

Power Structures: Assessing Building Design and Technology Pathways for Future Community Energy Resilience

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ABSTRACT

Deferred infrastructure upgrade costs are rising in conjunction with spending on energy retrofit efforts and programs including RetrofitNY and multiple housing authority-led upgrades, under the auspices of the “Reforming the Energy Vision” plan from the New York Governor’s office. Conventional energy network infrastructure upgrades in New York State cost taxpayers millions annually, and many remain susceptible to frequent damage from severe weather events. With climate change expected to place increasing demand on heating and cooling systems and cause unprecedented spikes during peak hours on already taxed substations and utility services, demand-side management programs alone are insufficient to address the growing burden.

The current study aims to define and assess pathways through which building design, development, and technology integration can play an active role in the successful deployment of a range of distributed energy systems to promote reliable energy availability and resilient communities in anticipation of greater temperature extremes and weather events. The presentation will posit three key aspects of the project: geographic areas of potential alignment with distributed energy infrastructure based on metrics established by relevant NY Prize feasibility studies; possible technological innovations and models for integration that could leverage complementary energy use cycles across zoning and building program types; and, a model for public-private partnerships between building owners, municipalities, the state, and utility companies, as well as energy technology providers.

BIOGRAPHY

Dr. Nina Sharifi is an inventor, designer, and educator conducting building technologies and infrastructure research in her lab at Syracuse University. Her work ranges from microgrid and distributed energy for community resilience, to active building environmental controls systems, to deep energy retrofit and assemblies for rapidly deployable structures. Her work has been funded most recently by NYSERDA and the American Institute of Architects, and in the past by state and federal governmental agencies.