Building an Energy Team
Today’s Topics

- Team structure
- Making the case
- Sample projects
- Diverse skill set
- Relationships with operational staff
- Open Discussion
Energy Team Structure

Josh Morejohn - Energy Manager

Nico Fauchier-Magnan
Energy Engineering supervisor

Sam Cole, Hiroko Masuda
Energy engineers

Dan Colvin, Correy Koshnick, Daniel Imperiale
Data scientists

Tom Ryan - Project Manager
Energy Team Structure

- Financial setup:
  - Portfolio of energy projects generates verified savings
  - Verified savings transferred to team’s budget
  - “Seed funding” for initial team start-up, paid back over time as portfolio grows
Making the Case for an Energy Team

- Large utility budget = opportunity to reduce waste
- Total UCD spend on utilities ~$25 M / year
  - 10% savings = $2.5 M / year!
  - Team budget about $1.2 - 1.5 M / year
- Half of savings potential in bldgs is “operational”
- 75% of savings is in 25% of bldgs
Making the Case for an Energy Team

Energy Team Savings - Forecast

- Primate Center ACE
- Earth and Physical Science ACE
- Chilled Water Optimization
- Meyer Hall - zone DDC upgrade
- Science Lab ACE project
- GBSF ACE project
- Steam Demand Response
- SWARM
- Shields Library ACE project
- Veterinary Medicine 3A ACE project
- Building Scheduling
- Opportunities Log
- Holiday Shutdowns
- Chilled Wtr Winter Mode
- Plant and Environmental Sciences Building ACE project
- Ghausi Hall ACE project
- Total Savings

FY16-17
FY17-18
FY18-19
FY19-20
FY20-21

$200,000
$400,000
$600,000
$800,000
$1,000,000
$1,200,000
$1,400,000
$1,600,000
$1,800,000
$2,000,000

$0
$200,000
$400,000
$600,000
$800,000
$1,000,000
$1,200,000
$1,400,000
$1,600,000
$1,800,000
$2,000,000
Making the Case for an Energy Team
Making the Case for an Energy Team

- FY 18-19: total savings $725k from 9 different projects
Sample projects at UC Davis

- Holiday shutdowns - $180k/yr savings
  - Adjust HVAC schedules for non-lab areas on all administrative holidays
  - Requires good coordination with building managers
  - Many parts of the process have been automated and streamlined
Sample projects at UC Davis

- Scheduling project - $90k/yr savings
  - 35 buildings have an improved HVAC schedule
  - Detailed coordination with each building’s stakeholders
  - 20+ more potential buildings to address
Sample projects at UC Davis

- Opportunities log project
  - Large savings ($239k), projects across campus
  - Fixing dysfunctional equipment / overridden schedules
  - Improving control sequences
  - Other miscellaneous improvements

Either found by our team or brought to our attention by field technicians, foremen and IPEs.
Sample projects at UC Davis

- SWARM project (automation system for small buildings)
  - 30 buildings connected so far
  - Led by 1 staff member (part-time) with a team of grad & undergrad interns
  - Great support from BMS HVAC refrigeration shop
Sample projects at UC Davis

- Lab retro-commissioning projects
  - Occupancy based controls for ventilation and temperature (6/4 ACH)
  - Dynamic wind control for exhaust stacks (modeled with wind consultant to ensure safety at every wind speed and direction)
  - Improved resets (SAT, DSP)
  - Controls upgrades
  - PES, Ghausi, VM3A, Shields (done), Genome (ETA Dec ‘20)
Team Diversity

- **Energy Engineers**
  - Project identification, implementation, commissioning
  - Interactions with campus customers, operational teams

- **Data scientists / programmers**
  - Performing Measurement & Verification for completed projects
  - Building tools to speed up & streamline workflows

- **Engineering Interns**
  - Fresh, outside perspective, creativity
  - Able to handle simple projects on their own
  - Build skills & experience
Relationships with Operational Staff

- How do we prove our value to them?

- TherMOOstat as a crowd-sourced FDD tool
  - Surges in feedback often indicate a mechanical issue
  - Can address problems before a work order is even put in
Relationships with Operational Staff

- How do we prove our value to them?

- SWARM
  - Started as energy project with operational benefits
  - Refrigeration team now a huge supporter
Relationships with Operational Staff

- How do we prove our value to them?

- HVAC scheduling for special events
  - Used to be HVAC techs’ responsibility
  - Energy Engineering took over and improved process (from 1 day / week to 1-2 hours)
Discussion

- Open discussion
Savings / Cost Projections

Active Commissioning Enterprise (ACE) Savings Program

Annual Savings/Costs


$500 | $600 | $800 | $1,200 | $2,400 | $3,600 | $4,800 | $6,000 | $7,200 | $8,400 | $9,600

- Total Annual New Project Savings
- ACE Program Investments - Annual