



Enhancing Customer Experience with SEM



Implementation Partners Deliver SEM for ComEd

CLEARResult®



Graphet
DATA MINING
<Empowering Energy Efficiency>



Cascade**Energy**®

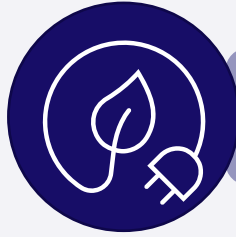


MichaelsEnergy



- 7 large commercial real estate sites currently enrolled in SEM
- Situational awareness
 - Opportunities
 - Challenges
- SEM is an important lever

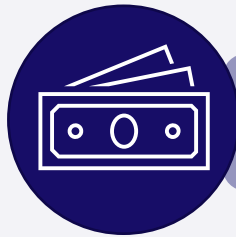
ComEd SEM Program, Benefits, and Innovation



Low cost/no cost savings



Create a culture for energy savings



Earn incentives



Dedicated energy coach

Enhance customer loyalty

Establish best practices

Improve program participation

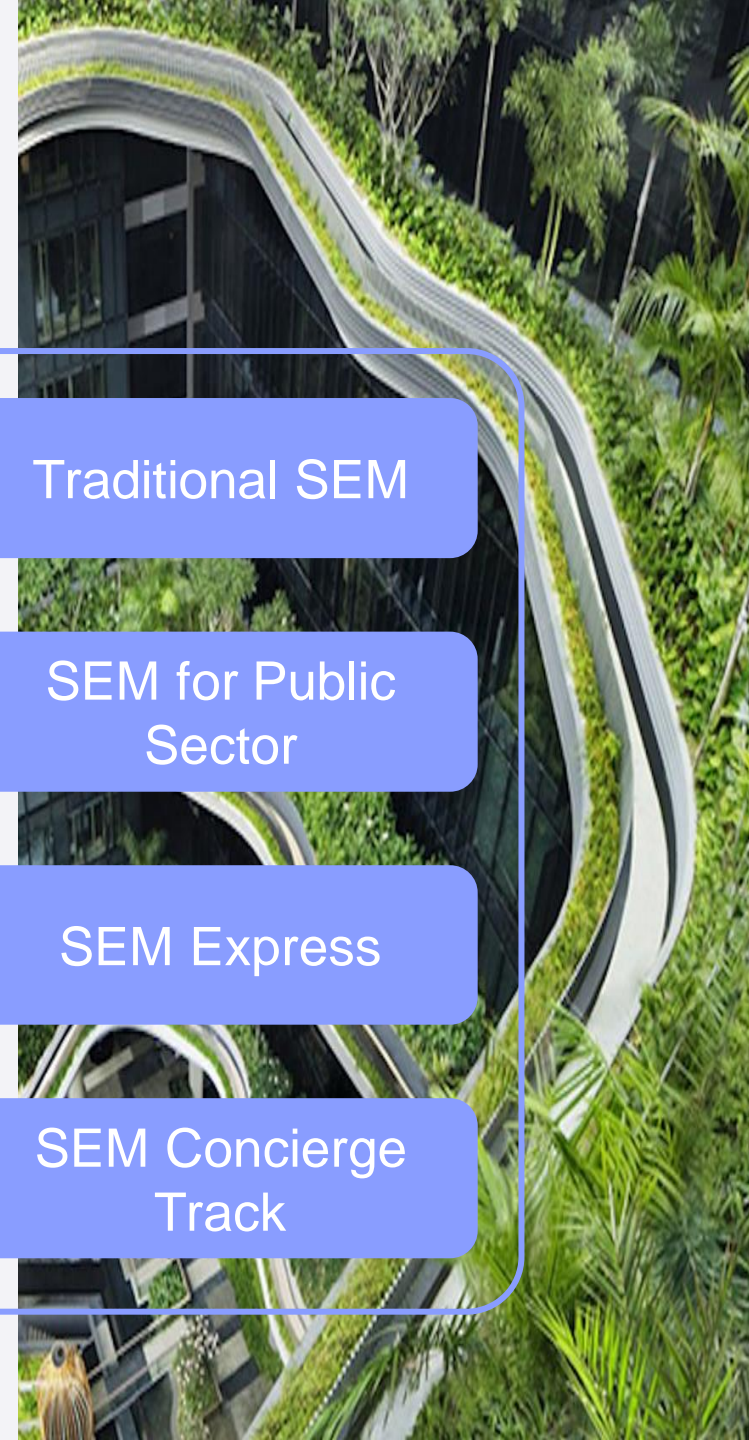
Track energy performance

Traditional SEM

SEM for Public Sector

SEM Express

SEM Concierge Track



SEM Concierge Track Premier Service Objective

Implement an SEM program to apply Graphet's data mining and analysis techniques for select facilities

- Mid, large, and very large energy users
- Commercial, institutional, industrial, or public sector
- Historically under-participated in EE programs
- Run complex operations and specialized systems and equipment
- Require data analysis to justify funding for energy projects



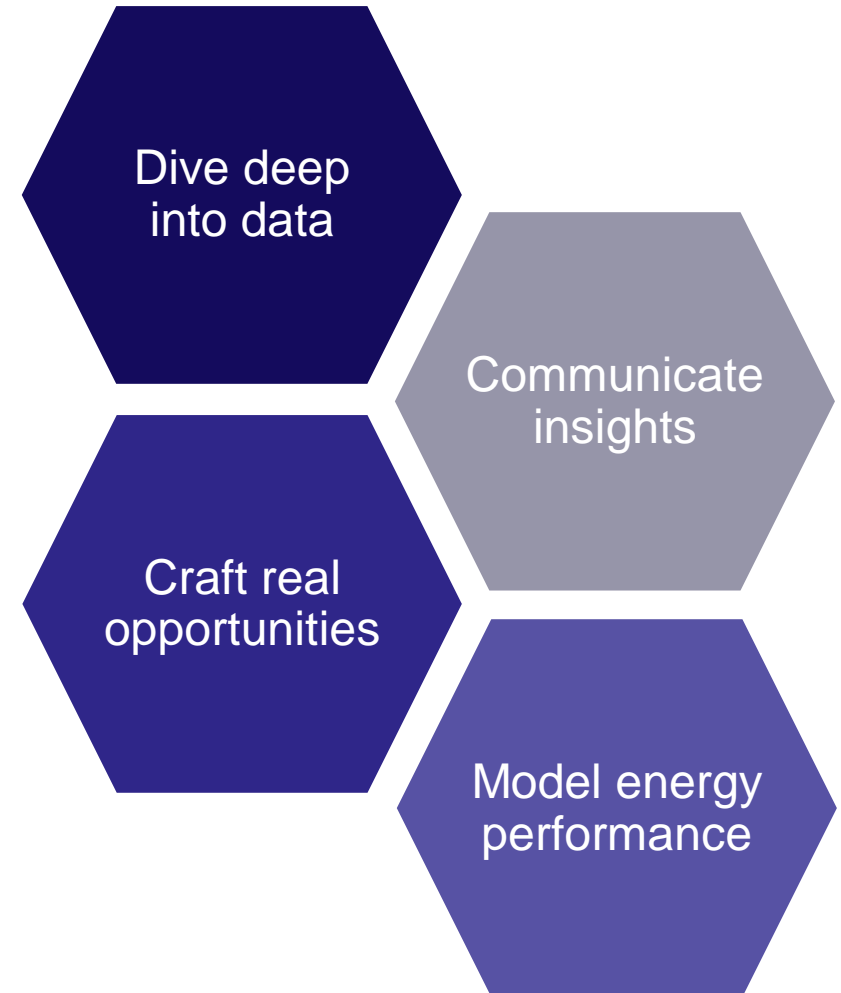
credibility

collaboration & consensus

continuous commitment to efficiency

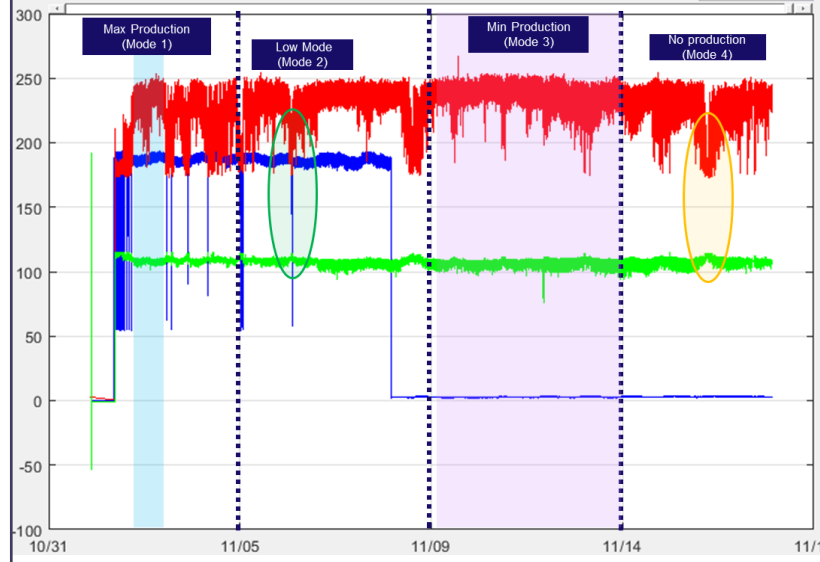
Concierge Track SEM is High Touch, Data Intensive, Comprehensive, and Collaborative

- Engage site upper management to align with business goals
- Facilitate consensus among diverse stakeholders
- Establish single-point of coordination for custom projects
- Position programs to enhance ROI
- Understand critical requirements for complex systems
- Develop sound replacement strategy for aging equipment
- Build a strong project pipeline and forecast real savings

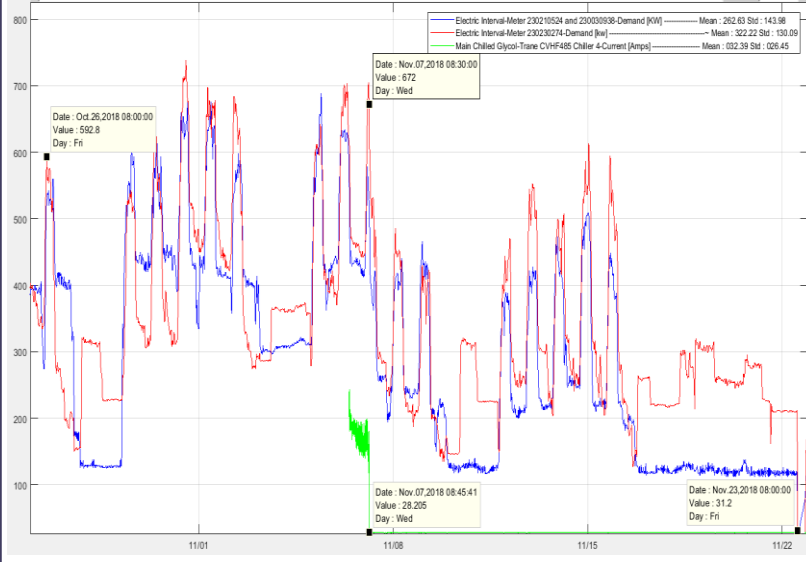


Concierge Track SEM Uncovers Insights for Actions

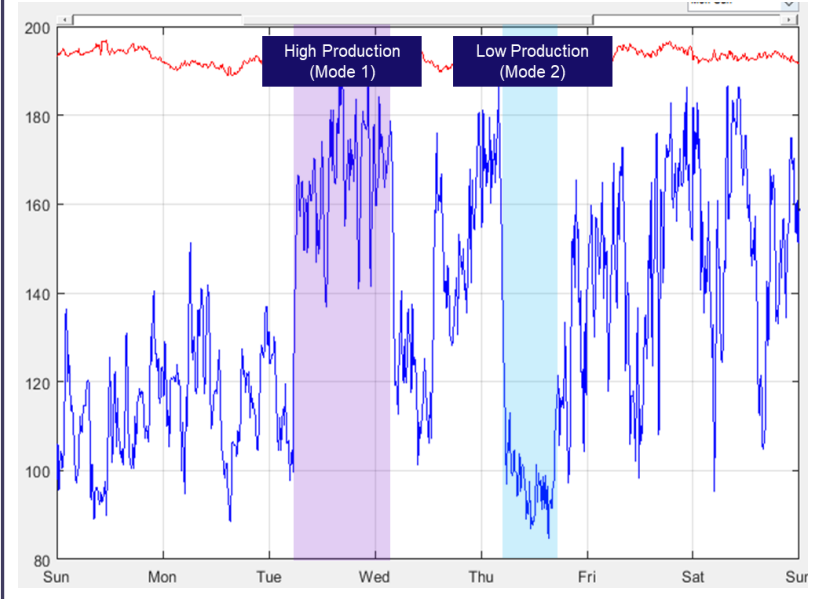
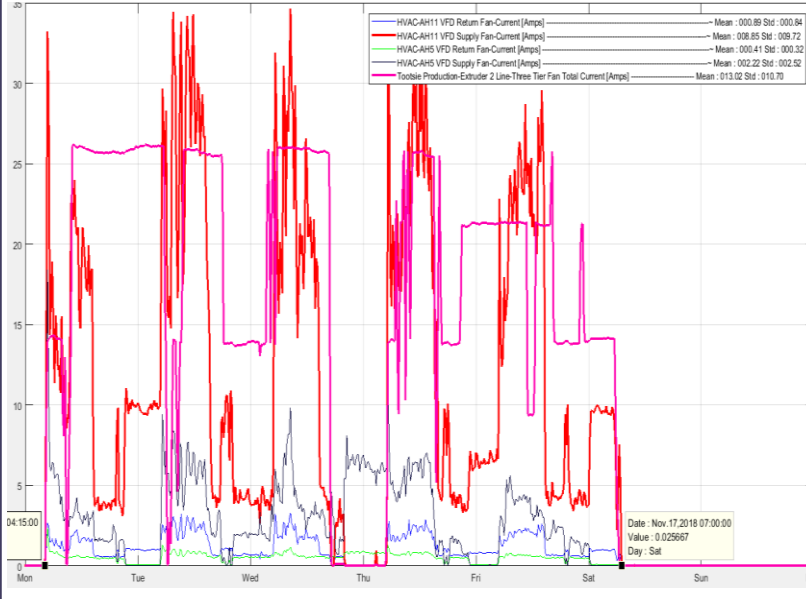
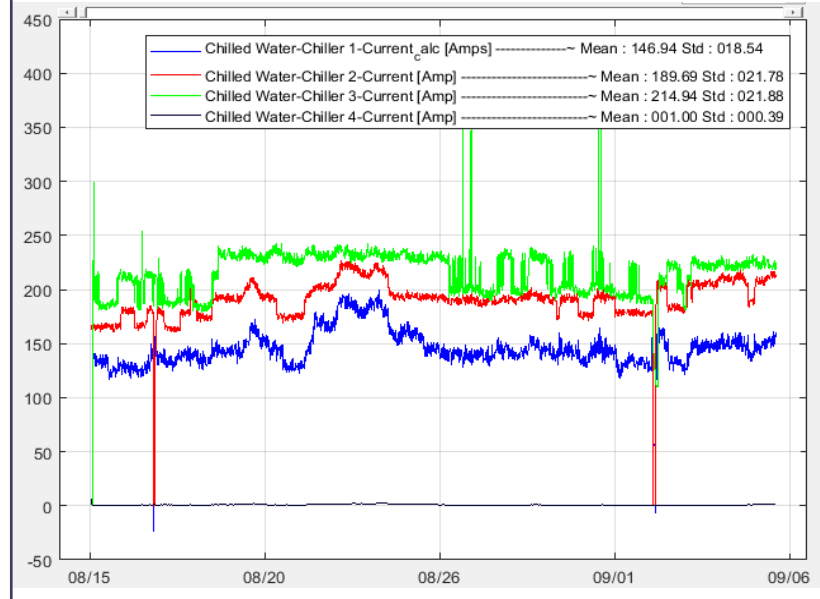
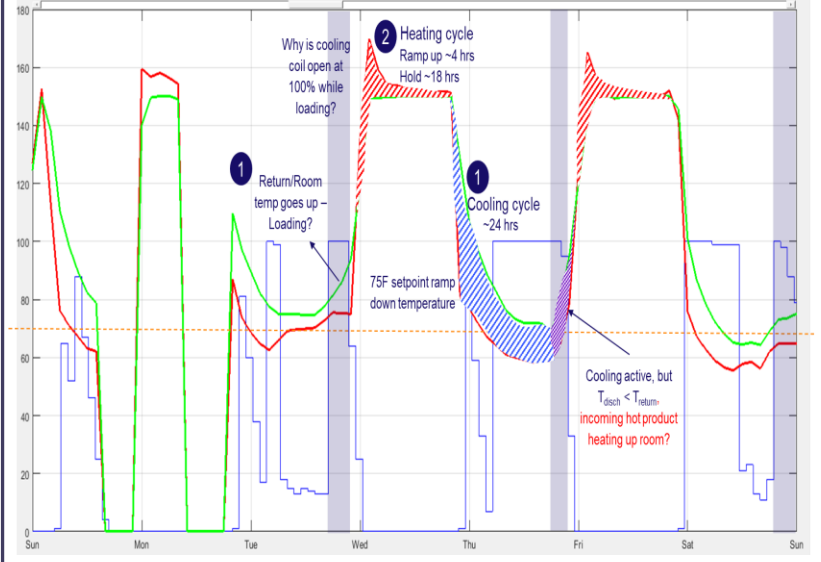
PLOT 1



PLOT 2



PLOT 3



Data Mining in SEM Empowers Commitment to Efficiency

System	Opportunity	Operational or Capital	System	Opportunity	Operational or Capital
HVAC	Operate Condenser Water VFD Pumps in	Operational	HVAC	Converting CV unit to VAV - Unit S11	Operational
Misc	Sprinkler zone schedule change. Reduced runtime from 24 hrs to 12 hrs. 40HP pump	Operational	HVAC	HVAC shutdown during night for 2/3 hours to reduce baseload	Operational
HVAC	Adjusted BAS scheduler to stagger fan powered box and AHU startup times	Operational	HVAC	Adjusted chiller stage-up set point from 80% to 95% to curb peak demand usage	Operational
HVAC	Increase Chilled Water Supply Temperature by 2°F	Operational	HVAC	Window blinds back open to allow for heat gain (winter)	Operational
HVAC	Sequence Chillers to Operate at Prime Efficiency Points in Summer	Operational	HVAC	Optimize OA% / economizer operation (S4, S6, S7, S8, S9, S10, S13, S14, S16)	Operational
HVAC	Optimize Bypass Flow Rate / System dT During Low Loads	Operational	Baseload	Unplug power from all unoccupied cubes and offices	Operational
HVAC	Close all window blinds in the building - reduce heat load during the day	Operational	HVAC	Garage exhausts covered to carbon monoxide control - 0 fans running	Operational
Baseload	Baseload management - lighting scheduling (zone 3B,3G,4G)	Operational	HVAC	Close windows to minimize sun exposure and heat gain throughout the building	Operational
Misc	Sanitary pumps for each building - monitoring and alarms to detect problems	Operational	HVAC	Electrical rooms temperature reset (can go till 78 - 80F)	Operational
HVAC	Twin AHU operation optimization - dual fan Units optimized to avoid air backflow	Operational	Compressed Air	Compressed air pressure reduction (currently set at 100 psig) can go down to 80 psig	Operational
Misc	Pond aerators - cut operation hours in half	Operational	Hot Water	Turn OFF hot water heaters at night	Operational
HVAC	Garage exhausts - 2 fans in operation as opposed to 4 fans	Operational	HVAC	Optimize OA% / Economizer Operation (S4, S6, S7, S8, S9, S10, S13, S14, S16)	Operational
HVAC	Heat tapes (radiate heat) in parking garage changed from 100% on to temperature control above 38F	Operational	HVAC	Reduced the amount of FPB units that need to run; shut off 151 boxes - 77% instead of 100% units operating	Operational

SEM Concierge Track First Year Results

- Cohort savings = 2.8% of baseline
- Achieved savings 22% over goal
- Influenced high value capital projects and project planning and decision making
 - Implemented projects could increase savings by an additional 7.2 – 9.5 GWh
- Deeper engagement for data and decision-making, driving shorter cycle time for approvals
- Enrolled corporate customer with 8 Chicagoland sites



Restoring an Icon: Willis Tower

- 110 stories and 4.5 Million ft²
- 24 x 7 Operation, 4 Million annual visitors
- Space Uses
 - Commercial
 - Broadcast
 - Retail
 - Dining
 - Entertainment
- A++ Operations Team
- Superior BAS technology
- Achievements
 - LEED Platinum Certification (2022)



Customized SEM Journey in First Year for Willis Tower

Kickoff
Summer, 2022

Measurement End
Summer, 2023



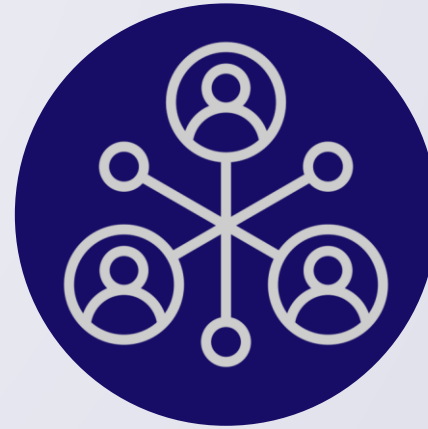
Establish Trust

- Share data
- Develop model
- 29 meters
- Occupancy data



Discover Insights

- Massive quantity of equipment & data points
- Establish baseline
- 650 data points to date, 15-minute data intervals



Achieve Consensus & Collaboration

- Framework developed to contextualize technical discussions
- Less than 2 months from identification to custom pre-approval



Sustain Commitment

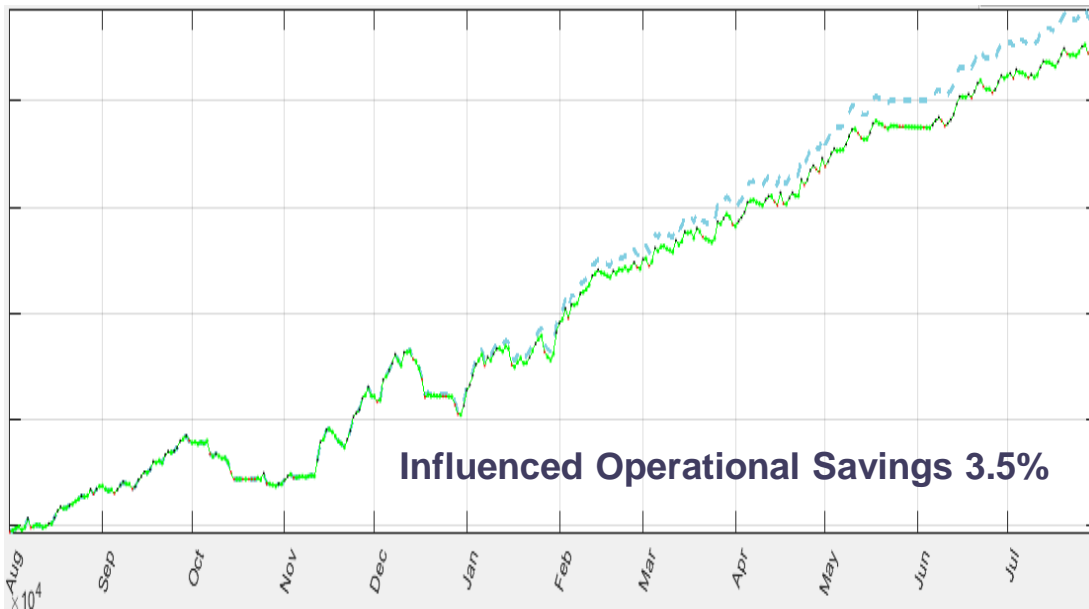
- Feasibility analysis and impact assessment
- 15+ meetings, calls, or visits with site
- 4 - 6 attendees per meeting



Complete First Year

Willis Tower SEM Highlights

- Savings – 3.5% annual energy reduction
 - Model includes occupancy data
 - Qualified for highest incentive rate
 - Implemented smart valves capital project
- Operational measures complete
 - Static pressure optimization
 - Free cooling optimization
 - Condenser temp reset
 - Chiller staging
 - AHU setpoint resets
- Other outcomes
 - Steve earned recognition as sustainability champion
 - Renewed energy charter and re-evaluating priorities for 2024 based on learnings to date





comedSM

AN EXELON COMPANY

Thank you

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