

SYSTEMS EFFICIENCY INITIATIVE

The Alliance to Save Energy launched the Systems Efficiency Initiative (SEI)—a multiyear collaboration among more than 50 entities, including manufacturers, designers and builders, electric and natural gas utilities, federal and state government agencies, and efficiency advocates—to advance energy efficiency in building systems.

Systems efficiency focuses on the interactions of equipment and controls within and among HVAC, lighting, and other building systems; interactions among multiple buildings; and the integration of buildings and the grid. Because adopting a systems perspective will become increasingly necessary to achieve future meaningful and cost-effective energy savings within the built environment, the SEI focused on developing strategies for moving the market in this direction.

THE OPPORTUNITY

The buildings sector accounts for roughly 36 percent of global primary energy useⁱ, including almost 40 percent in the United States.ⁱⁱ Significant energy efficiency gains in buildings already have been made through policies and programs that focus on individual building components (e.g., equipment energy efficiency standards) or whole buildings (e.g., building energy codes). However, building energy consumption continues to rise globally, due in large part to a combination of growing floor space and increasing electricity demand from new devices and equipment. The SEI provided a critical forum to look beyond traditional policy instruments and consider a new path to energy efficiency. The SEI members worked together to understand the energy savings potential of a systems approach and to recommend strategies for achieving this potential.

SEI ACCOMPLISHMENTS

The SEI produced two reports, available at www.ase.org/sei:

- *Greater than the Sum of its Parts: The Case for a Systems Approach to Energy Efficiency* (2016)
- *Going Beyond Zero: A Systems Efficiency Blueprint for Building Energy Optimization and Resilience* (2017)

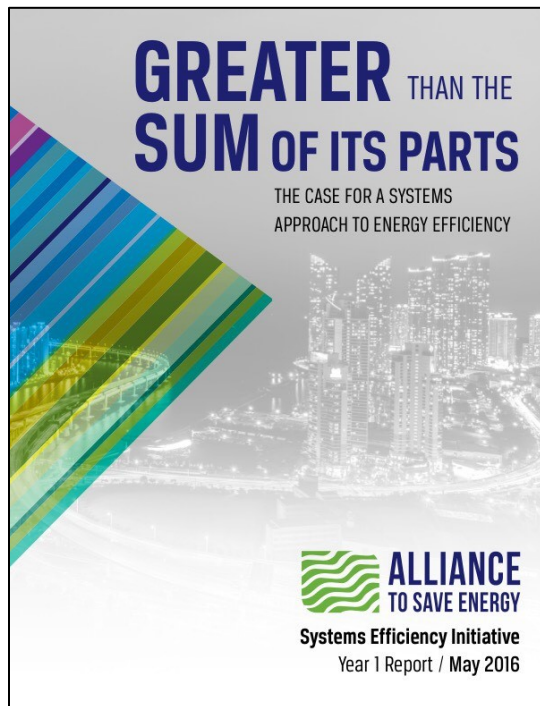
What is a building system? A combination of equipment, operations, controls, accessories and means of interconnection that use energy to perform a specific function.

Building system efficiency is the ratio of the services or functions provided by a building system to the amount of energy the system consumes directly (taking into account the thermal load imposed on other building systems).

A systems-efficient building is thus a building in which multiple building systems (e.g., lighting, HVAC) are designed, installed and operated to optimize performance collectively to provide a high level of service or functionality for a given level of energy use or input.

The first report, ***Greater than the Sum of its Parts***, compiles lessons learned about systems efficiency by the building industry in the U.S. and other countries, characterizes the potential benefits of a building systems approach, and prioritizes areas for further technical and policy research. With a focus on new and renovated commercial buildings, the report explores opportunities for improving efficiency in building mechanical systems, lighting systems, and miscellaneous electric loads (MELs); and through the use of direct

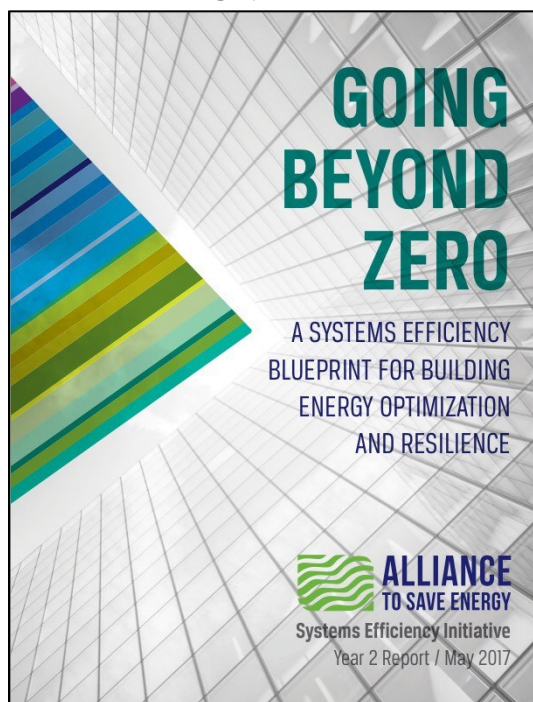
current (DC) power and building-to-grid (B2G) integration. For each of these topics, the report outlines the benefits, challenges, opportunities and recommendations for next steps to achieve greater efficiency through a building systems approach.



Overarching strategies discussed in SEI reports for promoting a systems approach include:

- **Breaking down silos.** A systems-oriented approach will require creativity and a new level of collaboration across a range of stakeholders—including architects, engineers, designers, developers and building operators—as well as between the building industry and policymakers.
- **Integrating systems.** Integration both within and among systems operating in a building is vital to maximizing efficiency gains and opportunities.
- **Optimizing operations through technology.** Controls and smart technologies are important for improving the efficiency of many types of systems.
- **Incorporating systems strategies through all phases of the building life cycle.** Strategies to incorporate a systems approach should be applied during building design and construction, as well as during the operations and maintenance phases.
- **Thinking outside the building.** Further opportunities for systems approaches exist beyond a building itself, across multiple buildings and between a building and the electric grid.

The second report, *Going Beyond Zero*, contains 84 recommendations for specific actions to be taken by a range of stakeholders, including national and state legislators, government agencies, utilities, industry associations, design professionals, the construction industry and building owners.



ONGOING SYSTEMS EFFICIENCY ACTIVITIES

The SEI has now transitioned into a standing Systems Efficiency Subcommittee of the Alliance to Save Energy, and continues to lead efforts to:

- Support systems efficiency through legislation;
- Promote systems efficiency through outreach and education activities; and
- Facilitate the implementation of the Blueprint recommendations.

To find out more about the Alliance to Save Energy's systems efficiency activities, contact Laura Van Wie McGrory at LVanWie@ase.org.

ⁱ International Energy Agency. <https://www.iea.org/buildings/>

ⁱⁱ Energy Information Administration. <https://www.eia.gov/tools/faqs>