



NASEO *Getting to Zero National Forum: Jolt Session*

BIM-Based Simulation and Analysis for Zero Energy Building Design

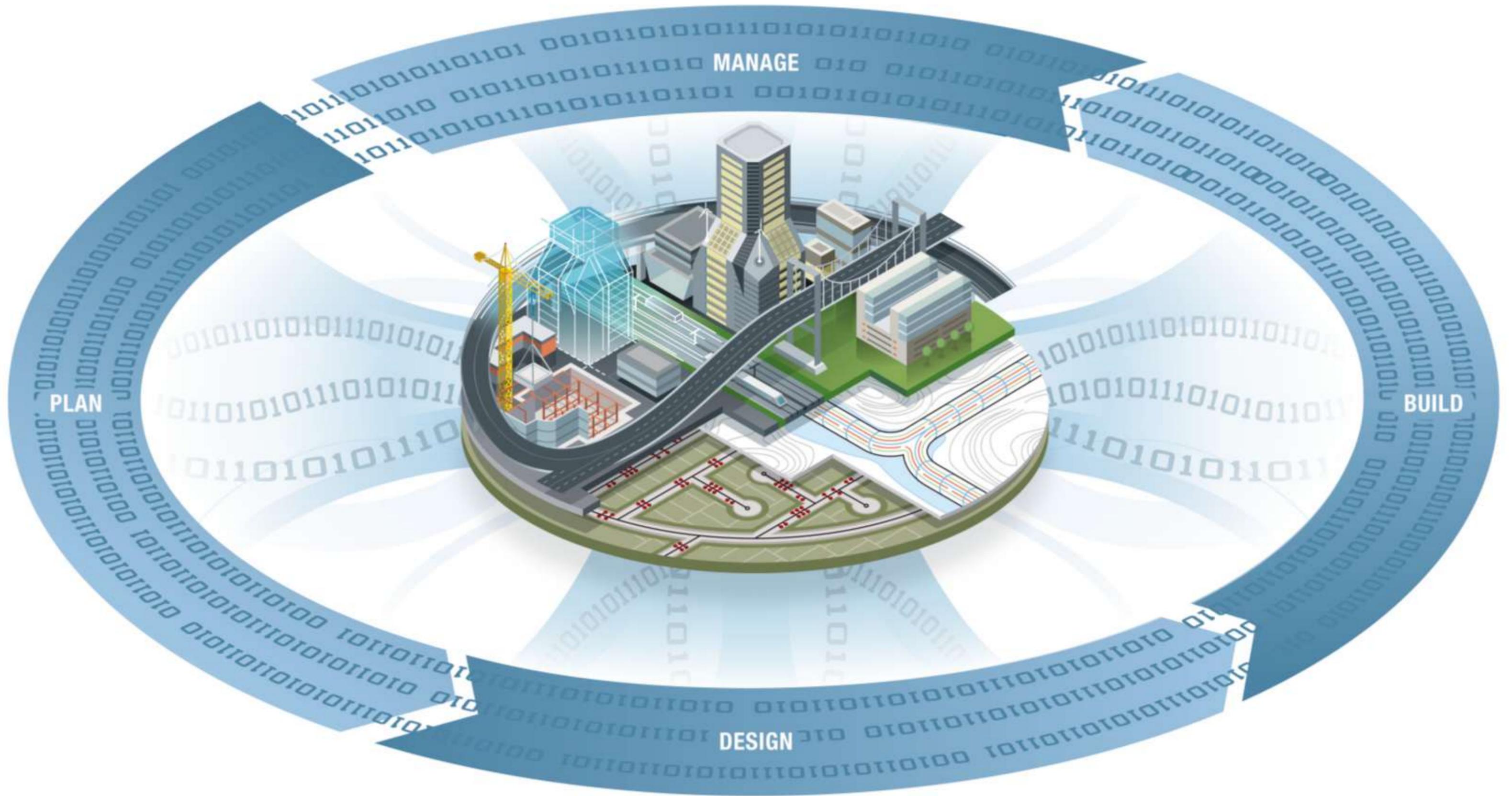
Jonathan Rowe

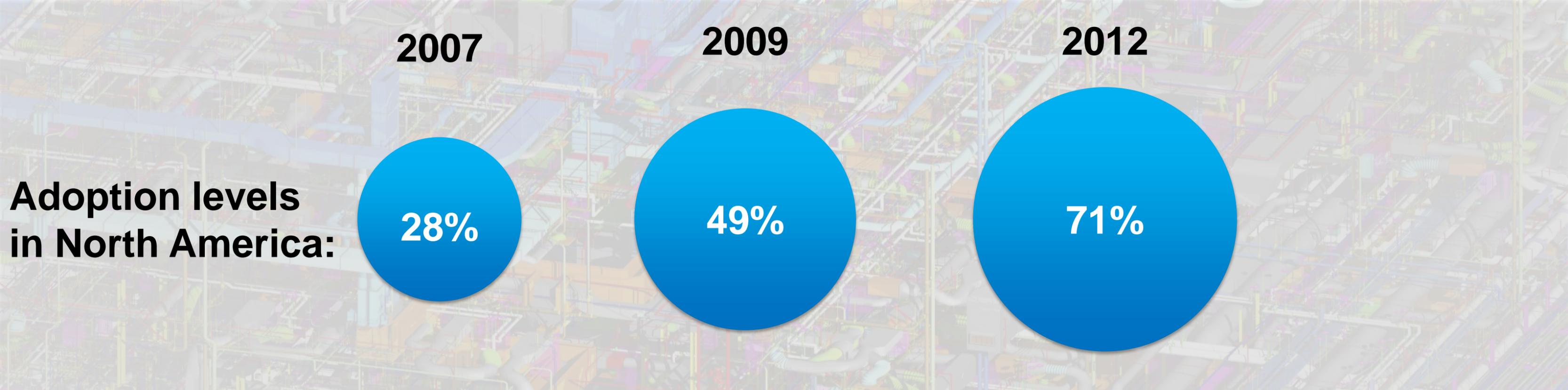
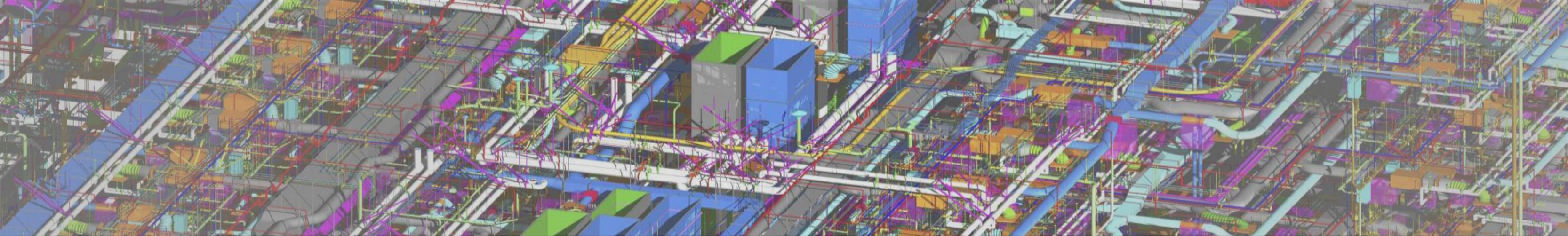
Autodesk Sustainability Solutions



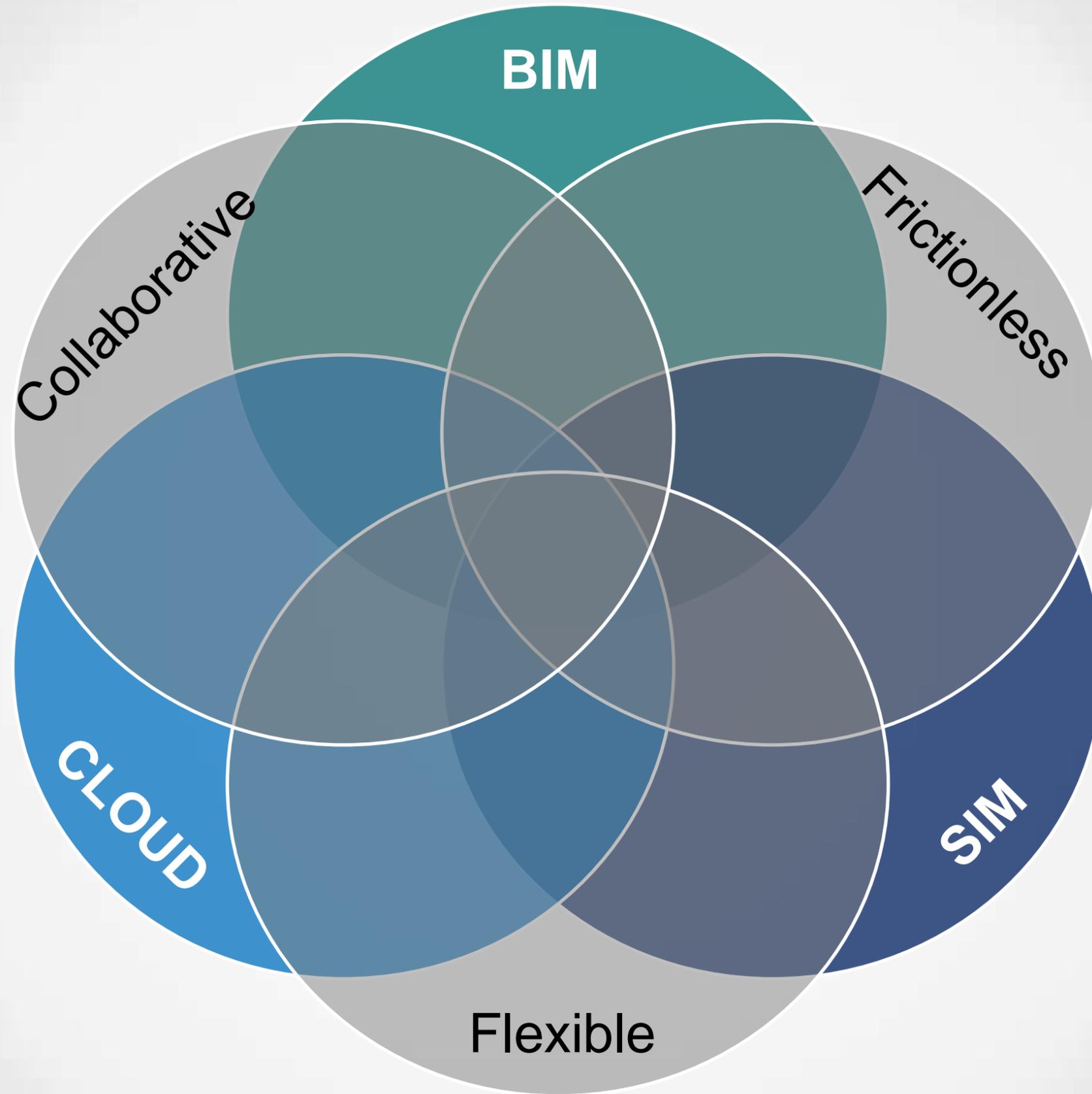
What's BIM?







Vision:
*Conduct high quality
energy analysis early,
easily, and frequently
throughout the
building project
delivery process.*

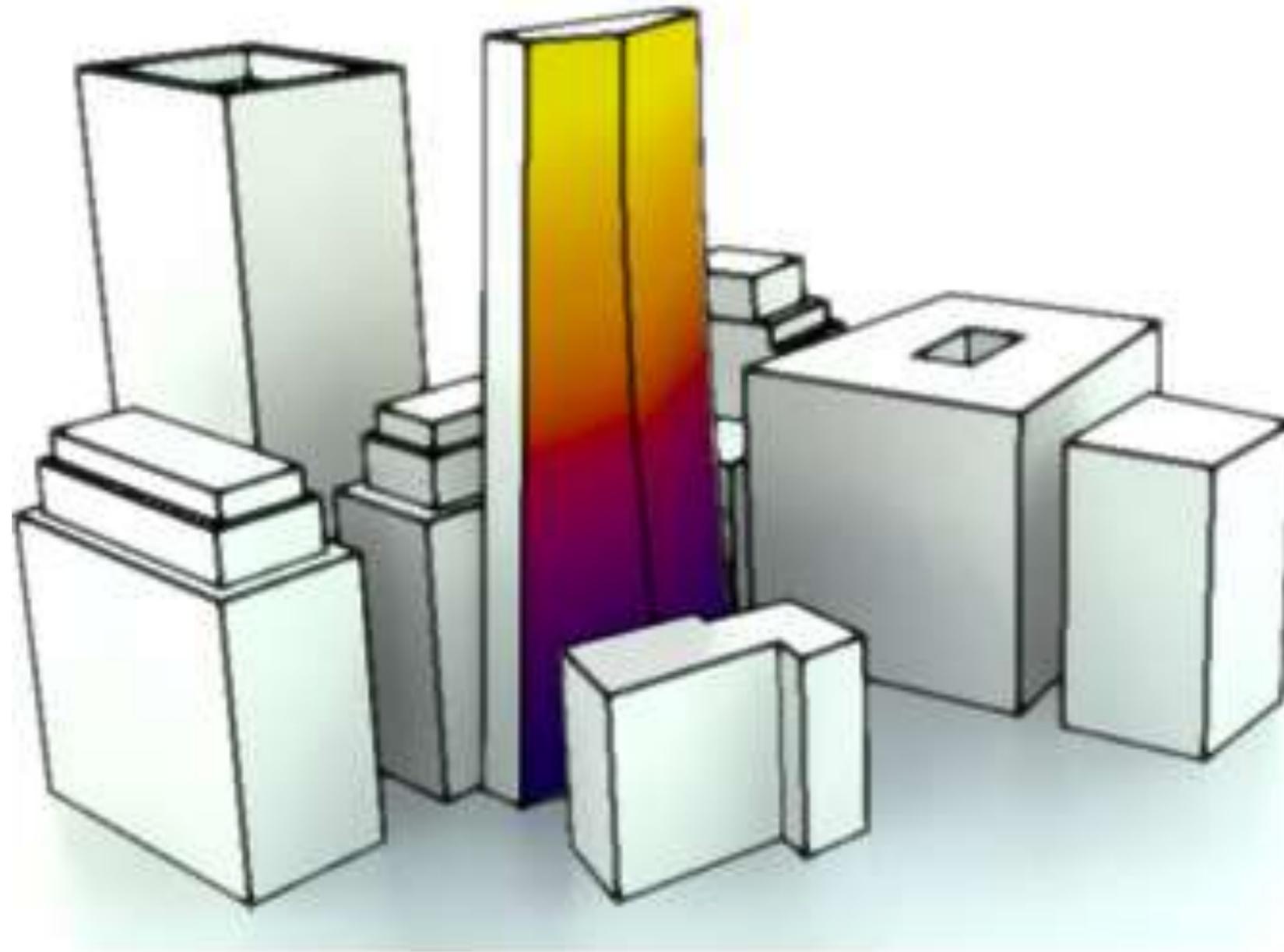




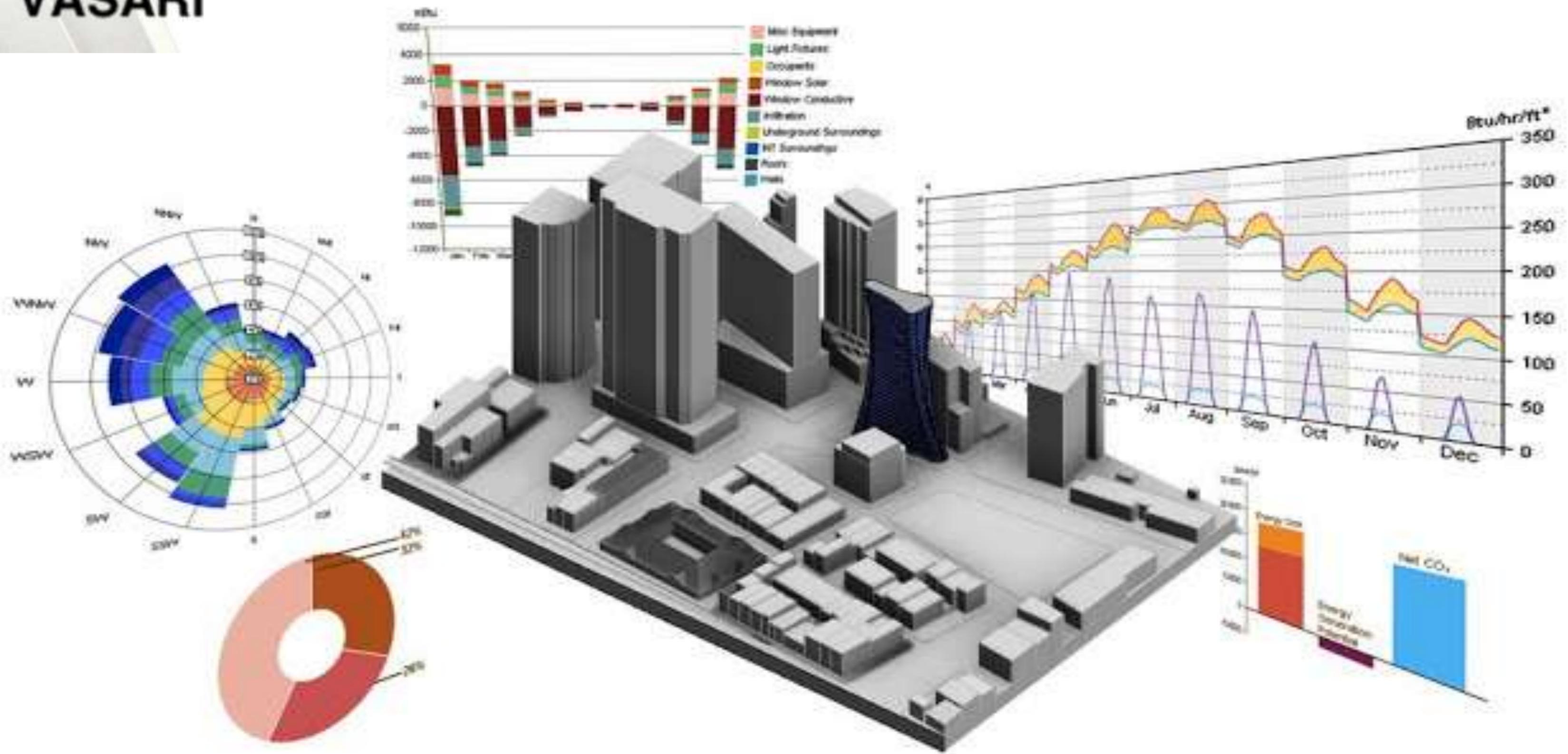
AUTODESK®
GREEN BUILDING STUDIO®



VASARI

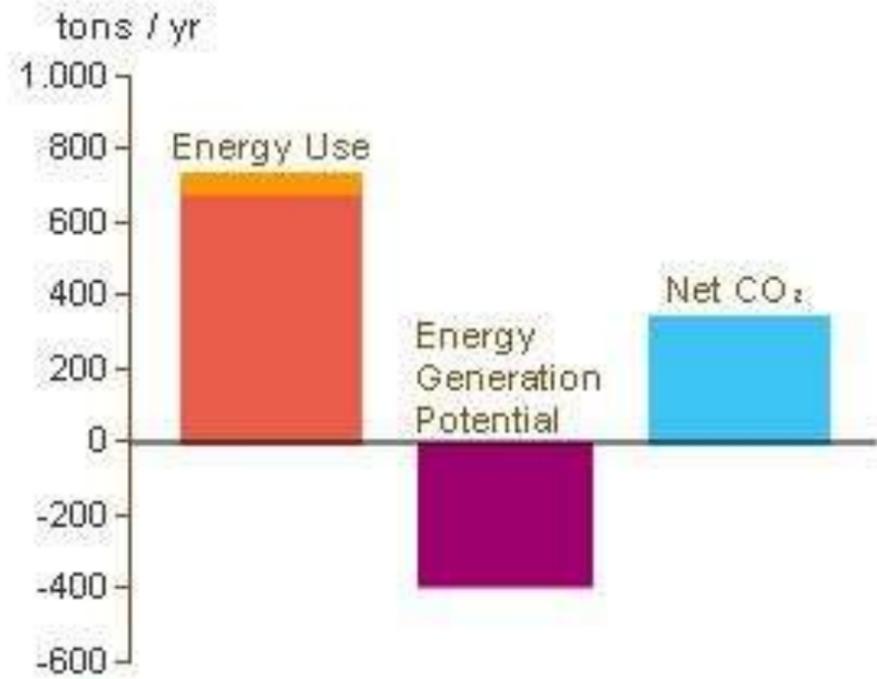


VASARI





Annual Carbon Emissions



(tons / yr)	
Electricity Consumption	679
Fuel Consumption	56
Roof PV Potential (High Efficiency)	-389
Single 15' Wind Turbine Potential	-2
Net CO₂	344



Properties

3D View

3D View: (3D) Edit Type

Graphics

View Scale: 1/8" = 1'-0"

Scale Value: 1: 96

Detail Level: Medium

Parts Visibility: Show Original

Detail Number: 1

Rotation on Sheet: None

Visibility/Graphic... Edit...

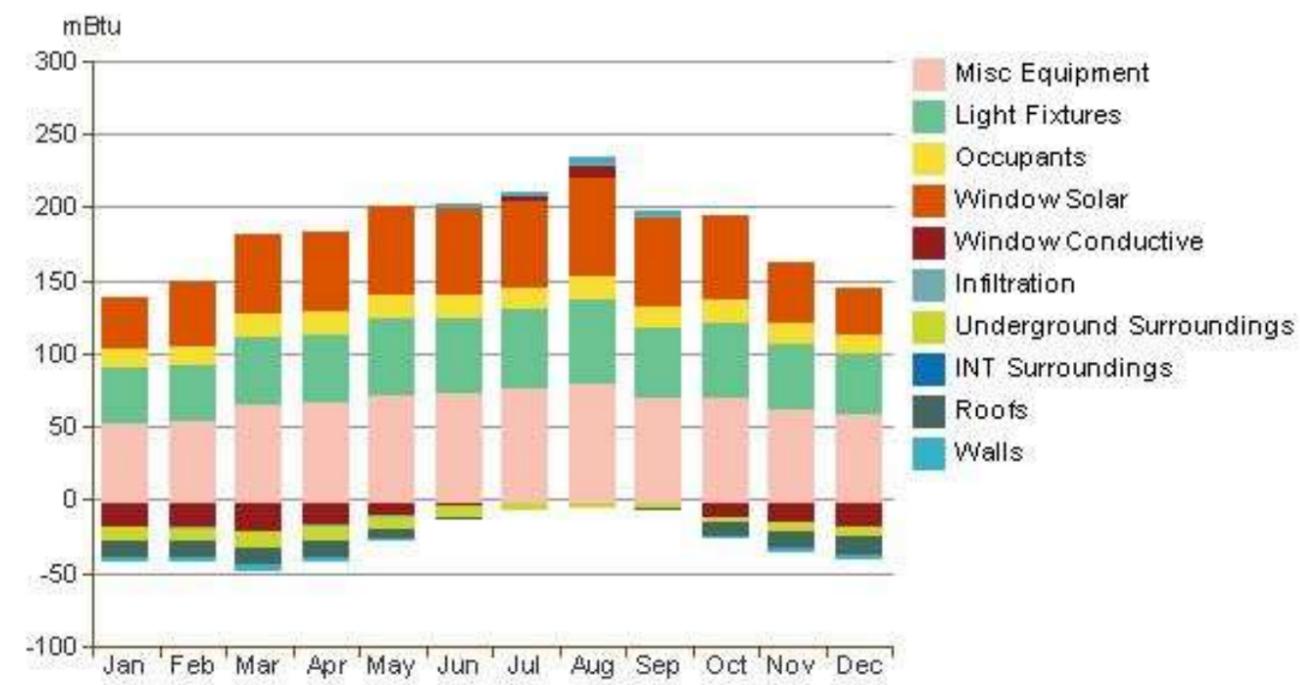
Graphic Display ... Edit...

Discipline: Coordination

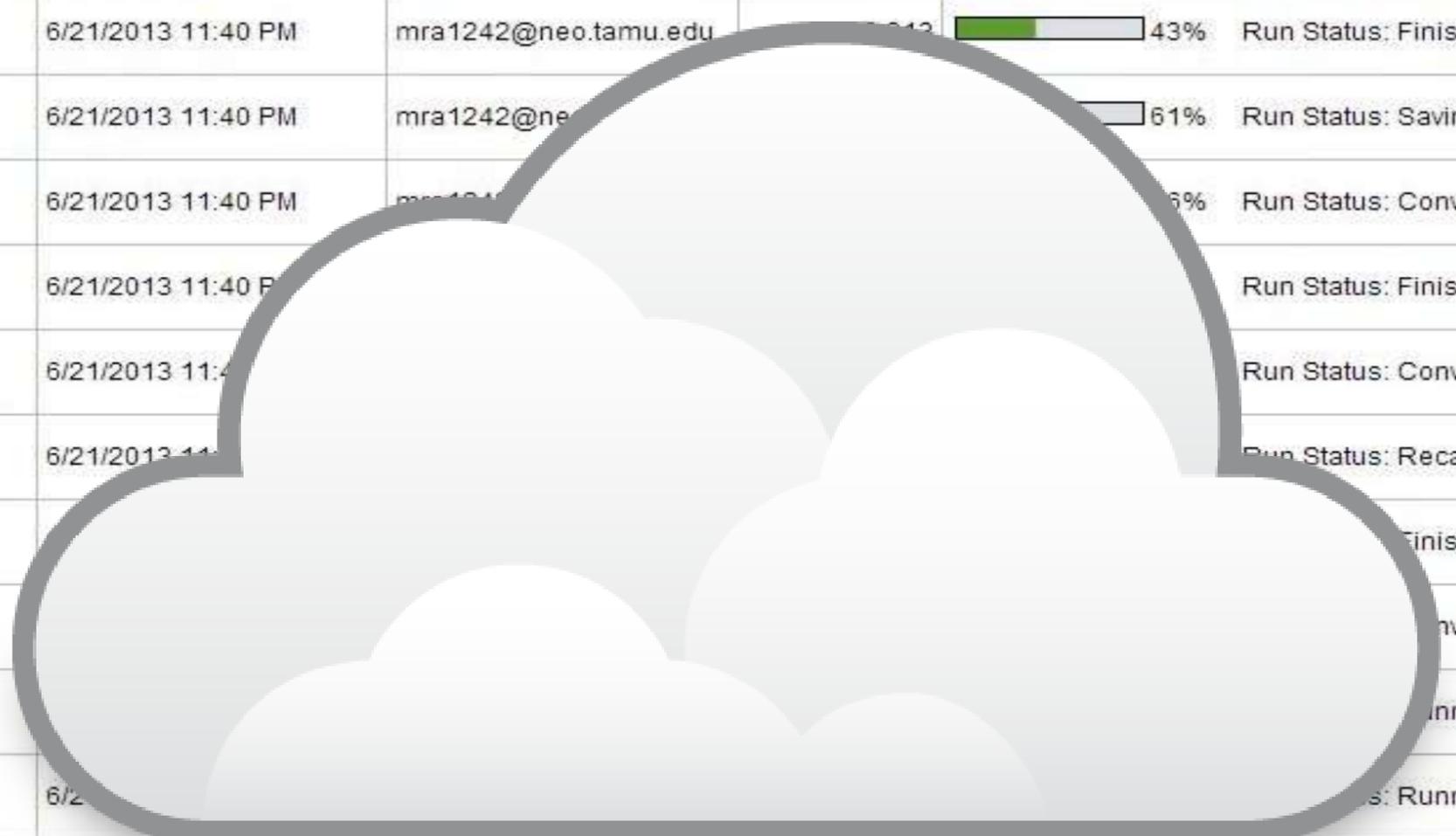
Default Analysis ... None

Sun Path:

Monthly Cooling Load

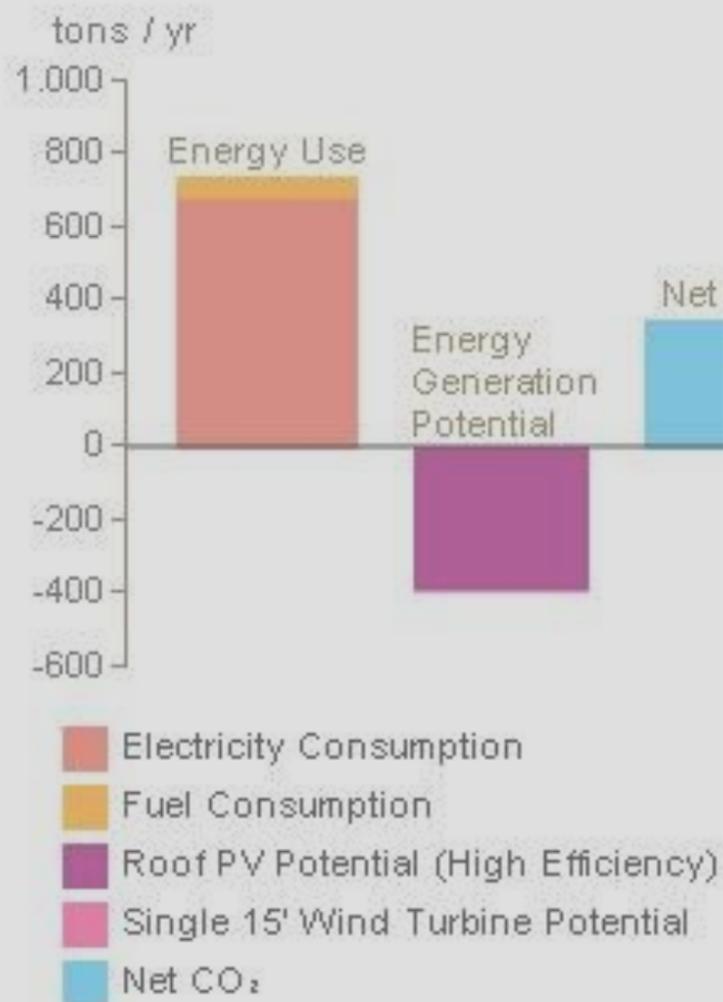


56750_BPA-PES Edit-Spaces-02 Analysis_Lighting_1.3_W/sqft	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	75%	Run Status: Running DOE-2.2 simulation
56750_BPA-PES Edit-Spaces-02 Analysis_Lighting_0.48_W/sqft	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	79%	Run Status: Reading simulation results
56750_BPA-PES Edit-Spaces-02 Analysis_PlugLoad_2.60_W/sqft	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	71%	Run Status: Converting gbXML file to DOE-2.2 file
56750_BPA-PES Edit-Spaces-02 Analysis_PlugLoad_0.78_W/sqft	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	43%	Run Status: Finishing PV potential calculations
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(-)135	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	61%	Run Status: Saving fully populated gbXML file prior to simulation
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(-)90	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	6%	Run Status: Converting gbXML file to EnergyPlus file
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(-)45	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Finishing PV potential calculations
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(+)180	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Converting gbXML file to EnergyPlus file
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(+)135	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Recalculating daylight sensor locations
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(+)90	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Finishing PV potential calculations
56750_BPA-PES Edit-Spaces-02 Analysis_Orientation_(+)45	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Converting units to IP
56750_BPA-PES Edit-Spaces-02 Analysis_OccSens_ON	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Running DOE-2.2 simulation
56750_BPA-PES Edit-Spaces-02 Analysis_OccSens_No_Change	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313		Run Status: Running DOE-2.2 simulation
56750_BPA-PES Edit-Spaces-02 Analysis_BaseRun_w/DC_No_Change	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	75%	Run Status: Running DOE-2.2 simulation
56750_BPA-PES Edit-Spaces-02 Analysis_R-60_continuous_Ins_Roof	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	79%	Run Status: Reading simulation results
56750_BPA-PES Edit-Spaces-02 Analysis_Uninsulated_framed_Wall	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	75%	Run Status: Running DOE-2.2 simulation
56750_BPA-PES Edit-Spaces-02 Analysis_Quad_Kryp_Clear_w/DC	6/21/2013 11:40 PM	mra1242@neo.tamu.edu	9,313	75%	Run Status: Running DOE-2.2 simulation



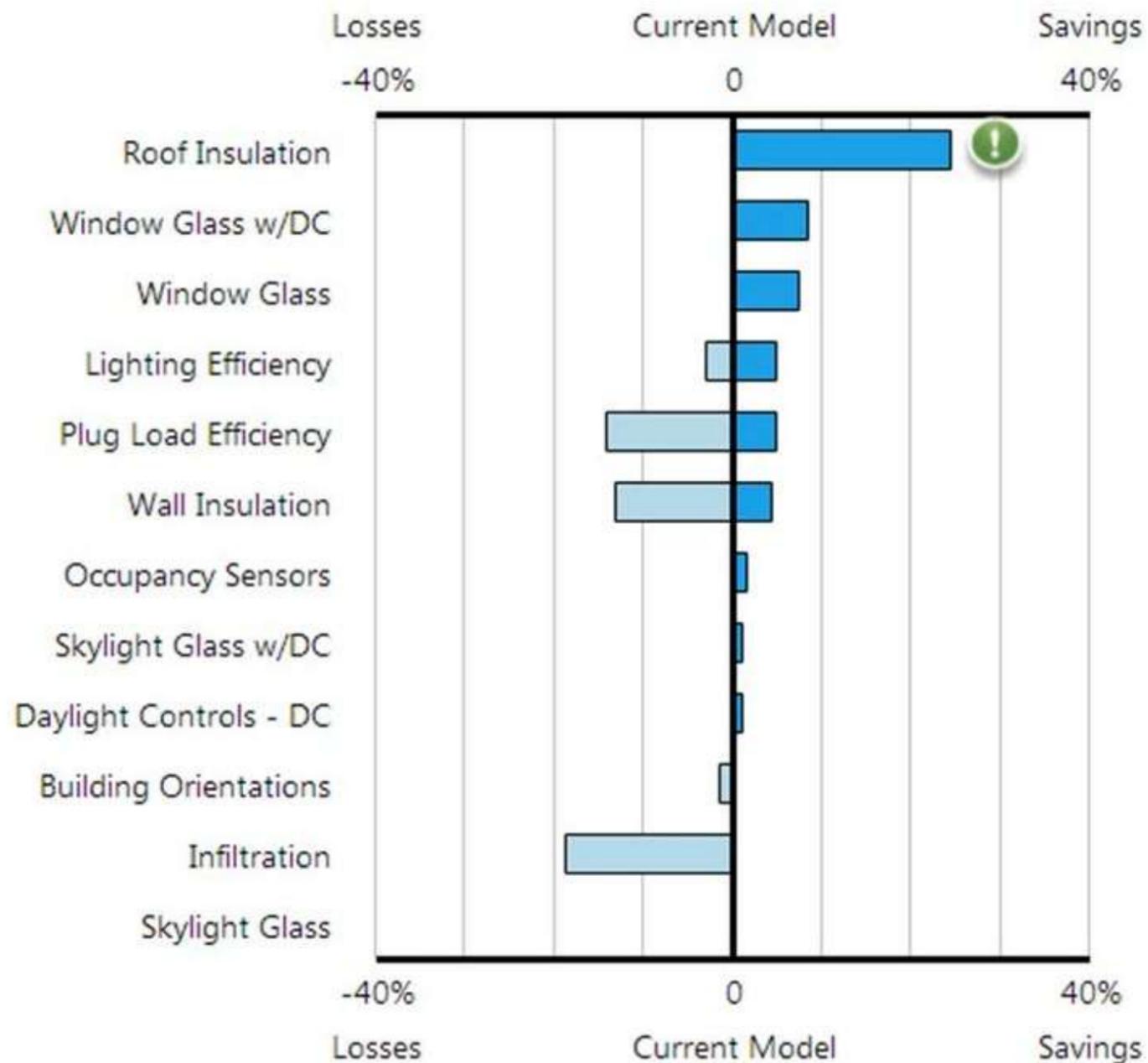


Annual Carbon Emissions



Potential Energy Savings Beta

All Analyzed Building Features



Potential Energy Savings/Losses

Project: Health Center- San Francisco, CA
 Location: SF, CA United States
 Base Run: Health Center
 Date: 6/9/2013 4:45 PM

Check Duct Systems, Check Pipe Systems, Check Circuits, Show Disconnects, Dust Legend, Pipe Legend, Color Fill Legend, Color Fill

Properties

3D View

3D View: (3D) Edit Type

Graphics

View Scale: 1/8" = 1'-0"

Scale Value: 1: 96

Detail Level: Medium

Parts Visibility: Show Original

Detail Number: 1

Rotation on Sheet: None

Visibility/Graphic... Edit...

Graphic Display ... Edit...

Discipline: Coordination

Default Analysis ... None

Sun Path:

Misc Equipment, Light Fixtures, Occupants, Window Solar, Window Conductive, Infiltration, Underground Surroundings, INT Surroundings, Roofs, Walls

Aug Sep Oct Nov Dec

Properties help Apply

Potential Energy Savings

All Analyzed Building Features

Losses
-110%

Current Model

Savings
110%

Window Glass w/DC

Window Glass

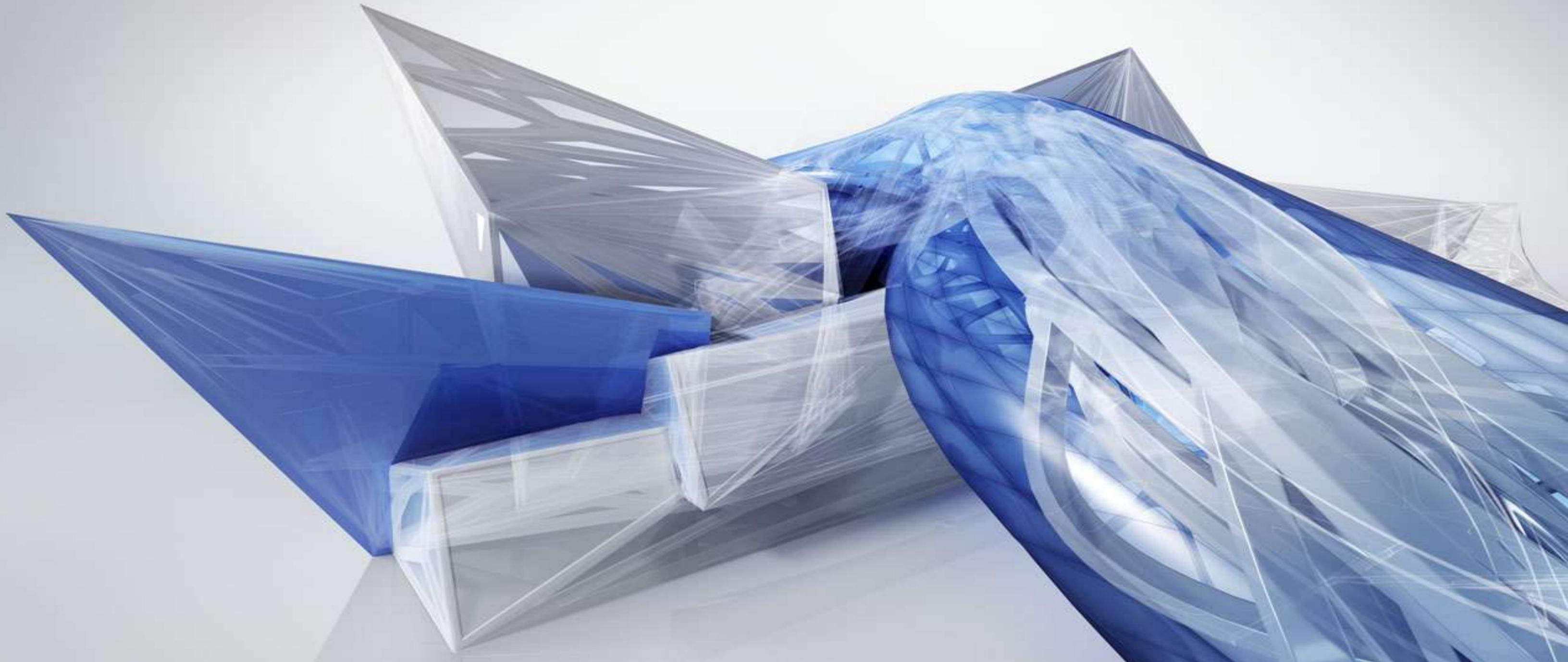
Wall Insulation

Plug Load Efficiency

Roof Insulation



Model courtesy of DesignGroup and the National Audubon Society





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