



# SUSTAINABLE OPERATIONS WORKSHOP – PROGRESSIVE ENERGY MANAGEMENT

AUSTIN STAHLY – MANAGER OF ENERGY AND FACILITIES PROJECTS

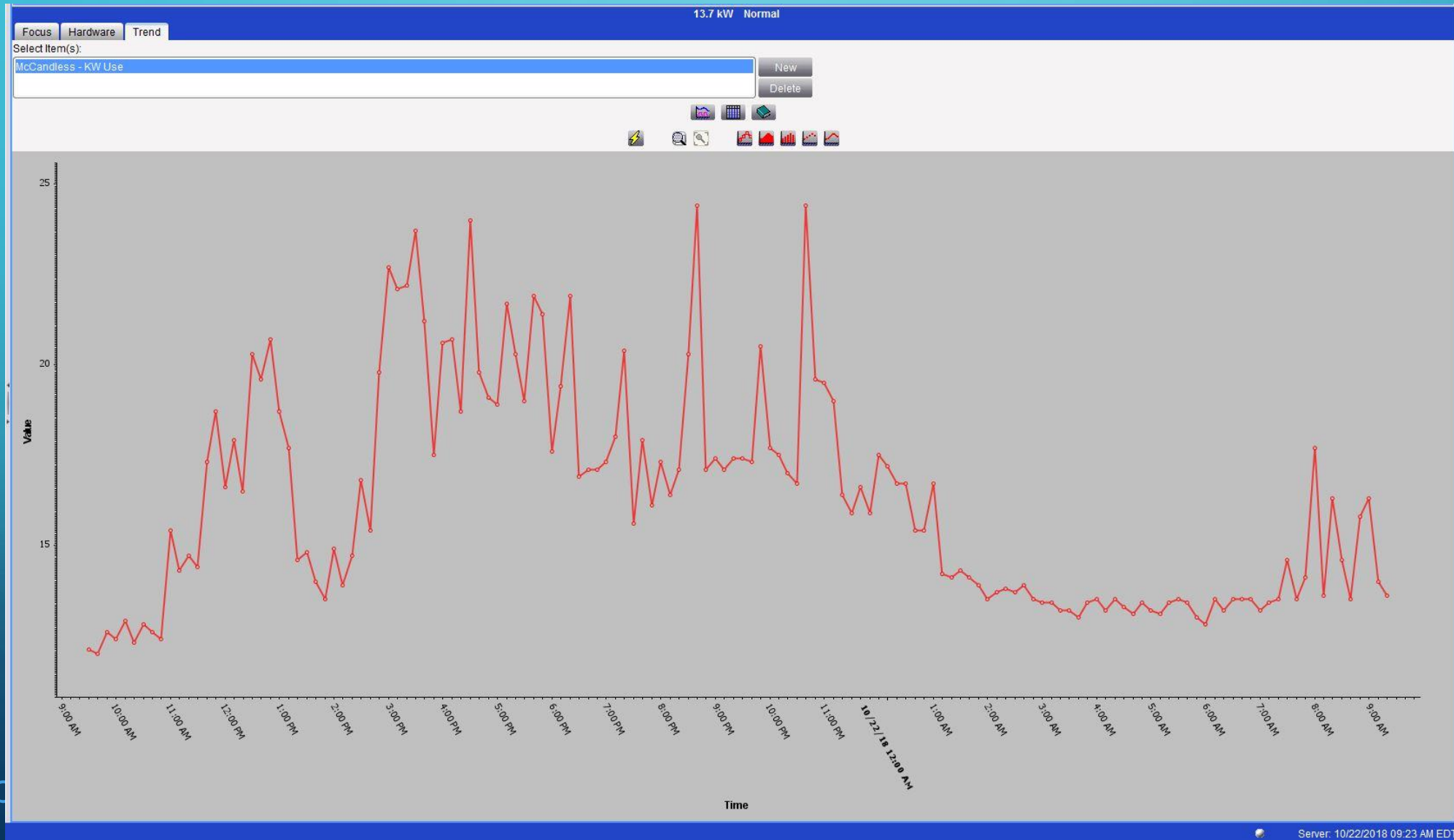
SAINT MARY'S COLLEGE

NOTRE DAME, IN

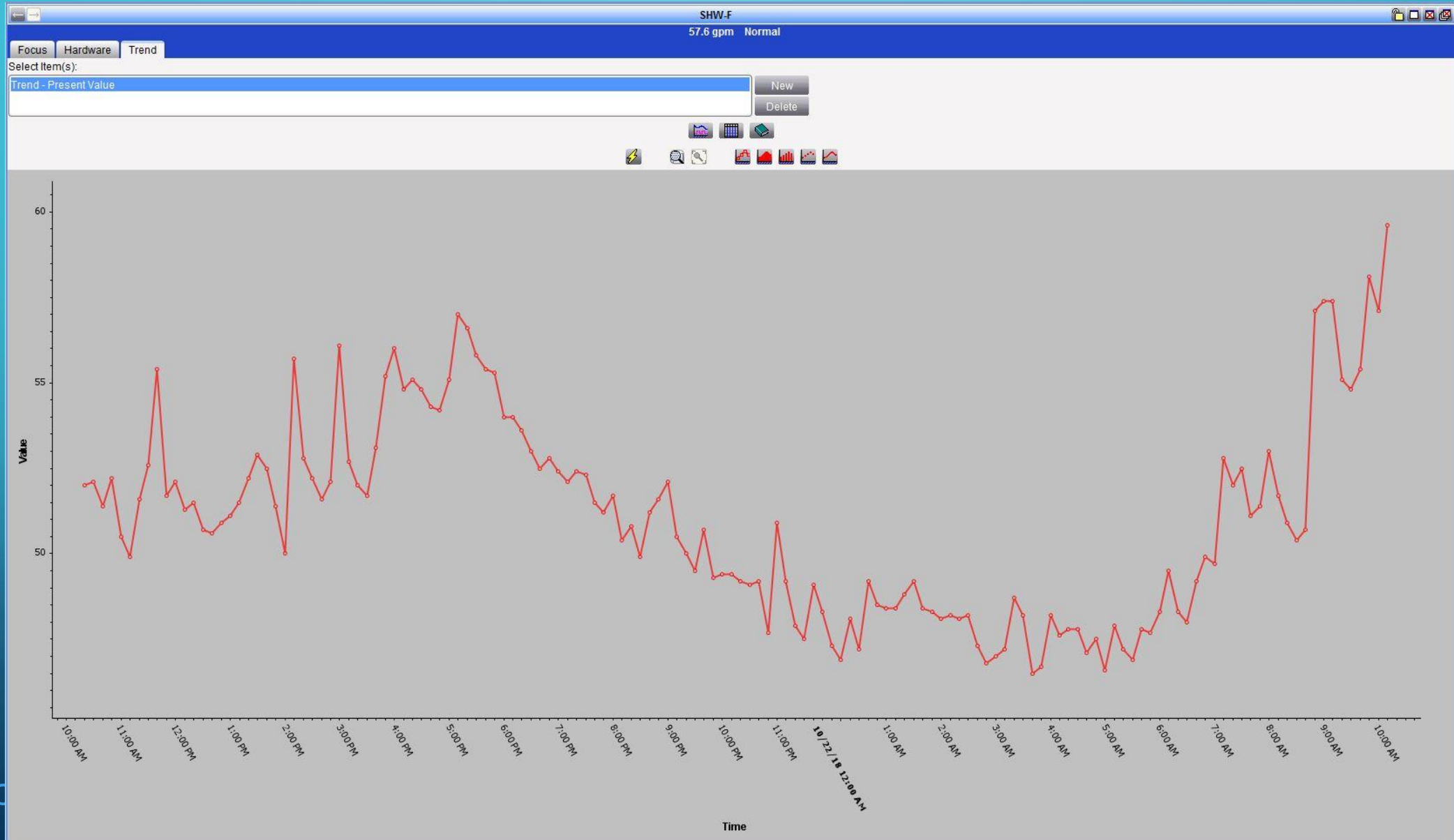
# HOW SAINT MARY'S COLLEGE TRACKS ENERGY

- Numerous types of energy tracking throughout our 19 buildings on campus.
  - Electrical energy meters, chilled water and hot water meters, steam condensate meters, domestic hot and cold water meters, flow meters for the different systems as well.
- This gives us the capability to monitor real time energy usage from our Building Automation Systems(BAS).
  - We have two BAS that we utilize on campus, Metasys through Johnson Controls and Tracer SC through Trane Controls.

# MCCANDLESS HALL ENERGY METER (KW USAGE)



# MCCANDLESS HALL HOT WATER METER(GPM)



# CURRENT METERING PROJECTS

- SMC has many older buildings on campus!
  - For all renovations/additions we incorporate metering into the projects when applicable.
- We are in the process of implementing metering to all of our dorm buildings.
  - The hope is to be able to broadcast real time data in each dorm to enable us the power of education via dorm competitions!
  - Some dorm buildings are in shared academic buildings which poses some challenges.
- Working with a demand response company on getting a campus wide real time energy meter installed.

# HOW TO DETERMINE WHICH ENERGY PROJECTS TO TACKLE

- Low hanging fruit/Quick payback – Biggest bang for our buck!!
  - Replacing inefficient lights such as T12, incandescent, HID to LED
  - Addressing steam traps that have worn out
  - Insulating piping across campus (reduce thermal transfer in tunnels and buildings)
  - Adding VFD's and DDC's to our HVAC systems
  - Adding occupancy/vacancy sensors to non emergency lighting
  - Taking advantage of all incentives to help offset project costs
  - Using our in house maintenance staff to complete projects saving on contractor costs
    - When special equipment is not required, more energy saving materials can be purchased

# OTHER FACTORS THAT AFFECT PROJECT SELECTION

- As inefficient equipment/materials fail, we replace with efficient measures.
  - For example, if an old motor has failed, we replace with newer technologies that ultimately improves the life of the overall system.
- Safety and security are always seen as a major deciding factor when choosing certain projects
  - Retrofitting/replacing HID's to LED across campus is a huge push for us right now.
  - LED lighting offers many great characteristics, such as increased CRI that helps brighten campus while increasing our CCTV capabilities. This takes away the gloomy orange hue and gives us a nice bright white light that increases moral while moving across campus.
  - Long life LED lighting significantly reduces the maintenance required by our staff.

# HOW TO TRACK THE IMPACT OF AN ENERGY CONSERVATION PROGRAM

- Before starting to address inefficiency's, we do building energy audits (typically in house) to get preliminary data.
  - This data can be as simple as how long lights are on in a typical day, which is required for incentive applications anyway, to what is the operations sequence in the controls for a buildings HVAC system. (I.e. Can we increase/decrease the available user set point on their thermostat to increase energy efficiency.)
  - With some of our buildings individual energy meters, we can see how much of an influence these changes make over a period of time.



# UTILITY BILL COMPARISONS

- Even with individual meters on our buildings, our overall utility bill is a great resource that helps us look at the big picture.
- Many factors play a big role in utility bill monitoring
  - Construction projects require a lot of energy
    - Defining a dollar amount per square foot for new construction and renovation utility budgeting
    - Increasing campus square footage while decreasing campus energy usage
  - Weather and season length from year to year
    - Comparing like months from previous years using graphs to incorporate variable factors
  - Over the last 4 years, we have increased our campus building footprint by over 100,000 square feet while staying utility bill neutral.

# QUESTIONS?

- Thank you!