



## 2020 Solar Decathlon Education Partner

### Cooperative Research and Development Final Report

**CRADA Number: CRD-19-00802**

NREL Technical Contact: Stacey Rothgeb

**NREL is a national laboratory of the U.S. Department of Energy  
Office of Energy Efficiency & Renewable Energy  
Operated by the Alliance for Sustainable Energy, LLC**

This report is available at no cost from the National Renewable Energy Laboratory (NREL) at [www.nrel.gov/publications](http://www.nrel.gov/publications).

Contract No. DE-AC36-08GO28308

**Technical Report**  
NREL/TP-5500-82349  
March 2022



# 2020 Solar Decathlon Education Partner

## Cooperative Research and Development Final Report

**CRADA Number: CRD-19-00802**

NREL Technical Contact: Stacey Rothgeb

### **Suggested Citation**

Rothgeb, Stacey. 2022. *2020 Solar Decathlon Education Partner: Cooperative Research and Development Final Report, CRADA Number CRD-19-00802*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5500-82349.  
<https://www.nrel.gov/docs/fy22osti/82349.pdf>.

**NREL is a national laboratory of the U.S. Department of Energy  
Office of Energy Efficiency & Renewable Energy  
Operated by the Alliance for Sustainable Energy, LLC**

This report is available at no cost from the National Renewable Energy Laboratory (NREL) at [www.nrel.gov/publications](http://www.nrel.gov/publications).

Contract No. DE-AC36-08GO28308

**Technical Report**  
NREL/TP-5500-82349  
March 2022

National Renewable Energy Laboratory  
15013 Denver West Parkway  
Golden, CO 80401  
303-275-3000 • [www.nrel.gov](http://www.nrel.gov)

## NOTICE

This work was authored by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Buildings Technologies Office. The views expressed herein do not necessarily represent the views of the DOE or the U.S. Government.

This work was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, its contractors or subcontractors.

This report is available at no cost from the National Renewable Energy Laboratory (NREL) at [www.nrel.gov/publications](http://www.nrel.gov/publications).

U.S. Department of Energy (DOE) reports produced after 1991 and a growing number of pre-1991 documents are available free via [www.OSTI.gov](http://www.OSTI.gov).

*Cover Photos by Dennis Schroeder: (clockwise, left to right) NREL 51934, NREL 45897, NREL 42160, NREL 45891, NREL 48097, NREL 46526.*

NREL prints on paper that contains recycled content.

## Cooperative Research and Development Final Report

**Report Date:** March 3, 2022

In accordance with requirements set forth in the terms of the CRADA agreement, this document is the final CRADA report, including a list of subject inventions, to be forwarded to the DOE Office of Scientific and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

**Parties to the Agreement:** Energy and Environmental Building Alliance (EEBA)

**CRADA Number:** CRD-19-00802

**CRADA Title:** 2020 Solar Decathlon Education Partner

**Responsible Technical Contact at Alliance/National Renewable Energy Laboratory (NREL):**

Stacey Rothgeb | [Stacey.Rothgeb@nrel.gov](mailto:Stacey.Rothgeb@nrel.gov)

**Name and Email Address of POC at Company:**

Aaron Smith | [aaron@eeba.org](mailto:aaron@eeba.org)

Nancy Bakeman | [nancy@eeba.org](mailto:nancy@eeba.org)

**DOE Program Office:** Office of Energy Efficiency and Renewable Energy (EERE), Building Technologies Office (BTO)

**Joint Work Statement Funding Table showing DOE commitment:**

<b>Costs</b>	<b>NREL Shared Resources a/k/a Government In-Kind</b>
Year 1	\$25,000.00
Year 2	\$50,000.00
TOTALS	\$75,000.00

## **Executive Summary (Abstract) of CRADA Work:**

The U.S. Department of Energy Solar Decathlon (DOE/SD) is a collegiate competition, comprising 10 contests, that challenges student teams to design and build highly efficient and innovative buildings powered by renewable energy. The winners will be those teams that best blend architectural and engineering excellence with innovation, market potential, building efficiency, and smart energy production. The DOE/SD is comprised of two Challenges—Design Challenge (annual, in April of each year at NREL in Golden, Colo.) and Build Challenge (biennial, held next in June/July 2020 in Washington D.C.). NREL provides competition management for DOE/SD.

For over 35 years, EEBA has provided the most trusted resources for building science information and education in the construction industry. EEBA delivers turn-key educational resources and events designed to transform residential construction practices through high performance design, marketing, materials, and technologies.

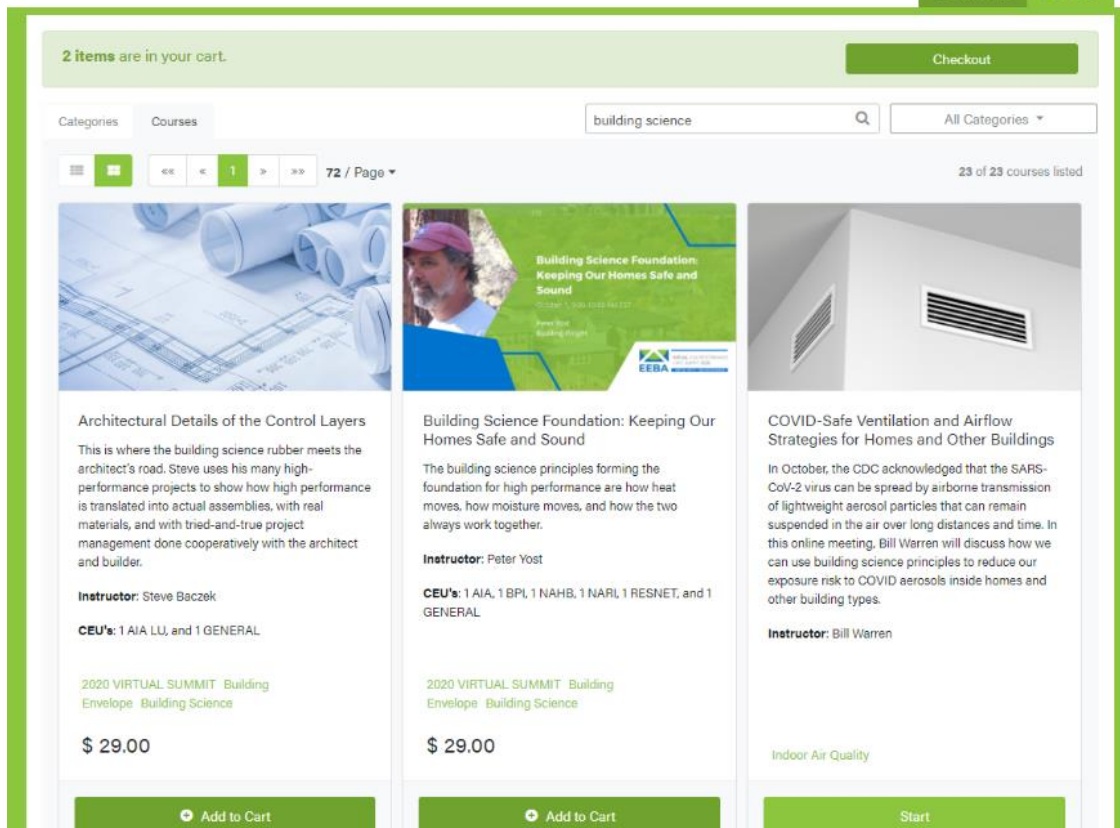
NREL and EEBA establish this CRADA to enable the success of the DOE/SD program in managing sponsorship funds and creating a professional education program. EEBA acted as an Education Partner to DOE/SD, which included: 1) accepting and dispersing sponsorship funds for DOE/SD; and 2) providing professional development content.

## **Summary of Research Results:**

### **Introduction:**

DOE/SD recruits sponsors to support student teams' activities, including the DOE/SD Competition Events, which are held each April at NREL in Golden, Colorado. Sponsors allow DOE/SD to host robust in-person and virtual events, and promotional activities that greatly benefit participating students, and bring substantial positive exposure to sponsors. NREL annually recruits sponsors while EEBA has served as a partner in accepting and dispersing sponsorship funds for DOE/SD and facilitating payment of competition expenses to support the student team experience.

EEBA has served as an Educational Partner, supporting DOE/SD by offering heavily discounted courses centered around building science topics to DOE/SD students. The thumbnail image below shows courses offered through EEBA's Learning Management System (LMS). EEBA also offers a discounted fee for attendance at their annual conference to all DOE/SD students (i.e., EEBA High-Performance Home Summit), and provides winning students with a travel scholarship and an opportunity for conference presentation with the NREL organizers.



**Figure 1: Example of courses offered through EEBA’s Learning Management System (LMS)**

## Task 1: Sponsorship Funds Management

### 1. Original Task Description:

In order to support the above, NREL will:

1. Recruit and contract cash sponsors for DOE/SD and direct sponsors to route sponsorship funds to EEBA (as appropriate)
2. Develop and approve income/expense budgets for the expenditure of sponsorship funds by EEBA
3. Track and fulfill sponsor program requirements.

In order to support the above, EEBA will:

1. Create a unique bank account to accept and disperse sponsorship funds for DOE/SD;
2. Charge a 5% processing fee on sponsorship funds collected
3. Issue sponsor invoices within 48 hours of notification from NREL that a sponsor has been secured
4. Adhere to the budget detailed by NREL for payment of sponsorship funds and gain written approval prior to payment of any expense
5. Pay approved expenses with 30 days receipt of approval
6. Provide monthly accounting of income and expense.

## 2. Explanation of Work Completed:

Beginning in April 2019, EEBA held an account for DOE/SD sponsorship funds, charging an annual 5% processing fee on funds collected. NREL has annually recruited new and returning sponsors, requesting an invoice from EEBA to charge sponsors for their donation amount. EEBA has helped NREL collect funds from 28 sponsors since April 2019, totaling \$183,000. NREL has developed and tracked income and expense budgets, maintaining a record of expenses paid for with sponsorship funds; EEBA has facilitated payment of these expenses in a timely manner. Expenses include, but are not limited to, Marriott event costs, food and beverage costs, and staff clothing for the DOE/SD competition events each April.

## **Task 2: Professional Development**

### 1. Original Task Description:

EEBA shall develop workforce professional development program that leverages EEBA training materials and resources to enhance DOE/SD experience for professionals in the homebuilding industry. All training content and materials shall remain the property of EEBA.

### 2. Explanation of Work Completed:

The Professional Development task originally outlined in the CRADA was modified in response to the COVID-19 pandemic. The abstract originally stated that EEBA would provide professional development workshop(s) during DOE/SD Build Challenge event(s) in June/July 2020. The DOE/SD Build Challenge did not conclude until April 2021, with no centralized public event at the Smithsonian Folklife Festival as originally planned.

As a result, EEBA's Professional Development task under the CRADA evolved into a focus on providing supplemental learning experiences for DOE/SD students, including building science education and participation in their annual conference. EEBA has provided DOE/SD students with affordable access to their courses on their LMS, where they are able to earn Continuing Education Credits (CEUs) and expand their knowledge of industry-relevant building science principles. The NREL organizers have presented at five annual EEBA conferences with DOE/SD students since 2017, sharing the students' projects with professional conference attendees. The screenshot below shows the presentation with DOE/SD students at the 2020 EEBA Summit. EEBA has offered discounted attendance at their annual conference to DOE/SD students, with several students taking advantage of this opportunity since 2019.



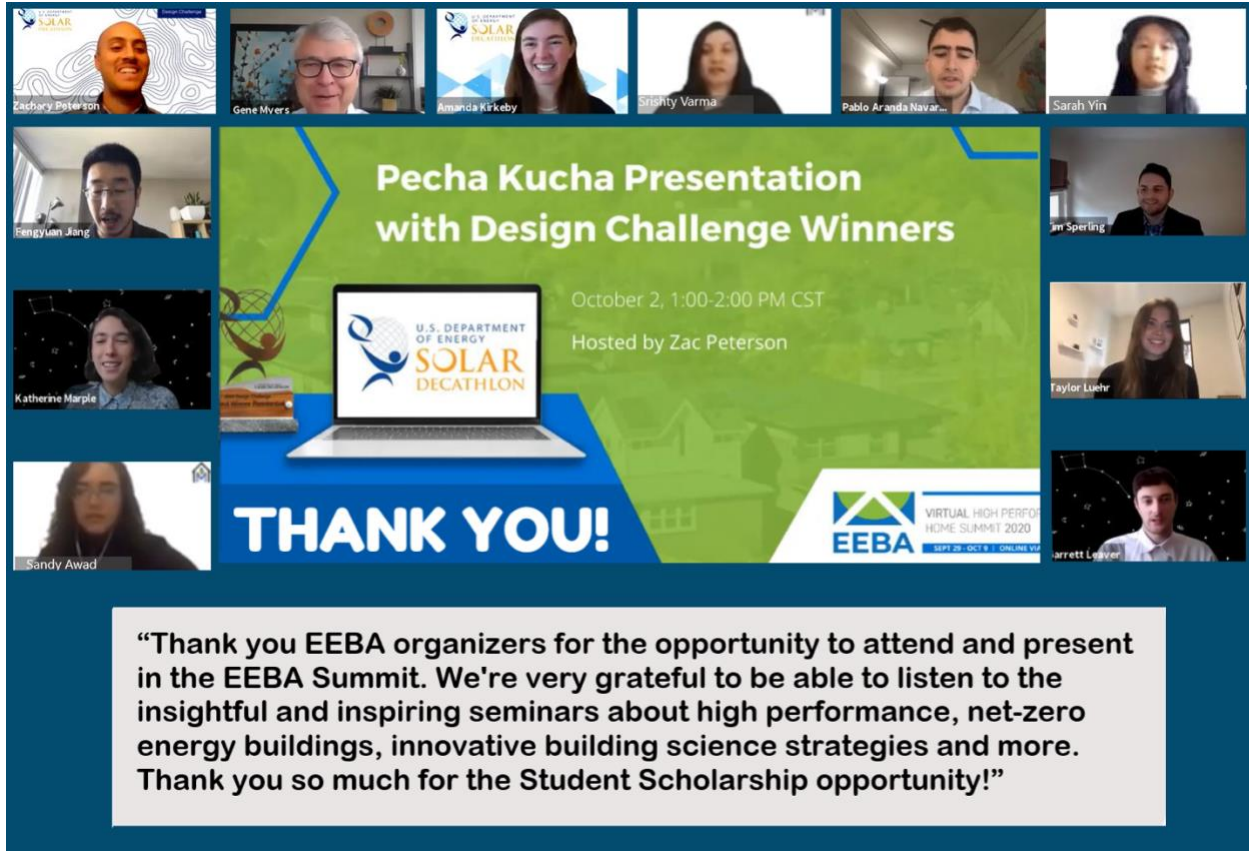


Figure 2: Screenshot from the presentation with DOE/SD students at the 2020 EEBA Summit

**Subject Inventions Listing:**

None

**ROI #:**

None