Tompkins County Climate Protection Initiative

Minutes – Friday, December 13, 2024
Video Conference
9 am to 11 am

Attending: Bill Dailey, Brian Eden, Carol Chock, Chris Skanski, Dave Bradley, Dawn Montanye, Gerri Wiley, Hailley Delisle, Inger Aaberg, Ingrid Zabel, Janelle Bourgeois, Karim Beers, Margaret McCasland, Marie McRae, Mike Straight, Paul Moore, Rebecca Evans, Kristen Van Hooreweghe, Savannah Vega, Sheila Out, Terry Conrad, Tom Hirasuna, Paul Mutolo, Evan Kurts, Anne Rhodes, bethany ojalehto mays, Christine O'Malley, Peter Bardaglio

Distributed-Scale Green Hydrogen to Prevent 'De-Celerating' the Energy Transition – Paul Mutolo and William Dailey

Paul Mutolo, CEO and co-founder of Standard Hydrogen Corp., and William Dailey, vice president and co-founder, discussed the role that green hydrogen can play in the clean energy transition, especially when it comes to energy storage, using their work in Ithaca as a case study.

- Standard Hydrogen make important pivot a couple of years ago from clean transportation alone to the grid itself
- As electrification starts to happen as pathway away from fossil fuels, electrification needs some help
- We see green hydrogen as big part of emissions free future
- Work with utilities includes National Grid, Con Edison, NYSEG, and RG&E
- Paul and Bill are two of early co-founders
- Green hydrogen has strong role to play in distribution grid energy storage
- Infrastructure under stress due to electrification of things – grid unable to handle it but demands on grid increasing
- Even with more distributed solar happening, grid is not built to handle it
- On one side, you have turbines powered by fossil fuels and nuclear with some renewables – on other side you have industrial, commercial, and residential sectors using that power
- Grid expects to operate at 60 Hz and use side expects 60 Hz to come in – 60 Hz maintained by peaker plant and spinning reserves
- Clean grid offers a lot of promise but more difficult to regulate flow of power when using wind, solar, and hydropower
- Need clean, dynamic, responsive energy storage to ensure smooth flow of power to offset intermittency and weather issues – batteries, pumped hydro, and metal-air batteries playing important role
- Hydrogen can also be important in spanning gap – reason hydrogen has so many versatile uses is due to its energy density, which is much higher than lithium-ion batteries

- Energy once stored as hydrogen gas does not dissipate – no degradation of stored energy
- No self-discharge and very responsive – can serve both long-term and short-term needs
- Standard Hydrogen is exploiting these operational advantages – can serve lots of different needs at one installation
- Not depending on any trucking or centralized manufacturing of hydrogen
- Modular, scalable, and flexible siting – emissions consist of water
- Developed energy transfer system that captures, stores, and delivers renewable energy
- Unit has quarter-acre footprint and has capacity to charge/refuel more than 20 buses a day
- At same time eliminates 6.4 million kg of CO2 each year – same as eliminating 100 years of pollution from one driver every month
- Business model is not to sell systems but to provide services and its ability to move clean energy – includes fast EV charging, distribution grid upgrades, and green hydrogen fueling
- Infrastructure as a service:
    - Access multi-functional clean hydrogen fuel and services
    - Avoid high capital cost of infrastructure
    - Improve investment in distributed solar + wind
    - Hardware operations & maintenance included
- Energy transfer system advantages:
    - Zero Emission
    - Energy Storage + Clean Fuel
    - Hydrogen Made & Used at Customer Site
    - Supports & Complements Intermittent Renewables
- Does not involve fossil fuels, combustion, blending with natural gas, or centralization and transportation of fuel
- One of things that makes hydrogen expensive is fact that it has to be transported – ability to produce and use it on site makes hydrogen much more affordable
- None of technology we're deploying is new – we're not start-up company implementing prototype
- Each of components in system – electrolyzer, storage, and fuel cell – available from multiple vendors around country – modular, scalable, and adaptable
- Capture — Electrolyzer (MW-scale)
    - Generates hydrogen from water + electricity
    - Scalable, silent, safe
- Store — Gaseous Hydrogen Storage
    - 17 kWh per cu. ft.
    - Hours to days of backup power
- Deliver — Fuel Cell (MW-scale)
    - Zero emission electricity
    - Silent, efficient, versatile
- Deliver — Transportation
    - Grid Neutral EV Charging
    - Hydrogen Vehicle Refueling (optional)

- Control & Optimize — Proprietary system design and supervisory software and controls – this is one part of system that's new
- Ready to go – have secured necessary approvals from PSC as well as funding from NYSERDA, and USDOE
- Working with City of Ithaca and Shift Capital to install first unit at SouthWorks multi-use campus
- Will be able to eliminate emissions from both electricity and transportation sectors – 6.4 metric tons per MW deployed
- SHC up at SouthWorks campus – redevelopment of Morris Chain and Emerson Power facility into mixed-use residential, commercial, and industrial campus
- Project goal is to provide SouthWorks and the Ithaca community with a hydrogen-based Long Duration Energy Storage facility to serve both energy and transportation needs
- Will help NYSEG handle electricity generated by large roof-top solar system at SouthWorks – South Hill substation not set up to handle all of this solar electricity
- This non-wires alternative avoids need to rebuild much larger substation
- Two functions: 1) provide power and fuel for TCAT's EV and fuel cell buses; and 2) energy storage resiliency and reliability for solar electricity

<u>Q&A</u>

- Peter: Can you talk about the different ways in which hydrogen is produced to provide some context for this project?
- Paul: So-called gray hydrogen is produced by natural gas reacted with steam to produce hydrogen, CO2, and CO – chemical process not amenable to scaling down – requires large, centralized facilities
- If using same process, you're able to sequester CO2, then that's called blue hydrogen
- If, as we're doing, you're producing hydrogen using electrolysis (splitting water) and electrolysis is powered by renewable energy, then that's called green hydrogen
- If your electrolysis is powered by nuclear, then that's called pink or sometimes red hydrogen
- Economics of moving hydrogen around are really challenging – by working locally and moving electrons instead of molecules, economics are much better – we're also producing hydrogen that has zero carbon intensity
- Key advantage of hydrogen is that it's dispatchable – so when excess solar or wind is being generated you can use it to power electrolysis and produce hydrogen
- One possible approach to retiring peaker plants while maintaining grid stability – by siting utility-scale solar and wind on site of retired peaker plants you are able to take advantage of interconnectivity provided by transmission lines and avoid problem of locating these projects in places that might generate opposition
- Ingrid Zabel: Are there examples of residential neighborhoods that are using kind of system you're developing at SHC?
- Paul: As far as we're aware, SouthWorks would be first neighborhood in this country – some neighborhoods possibly in Japan and Germany
- Tom Hirasuna: In making hydrogen, you're also making oxygen – do you have a plan for the oxygen and can that help with the economics?
- Paul: We're looking for opportunities to serve customers in the MUSH (municipalities, universities, schools, hospitals) sector – talking with hospitals about providing them with oxygen – another possibility is salmon farms

- Paul: By working at the distributed scale and making hydrogen where it's needed, you're able to avoid the steep transportation costs
- Our plan is to run the electrolyzer up and down as the grid needs electricity and as the renewable energy supply dictates rather than run it 24/7
- Also whole system is designed to be modular so it can move and grow as needs around it move and grow
- Peter asked Rebecca if she had any updates relating to this project – she noted that Common Council was very excited about this opportunity
- Rebecca hopeful that some other applications such as working with the school district to help them charge the all-electric fleet mandated by the state
- Also potential applicability regarding shared services with other municipalities, for example
- Could this technology help the city centralize charging hubs for EVs instead of having them scattered all over the city
- Dave Bradley pointed out that by providing oxygen to sewage treatment plant, it would help them process more of the organic waste without having to enlarge the plant due to the way oxygenation can improve the efficiency of the process
- Paul said they've had some good conversations with the folks at the waste treatment plant
- Paul also said they're working on developing ways to use the oxygen internally because it helps increase the efficiency of hydrogen production

Climate Solutions Accelerator of the Genesee-Finger Lakes Region – Kristen Van Hooreweghe

As part of our effort to better understand the work of other climate action organizations in upstate New York, Kristen Van Hooreweghe, the senior program director at Climate Solutions Accelerator in Rochester, shared with us the mission, vision, and recent work of the Accelerator, which started out in 2014 as the Rochester People's Climate Coalition.

- Mission of Climate Solutions Accelerator: "To create a healthier, more equitable, and regenerative community by catalyzing local efforts to eliminate greenhouse gas emissions and address the effects of climate change"
- Climate Solutions values:
    - Inclusive
    - Nonpartisan
    - Solutions-focused
    - Collaborative
    - Transparent
    - Scientifically-informed
    - Committed to social, racial, economic, environmental and intergenerational justice
- We engage in range of programs, including:
    - Genesee-FLX Climate Collective
    - AMPED Clean Energy Hub
    - Color Your Community Green
    - Color Your School Green
    - Color Your Organization Green
    - Climate Advocacy Network
- Used to be Rochester People's Climate Coalition (RPCC)

- Leading up to the 2014 Peoples Climate March, more than 30Rochester-area organizations joined together to demand action on climate change and form RPCC
- Following the march, representatives from member organizations continued to work together on climate action
- In Fall of 2020, rebranded and expanded geographic focus to the 9-county Genesee-Finger Lakes Region
- In Feb. 2021 we launched Genesee-FLX Climate Collective
- Started working with Stockholm Environment Institute on regional GHG inventory
- Climate change requires systemic solutions that reach across agencies, sectors, & organizations – adopted collective impact approach
- Climate-focused collective impact brings together cross-sector stakeholders to:
    - Develop a common understanding of the problem and common agenda
    - Establish a shared system of measurement
    - Foster mutually reinforcing activities
    - Encourage continuous communication
- Over course of 2020-21, during Covid:
    - Developed series of climate change fact sheets
    - Worked with Stockholm Environment Institute on GHG inventory
    - Carried out online public stakeholder engagement
    - Developed some various scenario analyses
    - Did some focus group visioning
    - Created plan of action strategy
- Results of GHG inventory showed transportation largest source of emissions, followed by buildings
- One thing that set us apart was impact of agriculture, especially dairy – 22% in Finger Lakes compared to 6% statewide
- With population of 1.2 million, Genesee-Finger Lakes region emitted 12.8 million metric tons, compared to Nepal with population of 29.1 million, which emitted 12.0 million metric tons
- Analysis of energy burden in region showed clearly that lowest income households were well above 6% guideline – even worse in city of Rochester
- Put together short video that drew on stakeholder engagement sessions, exploring what people from wide variety of backgrounds thought a thriving region on a healthy planet should look like
- Next step was to figure out how to make that vision happen – our strategy for next 3-5 years focuses on:
    - Key enablers of long-term systemic change
    - Targets our primary local emissions sources
    - Actions we know we have to take
    - Already existing/proven technologies
    - Maximizing co-benefits for the community (i.e., “multi-solving”)
- Working with ACT Rochester, developed following indicator categories for measuring progress, with each category containing several indicators
    - Community vitality
    - Demographics
    - Environmental justice and sustainability
    - Housing
    - K-12 education

    - Poverty
    - Transportation
- Climate Solutions Accelerator designated as NYSERDA clean energy hub in region, called AMPED – so far:
    - Over 2000 residents engaged at close to 100 events, with 50% located in state DACs
    - Over 250 energy adviser calls
    - Over 70 commercial & residential installations
    - Completed a Regional Clean Energy Workforce Development Assessment
- Have formed series of Color Your Community Green teams
    - CYCG aims to connect and organize people to form a network of climate-focused citizen action teams across the nine-county region – not yet active in every county
    - 195 active CYCG members with 11 active teams – largely concentrated in Monroe County
- Purpose of CYCG is to educate and mobilize neighbors and elected officials, identify and implement high-impact, local campaigns, and develop climate leadership of local residents
- Examples of action items include:
    - Clean heating & cooling campaigns
    - Community gardening projects
    - EV Infrastructure campaigns
    - County-wide composting campaign
- Have also developed Color Your Organization Green program to be launched next month – participants will:
    - Complete a guided course from January to November 2025
    - Conduct a vulnerability assessment, taking into account the climate's impact on you, not just your impact on the climate
    - Create a strategy and vision to guide your organization in addressing the climate crisis over the long term
- In addition, Climate Solutions Accelerator engages in policy and advocacy work
    - About 90 members in Climate Advocacy Network
    - Over 60 legislative engagement & advocacy activities
    - Participate in statewide coalitions NY Renews and Renewable Heat Now to fight for statewide priorities, e.g., NY HEAT and a just Cap-Trade-Invest System
    - Working on an energy standards for rental properties feasibility study
    - Will intervene in the 2025 RG&E/NYSEG rate case

<u>Q&A</u>

- Ann Rhodes: What are some of the things you've done to keep the group together for so long?
- Kristen: Passion and commitment of our executive director, board members, and volunteers
- Carol Chock: Can you say more about the size of your staff and how you assemble the resources to support it?
- Kristen: We have about 16 staff – we've been able to expand our staff because of the resources brought to us by NYSERDA as the region's clean energy hub – it was a game changer for us

- We also get funding from private foundations and generous donors
- We partner pretty closely with the Southern Tier and CNY clean energy hubs
- Brian Eden: Worked together on the NYSEG/RG&E rate case, statewide heat pump campaign, and getting intervenor funding to support public policy people who participate in rate cases
- Dawn Montanye: Would be good if we could talk outside this meeting about our respective workforce development efforts and how we've developed ours based on Roots of Success model
- Peter asked Rebecca for her reaction to the video that Kristen showed and the way it reflected some of the new approach the Ithaca Green Deal has adopted
- Rebecca observed that in communicating with the public it makes more sense to focus on issues such as clean air and water, walkable streets, and the other issues touched on in the video rather than using GHG emissions as metric of success
- Kristen offered to connect Rebecca with the woman who made the video for Climate Solutions Accelerator
- bethany ojalehto mays suggested that carbon pollution was something people understood even if GHG emissions metrics might seem abstract
- Peter noted that idea of pollution underpins the Climate Change Superfund Act and the make polluters pay model – really important to find ways to connect climate change to more concrete, day-to-day concerns of average person