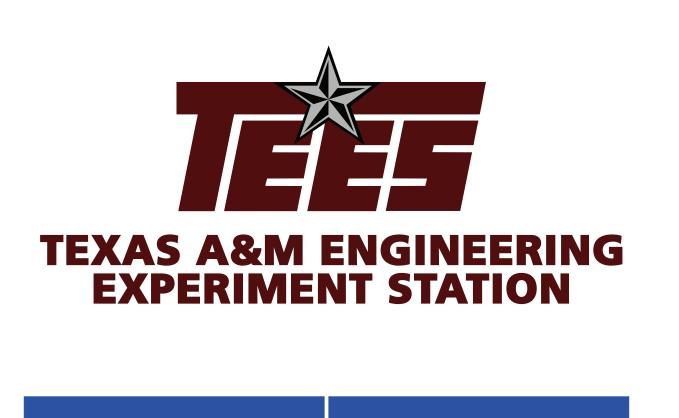
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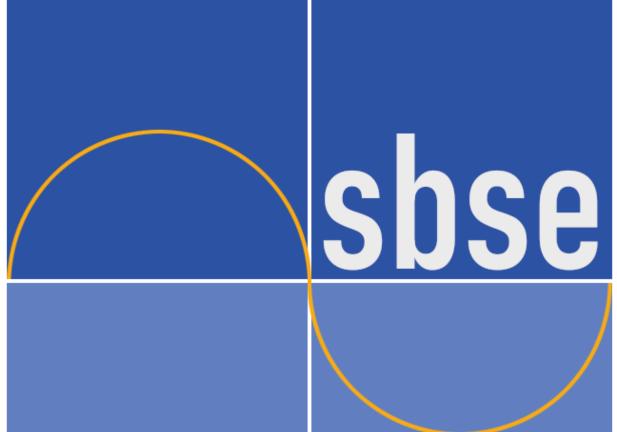
PRESENTER

Xiaohui 'Joe' Zhou **Director of Research & Innovation** Slipstream

Slipstream is a nonprofit that discovers, tests, and scales climate solutions in buildings and communities.

PARTNERS





National Institute of BUILDING SCIENCES[™]

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Office of **ENERGY EFFICIENCY &** RENEWABLE ENERGY

Development and Validation of Smart Building Technology Modules for Academic and Professional Education

DID YOU KNOW?

DOE funding allows the team to collaborate, strategize, develop, and validate the innovative curriculum that fills the competency gaps in traditional architectural engineering programs and for other building technology professionals.

OBJECTIVES

DEVELOP AND VALIDATE a set of module-based, course materials ready to be adopted by college professors in scalable smart building technologies.

DEVELOP online training videos suitable for building professionals' continuing education.

DISSEMINATE project information and resource to target audiences.

SUMMARY OF THE PROJECT Slipstream leads a team developing a semester-long

smart building curriculum for college students and adapting the contents into 16 training videos for building professionals and the public. The topics cover smart building technologies related content including industry trends and benefits, building systems, sensors and IoT devices, advanced building monitoring and controls, smart building control platform, methods, and applications.

MAJOR CONCLUSIONS

The training materials will be available for free by the end of 2024. The project will bridge a gap in systematically learning smart building technologies. The team believes the best practices in developing curriculum or training content are:

1) Involving project advisors early to review training outlines including topics covered;

2) Going through multiple rounds of internal and external technical expert reviews, if possible;

3) Collaborating with learning management system provider to structure the training course for effective learning and testing.

COURSE MODULES FOR COLLEGE EDUCATION

MODULE #	
0	Introduction of the
1	Fundamentals of System Integratio
2	Smart Building Te
3	Fundamentals of
4	Advanced in Build
5	Applications of Er
6	Smart Building Te

ONLINE TRAINING VIDEOS FOR BUILDING PROFESSIONALS

SESSION #	TOPIC CATEGORY	TOPIC
1	Introduction	Introduction to Smart Building Technologies
2		Building HVAC—Basic Systems
3	Building Systems	Building HVAC—Complex Systems
4		Networked Lighting Controls and HVAC Integration
5		Solar PV, BESS, and EV Charging
6		Smart Window, Automated Shades, Phase Change Materials, and Plug Loads
7	Sensors and IOT	Sensors
8	Devices	IOT Devices
9		Advanced Building Monitoring and Controls
10		Smart Building Control Platform
11	Smart Building Controls	Smart Building Control Platform Cybersecurity
12		Smart Building Control Methods
13		Occupant-centric Control
14	Smart Building	Grid-interactive Efficient Buildings and Connected Communities
15	Applications	Review of Whole-building Simulation Programs
16		Smart Building Application Examples

MODULE TITLE

ne Course

f Building Mechanical and Energy Systems, and Building

Technologies Drivers and Trends

f Smart Building Technologies

Iding Energy Management and Controls

Engineering Tools and Standards—Building Operation

Fechnologies Case Studies for Design and Operation

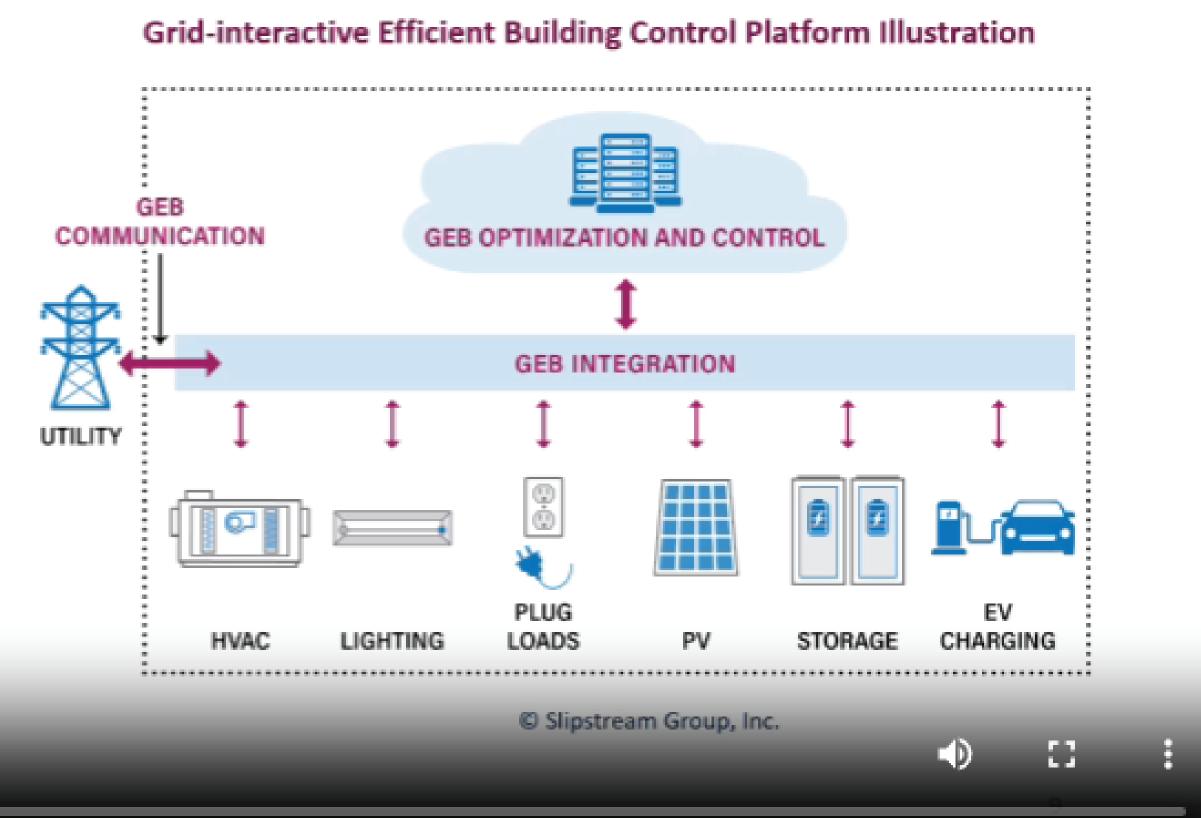
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Benefits of Smart Buildings

ergy and Resilience

- gnificant energy and cost vings through smart building sign and operations
- proved gird resilience by oviding grid services through rid-interactive Efficient ildings (GEBs)
- nproved building energy silience through DER tegration and microgrid



al Institute of DING SCIENCES [®]	1090 Vermont Avenue, NW, Suite 700 Wash	National Institute of Building Sciences An Authoritative Source of Innovative Solutions for the Built Environment 1090 Vermont Avenue, NW, Suite 700 Washington, DC 20005-4950 (202) 289-7800 © 2024 National Institute of Building Sciences. All rights reserved. Disclaimer				
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swer the following questions to the best of your ability. ALL questions must have an answer selected before the test be graded. To save your test and come back at a later time, click the Save Test button at the bottom of the page. ice saved, you may browse to another study page or you may close the window. To submit the test for grading, click Submit Test for Review button at the bottom of the page.

What is a smart building?

-) a. A building that can enhance occupant comfort
- b. A building that can improve energy efficiency
- c. A building that can leverage various interconnected devices
- d. There is no authoritative, consensus definition in the building industry

Smart building elements include:

-) a. Building systems
- D. Sensors, controls, and networks
- C. Occupants
- O d. All of the above

3. What are the benefits of smart buildings?

- a. Improve well-being of occupants
- b. Improve building energy resilience
- C. Reduce carbon emissions
- O d. All of the above