

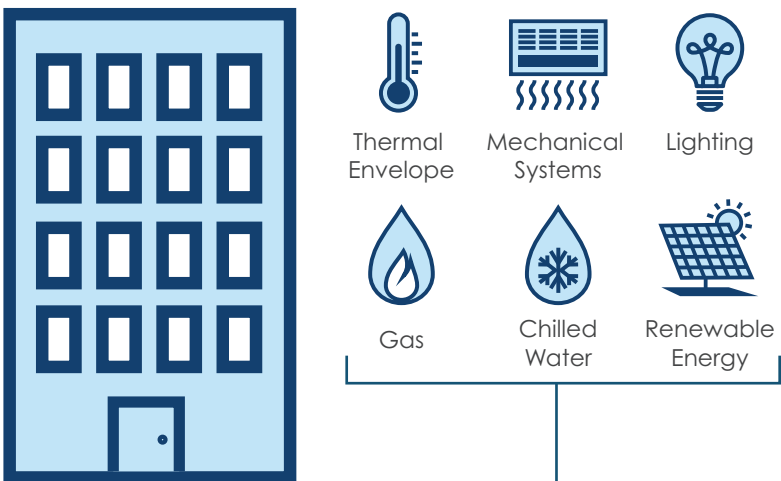
OWNERS' AND DEVELOPERS' GUIDE TO ENERGY MODELING

WHAT IS ENERGY MODELING?

Energy modeling is the process of estimating a building's expected energy consumption by taking the building envelope, lighting, mechanical and other powered systems connected to it and simulating its operation in specialized computer software.

This process can be as simple as a single system calculation or as in-depth as a simulation of a fully operational building.

Energy modeling recreates as much of a building's systems as desired, such as its **thermal envelope, HVAC systems, lighting, hot water systems**, and virtually analyzes its energy use.



HISTORY OF ENERGY MODELING

Historically, energy modeling was conducted after planning.

Models would begin in the design documents phase after floor plans and equipment systems had already been selected, which left little time for modifications in building layout and system analysis.

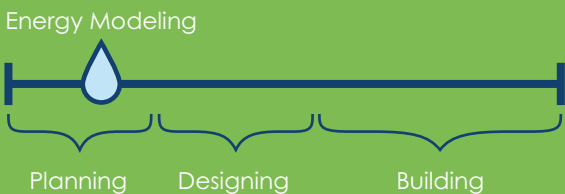
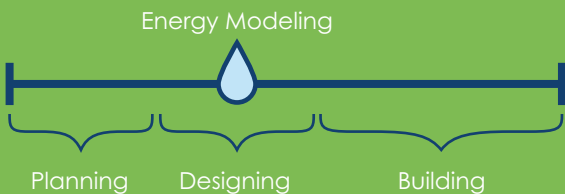
As a result, energy modeling efforts didn't have much impact in the design process.

Now, energy modeling typically begins during Schematic Design,

providing architects with a more holistic picture of a building's systems and operating conditions.

Modeling earlier in the design process allows for faster optimization and greater insight in building performance.

The results from the simulations, calculations, and analyses can inform design choices and help ensure code compliance and sustainability goals are met.



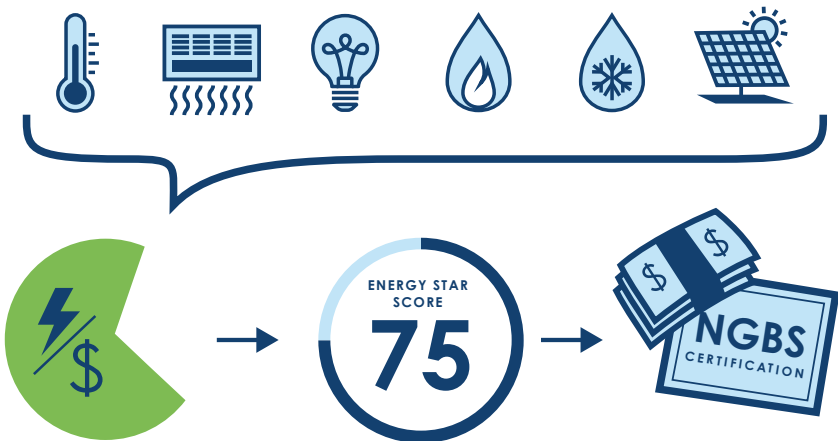
BENEFITS OF ENERGY MODELING

The models are created by sustainability consultants to calculate a project's estimated energy consumption compared to baseline buildings provided by ASHRAE 90.1 and the IECC using both industry and owner defined schedules of operations. These are used to show energy code compliance and improvements above green building rating system requirements. The ENERGY STAR score is also a baseline, but it is developed using actual consumption data of buildings in operation.

During the construction permitting process, energy code compliance is required to be shown. Energy modeling using either the IECC or ASHRAE 90.1 is a method to demonstrate a building is in compliance. Prescriptive options are also available, however energy modeling can provide greater flexibility.

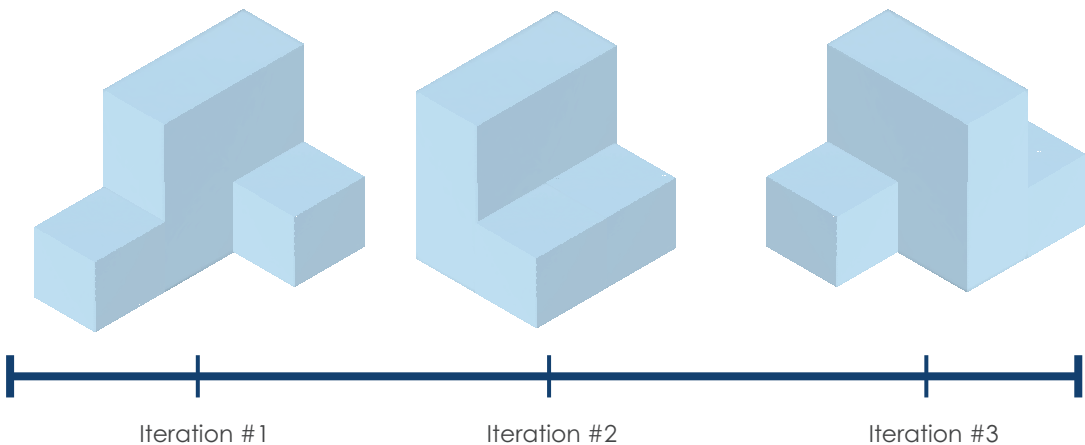
ENERGY STAR Statement of Energy Performance (SEP) indicate how a building performs in operation. ENERGY STAR Statment of Energy Design Intent (SEDI) provide insight into how a proposed design will compare against other buildings of the same use type. Scores indicate how the building's actual energy usage will likely perform in the ENERGY STAR Portfolio Manager.

The **ENERGY STAR Score is a significant factor when applying for green financing options or some green building certifications**; therefore, energy simulations should begin early in the design phase.



BEST PRACTICES OF ENERGY MODELING

The energy modeling process should be started early in the design phase and is an iterative process. Several run times are used to maximize energy savings and determine the most cost-effective approach to meet the building Owners' and Developers' energy-efficiency and budget goals.



As energy modeling becomes more prevalent throughout the building design process, and as energy codes and green building programs become more stringent to meet energy and emitted carbon goals, project teams are increasingly beginning the process earlier in the schematic design phase to ensure the best use of time and resources.

This allows for **multiple iterations** of different building orientations, window to wall ratios and mechanical systems to help optimize the building's design to meet energy code or green building program compliance and avoid costly errors during subsequent phases.

WHY JORDAN & SKALA SUSTAINABILITY SERVICES?

Due to the extensive data gathering, measurements, and calculations required for energy modeling, Owners and Developers should look for qualified sustainability consultants who have experience with different building systems and with their specific building type, as well as in-depth technical design knowledge, like the licensed experts at Jordan & Skala.

CONTACT US TO GET STARTED