

# Engineer's Playbook



Engineers and energy modelers are the technical experts that bring project performance goals to fruition. As one of these professionals, your analytical thinking and leadership on building system design, construction, and operation is vital for a project to achieve design targets. They understand the complicated interconnection between building systems, and as such, are critical to engage early in the design process.

## Take the Lead

- **Check your projects' past performance.** The City's large building (>50,000 sq. ft.) owners have been required to benchmark their building's energy performance since 2017. That information is public, which means there's an opportunity for you to look at the City's Covered Buildings List to check out how your past projects are performing and to see which of your clients are ahead of the curve and which might need your additional support on future projects.
- **Understand the latest regulations.** Ensure that you are up to speed on the latest rules and regulations about the City's Building Energy Performance Standards (BEPS) and updated building codes, and how they might affect your clients and therefore your work.
- **Identify which of your current projects will be required to comply with BEPS.** The City's BEPS start with municipal and non-municipal owned buildings that are larger than 50,000 sq. ft. However, in many cities, the size thresholds for buildings that are covered under BEPS ratchets down over time and may eventually include buildings larger than 10,000 sq. ft. Understand how your current projects may or may not meet the standard and talk to your clients about long-term compliance options. If working on a renovation, encourage your clients to talk to their tenants and property managers to determine opportunities for reducing energy consumption that are out of your design control (i.e. requiring LED light fixtures, adjusting HVAC setpoints, etc.).
- **Understand how performance is measured and tracked.** Familiarize yourself with ENERGY STAR Portfolio Manager, which is how building owners are required to track building performance for BEPS, in order to understand what will impact a building's weather normalized EUI and what will not, i.e. understanding that off-site purchases will not impact it, but installing on-site renewable energy can improve it. This knowledge can be used to guide clients through a highly technical decision-making process.
- **Improve your energy modeling skills.** Build your energy modeling and parametric modeling skills internally and ensure that the value of the tool is understood by both the architectural and ownership teams. Reference ASHRAE 209, which describes the process for energy modeling throughout a project, to get familiar with analytical software that can aid in early design decisions.
- **Learn how buildings can save energy.** Become familiar with energy efficiency opportunities in existing buildings by reviewing ANSI/ASHRAE/IES Standard 100, a resource that offers a number of measures to both help set and meet performance targets.

## Evaluate your renovation project's current performance

- **Ask your client to request an energy benchmarking scorecard by e-mailing the Building Division at [benchmarking@stlouis-mo.gov](mailto:benchmarking@stlouis-mo.gov). If your client has submitted benchmarking data to the City, the scorecard shows the building's historic performance relative to BEPS.** This information can help give you, and the building owner, a sense of how the building is performing.
- **Ensure your client has audited their property.** If the building owner has not already done so, advise them to get an on-site energy audit to better understand overall building characteristics, equipment, and performance. If they request additional information, the U.S. Department of Energy developed A Guide to Energy Audits, which can be used as a point of reference. As described in the guide, there are three levels of audits, each building on the previous level. Discuss with your energy auditor which level of audit would be most fitting for your project goals and budget. Visit Ameren's Trade Alley Network to find a qualified auditor.
- **Conduct an on-site assessment.** To compliment an energy audit report, engineers should conduct an additional site assessment to:
  - Review available engineering and architectural drawings of the building to evaluate building systems and determine opportunities for improvement.
  - Walk the building or space with the maintenance and/or engineering teams to uncover additional information about the building's systems, controls, and operation.
  - Assess the building façade's performance and work with architects to understand implications of potential upgrades and/or changes.



## Integrate the energy modeler into the project team

- Communicate the need for early and iterative energy modeling with your clients. Explain the need for early and iterative energy modeling to help the client meet their building performance goals. Ensure they understand potential risks associated with not executing that work.
- Coordinate with the whole design team. Ensure that the energy modeling team is coordinating early and often with the project's engineers and architects. The AIA has provided specific guidance for architects for how to integrate energy modeling into the design process. Ensure that all related consultants understand the information uncovered through the energy modeling effort.
- Create an easy-to-read energy report. Engineers and energy modelers should work together to create an easily understandable report for the building owner and other project team members that clearly identifies and summarizes recommendations and opportunities. This should include feasibility and costs of each option. Broad categories for consideration include:
  - Base building mechanical systems
  - Common area lighting
  - Sensors and controls
  - Tenant lighting, plug loads, and mechanical systems
  - Retail and ground-floor tenant systems
  - Operator and occupant training
- Engage directly with the decision-makers. Discuss the report with the building owner to identify an action plan to incorporate the findings into the project. Schedule a time to meet with the on-site building engineer, property manager, and tenants to explain upcoming upgrades and operational changes that will be made.

This resource is based upon content originally developed by the Institute for Market Transformation in collaboration with Arup for the Building Innovation Hub, with funding and support provided by the District of Columbia's Department of Energy & Environment.

