



Guide to Arc Insight

December 2020

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Introduction

Insight was developed by Skanska USA, the U.S. Green Building Council (USGBC), and Arc Skoru Inc. (Arc). Insight uses the Leadership in Energy and Environmental Design (LEED) project database to provide information about energy, water and waste design goals across regions and within targeted project types.

Insight interprets and aggregates project-level information and makes it easily accessible to those making decisions about the design and performance of buildings. Insight is currently limited to LEED New Construction projects.

Early adopters of Insight have applied the tools for business development, project visioning, and conceptual design.

Insight Solutions

- Analyze project design goals for energy, water, and waste;
- Evaluate the achievement rate for LEED strategies;
- View progress toward net zero energy with zEPI scores;
- Create and compare alternative project designs;
- Export high-quality reports and supporting data.

Access Insight

Insight is available to Arc Essentials users through ArcSkoru.com. There are three steps to get started.

1. Use your USGBC Username and Password to access ArcSkoru.com. You can [create a new account for free on USGBC.org](https://www.usgbc.org/arc-skoru).
2. Upgrade your account to Arc Essentials
3. Select Insight from the top navigation

Enter a search for a location or create a model and explore!

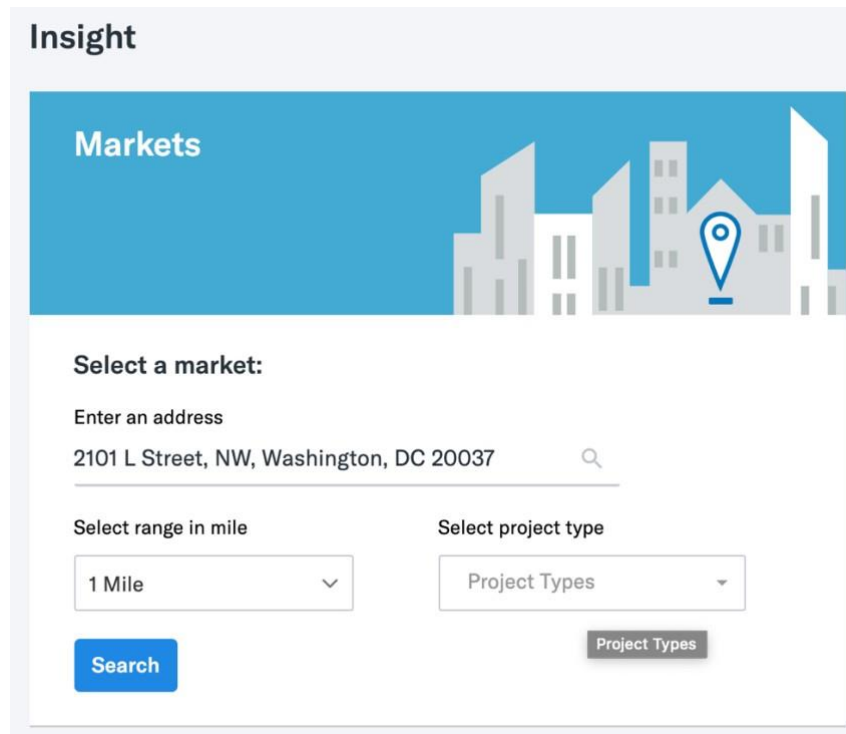
Analyze

Insight provides tools to analyze green building activity in markets around the world.

Start with the Markets tile. Enter an address or place name – anywhere recognized by Google will work.

Then, select a search radius and, optionally, select one or more project types. Not selecting a project type will return all LEED projects within the radius. Click **Search** to continue.

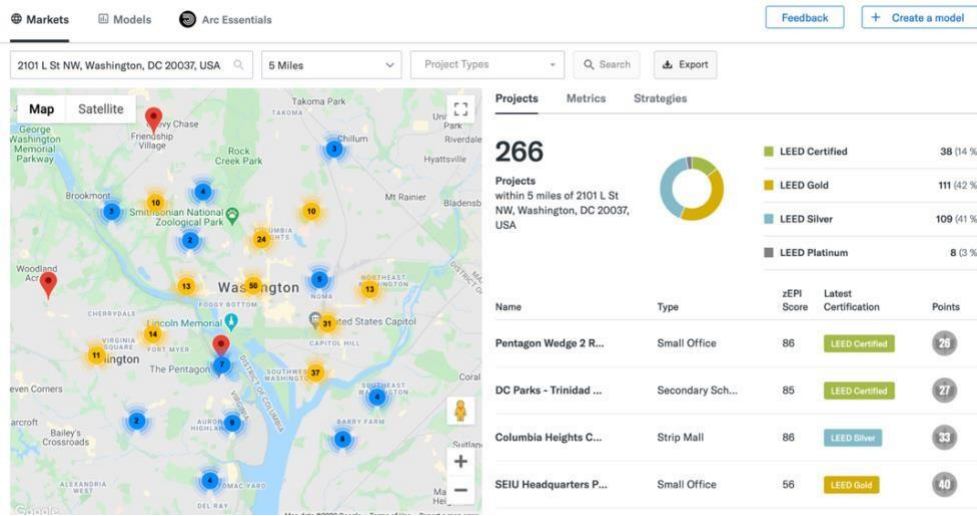
The Insight tool pulls information for all LEED New Construction projects contained in the USGBC's database that are publicly accessible (not marked as private/confidential), from version 2.1 and onwards.



The screenshot shows the 'Insight' application interface. At the top, there is a blue header with the word 'Markets' and a graphic of buildings and a location pin. Below this, the form is titled 'Select a market:'. It includes a text input field for an address, currently containing '2101 L Street, NW, Washington, DC 20037'. Below the address field are two dropdown menus: 'Select range in mile' (set to '1 Mile') and 'Select project type' (set to 'Project Types'). A blue 'Search' button is located at the bottom left, and a grey 'Project Types' button is at the bottom right.

Projects

The search defaults to a **Project View** with a map and project list. The search parameters are displayed below the total number of projects. Zooming in and clicking on the red symbols on the map displays the project names and USGBC project numbers. Note, only non-confidential projects are LEED projects are displayed on the map. In some cases, errors or incomplete address information may result in missing or misplaced projects. Project information can be updated in LEED Online or by contacting [GBCI Customer Service](#).



Metrics

Energy

Insight uses the [zEPI scale](#) to compare the designed energy performance of buildings across LEED versions, helping push the conversation and market towards net zero. A score of 100 equates to the average energy performance of U.S. building stock in the year 2000. A net zero energy building would have a score of 0. The designed energy performance for buildings in your data set is displayed on the zEPI scale. Projects are grouped into deciles to improve display quality.

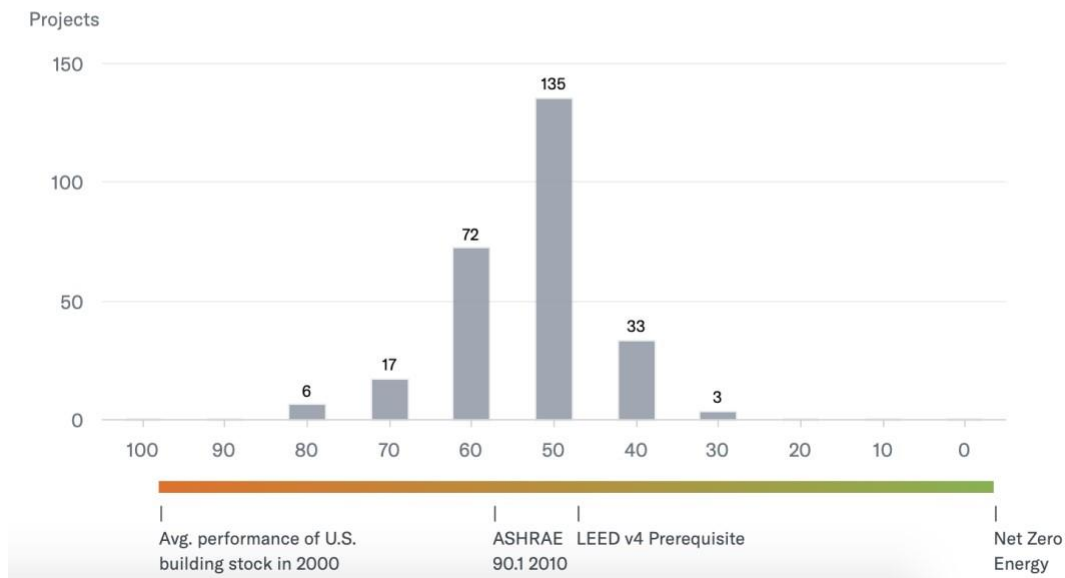
Both the ASHRAE 90.1 2010 Energy code baseline and the LEED v4 prerequisite (5% better than ASHRAE 90.1 2010) are shown as vertical lines to serve as reference points. Calculations are based on the Optimize Energy Performance credits and prerequisites in LEED, building type, location, and climate zones.

The LEED credits used to calculate the energy metric include Energy & Atmosphere (EA) credit 1.1-EAc1.10 in LEED version 2.1 and version 2.2, EA prerequisite 1, EA prerequisite 2, EAc1.1-EAc1.19 in LEED 2009 and the Optimize Energy Performance prerequisite and credits in LEED version 4. The database aggregates LEED certified new construction and major renovation projects. The zEPI score is based on the energy performance of new construction projects. Be aware that the energy reduction view will depict higher energy performance than average for renovation projects.

Sample of zEPI scores, water reduction, and waste diversion design goals for LEED BD&C projects within 10 miles of 2101 L Street, NW, Washington, D.C. Lower scores indicate more ambitious, higher performance designs.

<p>Average zEPI Score</p> <p>58</p> <p>zEPI Score</p>	<p>Average Water reduction</p> <p>14%</p> <p>Reduction below EPAAct 1992</p>	<p>Average Waste diversion</p> <p>68%</p> <p>Landfill waste diversion</p>
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Number of projects by zEPI score



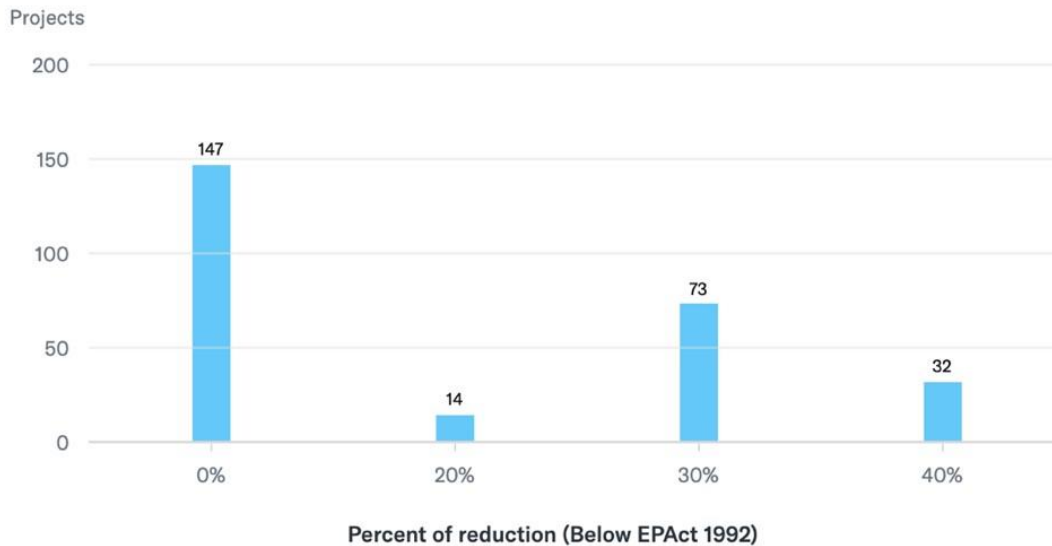
Water

Water savings are calculated with reference to [EPA Act 1992](#). For U.S. projects, this can be interpreted as improvement relative to regulatory minimum performance standards. Of course, local requirements may exceed these levels, and these are not captured in the tool. Similarly, some jurisdictions may have lower or no regulatory requirements. The savings calculation will underestimate benefits for these locations.

Projects that did not achieve the LEED credit show up as a 0% water savings (relative to EPA Act 1992) and are not used to calculate the percent average reduction. LEED credits WEc3.1, WEc3.2 in v2.1, v 2.2, v3, WEp1 in v3 and the Indoor water use credits and prerequisite in v4 form the basis of this data.

Sample of indoor water reduction for LEED BD&C projects within 10 miles of 2101 L Street, NW, Washington, D.C.

Number of projects by percent of reduction (Below EPA Act 1992)



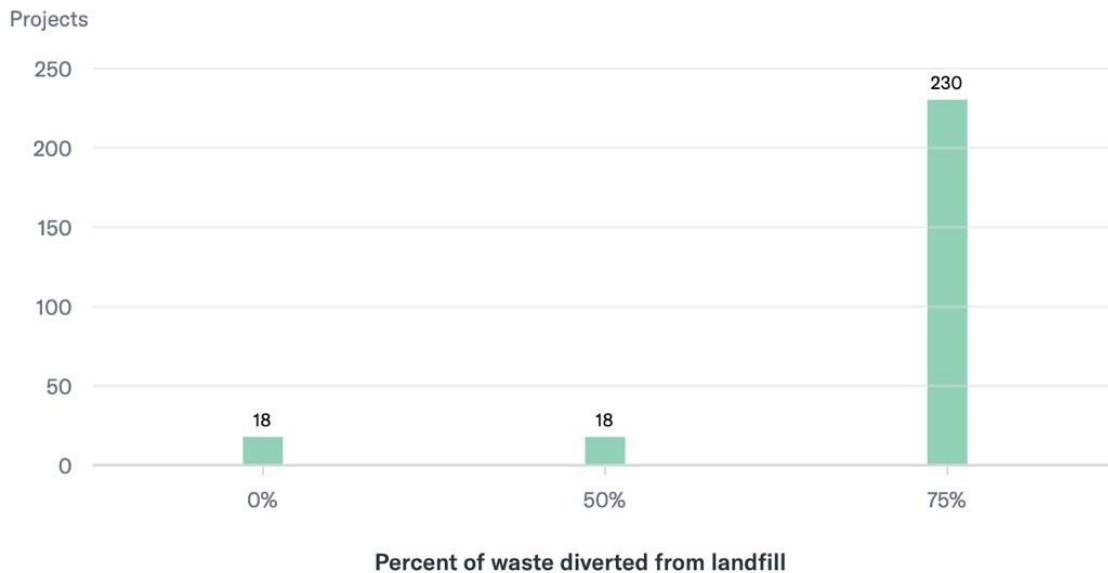
Waste

Waste reduction metrics reflect construction and demolition (C&D) waste diverted from landfill. LEED credits MRc2.1, 2.2 in V 2.1, 2.2 and 3 and the Construction and Demolition Waste Management credit in LEED v4 form the basis of this data. There is no widely used national or international benchmark for C&D waste, and it is reasonable to expect that practices will vary significantly between markets and regions.

Projects that did not achieve these credits are shown as having a 0% diversion from landfill and are not used to calculate the average diversion.

Sample of construction and demolition waste reduction for LEED BD&C projects within 10 miles of 2101 L Street, NW, Washington, D.C.

Number of projects by waste diverted from landfill













Strategies

The Strategies tab provides details about the use of green building practices in a given location and, if selected, property type. Strategies represent an aggregation of similar LEED credits from multiple building design and construction rating systems. This provides a synthetic view of practices; however, it does not represent any particular LEED version.

Projects Metrics **Strategies**

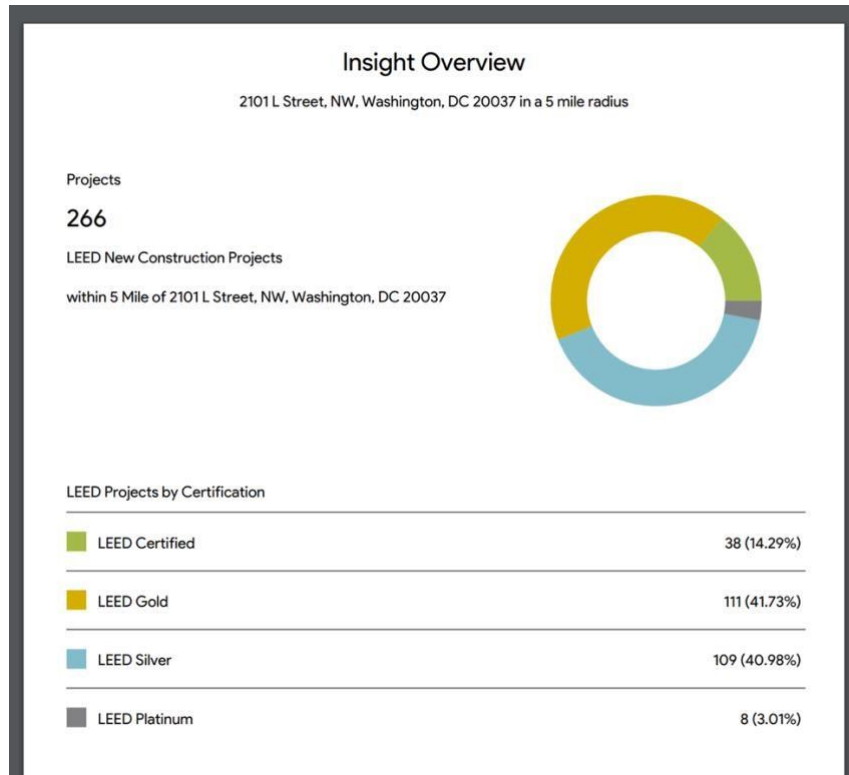
266 Projects within 5 Miles of 2101 L St NW, Washington, DC 20037, USA

LEED Strategies

 Energy & Atmosphere	Achieved by (%)
Prerequisite - Fundamental refrigerant management	 100%
Prerequisite - Minimum Energy Performance	 100%
Prerequisite - Fundamental Commissioning	 100%
Renewable Energy	 6.02%
Green Power and Carbon Offsets	 47.74%
Advanced Energy metering	 47.37%
Enhanced refrigerant management	 49.62%
Enhanced commissioning	 62.78%
Optimize energy performance	 90.60%

Export

Insight allows users to create a downloadable PDF containing project counts by certification level, zEPI scores, LEED strategies, and metrics. Users can generate the report by clicking the **Export** button at the top of the screen.



Models

Insight allows users to create “models”. These are tools that can be used to explore how combinations of credit achievement translate into energy, water, and waste performance. Models can be compared to each other or regional practices.

Models

0

Arc Insight Models

Compare sustainability strategies and see how this project stacks up against the performance of other buildings.

[Create your first model](#)

What is a Model (in Insight)?

mod·el, noun, a representation of a person or thing or of a proposed structure.

An Insight model is a hypothetical project. Insight models do not represent real projects or real-world energy use, water consumption, or waste generation. They are not connected to Arc project data. Information entered into Insight models is not accessible in other parts of the Arc platform.

Create a Model

Get started by clicking the **Create Your First Model** button.

The screenshot shows a web interface for creating a model. At the top, there are three steps: 1. Model details (active), 2. Strategies, and 3. Reduction view. To the right of these steps are 'Next' and 'Cancel' buttons. Below the steps is the 'Model details' form. The form has the following fields:

- Project Name (text input)
- Project Version (text input)
- Construction Manager (text input)
- CM Project Number (text input)
- Architect (text input)
- Rating System (dropdown menu, currently showing 'LEED 2009')

Fields include:

- **[Required] Name:** Enter a descriptive name for your project
- **[Required] Version:** Use this section to indicate what phase the project is at (e.g. Order of Magnitude or Design Development) per the standard preconstruction definitions (found [here](#)). This field is automatically populated with Version 1.0, but we encourage you to update that to something more meaningful that will allow us to accurately compare between versions as the project progresses.
- **[Required] CM/Arch:** Enter the Construction Manager (CM). This field can be used to aggregate projects for reporting by CM.
- **[Optional] CM Project Number:** Enter your internal project number.
- **[Optional] Rating System:** Enter a rating system to determine energy baseline.
- **[Optional] Space Type:** Enter the project type. This is used in the zEPI calculation. If the exact type is not available, select the space type that most closely resembles the energy use profile of the project.

- **[Optional] Do you plan to complete an energy model?:** A legacy internal tracking question.
- **[Optional] Do you plan to complete a carbon footprint?:** A legacy internal tracking question.
- **[Optional] Owner Type:** An internal tracking question.
- **[Optional] Owner Organization:** An internal tracking question.
- **[Optional] Owner Email:** An internal tracking question.
- **[Optional] Owner Country:** An internal tracking question.
- **[Optional] Year Built/Anticipated Construction Completion:** A legacy internal tracking question.
- **[Required] Area** (square feet): Area of the project will be used for benchmarking purposes.
- **[Optional] This project is private:** At this time, no project information is shared with anyone. All projects are currently treated as confidential and private. Projects entered into the market insight tool do not contribute data to the existing LEED database.
- **[Required] Address:** Project address. Required to look up climate zone and find nearby projects.
- **[Required] City:** Project city/state. Required to look up climate zone and find nearby projects.
- **[Required] Country:** Project country. Required to look up climate zone and find nearby projects.
- **[Required] Zip code:** Project zip code. Required to look up climate zone and find nearby projects.

Select LEED Strategies

After entering basic “Model Details”, click the **Next** button to create your project in the system. The next tab displays “Strategies”. The table presents high-level, aggregated strategies mirroring, to the degree possible, credit intents. They do not reflect Alternative Compliance Paths.

1 Model details 2 Strategies 3 Reduction view Next Cancel

Strategies

Enter the Estimated Points you expect to achieve for each strategy.

▼ Sustainable Sites 16 of 26

Credit	Points Possible	Estimated Points
Site selection	0 - 1	1
Development density and community connectivity	0 - 5	2
Brownfield redevelopment	0 - 1	1
Alternative transportation - public transportation access	0 - 6	1
Alternative transportation - bicycle storage and changing rooms	0 - 1	1

Estimated score (LEED 2009)

91/100

Estimated LEED points

After selecting credits and point achievement, click **Next** for the **reduction view**. This view presents the estimated energy, water, and waste impact of the selected credits.

1 Model details 2 Strategies 3 Reduction view Next Cancel

Reduction view

Net Zero Energy

This project is pursuing Net Zero Energy

Net Zero Water

This project is pursuing Net Zero Water

Net Zero Waste

This project is pursuing Net Zero Waste

Percentage reduction (LEED 2009)

48% Average energy reduction

40% Average water reduction

75% Average waste diverted from landfill

Optionally, projects may specify a goal that goes beyond credit achievements levels, such as zero net energy, water or waste.

1 Model details 2 Strategies 3 Reduction view Next Cancel

Reduction view

Net Zero Energy

This project is pursuing Net Zero Energy

Net Zero Water

This project is pursuing Net Zero Water

Net Zero Waste

This project is pursuing Net Zero Waste

Percentage reduction (LEED 2009)

100% Average energy reduction

100% Average water reduction

100% Average waste diverted from landfill

Benchmark Strategies

Clicking **Next** allows you to benchmark the reductions against existing LEED projects. The comparison set can be refined by location and project type.



More metrics are available in the **How Scoring Works** tab. Notably, this displays the zEPI score and its score components: space type, climate zone, baseline energy code (based on the rating system version), baseline energy use intensity (EUI), energy use reduction (based on LEED credit achievement), estimated building EUI (baseline – the energy use reduction).

Project locations are used to look up [ASHRAE Climate Zones](#). Data are based on ASHRAE Standard 169-2013 for locations across the [United States and internationally](#). Projects are assigned the climate zone for the closest ASHRAE station. These components are used to [estimate the zEPI score](#).

Chris Haus, 22305
1000006972 - 1 Current Version

- Reductions
- Strategies
- Comparisons
- How scoring works**
- Manage
- Model
- Team

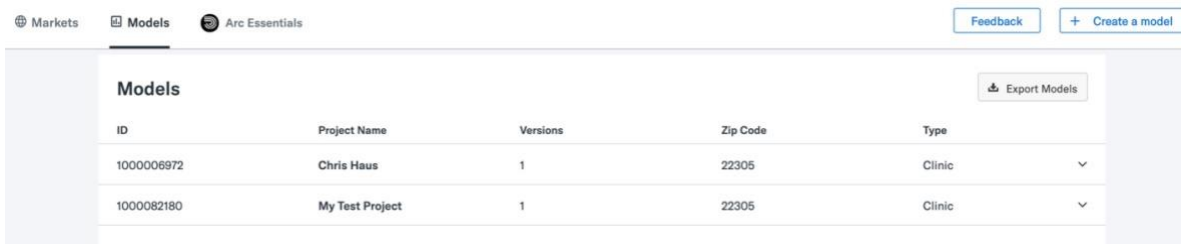
How scoring works

zEPI Score

36.55
Current zEPI Score

Score Inputs		Score Details	
Space type	Clinic	Baseline code	90.1-2007
Climate Zone	4A	Baseline EUI	149
LEED version	LEED 2009	Percent reduction	48
Energy Points	19	Estimated building EUI	77
		zEPI baseline EUI	159

The model created through these steps is automatically saved, and can be retrieved through the Models tab. The **Export Model** button creates an Excel file summarizing all model parameters and scores.



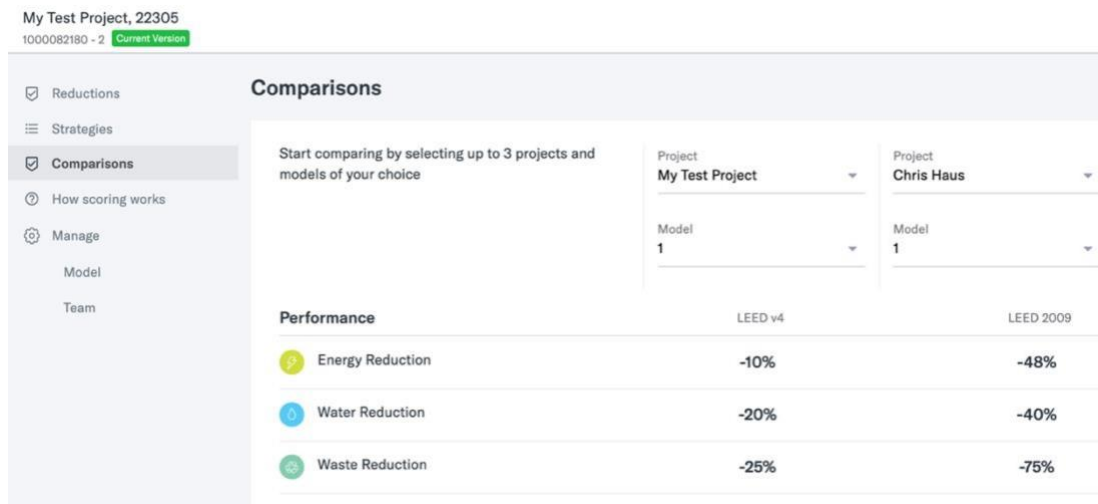
The screenshot shows the 'Models' tab in the Arc Insight interface. At the top, there are navigation tabs for 'Markets', 'Models', and 'Arc Essentials'. On the right, there are buttons for 'Feedback' and '+ Create a model'. Below the navigation is a table with the following data:

ID	Project Name	Versions	Zip Code	Type
1000008972	Chris Haus	1	22305	Clinic
1000082180	My Test Project	1	22305	Clinic

An 'Export Models' button is located to the right of the table.

Compare Projects

Users can compare up to three projects in a single view. The user selects a model for each column. They have the option to create one or more versions of this model. Reductions are summarized by performance area (energy, water, and waste) or LEED credit category (e.g., Location & Transportation, Energy & Atmosphere).



The screenshot shows the 'Comparisons' view in the Arc Insight interface. The title is 'My Test Project, 22305' with a sub-header '1000082180 - 2' and a 'Current Version' tag. On the left, there is a sidebar with navigation options: 'Reductions', 'Strategies', 'Comparisons' (selected), 'How scoring works', 'Manage', 'Model', and 'Team'. The main content area is titled 'Comparisons' and includes a prompt: 'Start comparing by selecting up to 3 projects and models of your choice'. Below this, there are two columns for project selection:

	Project	Model
	My Test Project	1
	Chris Haus	1

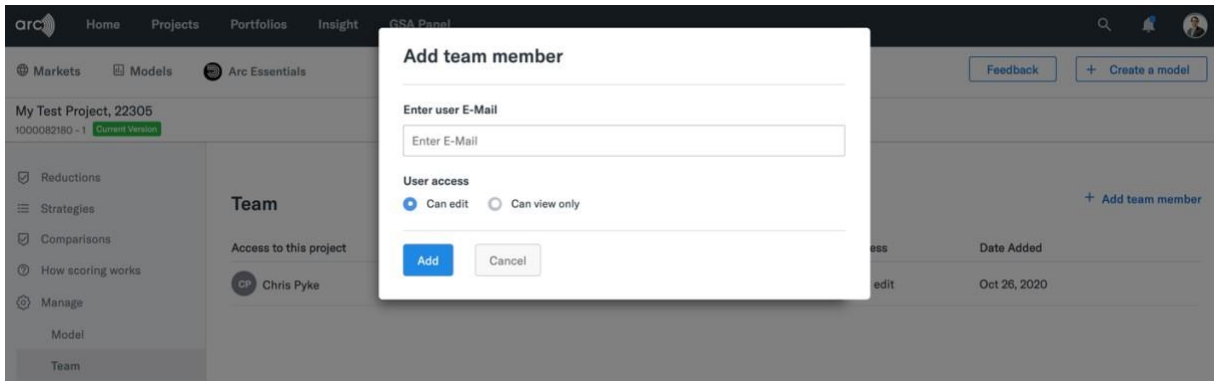
Below the selection area, there is a table showing performance metrics for LEED v4 and LEED 2009:

Performance	LEED v4	LEED 2009
Energy Reduction	-10%	-48%
Water Reduction	-20%	-40%
Waste Reduction	-25%	-75%

Manage a Team

Insight provides tools for teams to share and collaborate on analyses and models.

From the Manage tab, users can add team members by entering their email. They can provide edit or view-only access.



Note: All team members must have USGBC.org site user accounts. These can be [created for free](#).

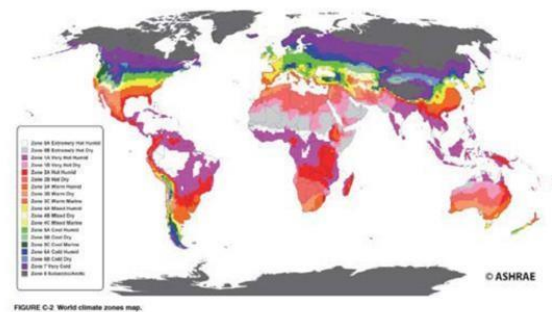
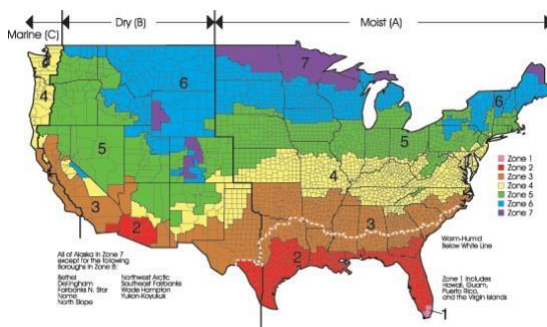
Acknowledgements

Insight reflects a long-term partnership between Skanska, the U.S. Green Building Council, and Arc Skoru, Inc. The efforts were led by Elizabeth Heider (Skanska) and Mahesh Ramanujam (USGBC/GBCI/Arc). The tool was developed, tested, and applied by Rajiv Sharma (Arc), Emily Durand (Skanska), and Kimberly Loscher (Skanska).

Glossary

ASHRAE: American Society of Heating, Refrigeration and Air-Conditioning Engineers set the standards used by LEED, many building codes and the Insight tool for the energy efficient performance of buildings. [About ASHRAE.](#)

Climate Zones: Climate zones are used as part of the zEPI calculation and are used to describe the climate in a given region. The US is sorted into eight distinct climate zones, which are further categorized by sub-climate (moist, dry and marine).



[Image source](#)

EPAct 1992: The Energy Policy Act of 1992 was passed by Congress October 24, 1992 with the goal of increasing clean energy use and improving energy efficiency in the United States. Insight also details uniform national standards for the manufacture of water using fixtures to promote conservation. Fixture requirements shown below:

Commercial Fixtures, Fittings, and Appliances	Baseline (IP Units)
Water closets (toilets)*	1.6 gallons per flush (gpf)
Urinal*	1.0 gpf
Public lavatory (restroom) faucet	0.5 gallons per minute (gpm) at 60 pounds per square inch (psi) all others except private applications
Private lavatory faucet*	2.2 gpm at 60 psi
Kitchen faucet (excluding faucets used exclusively for filling operations)	2.2 gpm at 60 psi
Showerhead*	2.5 gpm at 80 psi per shower stall

EUI: Refers to the energy use intensity of a building, it is calculated by dividing the energy used by the square footage. A three-minute video is available on the Energy Star website to help provide you with a better understanding. For more information: <https://portfoliomanager.zendesk.com/hc/en-us/articles/213381958-What-is-EUI->

zEPI Score: Historically we have measured energy performance as a percent better than code, but that kind of baseline continually shifts as new, more stringent codes are adopted. zEPI eliminates the challenge of comparing buildings across time and codes by setting an absolute scale where the end points are the average performance of US building stock in the year 2000 (a score of 100) and zero net energy (a score of 0). The zEPI scale extends in a linear fashion between, above, and below those two points. For example, a building that uses twice as much energy as an average building receives a score of a 200. A building that uses half as much energy as an average building receives a score of 50. It is normalized for building type and climate.

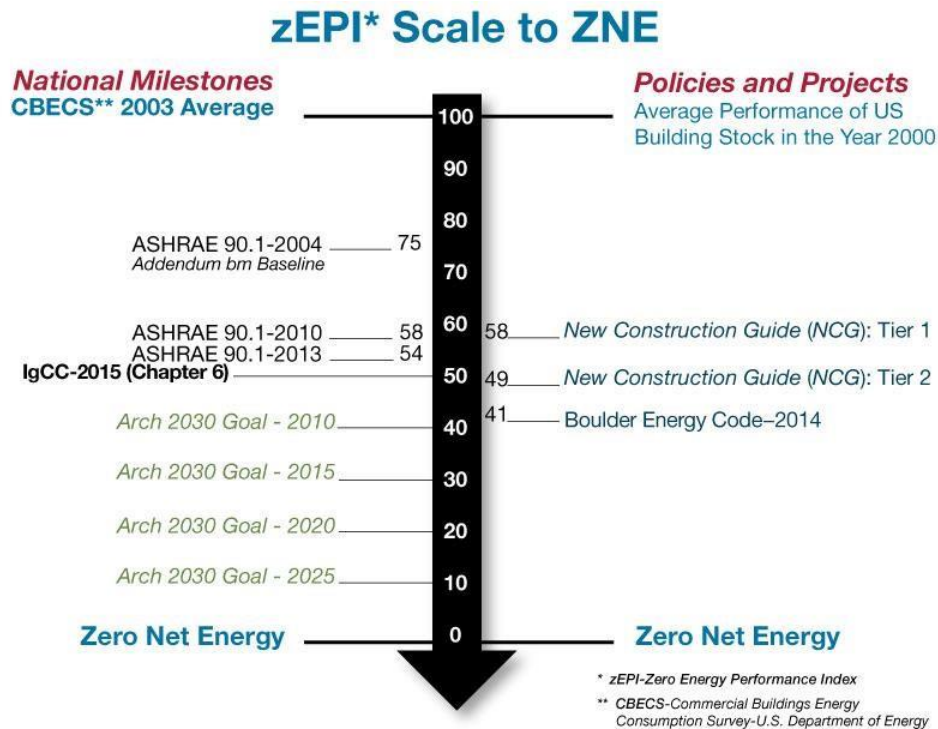


Image source: https://newbuildings.org/code_policy/zepi/