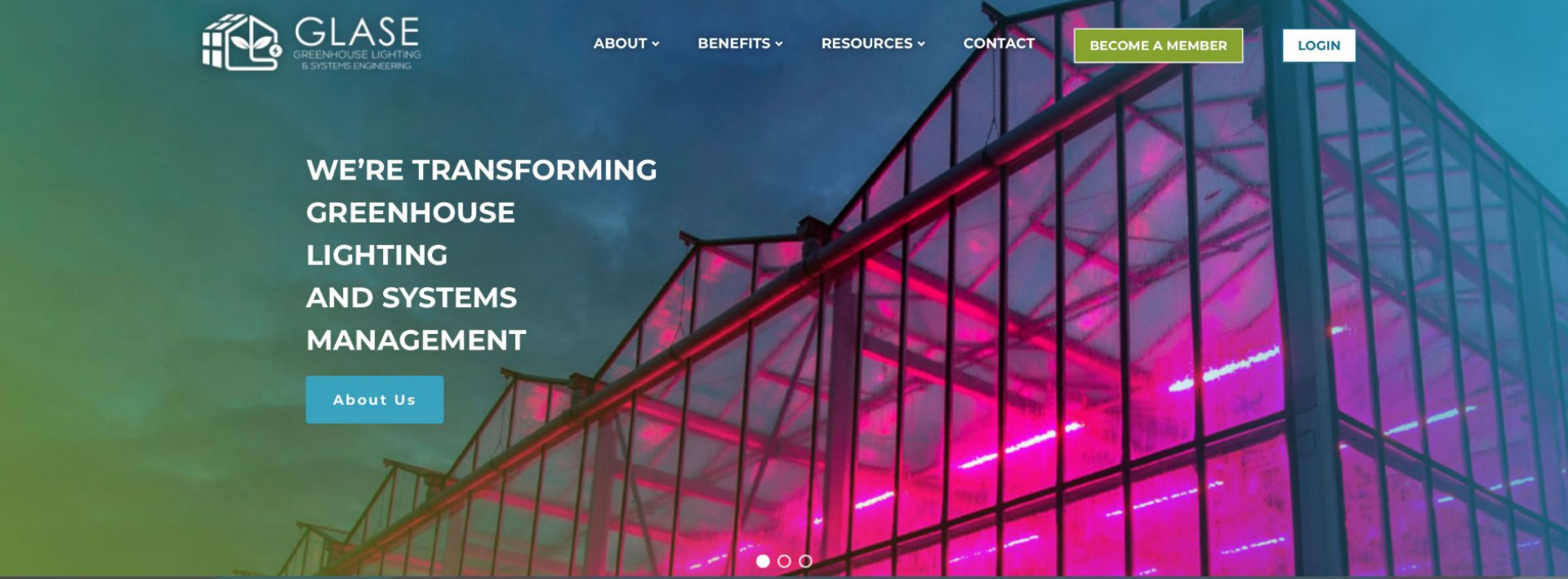
GLASE
GREENHOUSE LIGHTING
& SYSTEMS ENGINEERING

Industry Advisory Board

GLASE Summit November 2022



NEXT GENERATION GREENHOUSE TECHNOLOGY

We work at the leading edge of LED systems engineering, plant photobiology, plant physiology, and greenhouse environmental controls.

About Us

GLASE

GREENHOUSE LIGHTING
& SYSTEMS ENGINEERING

Cornell University

RUTGERS

Rensselaer

NEW YORK
STATE OF
OPPORTUNITY.

NYSERDA
Supported

GLASE Industry and CEA Members

International Members:

Badia Farms (Dubai)

Nexsel (India)

Sherpa Space (South Korea)

Dynamic LED systems

50% completed

Energy Efficacy

61% completed

Controls Integration

42% completed

Pilot Demonstrations

37% completed

Plant Sensing

51% completed

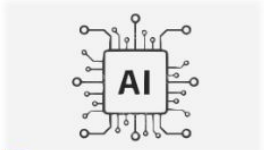
CO_2 Enrichment

100% completed

Engineering and Modeling

65% completed

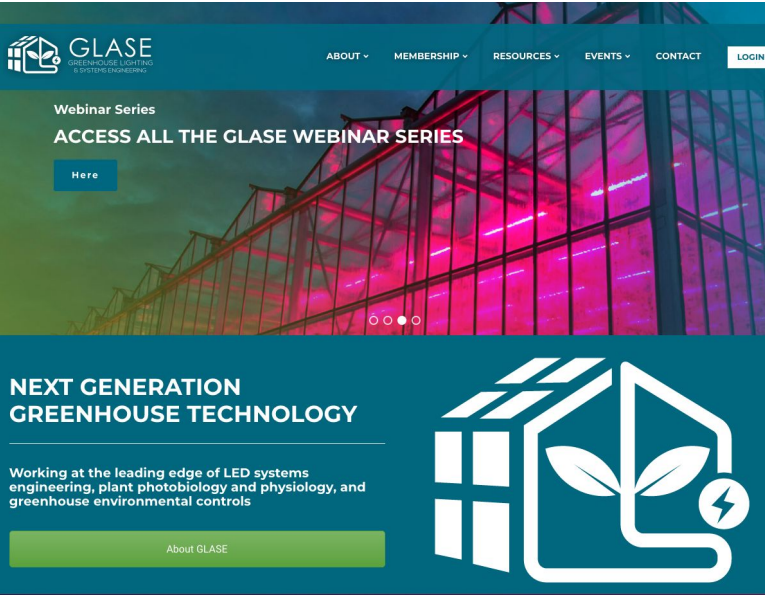
Artificial Intelligence



10% completed

Hemp Research

33% completed


GLASE
GREENHOUSE LIGHTING & SYSTEMS ENGINEERING
ABOUT
MEMBERSHIP
RESOURCES
EVENTS
CONTACT
LOGIN
Webinar Series
ACCESS ALL THE GLASE WEBINAR SERIES
Here
NEXT GENERATION GREENHOUSE TECHNOLOGY
Working at the leading edge of LED systems engineering, plant photobiology and physiology, and greenhouse environmental controls
About GLASE


GLASE
GREENHOUSE LIGHTING
& SYSTEMS ENGINEERING
Industry Advisory Board
Register Now for the February GLASE IAB Meeting
Wednesday February 23
3:00 - 4:30 pm EDT
Hello valued members of GLASE! Industry Advisory Board (IAB) meetings are one of the best perks to being a part of our consortium. We would love for all of our members to attend.
Register now to:
Learn about GLASE research progress and business activities
Network with other CEA growers and manufacturers
Give your input on how GLASE can most benefit you in 2022
Register Here


GLASE
Summit
2022

Category	2018 - 2021
Webinars	26
Technical Bulletins	10
Industry Talks	15
IAB meetings	10
Academic Meeting Presentations	14
Trade Publications	14
Peer review articles	2
GLASE tools	2
Filled IPs	5
Pilots Implementation	2

Knowledge Transfer

GLASE Tools and resources

- Thermal analyses protocol
- Lighting standards and regulations
- Available rebates and financial resources
- Lighting comparisons
- LASSI
- Energy modeling
- Data sharing
- Greenhouse Benchmark tool

Tech Implementation

5 filled Intellectual Properties

- New LED modules for indoor cultivation
- Remote fluorescence detection system
- CO2 LASSI (2 applications)
- Real time LASSI

Implementation

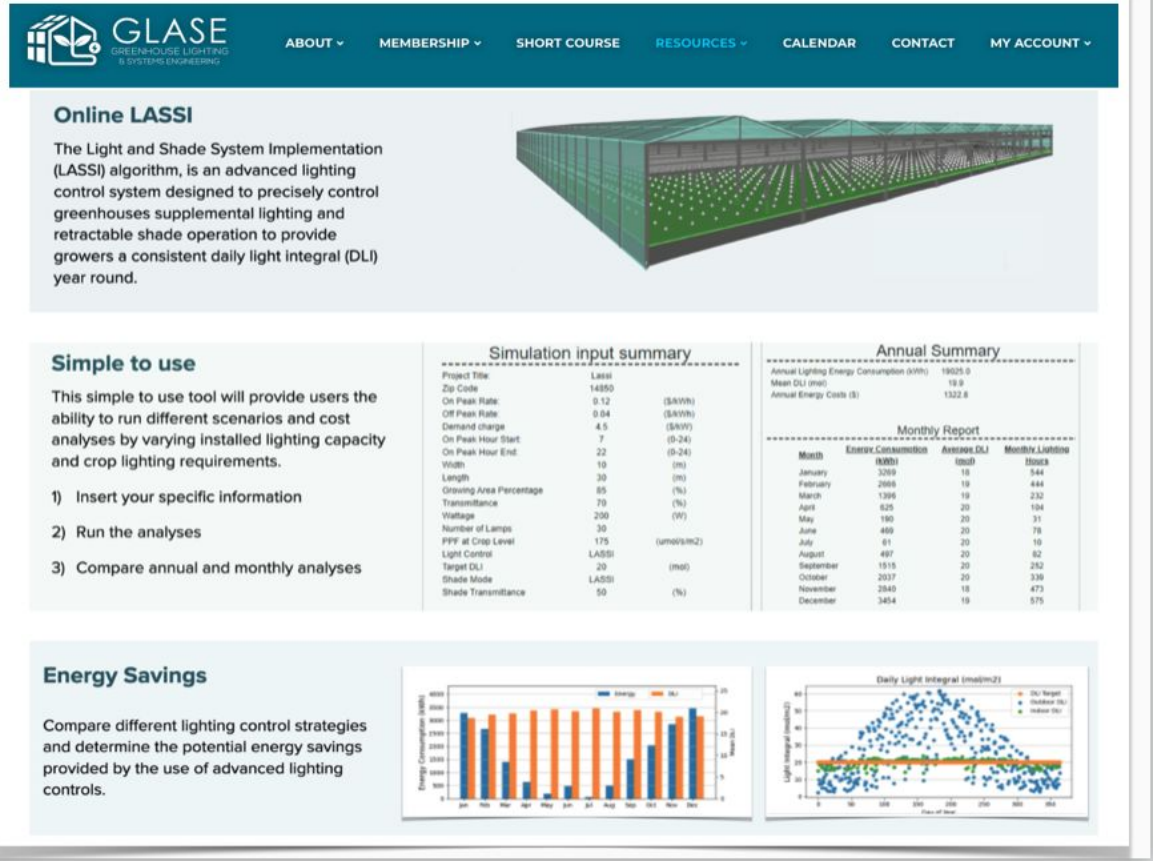
- GLASE: 2 commercial pilot facilities in NYS
- USDA SCBG: 8 commercial implementations in NYS

Resources

Online Tools: LASSI

- Available to GLASE Members
- Assessment of current energy consumption
- Assessment of potential energy savings
- Supports decision making process

Available at glase.org

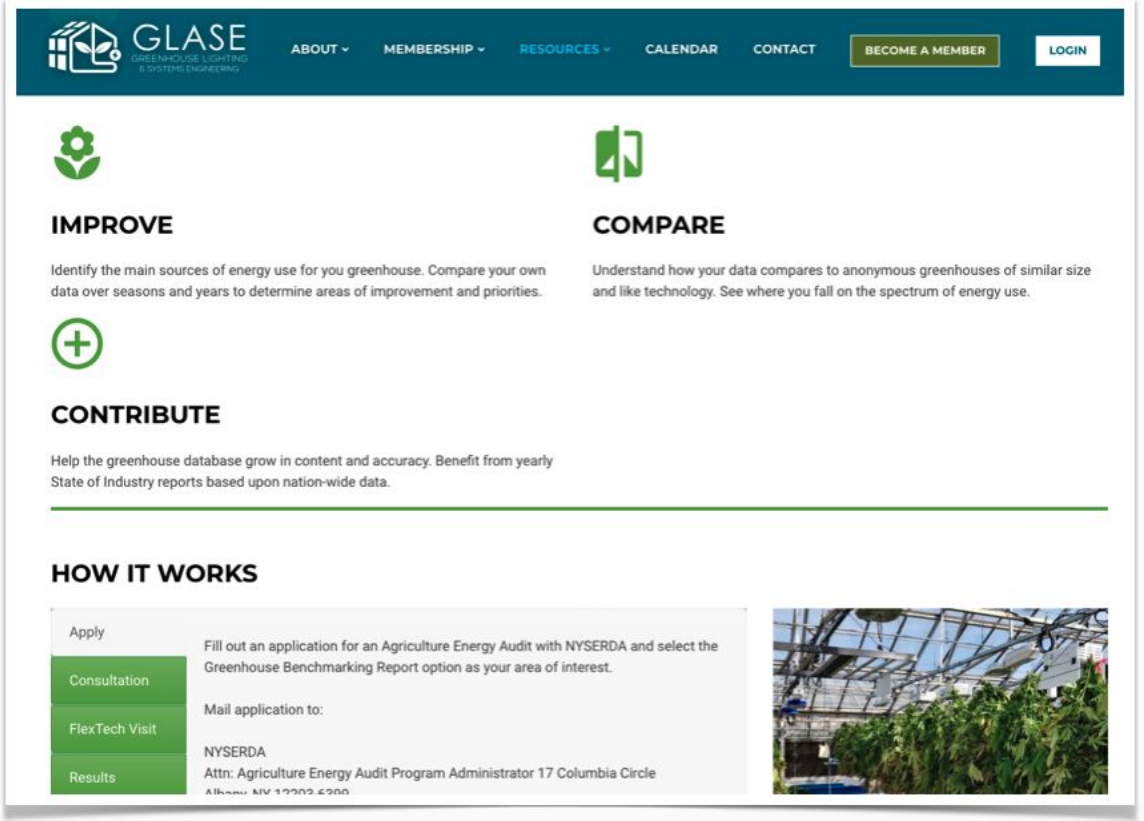


Resources

NYS GH Database & Benchmarking Tool

- Available to GLASE members
- Benchmark of CEA facilities
- Data mining benefits

Available at glase.org



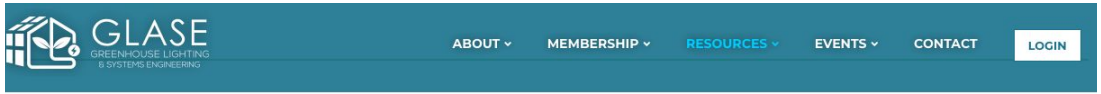
Partnerships

Leverage GLASE technologies to secure new projects and grants

Title/Sponsor	Amount	Period	Outreach	Outcomes
Database & Benchmarking Tool *NYSERDA*	$224,817	3 years	80 comercial GHs in NYS	Industry baseline Energy use efficiency improvements
Advanced lighting controls implementation *USDA SCBG*	$99,868	1.5 years	8 comercial GHs in NYS	Technology Implementation Energy use efficiency improvements Improve operations profitability

GLASE Outreach & Education

2022 GLASE Webinars



Plant Factory Innovations in Japan

October 13, 2022

CEA Round Table: Lighting Manufacturers

August 25, 2022

Greenhouse Growers' Round Table: The Path to CEA Sustainability

August 2, 2022

CEA Round Table: Indoor Growers

July 6, 2022

Collaboration with Academia and Industry: Case Study of the Dutch CEA Industry

May 13, 2022

CEA Round Table: Utility Companies

March 25, 2022

Date	Webinar	Live	Recording	Total
Feb 24	CEA Research and Extension at Texas A&M AgriLife at Dallas	65	93	158
March 24	CEA Round Table: Utility Companies	56	66	122
Apr 20	Lighting in Indoor Cannabis Cultivation	127	-	127
May 26	Collaboration with Academia and Private Growers	63	187	250
June 23	CEA Round Table: Indoor Growers	89	187	276
Jul 21	CEA Round Table: Greenhouse Growers	64	125	189
Aug 25	CEA Round Table: Lighting Manufacturers	85	175	260
Oct 27	Plant Factory Innovations in Japan	78	210	288

2023 VIRTUAL

CLIMATE CONTROL

SHORT COURSE

GLASE
GREENHOUSE LIGHTING & SYSTEMS ENGINEERING

Jan. 19 - Feb. 23
Thursdays 2 - 4 pm EST

6 Weeks
6 Modules

- Light
- Temperature
- CO_2
- Humidity
- Irrigation
- Autonomous

Live and On-Demand

Register Now

2023 VIRTUAL CLIMATE CONTROL SHORT COURSE

The Event

- 6-week interactive virtual course via Zoom Events
- January 19 - February 23
- Live modules Thursdays 2:00 - 4:00 pm EDT
- Recordings available On-Demand

Target Audience: 300-400 attendees

- Greenhouse growers and managers
- Indoor farm growers and managers
- Industry consultants
- Climate control manufacturers

Confirmed Speakers

- Kale Harbick (USDA-ARS)
- Timothy Shelford (Cornell University)
- Kellie Walters (University of Tennessee)
- Representative (Plenty)
- Ying Zhang (University of Florida)
- A.J. Both (Rutgers University)
- Josh Craver (Colorado State University)
- Jennifer Boldt (USDA-ARS)
- Stephanie Burnett (University of Maine)
- John Lea-Cox (University of Maryland)
- Fengqi You (Cornell University)
- Fokke Kracht (Koidra)
- Md Shamim Ahamed (UC Davis)

2023 VIRTUAL CLIMATE CONTROL SHORT COURSE

Content

1 Module 1
Lighting Controls
Jan 19 from 2-4 PM E.T.

Outcome: Understand how supplemental lighting systems enable consistent, quality crops year-round.

Confirmed speakers: Kale Harbick (USDA-ARS), Timothy Shelford (Cornell)

2 Module 2
Temperature Controls
Jan 26 from 2-4 PM E.T.

Outcome: Discover how efficient temperature sensors and controls can improve crop production and reduce operation costs.

Confirmed speakers: Kellie Walters (Tennessee)

3 Module 3
Humidity Controls
Feb 2 from 2-4 PM E.T.

Outcome: Learn the intricacies of measuring and controlling fluctuating humidity in your greenhouse to better control plant growth and health.

Confirmed speakers: Josh Craver (Colorado), Jennifer Boldt (USDA-ARS)

4 Module 4
CO2 Controls
Feb 9 from 2-4 PM E.T.

Outcome: Learn about available technology to measure and control CO2 concentrations in your greenhouse to improve fruit yield, flowering, and plant strength.

Confirmed speakers: Ying Zhang (Florida), A.J. Both (Rutgers)

5 Module 5
Irrigation Controls
Feb 16 from 2-4 PM E.T.

Outcome: Explore different systems of greenhouse irrigation and learn how to control exactly how much water plants receive.

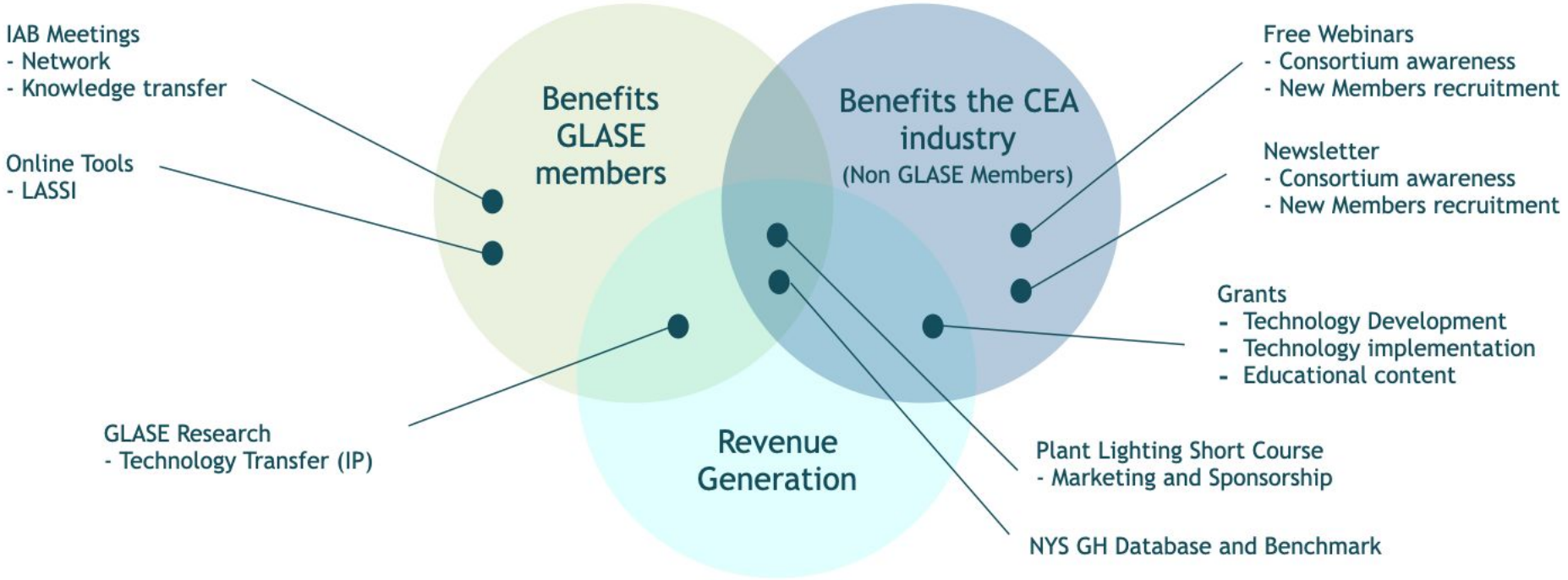
Confirmed speakers: Stephanie Burdett (Maine), John Lea-Cox (Maryland)

6 Module 6
Autonomous Controls
Feb 23 from 2-4 PM E.T.

Outcome: Understand how autonomous technologies can control all aspects of a greenhouse's climate and how growers are using them in real operations.

Confirmed speakers: Fengqi You (Cornell), Shamim Ahamed (UC Davis), Fokke Kracht (Koidra)

Path for Sustainability


IAB Meetings
- Network
- Knowledge transfer
Online Tools
- LASSI
Benefits GLASE members
Benefits the CEA industry
(Non GLASE Members)
Free Webinars
- Consortium awareness
- New Members recruitment
Newsletter
- Consortium awareness
- New Members recruitment
Grants
- Technology Development
- Technology implementation
- Educational content
GLASE Research
- Technology Transfer (IP)
Revenue Generation
Plant Lighting Short Course
- Marketing and Sponsorship
NYS GH Database and Benchmark

Core Activities

Define areas of industry relevance

- Expand successful activities
- Increase members engagement
- Industry surveys
- GLASE members feedback
- Identify/expand academic partnerships
- Market Transformation
- Implementation

Business Model

Value Proposition and Sustainability

- Industry Membership
- Training workshops
- Fed/State grants
- Industry partnerships

Marketing

Awareness and Value

- Increase industry awareness
- Recruit new members
- Opportunity for GLASE Members

Partnerships for Climate-Smart Commodities

Equity

Climate Solutions

Partnerships for Climate-Smart Commodities

Partnerships for Climate-Smart Commodities Project Summaries

FAQs

Climate Change Adaptation and USDA

USDA is committed to supporting a diverse range of farmers, ranchers, and private forest landowners through Partnerships for Climate-Smart Commodities. This effort will expand markets for America's climate-smart commodities, leverage the greenhouse gas benefits of climate-smart commodity production, and provide direct, meaningful benefits to production agriculture, including for small and underserved producers.

On September 14, 2022, Secretary Vilsack announced USDA is investing up to $2.8 billion in 70 selected projects under the first pool of the Partnerships for Climate-Smart Commodities funding opportunity. Projects from the second funding pool will be announced later this year. Ultimately, USDA's anticipated investment will triple to more than $3 billion in pilots that will create market opportunities for American commodities produced using climate-smart production practices.

Climate-Smart Greenhouse Crops through Advanced Plant Lighting Controls

- Implement Advanced Plant Lighting Controls (APLCs) at **36 greenhouses**
- Anticipated coverage crop canopy area of **3 million square feet (69 acres)**.
- Anticipated GHG emission reduction of **9,038 to 27,116 MtCO2e** over the 4-year project.
- Anticipate energy savings of approx. **6 kWh/ft^2/yr**.
- For a one-acre greenhouse, this equates to an average annual savings of:
  a. 259,500 kWh
  b. $25,950 at $0.10/kWh
- Applied across the U.S. CEA industry, a total potential savings of **$340 million** and **1.45 million tons of CO_2** can be achieved.

New Executive Director

- Business expertise
- Define the consortium path and long term goals
- Lead to consortium to self-sustainability

- Part Time or Full time - depending on Climate-Smart Commodity grant results