Energy efficiency has been, and will continue to be, foundational in our transformation towards a clear energy future. Utility programs, codes and standards, government initiatives, and others are leading the effort with over 27 million MWh of new electricity energy saved in 2018, adding to the nearly 250 million MWh of ongoing savings from previous years [1], which represents nearly 7% of total US annual electric consumption. In addition, the traditional division of our energy system into “behind-the-meter” loads and “in-front-of-the-meter” production is starting to fade, with buildings becoming recognized as a flexible asset and interactive resource to the grid. In order to continue to have impact, focus will be on better understanding, evaluating and providing energy efficiency at those times most beneficial to the grid. To accomplish this, stakeholders will continue to rely on effective and accurate tools that evaluate design solutions and technologies to continue to advance energy efficiency through building load flexibility. This work leverages state-of-the-art building energy modeling (BEM) toolsets to showcase the potential of effective commercial building load flexibility evaluation to improve our ability to achieve successful, high-performing building projects, but also to enabling advanced building system design and control techniques including the ability to respond to electric grid conditions. Through demonstrating the load flexibility potential of a single building technology, this effort proposes the value to industry for a more comprehensive set of technologies and evaluation strategies to harmonize conventional energy efficiency and load flexibility in support of the future grid.

[1] ACEEE (American Council for an Energy-Efficient Economy). 2019. *The 2094 State Energy Efficiency Scorecard*. <https://aceee.org/research-report/u1908>

Ryan,

I see this work fitting with Panel 3: Commercial Buildings: Technologies, Design, Operations, and Industry Trends. Two sessions ago there was as presentation titled Small Thermal Energy Storage and Its Role in Our Clean Energy Future, but that’s all I found in the past two years related specifically to TES.

Since the focus so far is on presenting the load flex potential, I foresee presenting:

* Impacts of sizing and control decisions on annual flex metrics (efficiency and shift)
* Post-processing results of possible +/- kW over given durations (shed and add)
* In-simulation results of load add/shed events – highlighting the additional analysis provided compared to the post-processing (improved shed and add characterization)

How much do we need to explicitly call out ice storage in the abstract?