



New Jersey Zero Energy Buildings Meeting Minutes

6.29.2021, 3:00 – 4:00 pm

Attendees

- Kai Palmer Dunning, NEEP
- Darren Port, NEEP
- Carolyn Sarno-Goldthwaite, NEEP
- Jess Gearan, NEEP
- Ben Adams, MaGrann Associates NJ
- Ann-Marie Peracchio, NJNG
- Jerry Ryan, NJNG
- Baird Brown, eco(n)law LLC
- Christine Liaukus, NJIT
- Christine Schell, NJ DEP
- Christopher Colacello, NJ BPU
- Scott Majka
- Helaine Barr, NJ DEP
- Jennifer Souder, Rutgers Center for Green Buildings
- Jennifer Senick, Rutgers Center for Green Buildings
- Jennifer Pierson
- Karl Hartkopf, NJ DEP
- Kevin Nedza, NJ BPU
- Kyle Holder, NJ Buildings Association
- Eric DeGesero, FMANJ
- Marie Daniels, NJ DCA
- Matthew Rivas, NJ DEP
- Matthew Kaplan
- Myrrh Caplan, Skanska
- William Amann, ME Engineers
- Paul Orlando, NJ DEP
- Rob Austin, NJ DCA Codes and Standards
- Rupa Deshmukh, NJ DEP
- Victor Viscomi

Grid Impacts of ZE Buildings and Electrification

Jerry Ryan, Energy Efficient Technology & Operations Manager at New Jersey Natural Gas

Balancing Act to Lower Emissions

- RAP: must meet one or more of the three conditions
 - Save consumers money over LR.
 - Enable better grid management.
 - Reduces neg enviro impacts.
- Must not adversely affect each other.
- Important to balance energy efficiency with renewable energy.

Consideration or Additional Electric Load

- Reality of PJM markets - how will the additional electric be generated.
 - Baseload generation - high in NJ for nuclear
- no GHG associated.
- NJNG - look at marginal emissions rate.
- Looking at the incremental impacts, not the average



- What is the cost of trying to clean up those marginal emissions? What is the cost? How can we most effectively do this?
- Think about energy distribution company and systems - can they handle this additional load?

Key Considerations for the Analysis

- Focus on the peak day rather than the average load.
- Look at marginal emissions rather than average.
- Look at the storage - technology available and cost.
- Look at what baseline we are comparing against.
 - Standard gas furnace? High efficiency furnace? Natural gas heat pumps?
- Include strategies that lower gas distribution system emissions.
- Must do the math and consider all options that help achieve the goals related to lowering emissions, minimizing cost, and maintaining reliability.
 - Depends on timing, what technologies are out there (renewable natural gas?)
 - Does electrification = lowering emissions?

What if the grid is not ready?

- % of current summer peak and what it would mean to fully electrify
- Could we negatively affect with a too fast transfer to electrification?
 - Really think through the transition process
 - Are the systems we are implementing secure?

Natural gas heat pumps

- Primary advantage: greater than 40% reduction in gas consumption over baseline
- Zero energy buildings are the goal but can the source of the fuel.
- Huge leaps and bounds made regarding the electric heat pumps.
- Combustion can be outside or sealed.
- Uses natural refrigerants.
 - Zero global warming potential

Baird Brown, Principal of eco(n)law LLC

- Decarbonizing is first energy efficiency and transportation electrification.
- Let us do things that save money and save the planet...
- The time of energy use is critical to the energy grid.
 - California
 - Strong subsidy for solar
 - Energy use peak moved from middle of the day to 6/7/8 at night b/c the solar reduced the demand on the grid.



- High price time at the end of the day
- Need a huge amount of gas fired power plants as the load jumps rapidly from 5:00 to 8:00
- Huge strain on the grid
- Engages power plants that would not be used normally.
 - Grid is built in a way that anyone can use however much electricity they want.
 - A lot of factors playing in here.
- When you get to peak use, you are using the oldest, dirtiest, most expensive energy.
 - On super-hot days, running out of power and not meeting the needs of the grid.
 - Huge monetary value in the shape of the load

Net zero buildings

- Doing a huge favor to the grid
- Batteries are controllable.
- Hot water comes with thermal storage... you can shift the time of use.
- Thermal use is controllable.
- When do you run your AC? Smart appliances?
- Home controller that manages the whole system and can deliver a different load shape - can move your energy consumption from when the grid is in worst shape to a time when the grid is not as overwhelmed.
 - I.e., chill water at 5am in the morning when no one is using it, then use it all day for AC when the prices are high.
- A whole range of services that a homeowner can provide to the grid...
- Do homeowners have enough controllable power at their disposable to make a difference in the grid?
 - Maybe not
- Aggregate buildings!
 - For example, Princeton University is signed up to be an aggregator.
 - Aggregator is making a large portfolio to sell to the grid and reduce/cover the cost of installing energy efficiency measure.
- NJ with the DOE working on (?) a program that would provide financing to provide vendors to provide smart energy efficiency to energy efficiency to solar on the roof etc.
 - Make sure that everything is being installed with common communication and protocol.
 - Easy to aggregate people.
 - Aggregate and sell!
 - Can structure an easily understandable and easily managed program... empowers customers to engage with the power.

Discussion

- Electric vehicles
 - You can feed back energy to the grid.



- Being actively explored by a lot of people right now
- One more asset to the smart building manager
- How will codes play a role in the energy efficiency of a building and moreover the grid?
 - **Kyle Holder:** <https://www.njspotlight.com/2021/05/interconnection-delays-big-problem-impeding-solar-growth-new-jersey-state-wants-fix/>