Outcome-Based Master Planning

THE ECOSYSTEM APPROACH

Higher education institutions across the country are facing the climate crisis and adapting their campuses for a more sustainable future. While the need for transformation is clear, the infrastructure improvements that will lead to efficient low- or no-carbon operation are complex and costly.

An actionable Energy Master Plan is a crucial tool in this transformation. It can help your campus to build community consensus around the project -- agreed goals and evaluation criteria lead to a clear roadmap to success. It can also provide the foundation for solutions implementation, allowing for phased and cost-effective projects. But many Energy Master Plans don't provide those outcomes – instead, they document current conditions without tracing a clear path to a low-carbon future, and they end up sitting on shelves gathering dust.

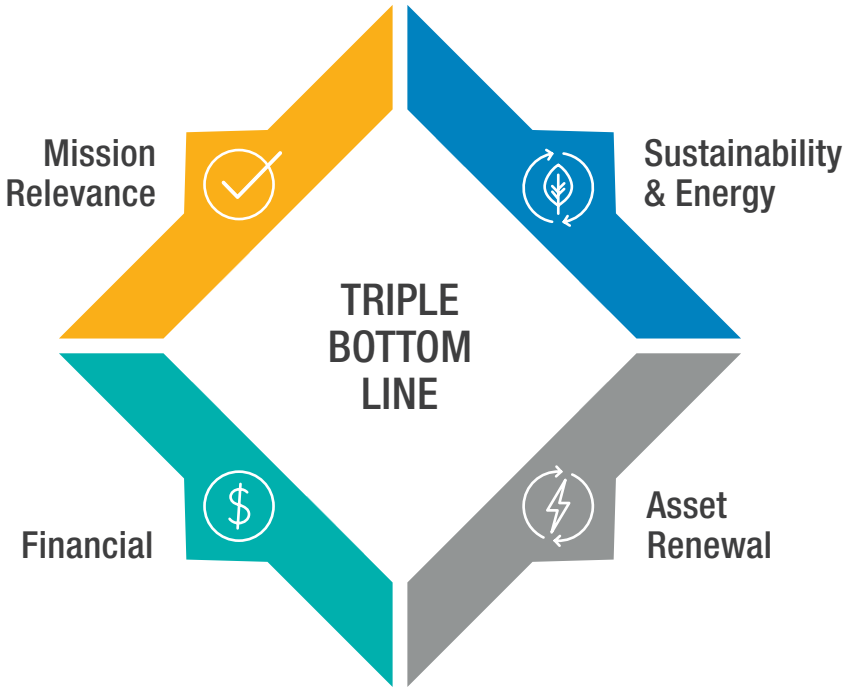
Ecosystem's tested approach to Energy and Net-Zero Master Planning is holistic, fast-track, and project-oriented. This Master Plan will clearly communicate key messaging to your stakeholders using a powerful combination of data analytics and high-quality graphics. Founded on a high level of engagement and consultation in the early stages it's a roadmap to successful project implementation, not a snapshot of the past that's out of date the moment it's printed.

The process begins with goal-setting, unifying campus stakeholders around a clear vision of the campus's future. And the outcome is a clear path forward.

1 Understand the Issues

Goal Framing

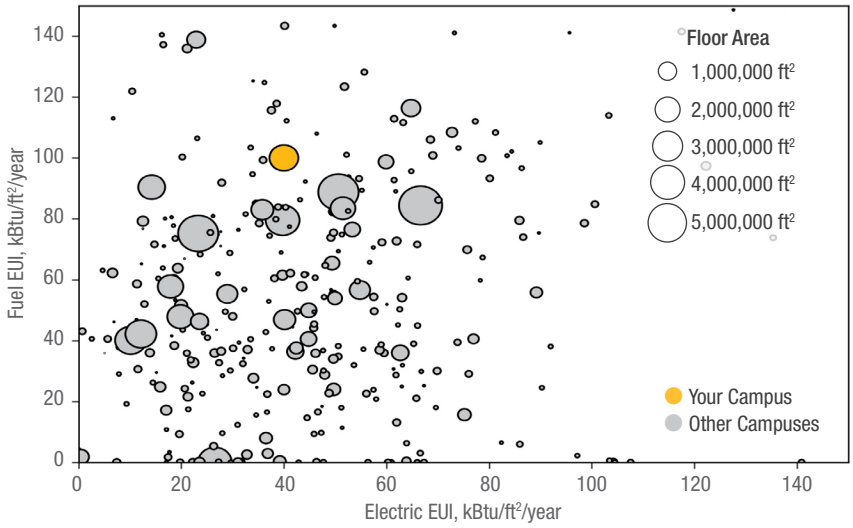
Without consensus around the need for an energy transformation, it is almost impossible for a campus to make progress. To create the right change culture, Ecosystem will lead charette sessions with you to identify, prioritize and frame your most critical goals. A multi-stakeholder meeting will identify and agree on goals/needs/financial parameters/risks, which can be weighted based on approved parameters.



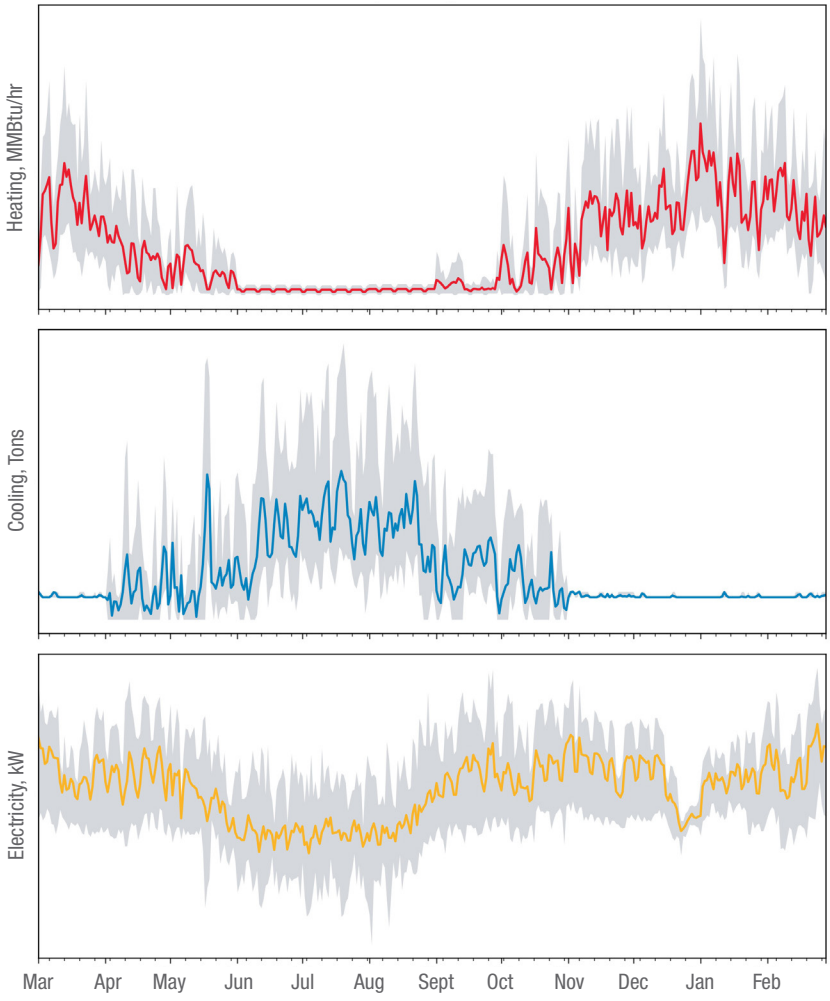
Data Gathering and Analytics

Ecosystem engineers will survey your campus to understand its key electromechanical systems and their interconnectivity (your "energy ecosystem"), analyze existing reports (such as campus development and utility master plans), and gather energy-related data. We will develop hourly heating, cooling and power profiles that will be used to model scenarios based on campus-specific conditions.

Benchmarking using Berkeley Lab Building Performance Database



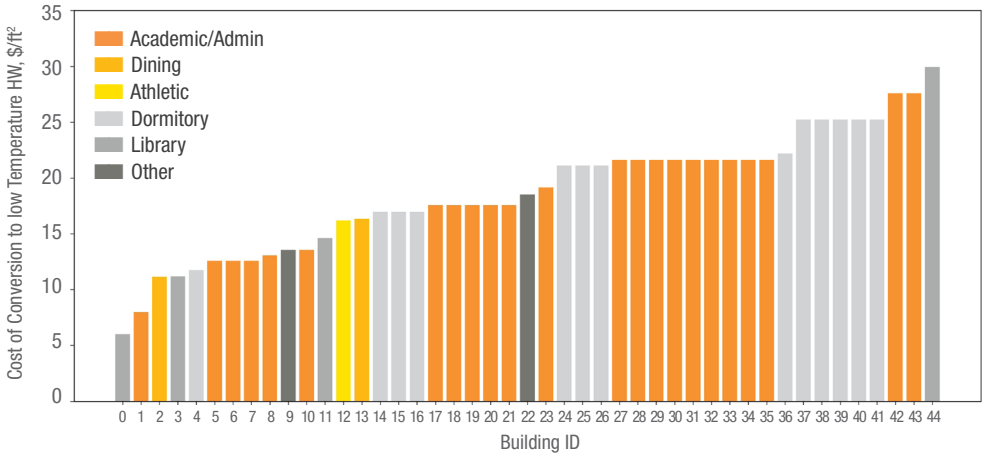
Average Daily Loads



Decode your Building Portfolio

In-building mechanical systems are one of the highest-impact but most undervalued factors influencing a switch to low-carbon energy. Ecosystem will survey a representative sample of buildings and will identify key indicators (tested over multiple projects). Using our data-driven approach, the results will be extrapolated to the rest of the campus to project the compatibility of your building portfolio with low-carbon energy.

Decode Your Buildings Fleet Net Zero Potential



2 Buildings First

ENERGY CONSERVATION MEASURES

Our first objective will be to tackle the potential for conservation of energy inside the buildings. This step will result in lower energy use, as well as right-sized energy generation and distribution systems. We will combine the data we've collected with our 25+ years of engineering and construction experience and advanced benchmarking techniques to develop a campus-wide list of potential ECMs.

3 Diverge

EXPLORE AND SCREEN ALTERNATIVES

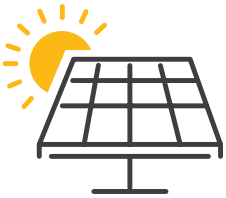
Together with your internal Energy Master Plan leadership team, we will identify and explore all viable energy sources and technologies. We will evaluate and screen them based on your goals (defined in step 1) and our hands-on market knowledge, including our insight into the implementation and relevance of emerging technologies.

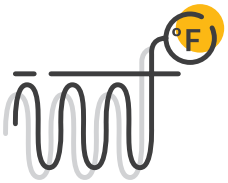
Energy sources may include:


Renewable Electricity


Biofuels


Heat Recovery


Solar Thermal



Ground-Source Heat


Air-Source Heat

Energy transformation and storage technologies may include:

- Boilers
- Heat pumps
- Thermal storage
- Batteries

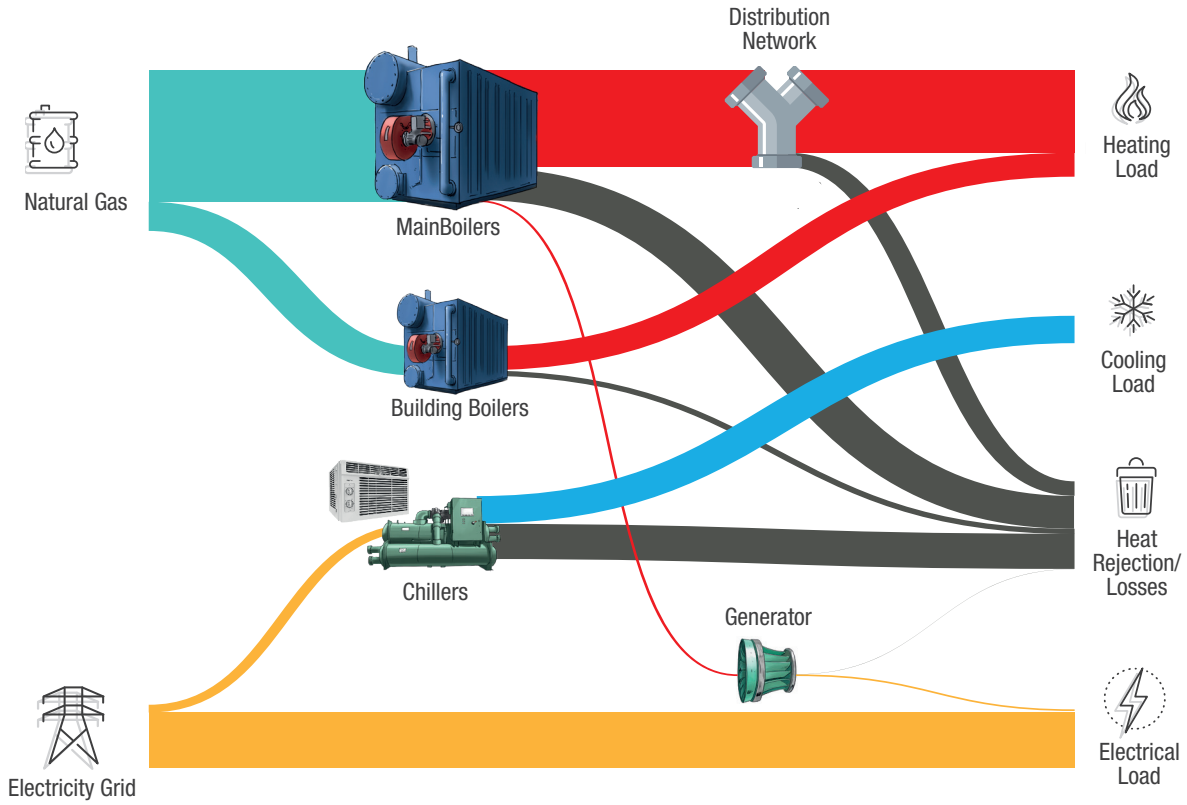
District energy options may include:

- 1st to 5th generation of district heating
- Medium used: steam or water
- Centralized vs distributed energy resources

4 Model Multiple Scenarios

A DATA-DRIVEN OPTIMIZATION TOOL

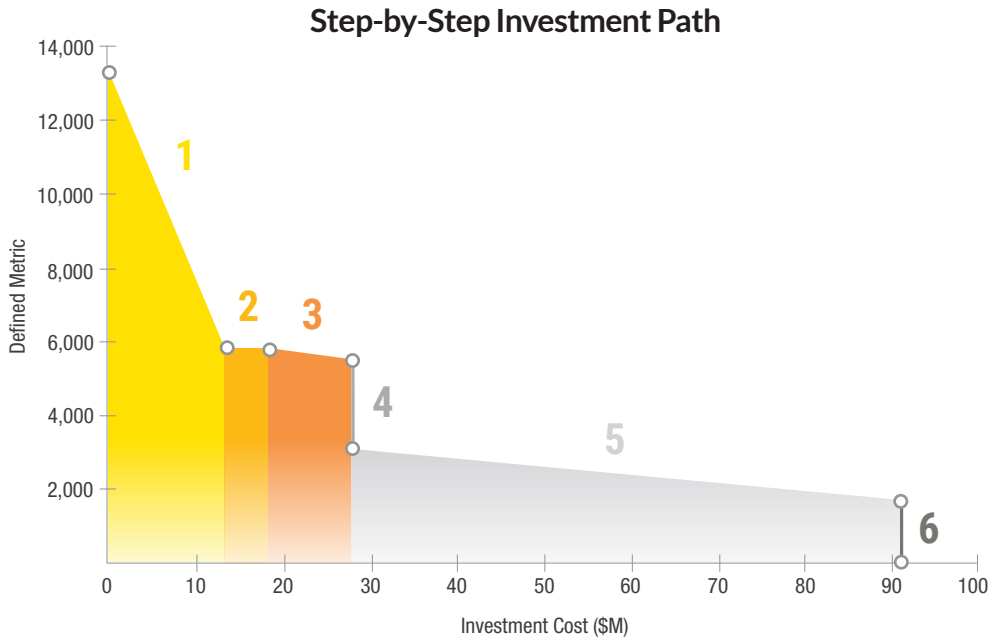
Using our proprietary energy simulation tool, Ecosystem will accurately model your campus based on the energy sources and technologies selected in step 3. We will generate powerful graphics to visualize and communicate the results. Energy performance and high-level capital costs will be developed for each scenario.



5 Converge

DEFINE A STRATEGIC INVESTMENT PLAN

As a final step, Ecosystem and your staff will evaluate each scenario against the the goals matrix developed in step 1. This process will help point to one or a combination of multiple scenarios. A life-cycle cost analysis will be developed for this final scenario, along with a coherent project path to achieve the identified campus needs and goals.



This Energy Master Plan will prepare your campus to move toward project implementation and toward your agreed goals.