, but the slide I showed was comparing the relative utility of different storage methods, and on the mainland, storing methane and converting it to hydrogen mitigates much of the GHG problem by sequestering the carbon and using it for other industrial purposes rather than releasing it into the air as CO2 or CO.

11. Luke - So are you now a KIUC member AC coupled?
Luke: No. Answered in number eight. We're still off-grid, but hoping to connect within the next eighteen months or so.

12. Stan-where's the new hydrogen fueling station on Oahu going to be?

Stan: SERVCO is building one in Mapunapuna for the Mirai they are starting to bring to market. I am working with some private investors to provide hydrogen for transportation use along Nimitz/Ala Moana Blvd. as transportation demand increases. I am also assisting HIDOT in designing and building a hydrogen station for a fleet of buses at the Honolulu Airport. We have not determined yet if the DOT station will sell to the public or be strictly to service a state fleet.

13. Why wouldn't anyone want to use nickel zinc batteries which are safer and more sense than lithium ion batteries?

Stan: I think if you take all the properties of different batteries, lithium seems to win, particularly in weight, power-in to power-out and maintaining voltage until near discharge. That said there are safety issues to be considered (that's why you can’t carry extra ones on airplanes easily) and there are hazmat issues at disposal. If your situation allows, there are certainly better choices than Li for a lot of reasons, safety and cost among the greatest.

14. Are there plans being developed to properly dispose of batteries (both utility and behind the meter scale) at the end of their lives?

Stan: I sure hope there’s someone working this. I'm a hydrogen guy, and my vehicles still need batteries to cover surges and smooth out power!!!

15. Who has a hydrogen generator for less than $125K?

Stan: Millennium Reign, out of Dayton, Ohio sells a 2kg/day electrolyzer with 2 kg of storage at 5000psi with a J2600 compliant dispenser for your vehicle for under $100K. I have one at our Cooke St. office, but I added 6kg of extra storage and that added about $20K to the cost.