



# Using Energy Data to Verify Shutdown

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# Brief Timeline of Pandemic in U.S.

- Mid February -Diamond Princess Cruise Ship incident - 39 U.S. nationals infected
- March 1<sup>st</sup> – NY records 1<sup>st</sup> case, OR records 2<sup>nd</sup>, 62 total U.S. cases
- Mid March – Social distancing ordinances enacted. Schools begin to close across U.S.. Major sporting leagues suspend seasons
- March 20<sup>th</sup> – CA, NY, and IL lead statewide non-essential workplace closures that occur across U.S.
- **Opportunity for us as energy professionals to act!**



# Post-Closure Observations



- General guidance issued for shutdown procedures
- Buildings are not mothballed but set in a ready status. Walkthroughs are common
- Challenge in commercial real estate with regards to lease obligations - intermittent occupancy and essential equipment operation
  - Hatch Data estimates national consumption has declined by 22% in CRE
- Temperate shoulder season has allowed some retail space to shutdown RTUs at disconnect
- Many owners are addressing deferred maintenance
  - Boiler, chiller, and cooling tower maintenance
  - Damper and actuator repairs
  - Building controls maintenance



# A Tale of Two Buildings



- Illustrate simple M&V strategy for shut-down procedures using energy data
- Observations at two office buildings
- Background
  - Building A ~ 70,000 ft<sup>2</sup> – DX equipment
  - Building B ~ 110,000 ft<sup>2</sup> -Evaporative cooling
- Both have a BMS and an enhanced analytics platforms
- Shutdown procedures were provided to staff ~March 20th
  - Setback HVAC equipment
  - Turn-off interior lights when not occupied
  - Unplug items that are not critical to operation



# A Tale of Two Buildings (cont'd)



## Building A

27% reduction in March

50% reduction in April

Assuming a 6-month shutdown

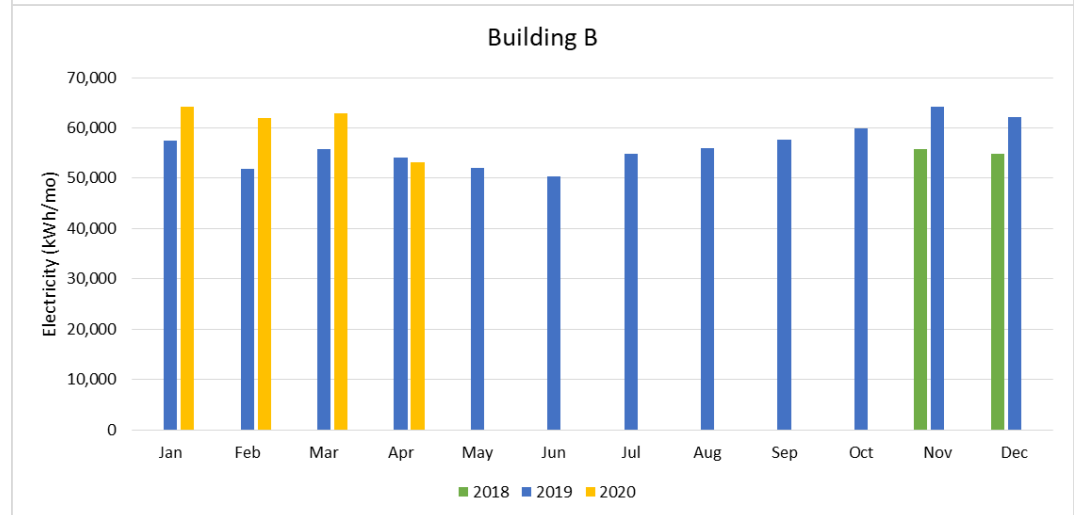
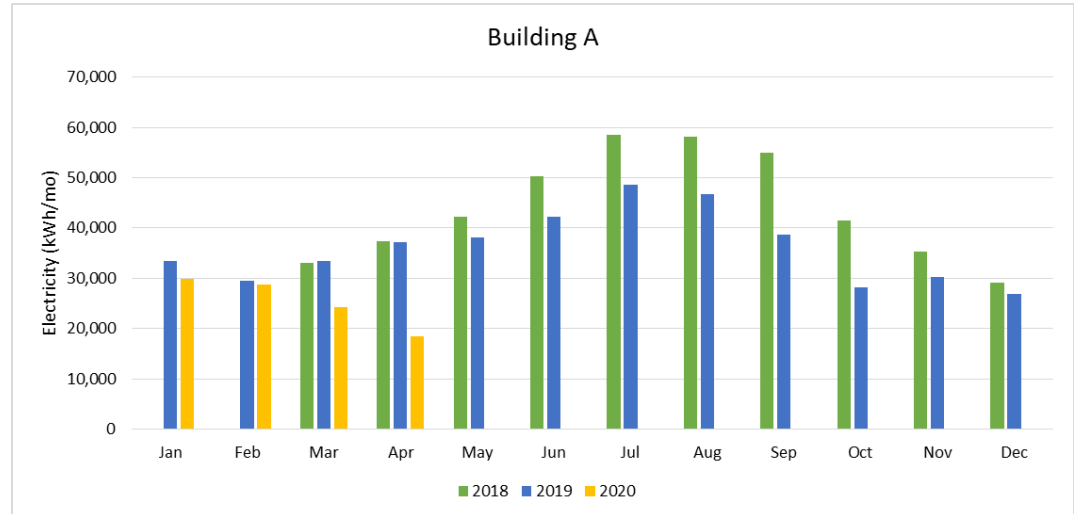
Expected costs savings ~\$11k

## Building B

Minimal reduction

Assuming a 6-month shutdown

Expected energy waste ~ \$13.5k





## A Tale of Two Buildings (cont'd)



- Enhanced analytics require staff training or an implementer to be effective
- Site operators are not identical
  - Some focus on operations and uptime
  - Others focus on energy efficiency
- It can be expensive to assume universal implementation of shutdown procedures on large assets.
- Simple energy use comparison can be effective M&V



# What Should We Be Looking for



- All Energy End-Uses Impacted by Shutdown
  - Lighting – 50% or more reductions
  - DHW - 80% or more reductions if tank systems are setback
  - HVAC - Site and location dependent ~15% or more
  - Plug Load – Site dependent ~ 25% or more
- **I would expect a 20% or greater reduction in April**

Typical Building End-Use (CBECS 2012)

