

NET ZERO ENERGY STATUS

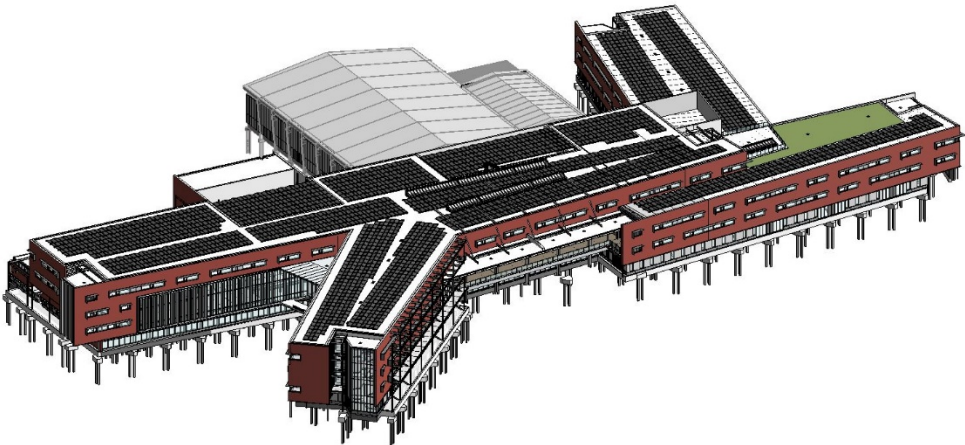
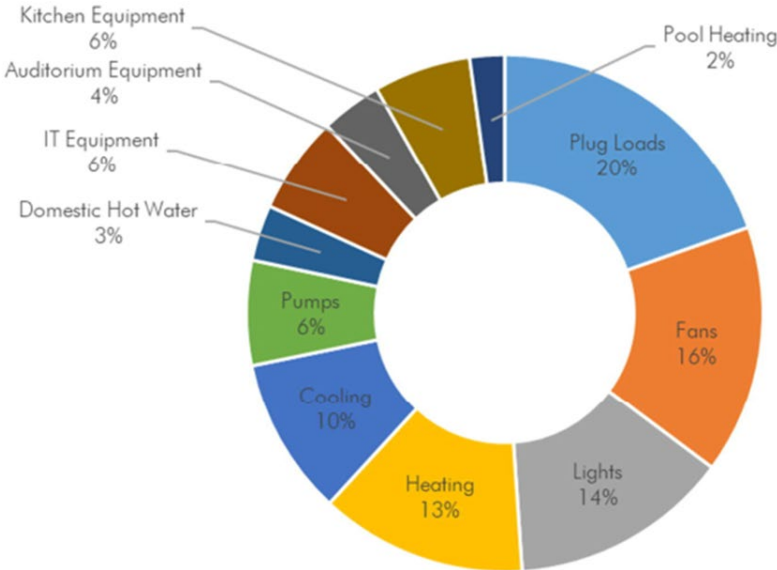
Current Estimated Annual Energy Use ~~4,294,000~~ kWh/yr

Current Estimated Energy Use Intensity (EUI) ~~32.5~~ kbtu/sf/yr

Current Estimated Annual Renewable Energy Generation ~~1,370,000~~ kWh/yr

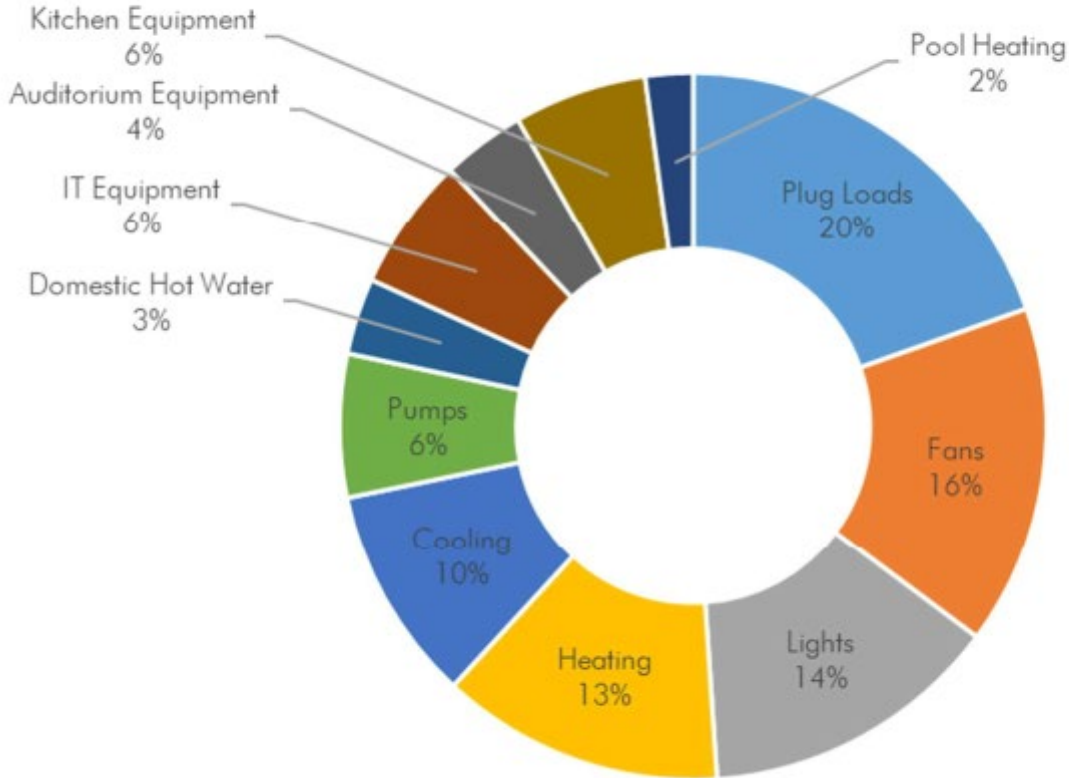
Current Percentage of Annual Energy Use Offset ~~32%~~

Annual Energy End-Use Comparison



ENERGY MODEL ANALYSIS

Annual Energy End-Use Comparison

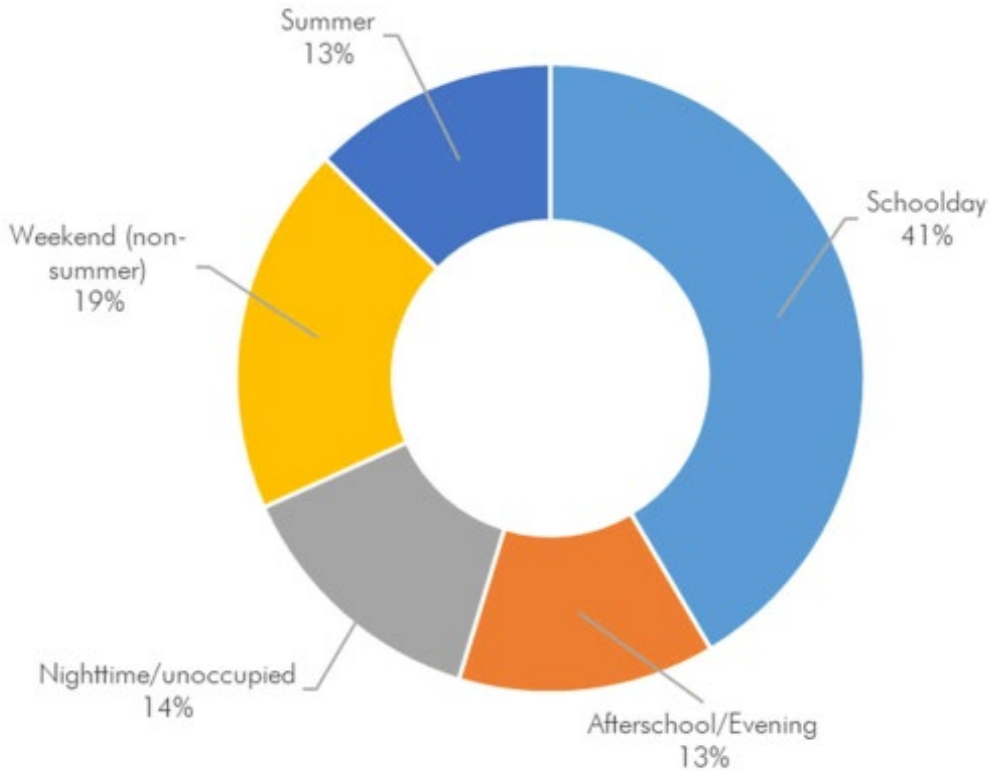


| Annual Energy End-Use Summary (kWh) | |
|-------------------------------------|------------------|
| Plug Loads | 842,673 |
| Fans | 668,054 |
| Lights | 590,035 |
| Heating | 555,979 |
| Cooling | 425,762 |
| Pumps | 279,953 |
| Domestic Hot Water | 149,062 |
| IT Equipment | 264,449 |
| Auditorium Equipment | 163,365 |
| Kitchen Equipment | 261,166 |
| Pool Heating | 93,523 |
| Total (kWh) | 4,294,021 |

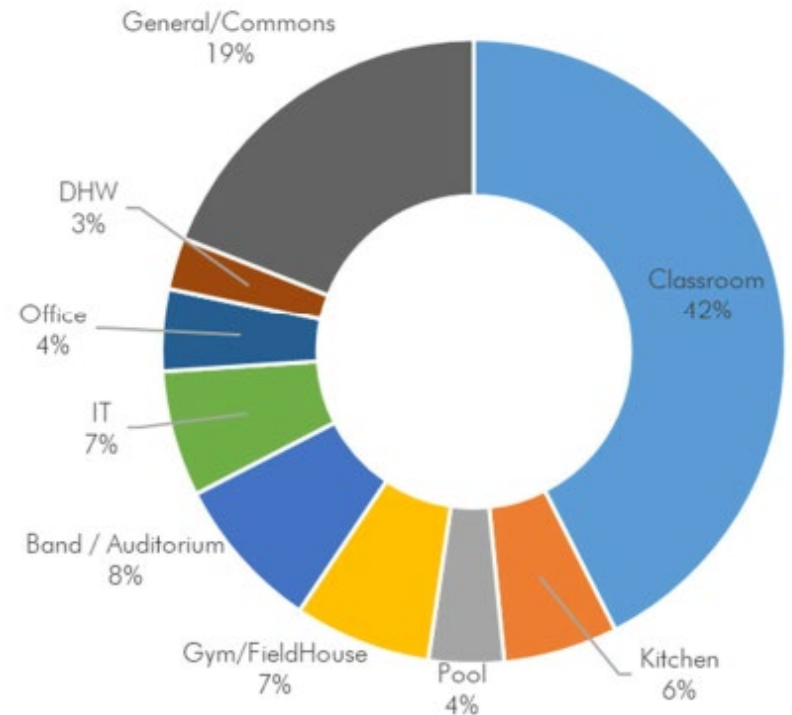
HVAC = 45% of Annual Use
Equipment = 36% of Annual Use

ENERGY MODEL ANNUAL ENERGY BY TIME PERIOD & BUILDING TYPE

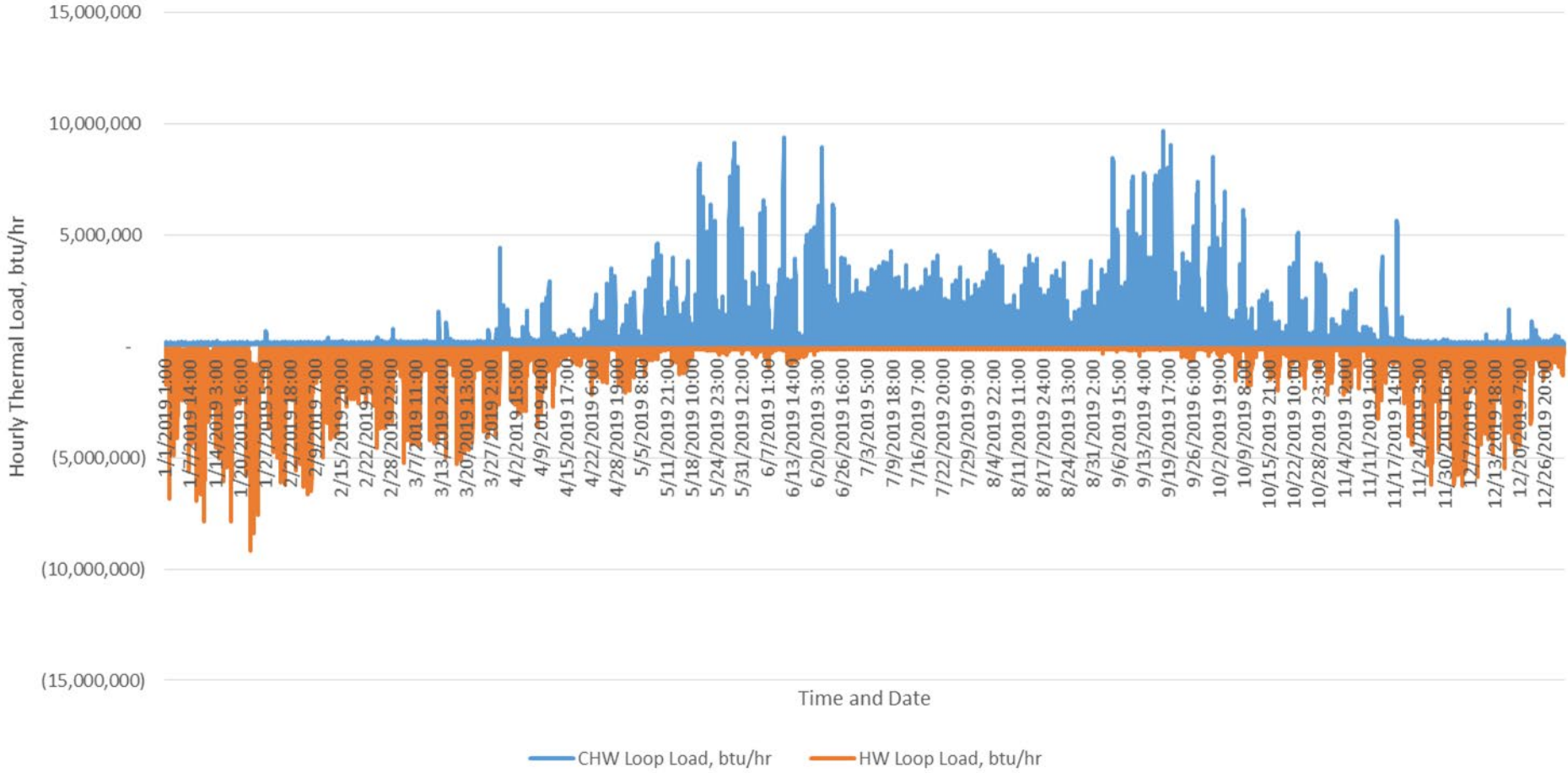
Annual Energy Consumption by Time Period



Annual End-Use by Building Type



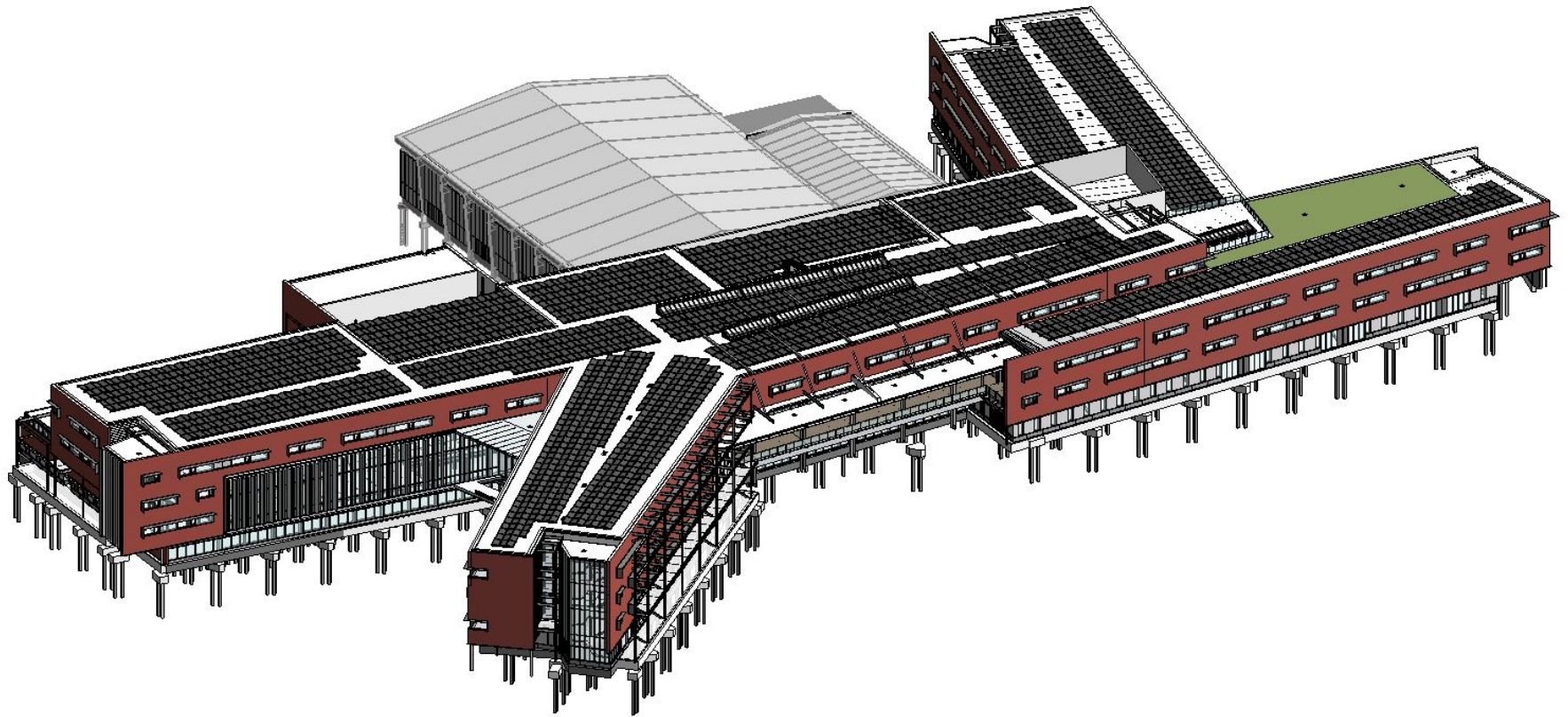
ENERGY MODEL: COOLING vs HEATING BUILDING LOADS



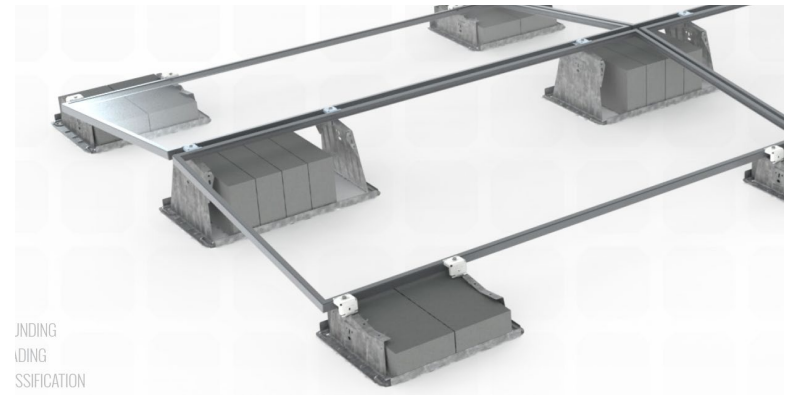
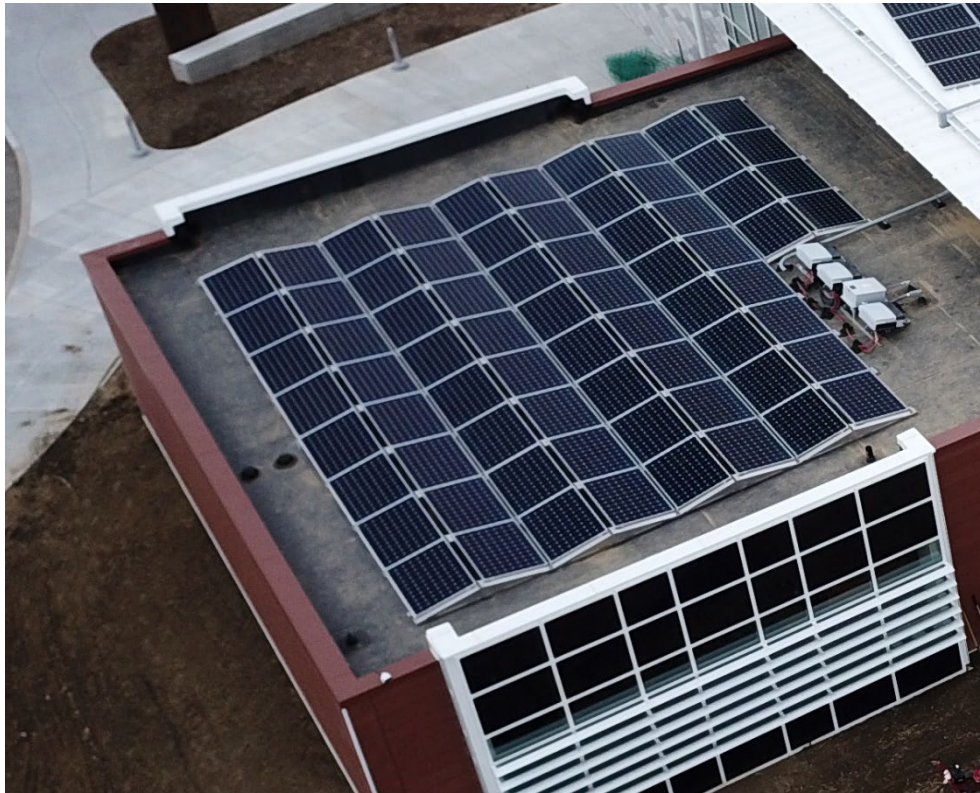
ENERGY MODELS

- **Energy Model**
 - Confirm occupancy schedules
- **Architectural Design Refinement**
 - Shading optimization
- **Mechanical System Design Refinement**
 - Transport energy: fan static pressures / pump heads
 - System size: design air flows / outside air flows
 - Control sequences
 - Pool conditioning (dehumidification)
- **Lighting Design Refinement**

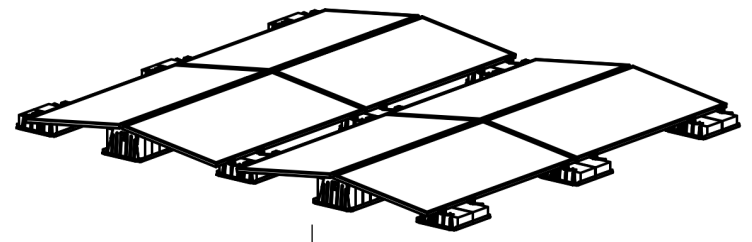
RENEWABLE ENERGY PV ARRAYS



RENEWABLE ENERGY



JNDING
DING
SSIFICATION



RENEWABLE ENERGY SYSTEMS

Sunpreme Maxima GxB 390-SM



Front View

Back View

Sunny Tripower Inverter

SUNNY TRIPOWER 12000TL-US / 15000TL-US /
20000TL-US / 24000TL-US / 30000TL-US



RENEWABLE ENERGY CURRENT SHORTFALL

Current Estimated Annual Energy Use ~~4,294,000~~ kWh/yr

Current Estimated Energy Use Intensity (EUI) ~~32.5~~ kbtu/sf/yr

Current Estimated Annual Renewable Energy Generation ~~1,370,000~~ kWh/yr

Current Estimated Percentage of Annual Energy Use Offset ~~32%~~

Current Renewable Energy System Size ~~1.33~~ mW

Number of PV Panels ~~3,448~~

Panel Area = ~~72,840~~ SF

Annual Renewable Energy Shortfall ~~2,924,000~~ kWh/yr

Required Additional Capacity ~~2.83~~ mW

Required Additional PV Panels ~~7,328~~

Required Additional Panel Area ~~154,800~~ SF

RENEWABLE ENERGY /

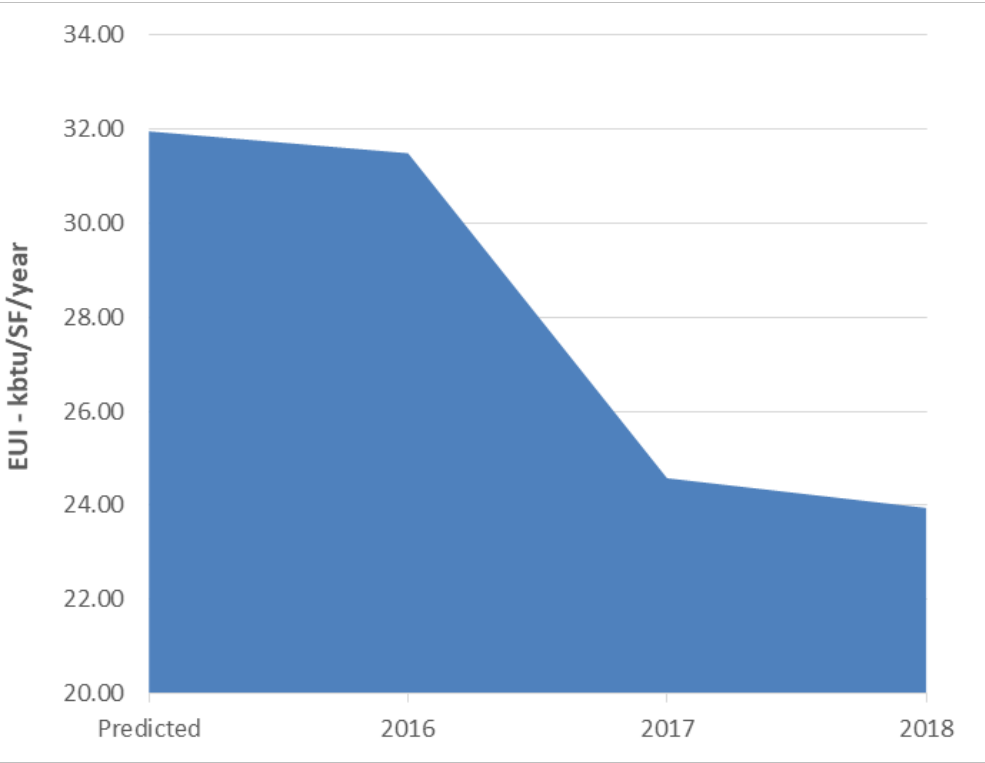
- **Increase Roof Mounted PV**
 - Reduce perimeter setback
 - Thin film product for Field House roof
- **Site Mounted PV**
 - Dual Axis Trackers
 - Parking lot canopies
- **Off-Site Opportunities**



NET ZERO ENERGY / OPPORTUNITIES FOR FURTHER PERFORMANCE IMPROVEMENT

- **Mechanical Systems**
 - Optimize air flow
 - Optimize transport energy (fans & pumps)
- **Plumbing**
 - Geothermal heat pump water heaters
- **Pool**
 - Optimize pool make-up water requirements
- **Plug Loads**
 - Optimize amount & efficiency of equipment
 - Fully utilize automatic shutdown including all computers
- **Commissioning**
 - Post-Occupancy Performance Improvements

NET ZERO ENERGY / OPERATIONAL IMPROVEMENTS



MLK School— Post Occupancy Performance Improvements