



THE UNITED STATES' EXPERIENCE

TITLE:

FRAUNHOFER CENTER FOR SUSTAINABLE ENERGY SYSTEMS (CSE)

GENERAL INFORMATION

Country: United States

Coordinating Institution: US Department of Commerce's Economic Development Administration

Other institutions involved: Massachusetts Development Authority, Massachusetts Clean Energy Center

Webpage: cse.fraunhofer.org

1) Objectives

Fraunhofer occupies a unique niche in the economic development landscape, operating at the intersection of industry, government and academia. Through its work with growing small and mid-sized businesses in the sustainable and building energy efficiency space and its ability to “de-risk” their products and technologies, Fraunhofer has significant impact in helping companies grow, add high-value jobs, and create significant impact in their industries and communities. Through its contract R&D capabilities, Fraunhofer has a deep understanding of industry and consumer needs, while engaging longer-term stakeholders interested in developing new and innovative, commercializable technologies for the benefit of society.

In 2013, Fraunhofer completed construction and moved into its Living Laboratory, a home to Fraunhofer CSE's Massachusetts R&D activities for the advancement of sustainable energy systems. Born out of a deep energy-retrofit of a 100-year-old building, the main objective of the Living Laboratory is to play an important role in accelerating the adoption and acceptance of cutting-edge building energy technologies in Massachusetts and the United States. The Lab leverages cutting-edge design concepts and historic architecture alongside in-house research facilities, including a pilot solar module fabrication line, dedicated thermal testing laboratory, and extensive characterization/environmental testing resources. CSE researchers evaluate the reliability and effectiveness of the technologies incorporated into the building, helping

technology developers prove out their products with building-integrated and other applied research.

2) Relevance

Buildings make up over 40% of energy usage nationwide. Therefore, energy efficiency initiatives are key to reducing our climate change impact. The Fraunhofer CSE Living Laboratory is the premier showcase of building energy efficiency technologies and provides a platform for the awareness, testing and deployment of new and existing clean energy technologies. The Living Laboratory showcases the wide array of possibilities for retrofitting historic buildings. Through this initiative, the Living Laboratory helped bring together people who are generally at opposite ends of the supply chain spectrum – from R&D and manufacturers to architects and installers / developers.

Through its efforts, Fraunhofer CSE has brought together product manufacturing companies throughout the U.S. to deploy and evaluate technologies and provide valuable feedback about product development.

3) Concrete activities and actions

To promote the growth of clean energy technologies, Fraunhofer CSE initiated the Building Technologies Showcase (BTS) partnership, a collaboration of partners from leading building industry manufacturers and businesses that provided funding and donated energy-efficient systems, materials and services to the project. These partners turn to Fraunhofer CSE for product testing. In turn, Fraunhofer gains access to the latest innovation in the sustainable energy systems space, and can test the products in a real-world setting.

After completion, the Living Laboratory became an integral part of Fraunhofer CSE's applied research and development. In-house research facilities, including a pilot solar module fabrication line, dedicated thermal testing laboratory, and extensive characterization/environmental testing resources, elevate Fraunhofer CSE's capabilities.

4) Achievements and results

During the beginning stages of the initiative, Fraunhofer CSE leveraged the initial EDA investment to fundraise \$29M USD for the project. They also brought together a diverse set of 37 partners from the construction, architecture, engineering, and trade industries to form the Building Technologies Showcase.

Since construction was completed, Fraunhofer CSE welcomed over 50 trade organizations for building tours and meetings; hosted 250+ members of Boston's clean energy community for the building's grand opening, which featured Massachusetts Governor Deval Patrick, Massachusetts

Secretary of EEA Maeve Vallely Bartlett, Deputy German Ambassador to the U.S. Dr. Philipp Ackermann, Fraunhofer USA President Prof. Dr. Georg Rosenfeld, and DOE Director of the Solar Energy Technologies Office Mihn Le.

Currently, the Fraunhofer CSE building is in the process of becoming Gold LEAD certified. The design team projects that the numerous energy efficiency features implemented in the building will reduce whole-building energy consumption by approximately 49 percent relative to its baseline.

5) Sustainability

To further promote the growth of clean energy technologies, Fraunhofer CSE is collaborating with partners across all sectors; hosting monthly public tours of their Building Technology Showcase exhibit space; and welcomes visitors from professional trade associations, international delegations, higher education and non-profit organizations on a weekly basis.

The first floor of the Living Laboratory, the BTS exhibit, offers an interactive educational showcase that is designed to showcase new technologies to facilitate the widespread adoption of commercial and residential energy-saving technologies. This space is open to the public and included in the guided building tour.

Visitors who take part in a guided building tour gain a closer look at the leading innovations in building energy technologies, photovoltaic technologies and distributed electrical energy systems. Tours are comprised of attendees from government, industry, and academia.

The Fraunhofer CSE Living Laboratory is an integral part of the center's research and development. With these facilities, Fraunhofer CSE will engage the sustainable energy community; create value for clients; and work with industry partners to design better products for many years to come.

6) Lessons learned

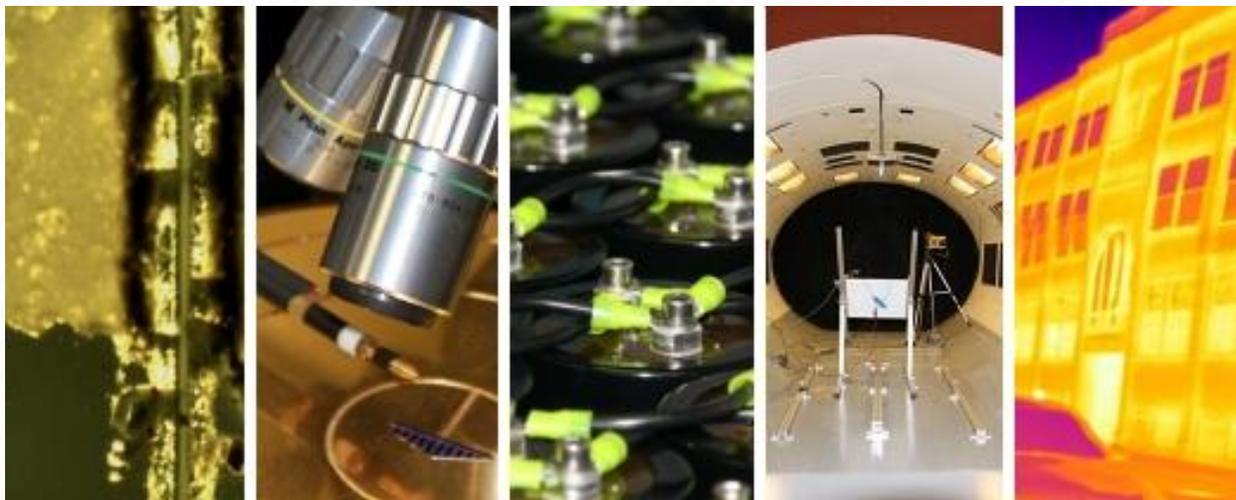
If we were to undertake a similar type of initiative, we would allocate more time for upfront for communication with our stakeholders. Once the financial aspects were approved, it was difficult to change the scope of the project. Also, we would allocate community outreach time more clearly into the construction timetable.

7) Capacity for the exchange of this experience

Cooperation modality	Cooperation modalities the institution can provide to others	The institution may be able to provide this cooperation to others by
Information Sharing	x	Now
Conference Calls	x	Now
Videoconferences	x	Now
Workshops	x	Now
Technical and Experts Visits	x	Now

8) Author of this story

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