

WELCOME TO ALL ATTENDEES!!!



**National Science Foundation
Advanced Technological Education Center**



**Building Efficiency for a Sustainable Tomorrow
BEST Center**

RECEPTION & INTRODUCTIONS



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RECEPTION & INTRODUCTIONS

1. What is your name, title, institution you're representing, what you hope to gain from the workshop?
2. What are the three most important technical skills you see as being required of an entry-level BAS technician?
3. What is the single most important soft skill required of entry-level BAS technicians?
4. What single most important trend do you see happening in the BAS industry?

For information on the industry, please visit Automated Buildings or DDC Online

Links: <http://www.automatedbuildings.com/> or <http://www.ddc-online.org/>

Building Efficiency for a Sustainable Tomorrow (BEST) National ATE Center



National Science Foundation
Advanced Technology Education

Presented by Peter Crabtree
Center Principal Investigator
CTE Dean
Laney College, Oakland, CA

The need for the BEST Center

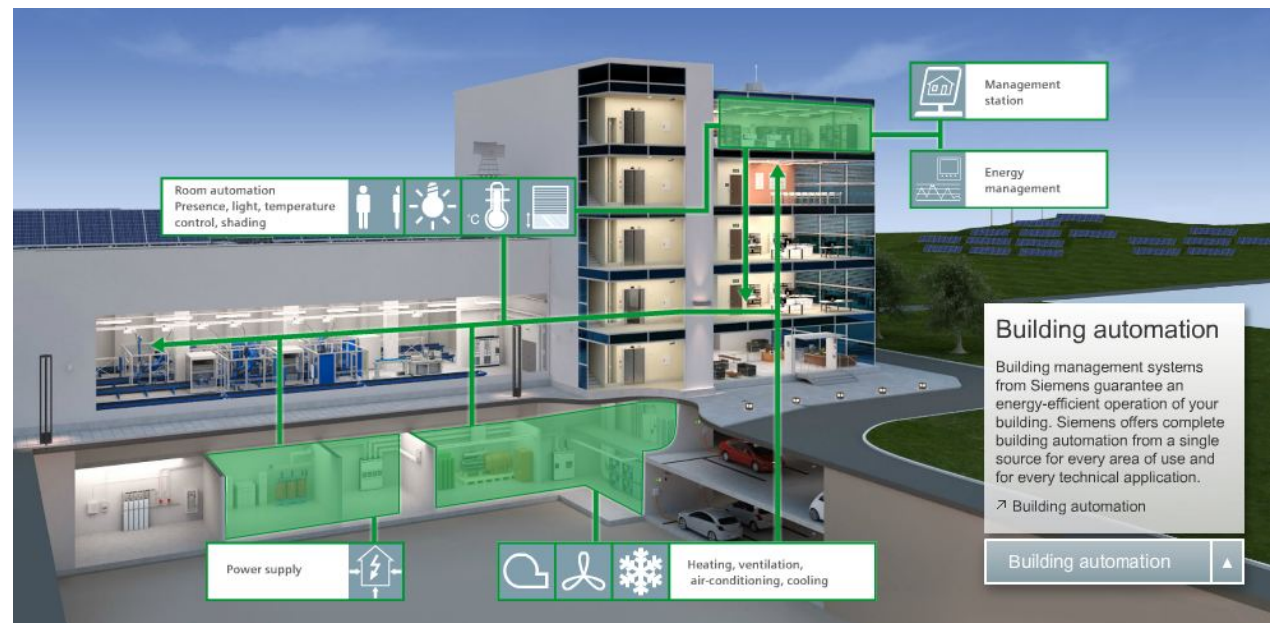


- Rapidly evolving “smart building” technologies including automated building controls, energy management systems, and the convergence of mechanical systems with IT systems
- Need to professionalize building operations
- Economic drivers including global business competition and rising energy costs
- “Greening” of the commercial building sector and technical occupations within it
- Climate change & the critical role of building efficiency in reducing carbon footprint
- Urgent need for building technicians who can keep up with technology – technicians who can learn
- Need for the development of energy literacy for technicians as well as all building stakeholders
- Need to engage all building stakeholders, including occupants in energy efficiency and conservation efforts

A RACE AGAINST TIME, A CALL TO ACTION

Our Vision & Mission

- To support the transition to high-performance, energy efficient buildings in the commercial building sector by creating a national forum on building efficiency issues
- To serve as a responsive vehicle for the dissemination and adoption of exceptional building technician educational programs, research, technology, and industry collaboration
- To advocate for high-performance buildings and appropriate technician training at local, regional, and national levels



The BEST Center will have an emphasis commercial buildings



- **Buildings account for about 40% of U.S. greenhouse gas emissions and for about 70% of electricity usage.**
- Commercial buildings are the only sector that has outpaced gross domestic product in emissions growth.
- The convergence of information technology with building automation systems and energy management systems creates complex building operations and increased demands on technicians. A well-trained clean energy workforce will help U.S. businesses to cut energy costs, become more competitive in the global market, and reduce greenhouse gas emissions.
- The U.S. Better Buildings Initiative goal of improving energy efficiency nationwide in commercial & industrial buildings by 20% by 2020 can reduce energy costs by nearly \$40 billion and create American jobs.

What are the new roles of building technicians?

- As older buildings are retrofitted and stringent environmental regulations are applied to new construction, demand is rapidly increasing for highly-trained technicians to operate and maintain technologically-complex, “high performance” buildings.
- Technicians must service and manage multiple building systems including HVAC/R, lighting, Building Automation and Energy Management systems and ensure indoor air quality.
- Technicians play a critical role in ensuring occupant health, promoting energy conservation, and sustaining financial savings.



What must today's building technicians know and be able to do?



Key Competencies

- Apply systems thinking to perform root cause problem-solving
- Use data analysis for fault detection & energy modeling
- Apply critical thinking skills to building system diagnostics
- Present ideas effectively orally and in writing to building stakeholders including owners, managers, and occupants

High level Job Functions

- Perform ongoing energy audits and optimize sequences of mechanical system operations
- Measure and verify system performance
- Troubleshoot system-level problems
- Develop cost-benefit analysis for capital improvement opportunities
- Use soft skills to manage teams, work with multiple stakeholders, and present ideas to building managers
- Apply routine preventative maintenance strategies and practices
- Ensure currency of knowledge and skills by engaging in ongoing professional development activities

The goals of the BEST Center

1. Build and transform the instructional capacity of community colleges in the field of building systems technician education



The goals of the BEST Center

2. Engage industry stakeholders in a national collaboration with community colleges to support high quality instructional programs for new and incumbent building technicians

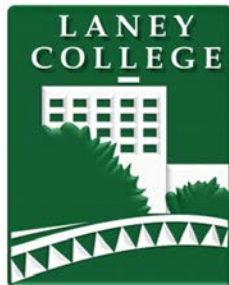


The goals of the BEST Center

3. Strengthen the national STEM pipeline for educating building technicians and engineers, starting in high school



Who We Are



Principal Investigator and Co-PIs

- Laney College (CA) – PI & Co-PI
- Georgia Piedmont Technical College (GA) – Co-PI
- Milwaukee Area Technical College (WI) - Co-PI
- Lawrence Berkeley National Lab (CA) - Co-PI

Dissemination Partners

- Adv. Technology Environmental and Energy Center (IA)
- Central New Mexico Community College (NM)
- Edmonds Community College (WA)
- Lansing Community College (MI)

Curriculum Partners

- L.A. Trade Technical College (CA)
- Mt. San Antonio College (CA)
- Salt Lake Community College (UT)
- Wenatchee Valley College (WA)

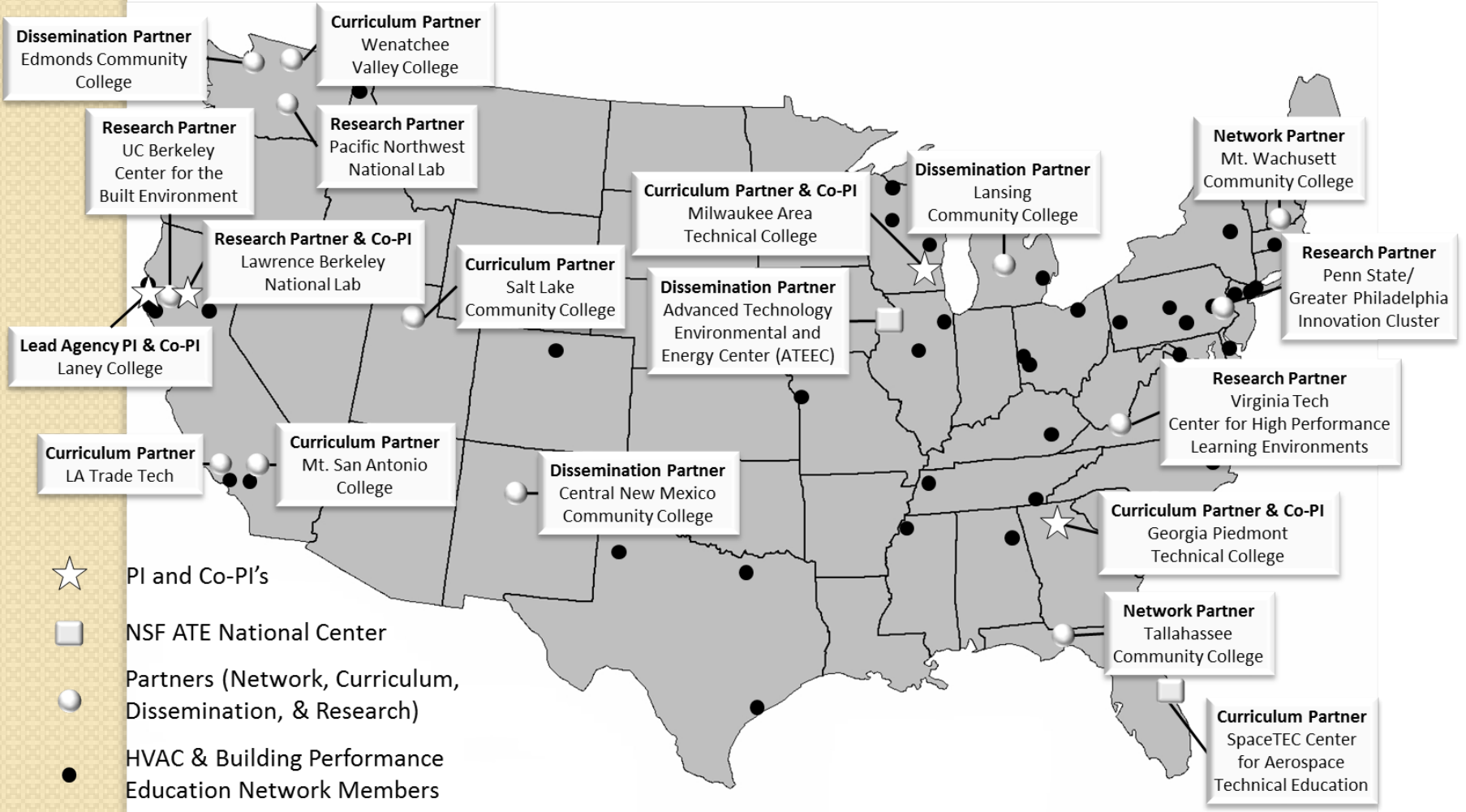
Network Partners

- Mt Wachusett Community College (MA)
- Tallahassee Community College (FL)
- SpaceTEC Center for Aerospace Technical Education (FL)

Research Partners

- Pacific Northwest National Lab (WA)
- Penn State/ Greater Philadelphia Innovation Cluster (PA)
- UC Berkeley Center for the Built Environment (CA)
- VA Tech Center for High Performance Learning Environments (VA)

BEST Center Affiliates Across the Country



Benefits for Participating Colleges

- ❖ Access to model curriculum
- ❖ Access to research on industry trends and technician skill requirements
- ❖ Support for lab equipment acquisition
- ❖ Professional development opportunities.
- ❖ Opportunity to participate in a national educators' network on building science and technician education
- ❖ Access to onsite technical assistance



How Do Community College Students Benefit?

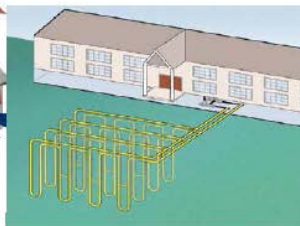
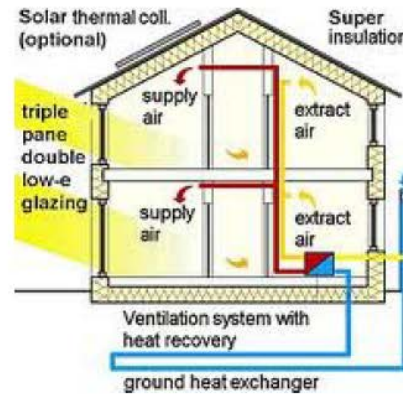
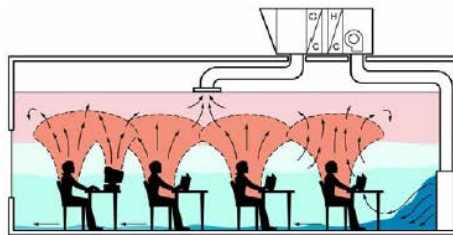
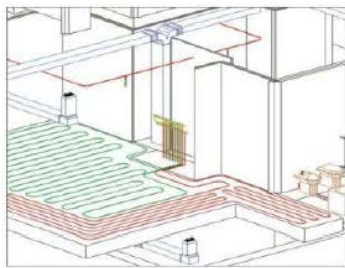


- **Access to cutting edge curriculum and instructional programs**
- **Advanced instructional laboratories**
- **Internships and job placement assistance**
- **Effective instructional practices including problem-based learning**

Key Program Themes of the BEST CENTER

- Building Automation
- Sustainable building operations
- Energy Management
- Energy Efficiency in buildings
- Lighting efficiency technology
- System integration
- Smart grid and micro-grid
- On-site energy generation and recapture

performance: passiv classroom elements



Importance of BAS Systems

- Allow technicians to monitor system performance, troubleshoot system components, and improve system performance
- BAS do not guarantee a well tuned building, but much harder to tune the building without a system
- BAS systems do not automate building systems, but allow technicians to perform more effectively
- Allow building owners to realize energy savings
- Hot employment area for building technicians

