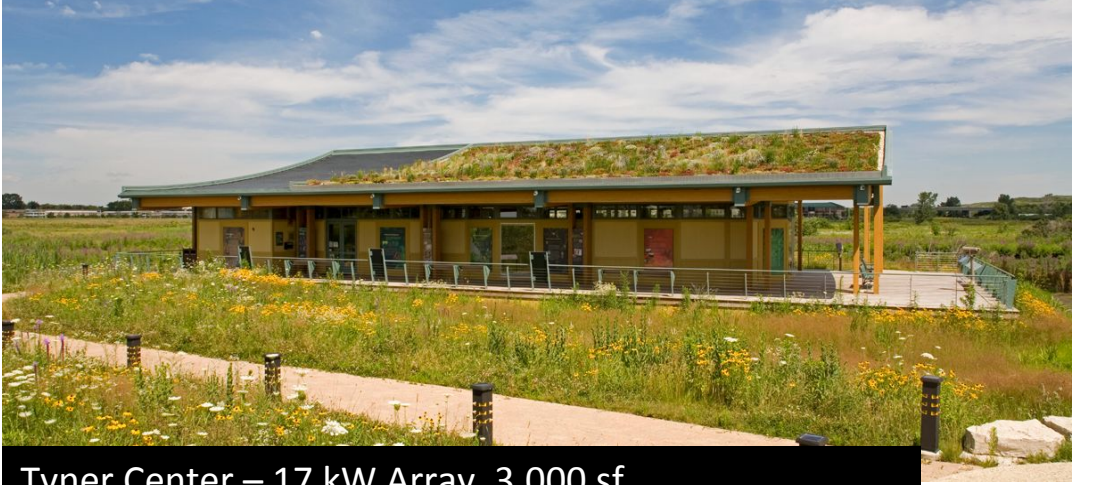


Stevenson HS Classroom Addition, 465 kW Array, 58,000 sf



Tyner Center – 17 kW Array, 3,000 sf



Sunset Ridge Middle School 420 kW Array, 70,000 sf School

# Net Zero Energy Design as a Practice

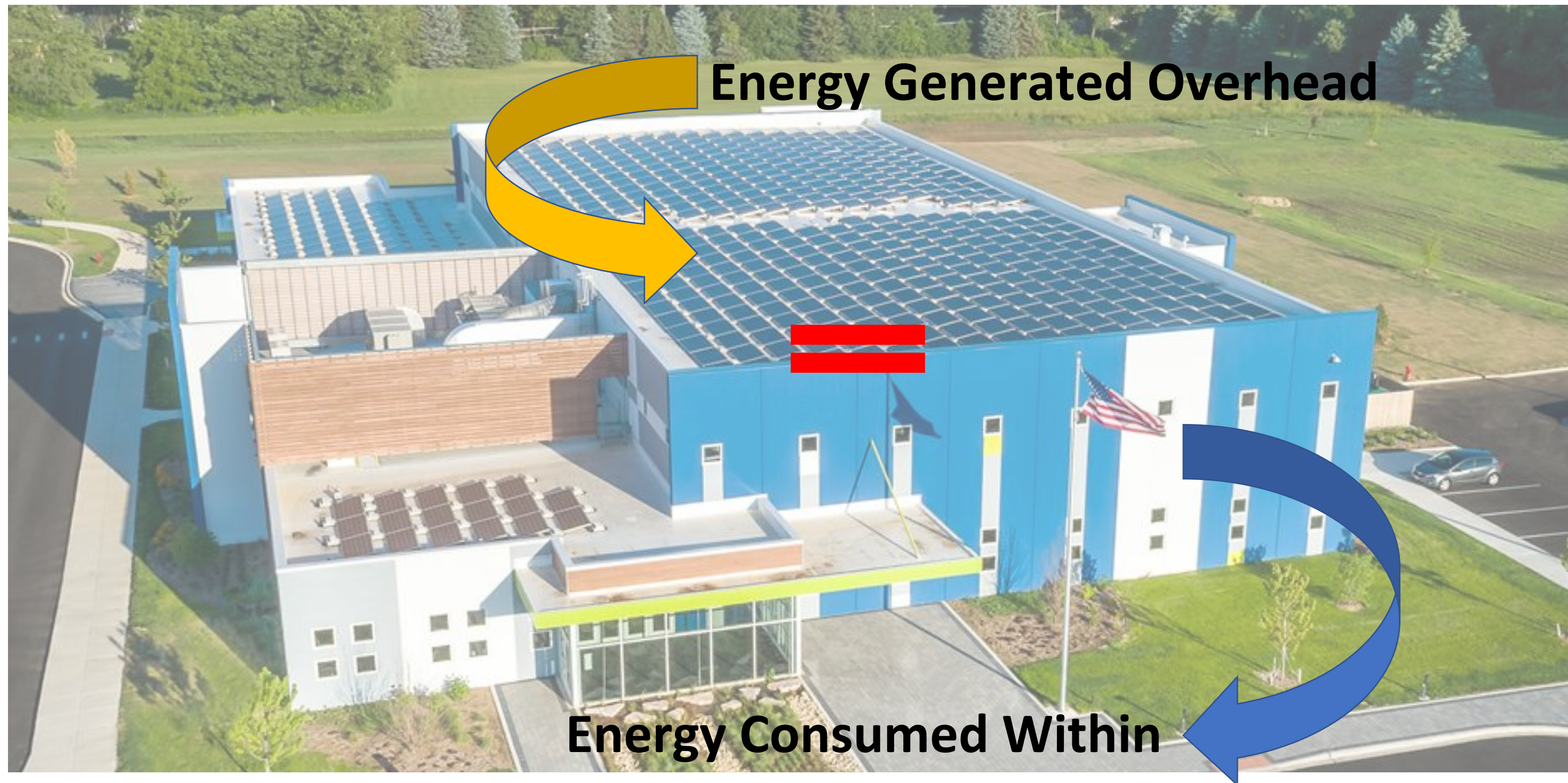


Stevenson HS Fieldhouse 1.1 MW Array, 67,000 sf



Northbrook Activity Center, 314 KW Array, 44,000 sf

# What is a Net Zero Energy Building?

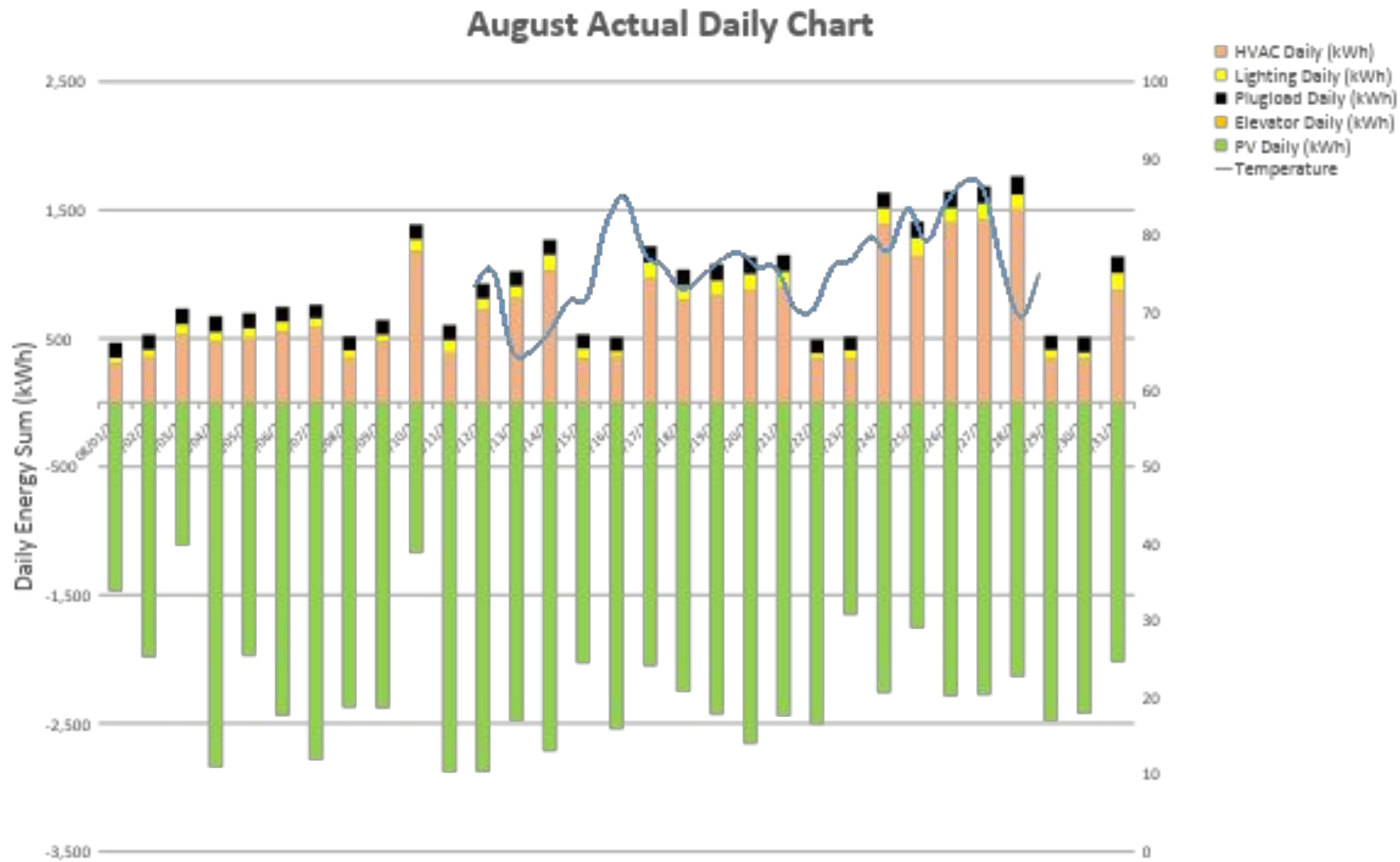


On an *Annual* Basis

# Net Zero Energy Buildings *Come Alive* in Performance Period



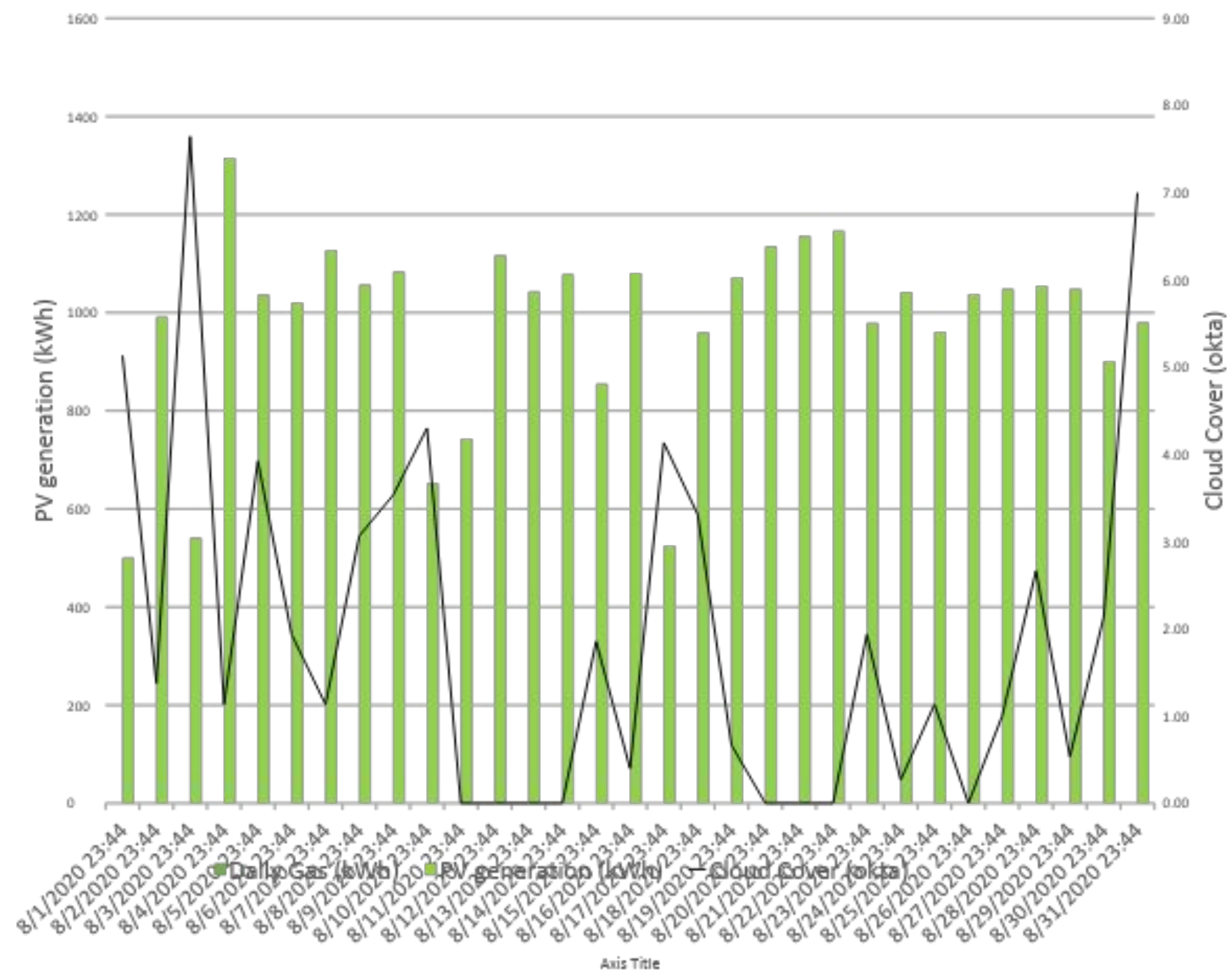
# One Month of Performance Data



# Solar Production is *Sensitive* to Cloud Cover



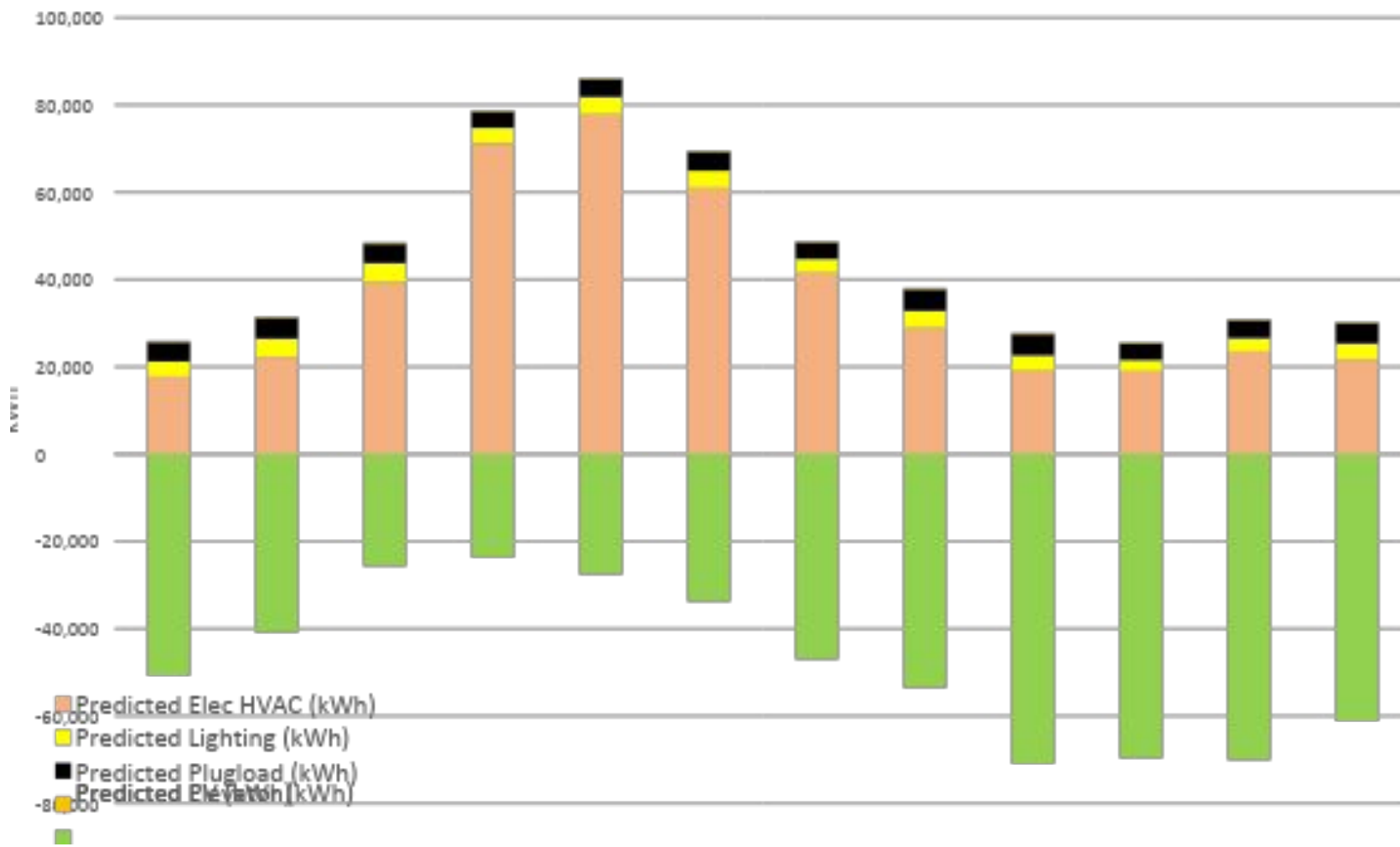
August PV Daily



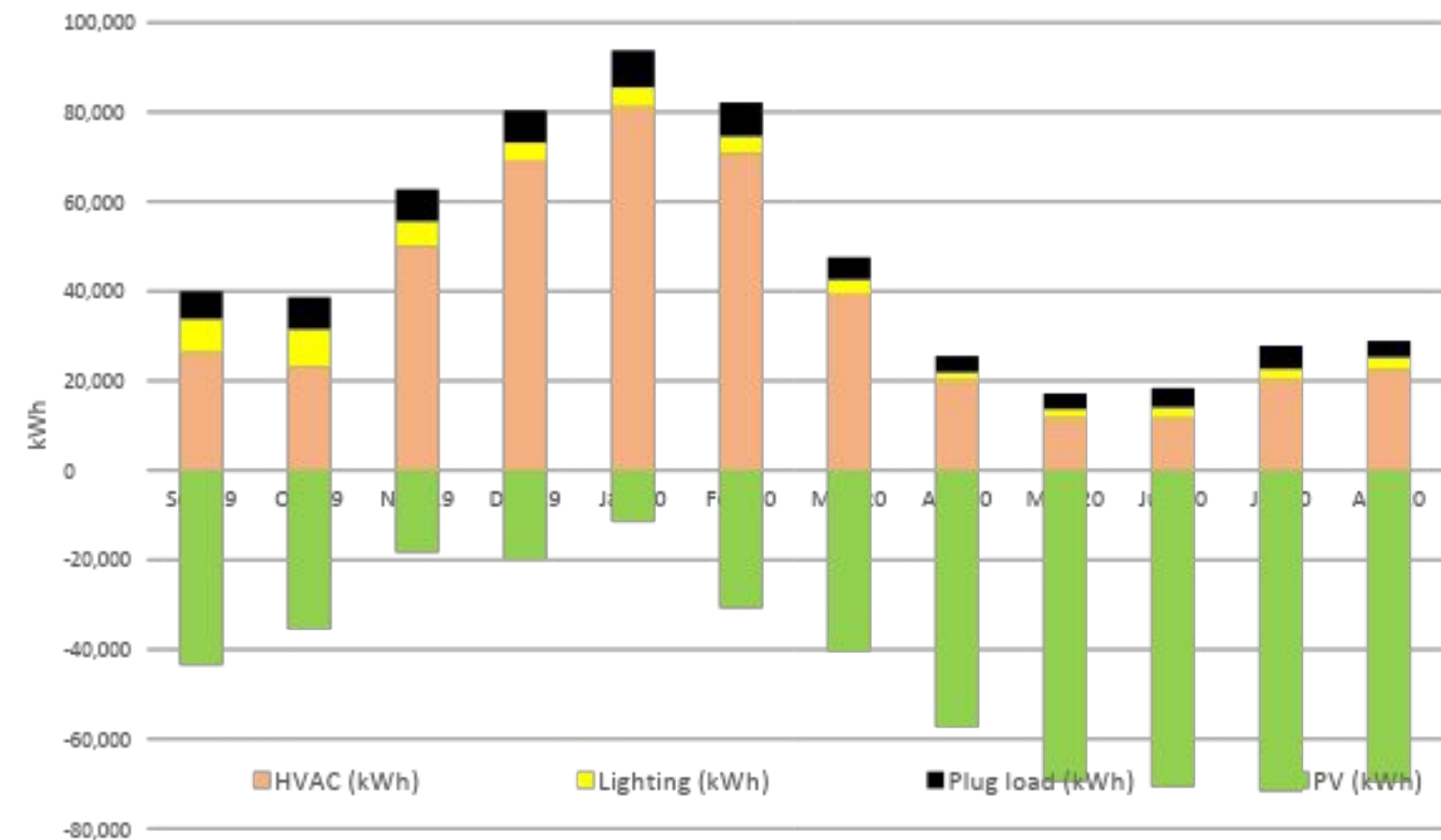
# Net Zero Energy Buildings are Built on PREDICTED Models



Annual Predicted Performance



Annual Actual Performance



# Lessons Learned on Delivering Net Zero Energy



## M & V

- Energy model assumptions and equipment performance parameters don't always sync.
- Commissioning is key. And recommissioning.
- Net Zero is a **VERB**. In a performance period, you can't afford to adjust and wait for 30 days of results.
- Someone must be tasked with monitoring all the systems frequently.
- Problems are best solved with integrated team approach.

## Operation

- Use the warranty period to keep trade contractors and equipment manufacturers engaged.
- The weather is going to be different than the weather model files.
- It's not always the weather. But you will become very weather conscious.
- Explore the comfort parameters and see if you can expand the comfort zone.
- If you think it's challenging to be net zero, you're right. So far....because it's a new practice...but shouldn't we apply this scrutiny to all buildings?

**Thank You.**  
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