

Technology Focus Areas

Empire Building Challenge retrofit projects are expected to be transformative beyond traditional energy efficiency improvements. These projects focus on shifting thermal loads from fossil fuels to electric and/or constitute enabling work that prepares building(s) for future electrification, such as projects that reduce thermal loads and thermal and electric peaks.

The Challenge is looking to advance three major technology focus areas:

Thermal Storage Technologies

Integrating advanced thermal storage technologies into buildings, providing grid interactivity, and feeding electrified thermal energy systems (e.g., heat pumps) is key to fully decarbonizing our building stock. Emerging thermal storage technologies alleviate space constraint issues, provide peak thermal capacity, optimize operational efficiencies, utilize waste heat, and reduce the need for oversized electrified thermal energy systems, which creates retrofit cost compression.

Building Energy Distribution Design Innovation

New engineering design means and methods are needed to enable and speed the adoption of low carbon retrofit technologies. Decarbonization requires adapting distribution designed for legacy thermal supply— whether steam, hot water, forced air, or unitary— to systems with carbon-free heat. New design strategies are emerging that can also alleviate space constraint issues, provide peak thermal capacity, optimize operational efficiencies, utilize waste heat, and reduce the need for oversized electrified thermal energy systems, which creates retrofit cost compression. Interventions must be minimally intrusive to tenants, scalable for portfolio owners, and continuously functioning y in a phased decarbonization plan. A variety of technological solutions demonstrate promise: hydronic distribution; exterior/envelope integration; reusing/modifying existing thermal, sanitary, fire suppression, and other distribution systems; and integration with thermal storage.

Advanced Heat Pump Solutions for Large Buildings

Heat pump technology is rapidly evolving. Advanced heat pumps that are not yet available for widespread use in the United States are available in European and Asian markets, and technology is emerging to maintain capacity and efficiency in cold climates. A significant need exists for various format heat pumps (e.g., water-water, water-air, air-water, etc.) to allow for phased decarbonization, waste heat recovery, thermal storage optimization, retention of existing thermal distribution systems, and retrofits of a large office or residential building heating plants to significantly reduce or eliminate on-site fossil fuel consumption.

Join the Challenge

The Empire Building Challenge is looking to connect with solution providers and cleantech manufacturers worldwide that fall under these technology focus areas to help real estate companies uncover new solutions for low carbon high-rise buildings. Learn more about the Challenge and how you can get involved and gain access to New York's growing clean energy economy.

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