CREATING THE SANDBOX

*For a market rate Passive House office building in the Upper Midwest
MAINLY ENVELOPE FOCUSED

*And mostly glass....
REAL PROJECT

• 270,000 SF SPEC OFFICE
• 9 STORIES
• 68% WINDOW TO WALL
• IN CONCEPTUAL DESIGN/PRICING
MODEL IT

FIND A SET OF TARGET VALUES
COMPARE TO A REFERENCE PROJECT

- 300,000 SF SPEC OFFICE
- 12 STORIES
- 69% WINDOW TO WALL
- UNDER CONSTRUCTION
NOT THAT SURPRISING...MOSTLY

WHAT WE FOUND
COOLING AND SOURCE ENERGY DOMINATED
LOW PLUG LOAD & LIGHTING POWER

WHAT WILL TENANTS THINK?

Common Poorwill - daily enters periods of torpor to conserve energy
PV ROOF ARRAY REQUIRED

Wood Ants - Maximize solar heat absorption by the nest via optimum angle
ONLY SLIGHTLY MORE INSULATION

Emperor Penguins - Use blubber and special feathers to retain heat.
HOWEVER...
TRIPLE GLAZING IS REQUIRED

DOUBLE PANE POSSIBLE NEAR 40% WWR
IMPROVED SPANDREL
SUMMARY
LOW GLASS % (40%) + SLIGHTLY BETTER WINDOW (U0.30) OR HIGH GLASS % (>45%) + REALLY GOOD WINDOW (<U0.20)
LOW GLASS % (40%) + GOOD SHGC (0.30) OR HIGH GLASS % (>45%) + SHADING OR LOW SHGC (< 0.25)
AGGRESSIVE LPD REDUCTIONS
TARGET 0.50 WATTS/SF
90.1 2013 = 0.82
ALL ENERGY
STAR EQUIPMENT & APPLIANCES + PLUG LOAD CONTROLS
PLAN FOR ROOFTOP PV

- STRUCTURE
- ELECTRICAL
- ROOF AREA
- COST
IN DESIGN STUDIES
CONSIDER WINDOW PLACEMENT IN WALL SECTION CAREFULLY
• STARTING POINT IS DOAS + VRF
• GSHP FOR PARTIAL CAPACITY WORTH LOOKING AT
COMMERCIAL CONSTRUCTION + ASSEMBLY VALUES OF WINDOWS
Duane Carter
duane.carter@scb.com

Jason Sippel
jason.sippel@scb.com