

THE SECRETS TO MEETING ENERGY GOALS: COMMERCIAL DESIGN TEAMS TELL ALL!

By Jen Loomis, PhD

October 10, 2019

The Challenge: Performance doesn't always match predictions

- Commercial building energy performance does not always match energy models' predictions
- Closing the gap is critical to meeting GHG reduction goals
 - California goals of all new commercial construction ZNE by 2030; 50% of existing commercial buildings ZNE
- What can we do?





Methods

- Interviews with 74 market actors experienced with ZNE or other ultra-efficient commercial buildings
 - Part of study for the California IOUs, managed by PG&E. Led by TRC Engineers.
- We asked commercial market actors:

What are some strategies that can help ensure the energy goal is met, especially in later stages of a project and when value engineering comes into play?



FINDINGS



Tip 1: Clear energy performance goals

- Is ZNE the goal?
- Goal = north star to which team aligns
- Cannot be vague or a moving target
- Must be full commitment



Tip 2: An integrated design process

- Design building parts for multiple functions
- Energy-saving features built into design
 - Passive principles
- Takes into account
 - Site selection, building orientation
 - End-uses
 - Codes
- Basis of design: useful tool

“In design, define the goal clearly. What elements are needed? Explain those elements will not be subject to any cost-reduction effort and then you don't have to worry about it.”

~Construction manager





Tip 3: Iterative energy modeling

- Skilled energy modeler re-runs model when change is made
- Informs team and owner of implications
 - On the budget
 - On the energy goal
 - On energy systems



Tip 4: Internal champion to coordinate team

- Ensures team stays aligned to goal
- Facilitates communication among owners, architect, engineer, and contractors

“No one person will know how all systems work together. You have to stay in communication about what the goals are and keep those top of mind.”

~Engineer





Tip 5: QA representative on-site during construction



- Periodically visit to make sure things are being put together as they should
 - General contractors don't always know
- Have authority to stop work
- Build this cost into budget
 - Money well-spent



Tip 6: Properly commission systems

- Commission as designed
 - Ensures energy targets are met
 - Realizes non-energy benefits
- Also needs to build into budget
- Retro-commission (RCx) each year
 - End-uses change, occupants change
 - Sub-meters and tracking of energy use by end load informs RCx



 Opinion Dynamics
 | SUMMARY
Getting to Zero Forum 2019 11

Summary

- Technology is here; we need to work together
- Goal guides everyone
- Design teams very important
 - Use integrated design
 - Do model iterations as changes are made
 - Have an internal champion
- Construct and commission as designed
 - Build QA and Cx into budget

 Opinion Dynamics
Getting to Zero Forum 2019 12



Contact Information

Jen Loomis, PhD
Senior Consultant
jloomis@opiniondynamics.com
503-943-2125

