NZEL INTERNSHIP WITH ANKROM MOISAN

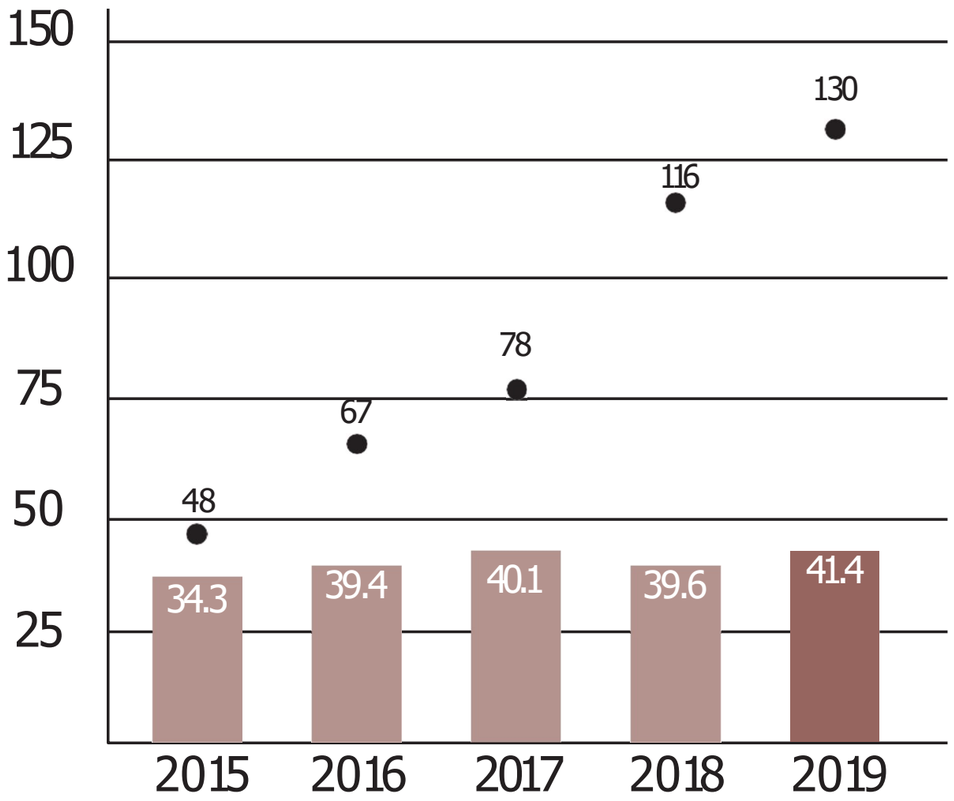
ALYSSA BIRUM

GOALS

-Understanding the basics of EUI
    -Sharing that knowledge with others
    -Helping teams use EUI to inform their projects
-Inputting projects into the DDx
-Researching the basic impact our projects have
    -How do we decrease that impact?
-Understanding what steps need to be taken to reach our energy goals

AMA RESULTS

-130 projects input
-41.2% EUI reduction (up 1.5%)
-33/130 projects energy modeled



Sustainability Target Certification

-Living Building Challenge: 2
-Passive Haus: 1
-Earth Advantage: 2
-LEED Silver: 8
-LEED Gold: 8
-LEED Platinum: 1

17% of all projects achieved certification

THE PROCESS OF REPORTING

-Encourage large firm-wide participation
    -More knowledgeable
    -More accountable
-Start by updating previously reported projects
-Using our reporting guide, teams are asked to input their project
    -91 people available to input
    -Input every project
-Meet with teams
-Review projects
    -Look for EUIs that appear off
    -Any other inconsistencies
-Submit!

DDx REPORTING GUIDE

INTRODUCTION

REPORTING PROCESS

1. Read this Reporting Guide in its entirety before starting.
2. Gather project information and resources.
3. Calculate Baseline & Target EUI with the Zero Tool.
4. Enter project data and Zero Tool EUI information into AIA 2030 Commitment Recording and Data Management tool (DDx).
5. Save results to your project directory.

Which Projects Are Reported?

- All projects in Design, Construction Administration, or Closeout each year, looking back at the previous year.
- If your project has multiple buildings or a mix of renovation and new construction, use the naming and scope defined by your jurisdiction's permitting authority. Often mix reno/new buildings require MEP or other code related upgrades that bring whole-building energy use into consideration.

RESOURCES

Zero Tool Target Finder - Online tool used to define Baseline and Target EUI

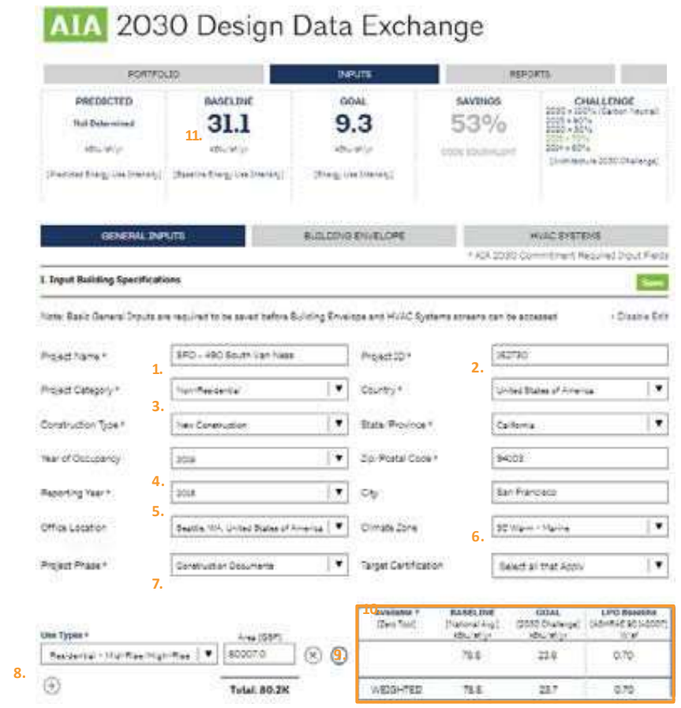
- Utilizes the Commercial Building Energy Consumption Survey (CBECS) Database
- Defines Median or Average energy use for various building types based on site EUI
- Scores buildings on a scale of 1-100 Performance Percentile

User Guide: https://zerotool.org/user-guide/
Tool: https://zerotool.org/zerotool/

AIA DDx - Online database of project data.
Need a profile? Start at: http://2030ddx.aia.org/users/sign_in

2. 2030 DESIGN DATA EXCHANGE

http://2030ddx.aia.org/users/sign_in



NOTES

1. PROJECT NAME - Here we use a particular naming convention for organization: Office (PDX, SEA, SFO) - Project Name, for example: "PDX - 1000 E. Broadway"
2. Project ID - This is the AMA Project Number.
3. Project Category - Use Residential category if the building is only housing and parking. If it is mixed-use, use Commercial category.
4. Year of Occupancy - year when project reached or will reach substantial completion.
5. Reporting Year - the last complete year, 2019.
6. Climate Zone automatically populates when the Zip Code is entered.
7. Home office of the Project Manager.
8. **DO NOT include parking in this value. Enter parking as its own use/line.**
9. Click the information icon here to be directed to the Zero Tool.
10. Shows NATIONAL AVERAGE. Input more detailed information below.
11. Numbers will match data in #10 until more detailed information is input.

EUI REPORT CARD

-Goal: Encourage the use of EUI as a tool to inform design through early energy modeling and sustainable methods.

Ankrom Moisan

PROJECT NAME / ID

CONCEPT DESIGN

BASELINE EUI	PREDICTED EUI	EUI GOAL

WHAT TO CONSIDER:

-DAYLIGHTING STRATEGIES (AIM FOR 20-40% WWR)

-PASSIVE STRATEGIES

--THERMAL MASS, NATURAL VENTILATION, SHADING, SOLAR, WINDOW ORIENTATION, ETC.

-LOOK AT WAYS TO REDUCE LOADS (EXTERNAL, INTERNAL, VENTILATION, PEAK)

--IMPROVE ENVELOPE, EXAMINE SIZE AND LOCATION OF GLAZING, EVALUATE SHADING OPTIONS, REDUCE INSTALLED LIGHTING AND EQUIPMENT POWER

-PROGRAMMING EFFICIENCIES (ADJACENT PROGRAMMING)

-DESIGNING WITH AWARENESS OF THE CLIMATE (LOOK AT CLIMATE DATA SHEETS)

-DETERMINE AN EFFECTIVE ENVELOPE DESIGN (THIS CAN ELIMINATE 70-80% OF ENERGY CONSUMPTION)

--THERMAL PERFORMANCE, R-VALUE, U-VALUE, AIR-TIGHT, CONTINUOUS INSULATION, ETC.

-BEGIN EARLY ENERGY MODELING TO HELP ACHEIVE YOUR GOALS

--THE ONLY WAY TO GET A PREDICTED EUI IS THROUGH EARLY ENERGY MODELING!!

-BEGIN WORKING WITH MECHANICAL ENGINEER (PRPOPER SIZING FOR MECHANICAL)

SUSTAINABLE STRATEGIES YOU ARE USING:

SUSTAINABLE STRATEGIES YOU ARE LOOKING INTO:

ARE YOU ON TRACK TO MEET YOUR GOALS:

INSIGHT 360-

MODEL SETUP:

- ☐ CREATE MODEL INREVIT
  - -LINKED FROM WORKING MODEL IN NEW ENERGY MODEL FILE
  - -TRACE WALLS
  - -CREATE FLOOR SLABS
  - -TRACE ROOF SHAPE
- ☐ SET MODEL LOCATION
- ☐ SET ENERGY SETTINGS
  - -"USE CONCEPTUAL MASSES AND BUILDING ELEMENTS"
  - -CAN ADD ADVANCED OPTIONS IF KNOWN
- ☐ GENERATE ENERGY MODEL
- ☐ CHECK FOR GAPS IN ANALYTICAL SURFACES

*ENTER IN ANY KNOWN INFORMATION TO THE INSIGHT WIDGETS
*BOOKMARK SCENARIOS TO KEEP A BASE
*EACH REVIT REVISION NEEDS TO BE A SEPARATE FILE TO COMPARE TO PAST VERSIONS
*INSIGHT ARRANGES WIDGETS FROM GREATEST IMPACTS TO LEAST DEPENDING ON YOUR PROJECT

MOST SIGNIFICANT FACTORS THAT CAN BE CHANGED:

(LOOK AT INSIGHT 360 WIDGETS: WINDOW-WALL-RATIO, SHADING, BUILDING ORIENTATION, CONSTRUCTION, ETC.)

EUI REPORT CARD

Ankrom Moisan

PROJECT NAME / ID

DESIGN DEVELOPMENT

BASELINE EUI	PREDICTED EUI	EUI GOAL

WHAT TO CONSIDER:

-WHAT SYSTEMS WORK MOST EFFICIENTLY IN THE DETAILED MODELS?

-IS THE MECHANICAL EQUIPMENT SIZED CORRECTLY?

--SIZED SPECIFICALLY FOR THIS PROJECT, NOT JUST A BROAD ESTIMATE

-HOW IS ENERGY BEING MANAGED DURING BUILDING OPERATIONS AND PEAK LOADS?

-DO THE MODELING INPUTS ACCURATELY REFLECT THE DESIGN?

-WILL OCCUPANT COMFORT BE MAINTAINED BASED ON PROJECT SPECIFICS?

--OPPORTUNITIES OF FLEXIBILITY / TO ADJUST BASED ON THERMAL NEEDS

-OPTIMAL THERMAL ZONE AND SPACE CONFIGURATION DESIGN TO MEET EUI GOAL

-OUTSOURCE PROJECT FOR A MORE COMPLEX ENERGY MODEL (IF POSSIBLE)

-WHAT IS THE SOLAR HEAT GAIN? (EXTRA CREDIT)

--IF TOO HIGH, CAN IT BE REDUCED THROUGH SHADING OR OTHER MEANS?

-EVALUATION OF SPECIFIC DESIGN OPTIONS AND DECISIONS AND HOW THEY AFFECTED THE ENERGY MODEL (EXTRA CREDIT)

SUSTAINABLE STRATEGIES YOU ARE IMPLEMENTING:

ARE YOU ON TRACK TO MEET YOUR GOALS:

INSIGHT 360-

MODEL INPUTS SHOULD INCLUDE:

- ☐ UPDATED MODEL
- ☐ BUILDING SITE AND ORIENTATION
- ☐ SHADING AND DAYLIGHTING
- ☐ BUILDING PROGRAM
- ☐ EXTERIOR ASSEMBLY
- ☐ GLAZING SIZE AND LOCATION
- ☐ OTHER MODELS (DAYLIGHT, LIGHTING, ETC.)
- ☐ THERMAL ZONE AND SPACE CONFIGURATION
- ☐ ALL SYSTEMS THAT ARE EASILY INPUT

*OUTSOURCE TO ENERGY MODELER FOR BEST RESULTS
*COMPARE YOUR INSIGHT MODEL TO COMPLEX ENERGY MODEL

MOST SIGNIFICANT FACTORS THAT CAN BE CHANGED:

ENERGY MODELING

-A predicted EUI cannot be found without energy modeling
-How can we increase the use of energy modeling within our projects?
    -EUI Report Cards
    -Training team members
    -Firm measures
-What is the best energy modeling tool for AMA?
    -Insight 360
        -Revit plug in
        -In house ability

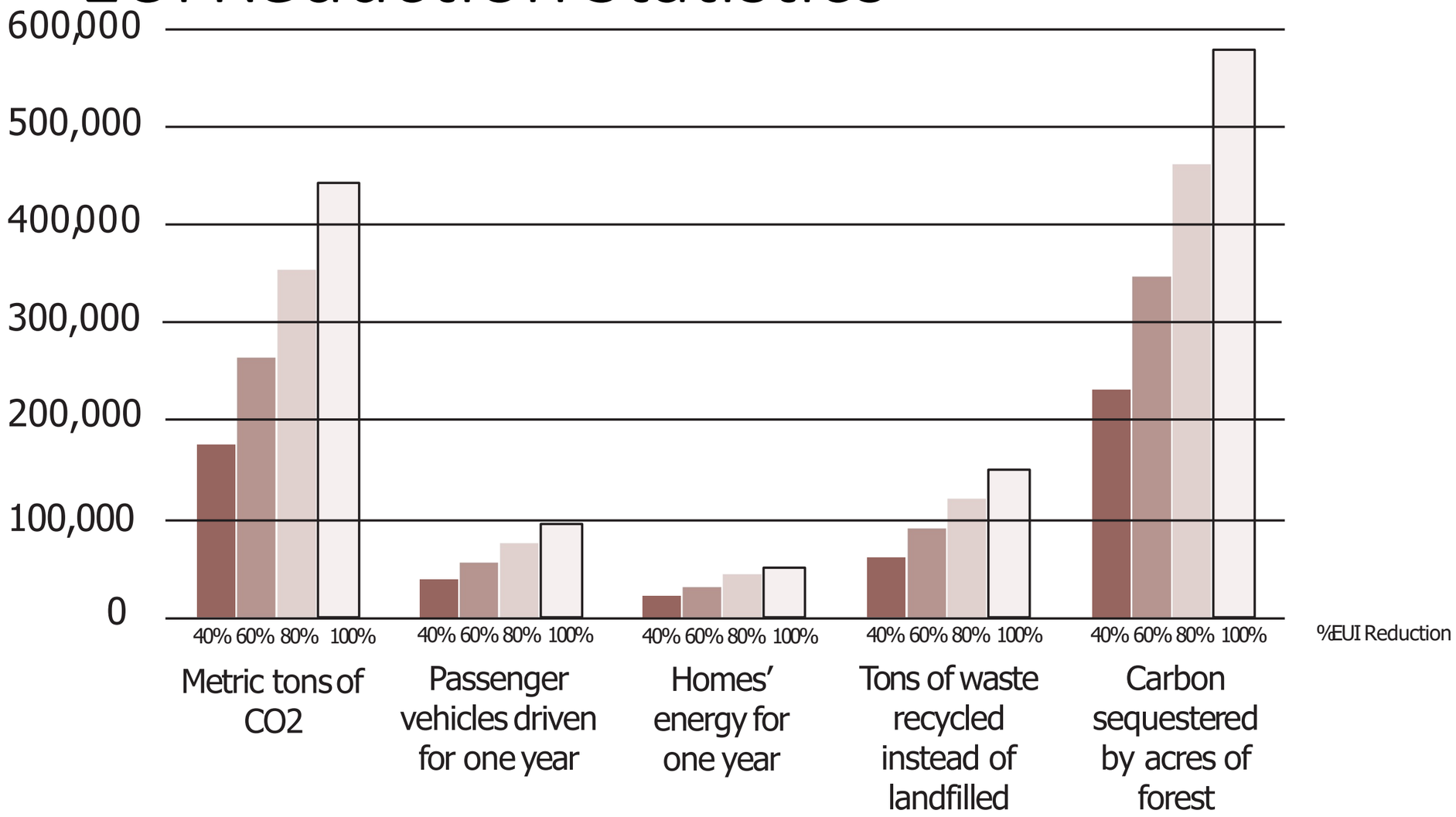
AUTODESK® INSIGHT

UNDERSTANDING OUR IMPACT

-Multi-family projects on the boards
  -110 projects on the boards
  -Minimum of 24,206,930 sf
  -Over 21,000 units

UNDERSTANDING OUR IMPACT

EUI Reduction Statistics



AMA PROJECT: ALBETINAKERR

New construction
Gresham, OR

-A net-zero, passive haus, affordable housing

-Zero energy discussions began in early design stages, energy modeling began in schematic design

-Envelope, electric heat pump for hot water, tempered air approach, tenant education

-56% EUI reduction

AMA PROJECT: AEGIS OF LAKE UNION

New construction
Seattle, WA

-Living Building Challenge Petal Certification in a senior living development

-Achievement of the Place, Energy, and Beauty Petals

-Careful selection of systems, materials, assemblies, and design concepts

-63% EUI reduction

AMA PROJECT: CCC EASTSIDE BLACKBURN

New construction
Portland, OR

-Multi-family housing

-Focus on LEED and WELL ideas

-Constant communication with consultants

-Air tightness, continuous insulation, energy modeling, high performance equipment and materials

-51% EUI reduction

CODES

-Why are many firms in the area hovering at 40% EUI reduction?
-Baseline: CBECS 2003 Data Set
-To achieve a higher EUI reduction we must do more than just meet code

FOCUSING ON THE FUTURE

-Firm measures
-Using EUI as a tool for design
-Holding ourselves to a higher standard

THANK YOU