



Energy Modeling

From Conceptual Design to an Energy Model

BLD125981

Andrew Leavitt
Electrical Designer

Nik Weller
Digital Practice Manager

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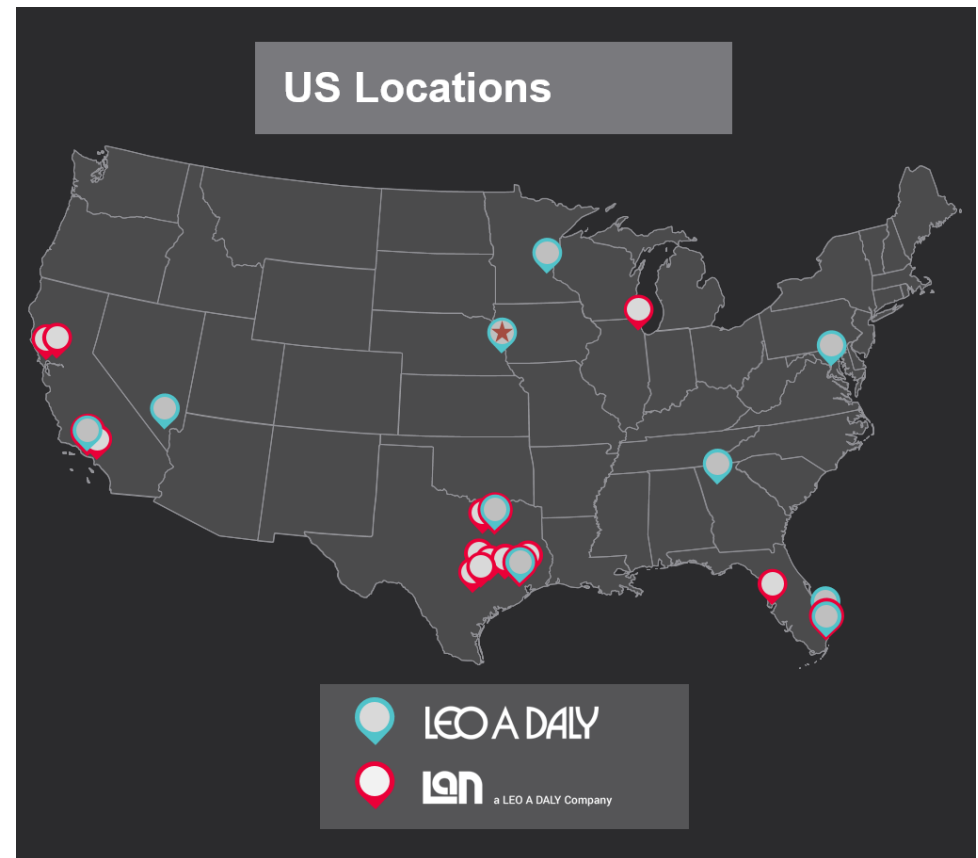
Your Presenters

- Andrew Leavitt
 - Electrical Designer
 - 20 years using Autodesk products
 - First time presenting at AU
- Nik Weller
 - Digital Practice Manager
 - Enjoys a nice pair of slacks
 - Presented at AU in 2012



LEO A DALY

- Three generations of design
- One of the largest privately held A/E firms in North America
- Over 800 professionals in 31 offices
- Working internationally for over 50 years



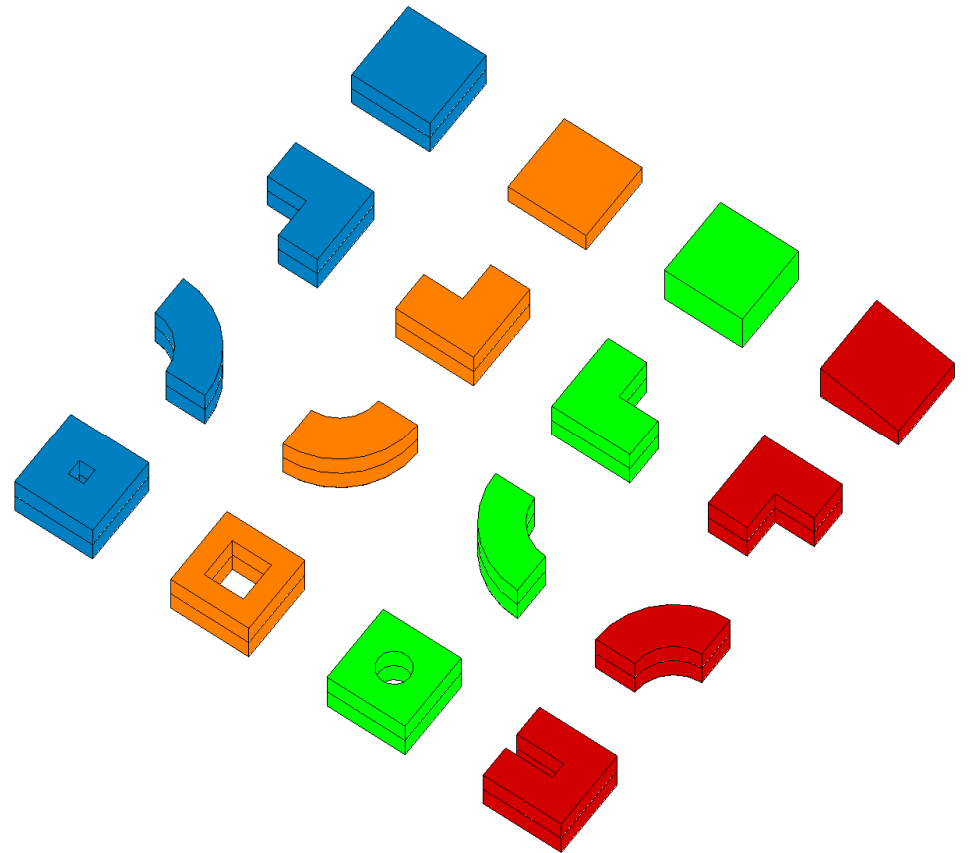
Creating an Energy Model from Scratch


- Develop Building Concept
- Model Masses
- Assign Energy Settings
- Fine-Tune
- Analyze the Model
- Iterate, Iterate, Iterate!



Energy Analysis with Conceptual Masses

- Rapid assessment
- Inform decisions
- Iterate successful designs
- Not Building Element Energy Analysis





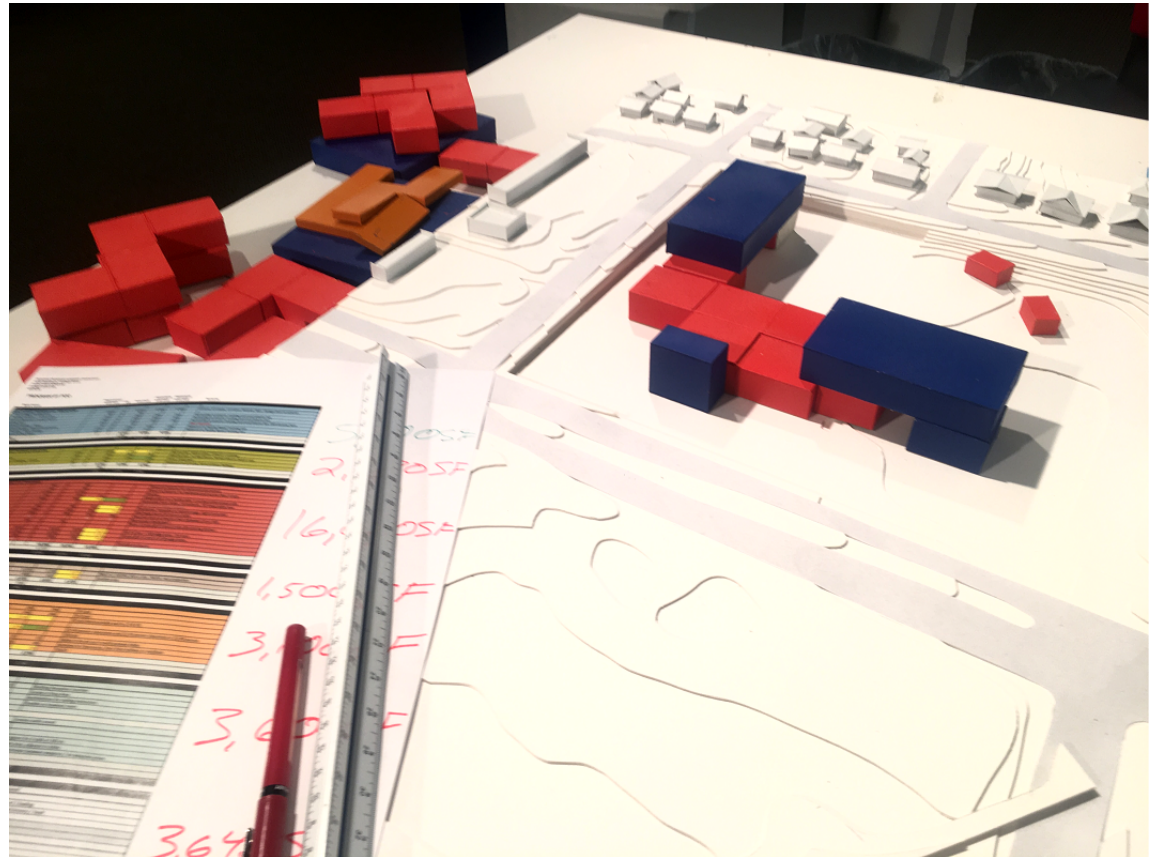
Integrative Design and Sustainability

- 47% of energy usage
- 2030 Challenge and Net Zero
- Collaboration is key

Florida Atlantic University, Engineering and Computer Sciences Classroom Building
LEO A DALY 2010

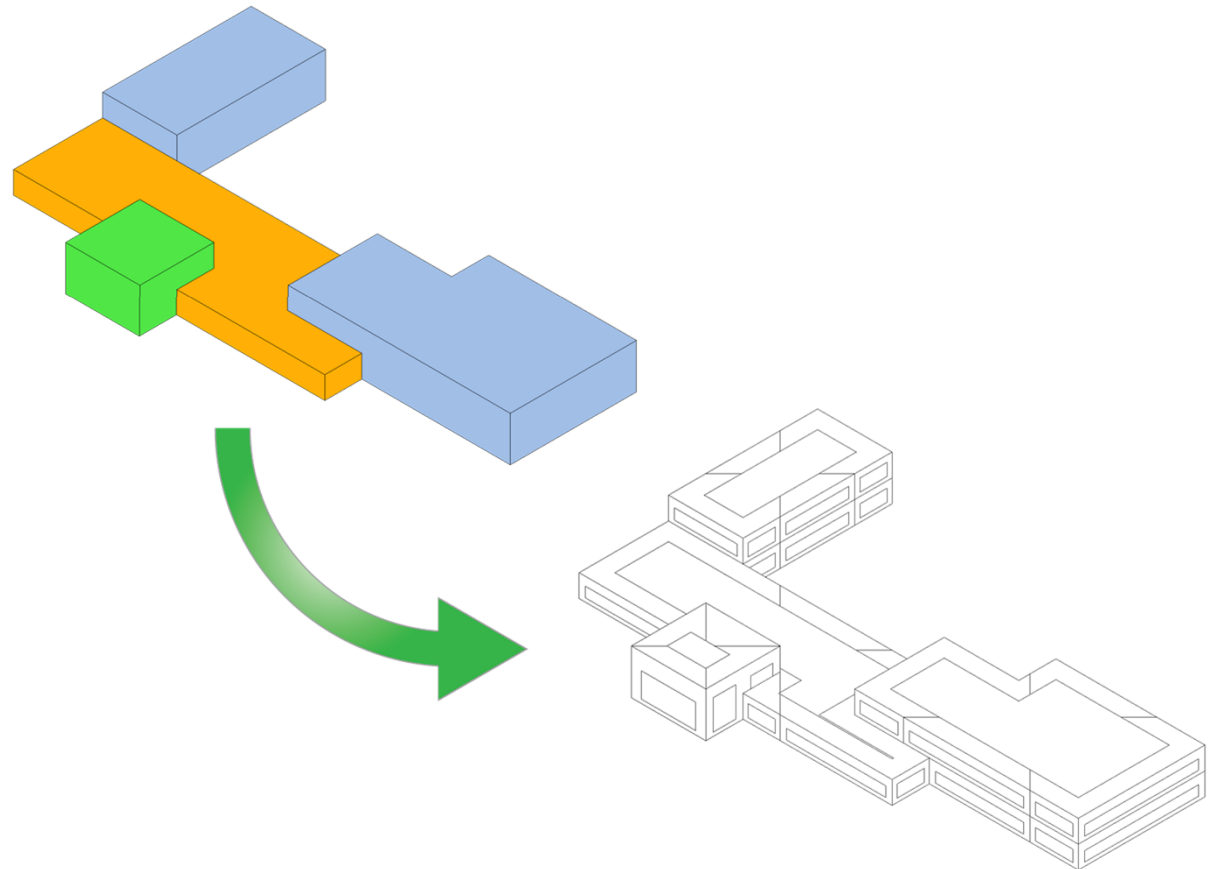
Building Concept

- Programming study
- Existing drawings
- Google Earth
- Just an idea



Creating a Conceptual Mass Model

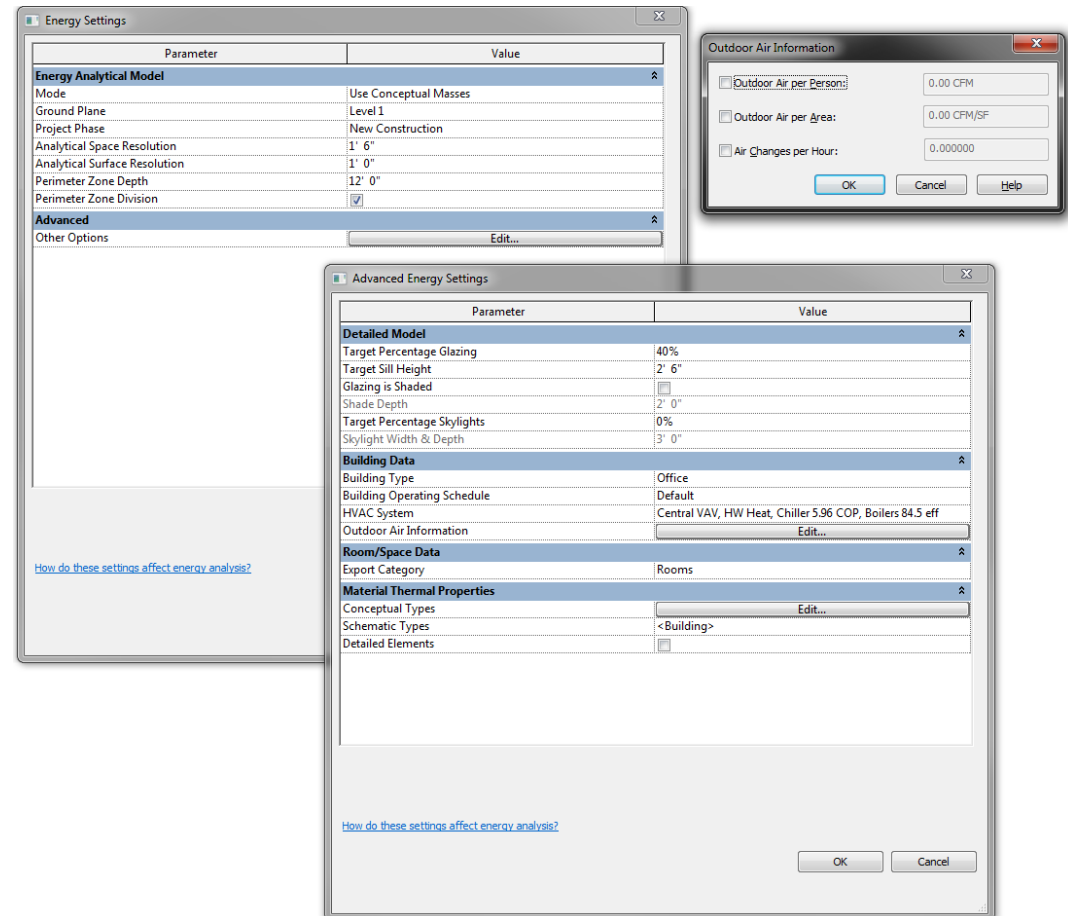
- Set Project Location
- Create Masses
 - Programming Study
 - Model In-Place
 - Mass Families
- Assign Mass Floors
- Create Energy Model



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Energy Settings

- Basic Energy Settings
- Advanced Energy Settings
- HVAC Systems
- Conceptual Types



Fine-Tuning the Mass Model

- Zones
- Masses
- Surfaces
- Building and Space Types
- FenestraPro

FenestraPro Premium (Version 4.0.0.6 beta)

Calculated average values

Facade Area: 448 ft²
Glazed Area: 179.2 ft²
Total Area: 627.2 ft²

R Value: 4 ft²F hr/BTU
Heat gain: 0 BTU/ft² hr
Daylighting: NaN

40%

Performance Manager Facade Manager

Selected Standard: ASHREA 90.1 2013 Zone 1-4

Building Elemental Performance

Maximum Overall Performance: 16.95 ft²F hr/BTU

R-value Roof: 23 ft²F hr/BTU
R-value Ground Floor: 23 ft²F hr/BTU

Facade Elemental Performance

Maximum Facade Performance: 14.4 ft²F hr/BTU

Select Facade Performance: 14.4 ft²F hr/BTU
U-value Glazing: 0.32 BTU/hr ft² F
R-value Wall: 16 ft²F hr/BTU

Current Facade Performance: 6.11 ft²F hr/BTU

Overall Percentage Glazing

Maximum Allowable Glazing [%]: 3.06
Percentage Glazing: 40.00 %

Set to maximum percentage glazing

Recalculate

Glazing Solar Load Daylight

Building glazing

Value per facade (%)

Facade	Value (%)
Facade1[E]	40
Facade2[E]	40
Facade3[S]	40
Facade4[S]	40
Facade5[W]	40
Facade6[N]	40

General Document changes Guidance Notes

Project Manager

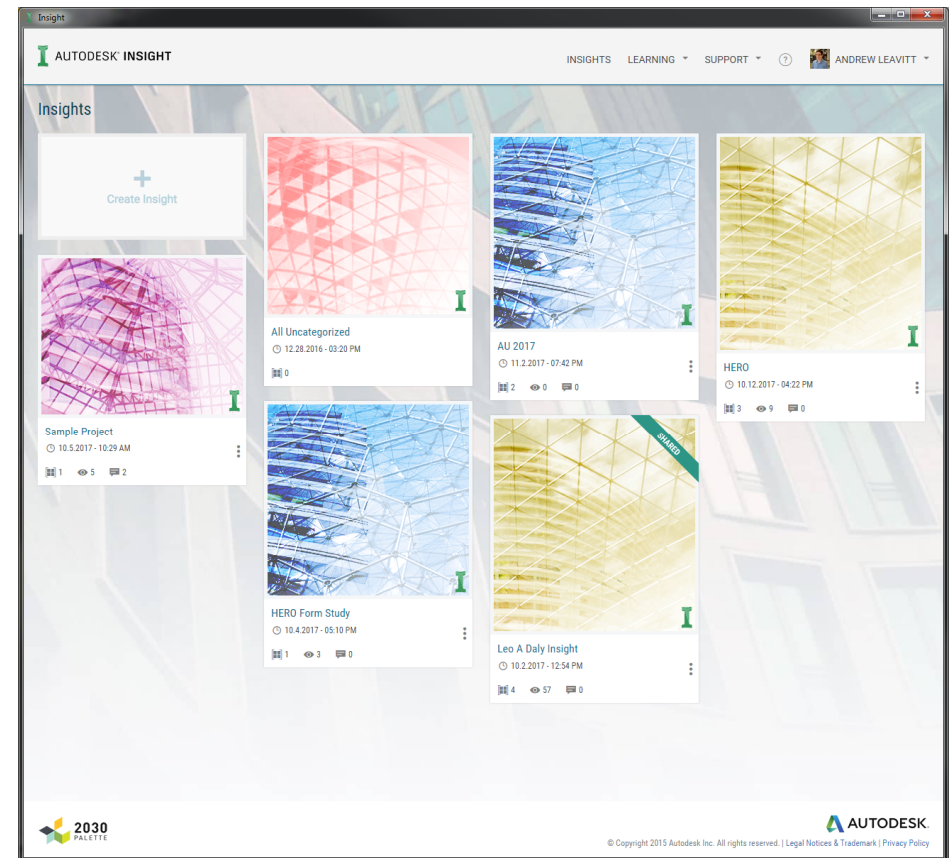
Set Project specific administrative details for your Model, such as Project Name and Project Number, which will be displayed in your Report.

Address

This information will be passed directly from the Project

Generate Insight

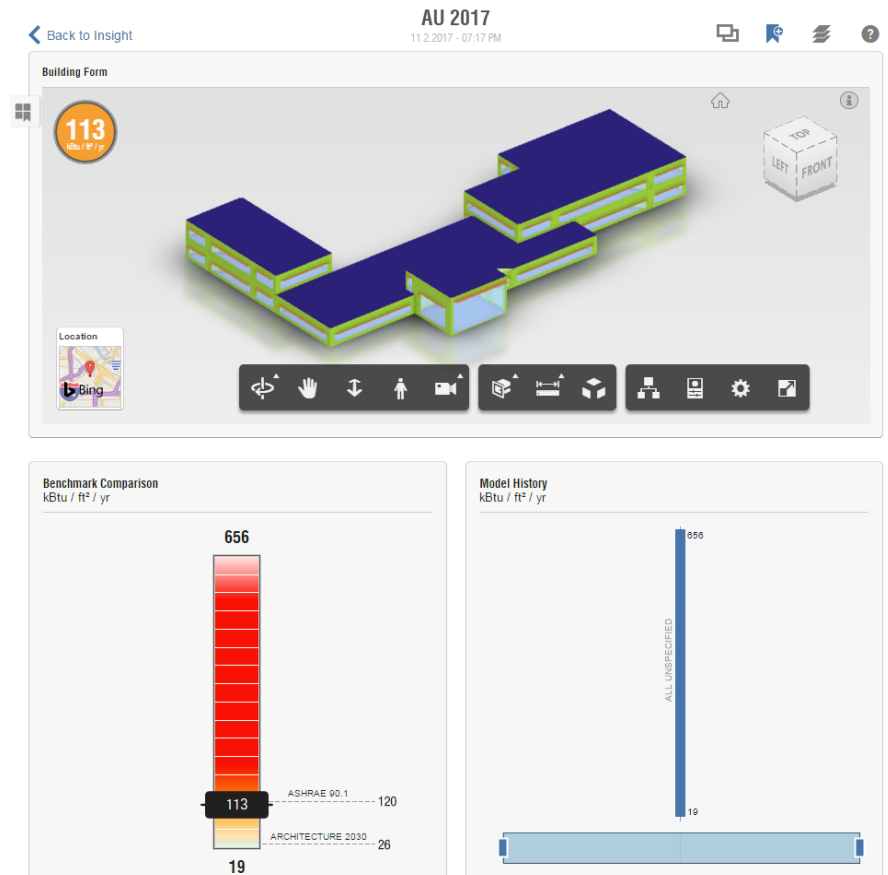
- Upload the Mass Model
- Analyze the model
- Review potential design changes
- Compare benchmarks
 - EUI
 - Cost per area
- Share and compare models



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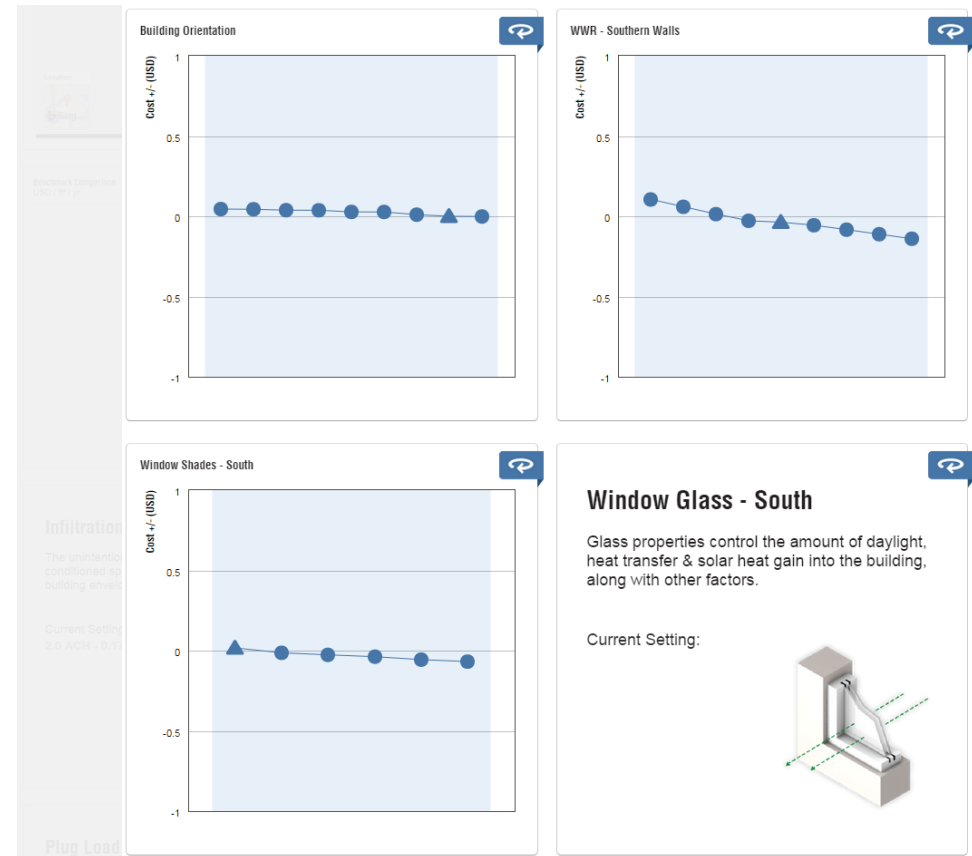
Insight 360 Model Analysis

- View model benchmark and building form
 - Photovoltaic analysis
 - Heating Loads
 - Cooling Loads
- Review model history



Insight 360 Widgets

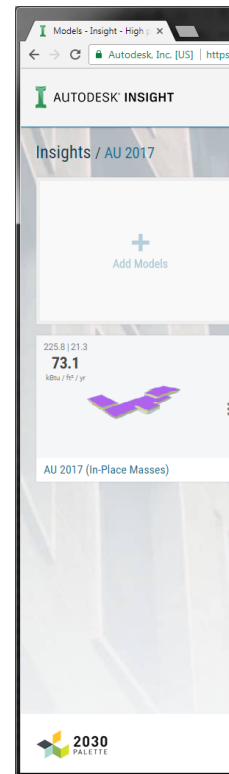
- Results for specific model categories
 - Building Orientation
 - HVAC System
 - Glazing
 - Etc.
- Apply constraints
- Reorder based on importance



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Insight 360 Scenarios

- Save configurations and constraints
- Compare multiple Scenarios
- Compare multiple buildings
- Sample Scenarios: Net Zero, Architecture 2030



Designing with Insight 360 Energy Analysis

- A360 Cloud service
- Analyze major decisions early
- Track results of changes
- Share with colleagues
- Apply recommendations to Revit model
- Plan for sustainability from the beginning



Energy Analysis and Integrative Design

- Drive decisions for multiple disciplines
 - Building form and orientation
 - Materials and assemblies
 - Electrical and mechanical loads and systems
- Unite disciplines in pursuit of the same goals



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Conclusion

- All you need is an idea
- Model masses and apply settings
- Use Insight 360 to inform, drive, and track design decisions
- Bring disciplines together
- Design more sustainable buildings



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The background of the slide features a complex, abstract wireframe mesh structure. It consists of numerous interconnected triangles and polygons, creating a fluid, organic shape that resembles a stylized, flowing architectural form or a digital landscape. The mesh is rendered in a light gray color against a white background, with some areas appearing slightly more opaque than others, giving it a three-dimensional feel.

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