



SECURITY & SUSTAINABILITY FORUM

SECURITY & SUSTAINABILITY FORUM

Convening Global Experts to Guide Decision Making

CONVENING GLOBAL EXPERTS TO GUIDE DECISION MAKING

**A Conversation with Vancouver's Deputy
City Manager, Sadhu Johnston**
September 20, 2013 1:15 pm – 2:15 pm ET
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National Council for Science and the Environment

Improving the scientific basis for environmental decisionmaking



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Community Colleges as Living Laboratories

September 10, 2013



Moderator: Todd Cohen

Director, [SEED Center](#) (a program of the American Association of Community Colleges)





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- **Cadmus Can Help:**

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- Evaluates the effectiveness of program and marketing initiatives

- **Contact:**

- Linda [Dethman](mailto:Linda.Dethman@cadmusgroup.com) | Linda.Dethman@cadmusgroup.com | (503) 467-7146

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Local Solutions (Days 1 & 2)

Educators' Summit (Day 3)

www.antiochne.edu/climate-prepare

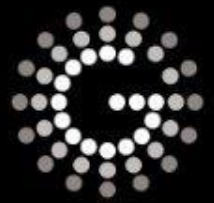
Building  **Climate Solutions**
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Washington, D.C. 14th National Conference and Global Forum
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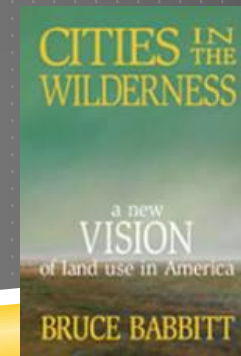
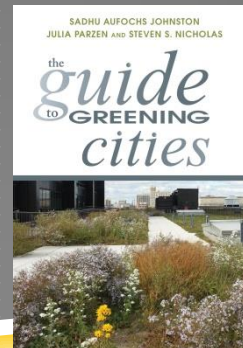
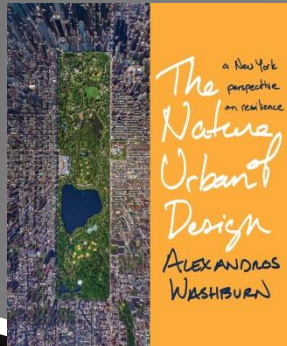
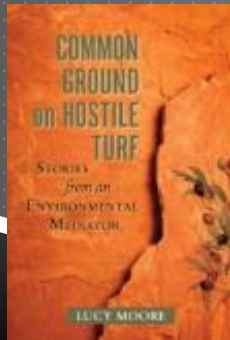
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Todd Cohen, Director, [SEED Center](#), launched and directs all aspects of the American Association of Community Colleges' (AACC) national Sustainability Education and Economic Development Center (SEED), a multi-million dollar clean energy sector initiative aimed at supporting 470 community college members in advancing education and training program to align to industry needs.



Session Agenda

- Introduction to the Panel: **Todd Cohen**
- Panel Presentations
 - **Bryan Albrecht**, President, [Gateway Technical College](#) (WI)
 - **Stephanie Sklba**, Gateway's VP for Community and Government Relations
 - **Brian Lovell**, Co-Principal Investigator, [National Science Foundation's Building Efficiency for a Sustainable Tomorrow \(BEST\) Center](#) (former faculty member at Georgia Piedmont Technical College)
- Discussion Questions
- Audience Questions: *Send your questions through the chat box*
- Summary Points
- Thank you!

Please fill out the audience exit survey



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Panel



Dr. Bryan Albrecht has served as Gateway Technical College's President since 2006. Serving as the college's chief executive, Dr. Albrecht oversees the college's 65 academic programs, 15 educational facilities, and a comprehensive \$160 million budget and a progressive \$4 million college foundation. Gateway represents Kenosha, Racine, and Walworth counties and has an economic impact of more than \$400 million annually.



Stephanie Sklba, is the Vice President for Community and Government Relations at Gateway Technical College and oversees the Sustainability initiative. Stephanie served on the National Association of Career and Technical Education Sustainability Taskforce as the chair and currently serves on many regional and local committees directly related to sustainability.



Brian Lovell has worked in the automation & controls industry for over 20 years as a small business owner, an educator, and now as a co-principal investigator for the National Science Foundation's B.E.S.T. Center through which he's disseminating automation curriculum developed specifically for community colleges. Previously, Brian led the development of Georgia Piedmont Technical College's Green Technologies Academy and Building Automation Systems program. He is also a managing member of The Watt Doctors, LLC, an engineering firm specializing in energy management and higher education consulting.



***Supporting community colleges in educating for and building
a green and sustainable economy***

All the tools your college needs to educate for and build a clean economy



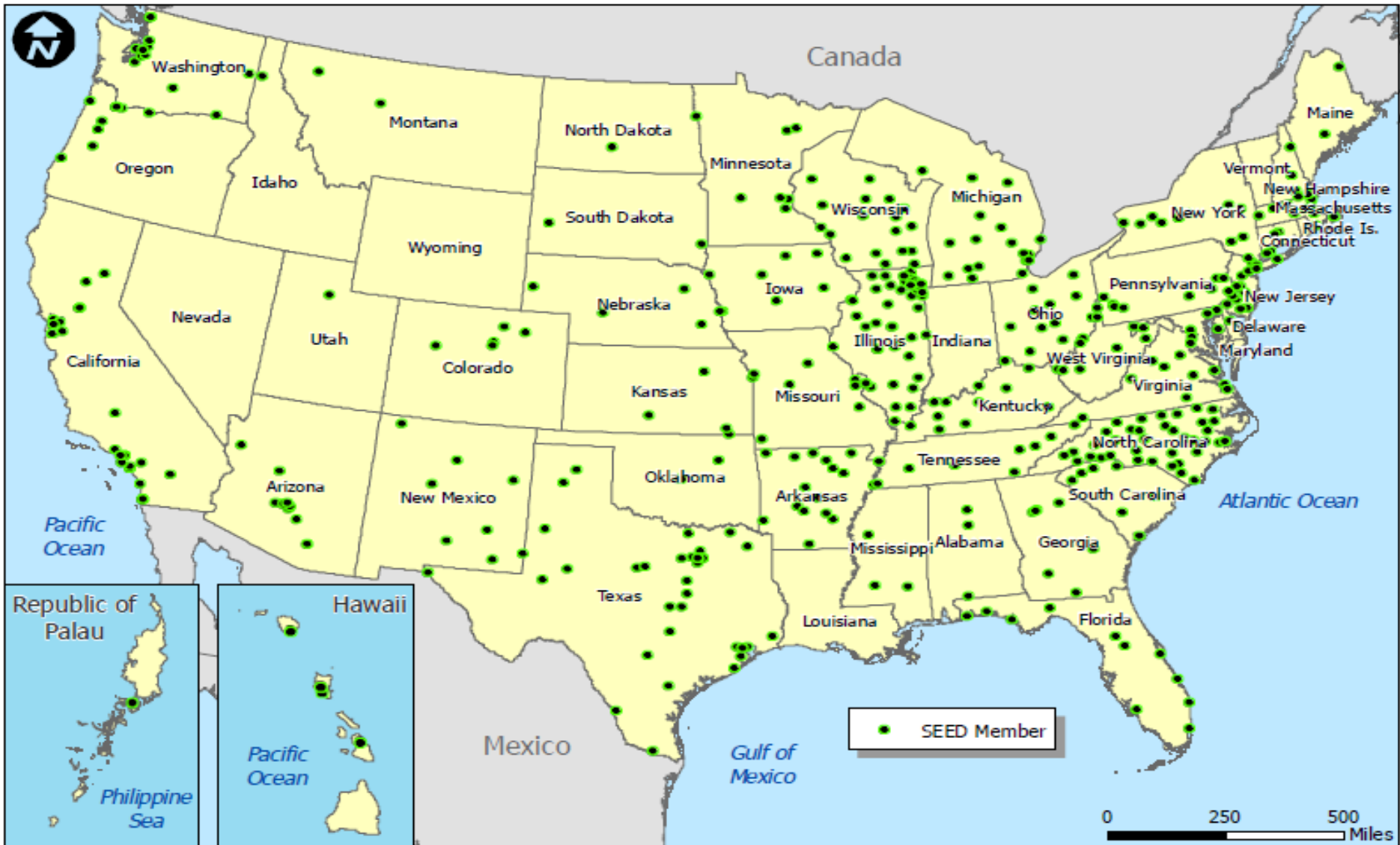
LEADERSHIP DEVELOPMENT (president-to-president mentoring; sustainability messaging)

EDUCATION & TRAINING RESOURCES (curriculum, best practices on clean tech career pathways; industry engagement, etc)

SUSTAINABILITY ASSESSMENTS (institutional sustainability benchmarks; national awards program)

www.theseedcenter.org

SEED: 470 Colleges



Campus as a Living Lab: New Guide!

FOOD SERVICES

Redesign college composting procedures, analyze cost of recyclable bottles and flatware, turn waste into bio-diesel fuel

BUILDINGS

Install building sensors, monitor energy use, calculate return on investment for renewable sources

CONSTRUCTION AND LAND USE

Assess waste remediation practices, benchmark facilities against LEED criteria, restore native plants

GROUNDS

Assess campus pesticide use, build rainwater harvesting tank

TRANSPORTATION

Develop business plan for alternative campus fleet

PARKING

Develop financial model for lighting retrofits, student attitudes, ride-sharing

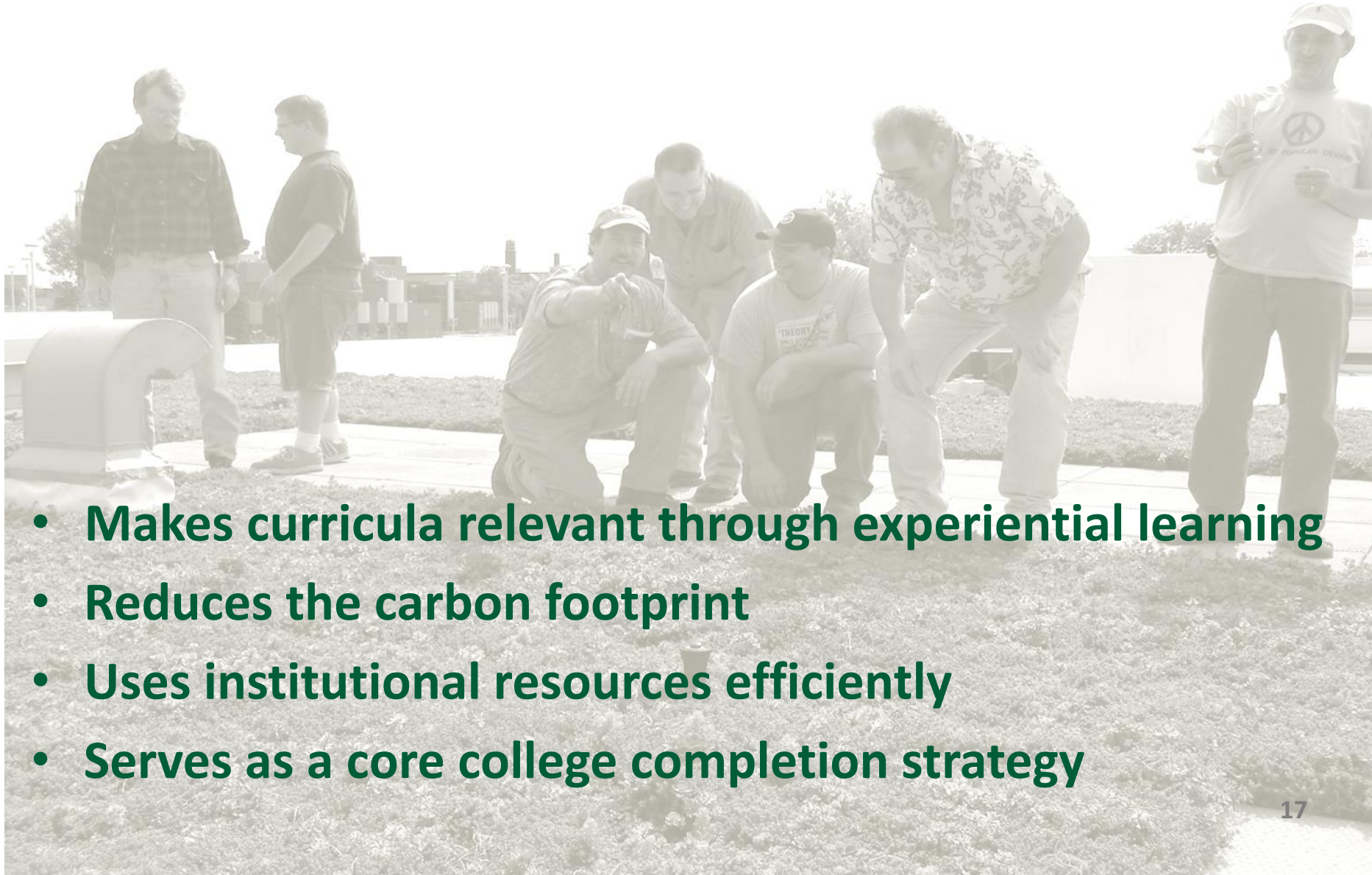
Released
summer 2013 in
partnership
with USGBC's
Center for
Green Schools



THE CENTER
FOR GREEN SCHOOLS



Campus as a Living Laboratory: A Core 21st Century College Strategy

- 
- **Makes curricula relevant through experiential learning**
 - **Reduces the carbon footprint**
 - **Uses institutional resources efficiently**
 - **Serves as a core college completion strategy**

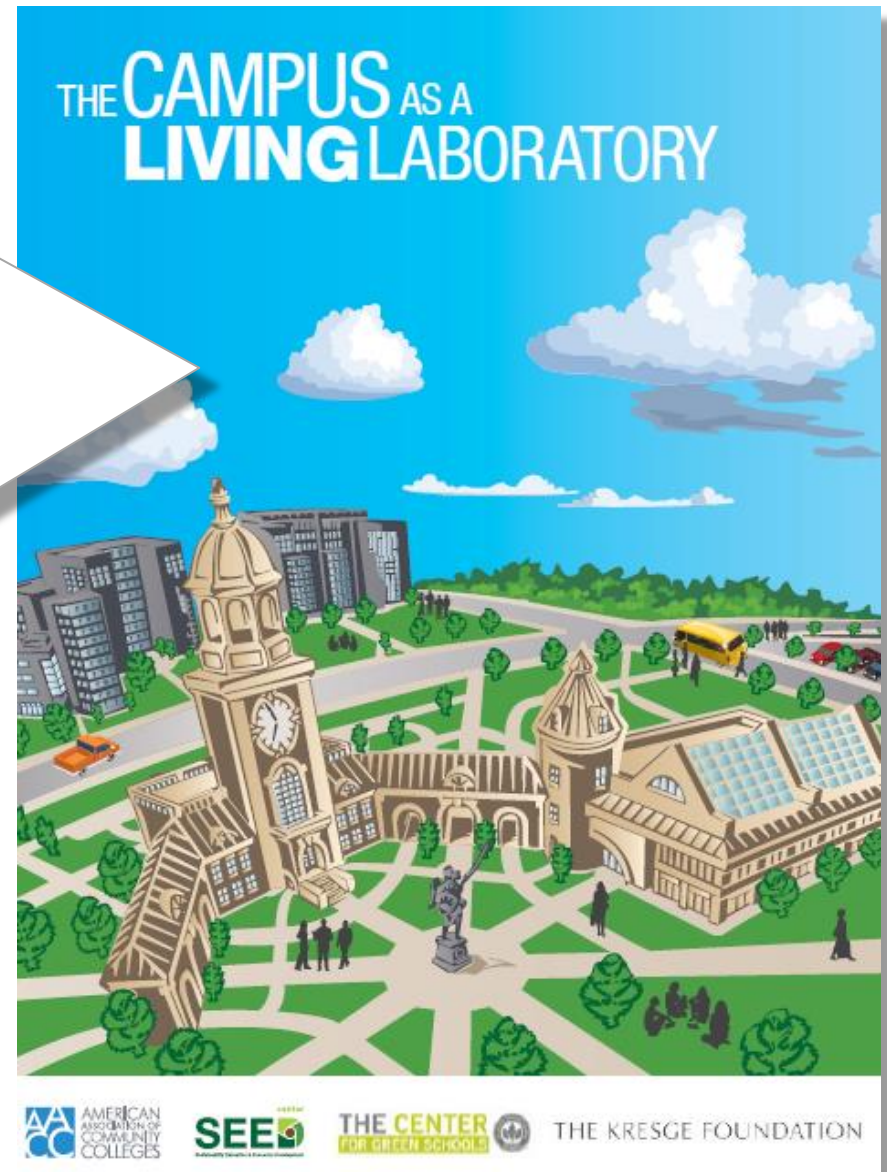
Campus-as-a-Living Laboratory: Underutilized as a Practice

80% of institutions of higher education have conducted at least some green retrofits and operational improvements*

<5% of community colleges have considered using these opportunities as student learning opportunities**

Eight Elements to Building a Campus Living Lab

1. Engage the right campus participants
2. ID key collegiate programs
3. Build credibility through engagement and data
4. Integrate into curriculum
5. Expand beyond individual programs of study
6. Build partnerships with industry
7. Engage support beyond campus
8. Open your labs to the community





Stephanie Sklba,
VP-Community + Government Relations

Bryan Albrecht
President

SUSTAINABLE  **GATEWAY**

Sustainability: A catalyst for change

Governance

- Presidents Climate Commitment – Board signature
- AACCC / SEED
- Local sustainable focused organizations

Program

- Student and staff interest drives change
- Community outreach drives change
- Program development drives change

Community

- Positive brand identity
- Industry partnerships
- ROI – envelope efficiency

Sustainability Dashboard

Gateway Technical College Sustainability Dashboard Measures

Gateway Technical College Sustainability Dashboard Measures												
Utility Usage	Fiscal Year 2010			Fiscal Year 2011			Fiscal Year 2012			Fiscal Year 2013		
	Sq Ft	Electric	Gas	Sq Ft	Electric	Gas	Sq Ft	Electric	Gas	Sq Ft	Electric	Gas
		Kwh	Therms		Kwh	Therms		Kwh	Therms		Kwh	Therms
Racine	270,917	4,410,800	134,786	270,917	4,301,920	144,160	274,888	3,989,440	101,008	290,888	3,723,200	133,438
Per Sq. Ft		16.28	0.50		15.88	0.53		14.51	0.37		12.80	0.46
Kenosha	339,248	4,668,799	226,711	339,248	4,654,790	207,175	339,248	4,483,231	163,357	339,248	4,579,718	205,650
Per Sq. Ft		13.76	0.67		13.72	0.61		13.22	0.48		13.50	0.61
Walworth	95,381	1,062,682	46,023	95,381	953,680	45,341	102,484	1,021,067	37,518	102,484	1,028,095	42,232
Per Sq. Ft		11.14	0.48		10.00	0.48		9.96	0.37		10.03	0.41
Burlington	55,767	380,107	13,894	55,767	442,960	20,070	55,767	404,880	15,089	55,767	415,520	17,147
Per Sq. Ft		6.82	0.25		7.94	0.36		7.26	0.27		7.45	0.31
Total All Buildings	761,313	10,522,388	421,414	761,313	10,353,350	416,746	772,387	9,898,618	316,972	788,387	9,746,533	398,467
Per Sq. Ft		13.82	0.55		13.60	0.55		12.82	0.41		12.36	0.51
Renewable Energy Projects:												
		Fiscal Year 2010 Energy Generated			Fiscal Year 2011 Energy Generated			Fiscal Year 2012 Energy Generated			Fiscal Year 2013 Energy Generated	
		Kwh	\$ Value		Kwh	\$ Value		Kwh	\$ Value		Kwh	\$ Value
Photovoltaic Panels:												
Horizon Center		2006	\$216		5,209	\$572		5,775	\$624		4,910	\$530
Racine Solar Wall		-	-		657	\$72		3,743	\$449		3,220	\$388
Ctr. for Sustainable Living		-	-		-	-		5,710	\$799		5,590	\$743
Four Winspires	Estimated annual generated of \$200 per unit, \$800 per year total.											
Solar Hot water - Elkhorn	Estimated savings of \$350 per year.											
Solar Hot Water - CSL	Estimated savings of \$200 per year.											

What does a Living Campus Look Like?

- Demonstrates the commitment
- Serves as a model for your community
- Expands faculty engagement and awareness
- Changes habits
- Practical application of knowledge and skill
- Connects students and staff with the campus facilities and builds pride



Examples at Gateway



Sustaining Results

Students

- Green scholars
- Sustainable student organization
- Service learning
- Technical skills in emerging industries

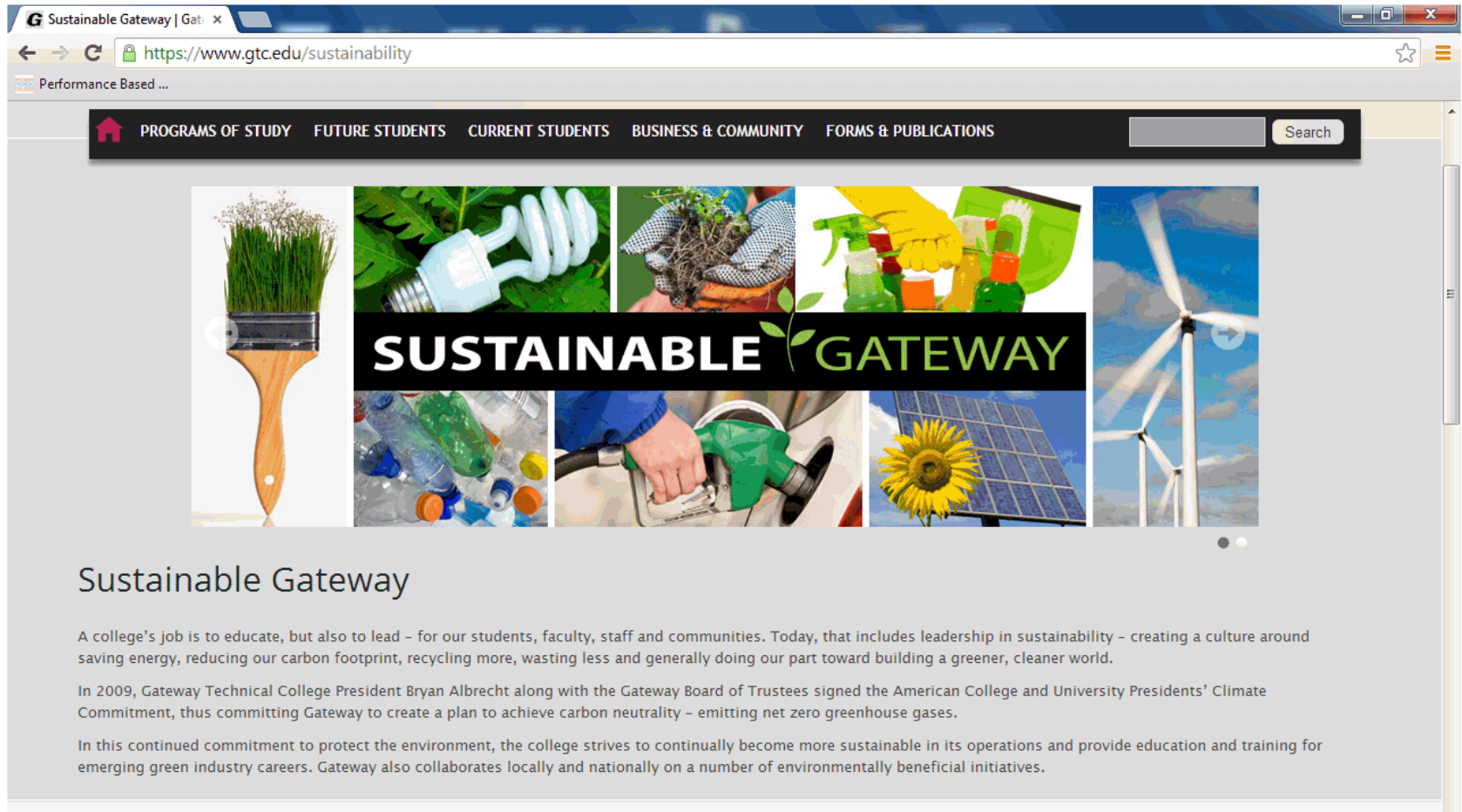
College

- Data tracking
- Re-Investment of resources
- Core Competencies
- Enrollment impact

Community

- Campus beautification recognition
- Service club partnerships
- Positions Gateway as a community resource

Our Sustainability Website



SUSTAINABLE GATEWAY

Sustainable Gateway

A college's job is to educate, but also to lead – for our students, faculty, staff and communities. Today, that includes leadership in sustainability – creating a culture around saving energy, reducing our carbon footprint, recycling more, wasting less and generally doing our part toward building a greener, cleaner world.

In 2009, Gateway Technical College President Bryan Albrecht along with the Gateway Board of Trustees signed the American College and University Presidents' Climate Commitment, thus committing Gateway to create a plan to achieve carbon neutrality – emitting net zero greenhouse gases.

In this continued commitment to protect the environment, the college strives to continually become more sustainable in its operations and provide education and training for emerging green industry careers. Gateway also collaborates locally and nationally on a number of environmentally beneficial initiatives.

Georgia Piedmont Technical College Living Laboratory

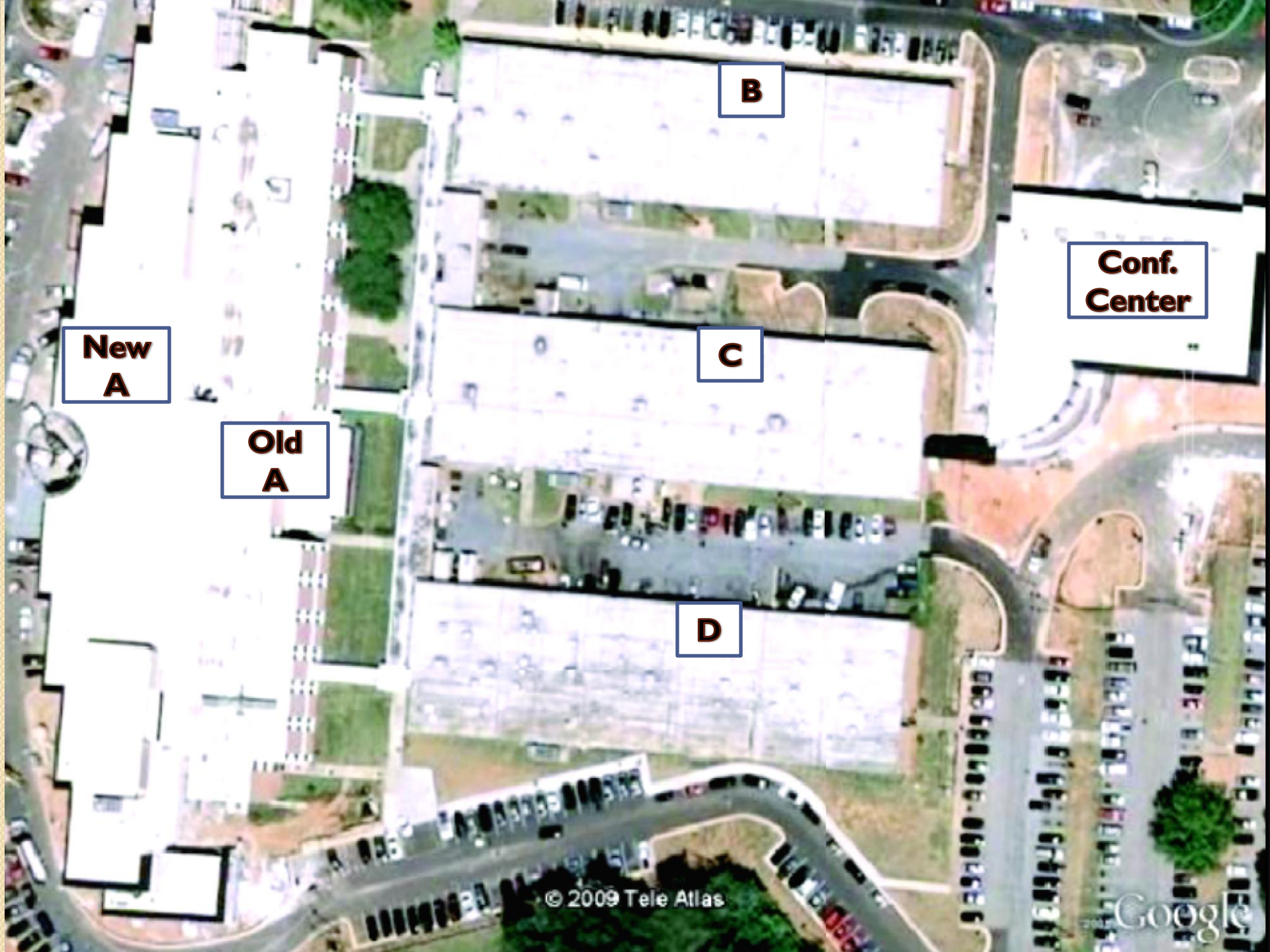


**GEORGIA
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TECHNICAL COLLEGE

Formerly DeKalb Technical College

Living Labs @ GPTC How it Started: Faculty and Student Driven

- Joined GPTC in 2007 to build new programs
- Fall 2007 – HVAC students & instructors notice heating / cooling systems running concurrently
- Students & instructors began tracking chillers / boilers (4 months) in three buildings (each approx. 30,000 sq. ft.)
- Study revealed systems ran 24/7 while college only occupied 6AM – 9PM M-TH, 6AM – 2PM Sat (68 hours per week) systems ran 168 hours/week



B

**Conf.
Center**

**New
A**

C

**Old
A**

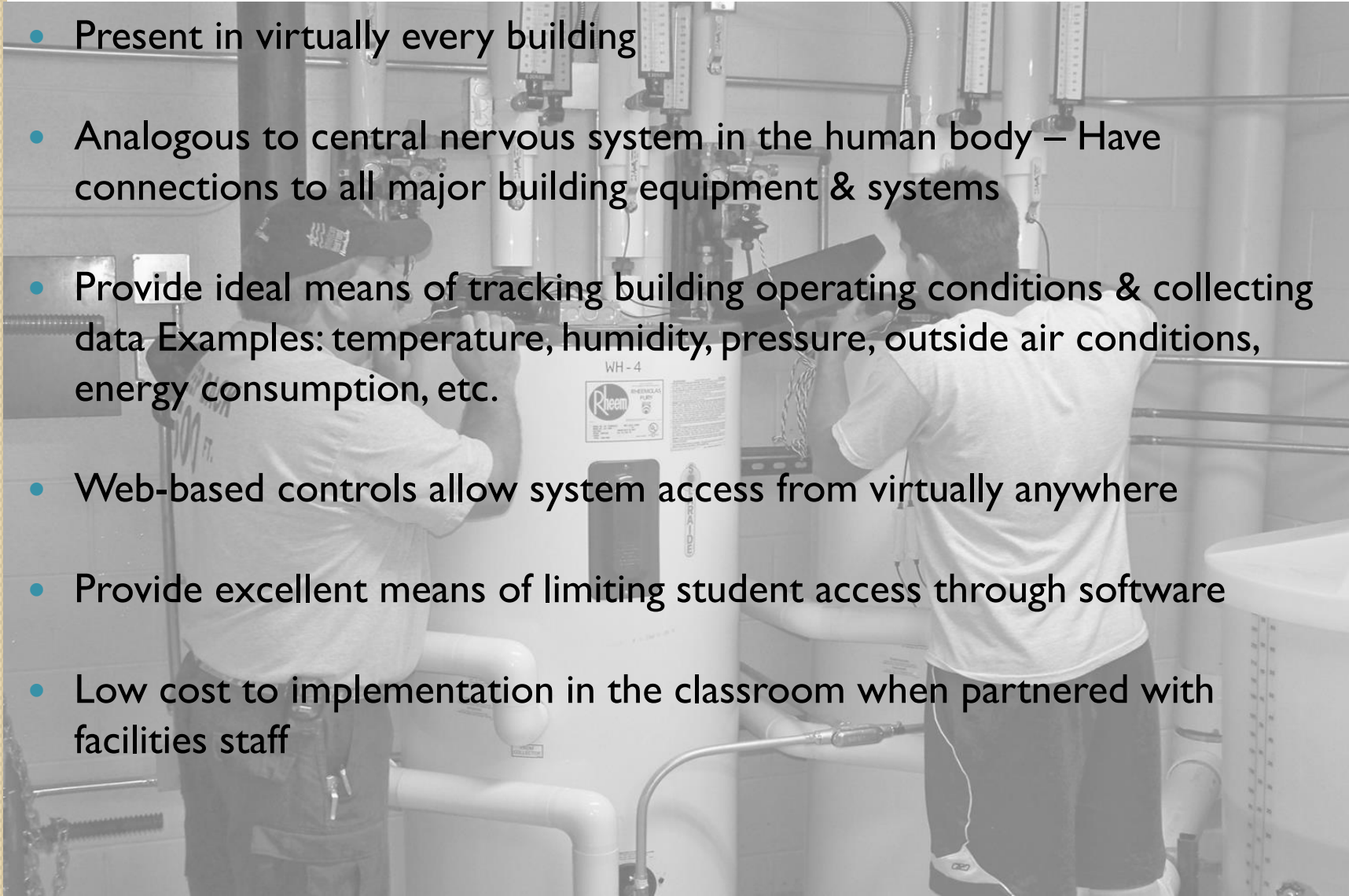
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Living Labs @ GPTC: From Simple Project to Full Integration

- Instructors presented findings to **president, VPAA, division chair, facilities director & staff, HR director**. Focused on improved student learning opportunities AND campus energy savings
- Outcome: Approval for **comprehensive and integrated** living laboratory activities in C-building:
 - Activities must be ID'd in syllabi
 - Students must have had a safety course prior to participation
 - Coordination with facilities staff for access and reporting
 - Student supervision at all times
- Students began in-depth studies of building performance, lighting assessments, heat gain & loss calculations, building shell investigations, mechanical systems inventories
- **Studies informed 3 grant proposals later funded** in 2009
- Building Automation Systems program approved by Technical College System of GA (2008)

Why Campus Building Automation Systems as a Campus Living Lab Starting Point?

- Present in virtually every building
- Analogous to central nervous system in the human body – Have connections to all major building equipment & systems
- Provide ideal means of tracking building operating conditions & collecting data Examples: temperature, humidity, pressure, outside air conditions, energy consumption, etc.
- Web-based controls allow system access from virtually anywhere
- Provide excellent means of limiting student access through software
- Low cost to implementation in the classroom when partnered with facilities staff



Living Labs @ GPTC C-Building

- BAS students expanded project by installing sensors, networks, controllers throughout C-building
- System disassembled each semester & then re-designed & installed by students to include physical equipment, devices, controls, communications networks & software as part of graded assignments in each BAS course



Living Labs Expansion: Cross-Disciplinary & Real World Project

- Starnes Center: 2 miles from GPTC main campus
- Students from: BAS, HVAC, Drafting, Commercial Refrigeration, Accounting, and Georgia Perimeter College Engineering students (with other disciplines engaged)
- Energy model & audit; BAS system design; Load calculations; Building systems inventory; Small business management
- Used Collaborative Operating System (COS) to gain faculty alignment, facilitate productive meetings, focused planning

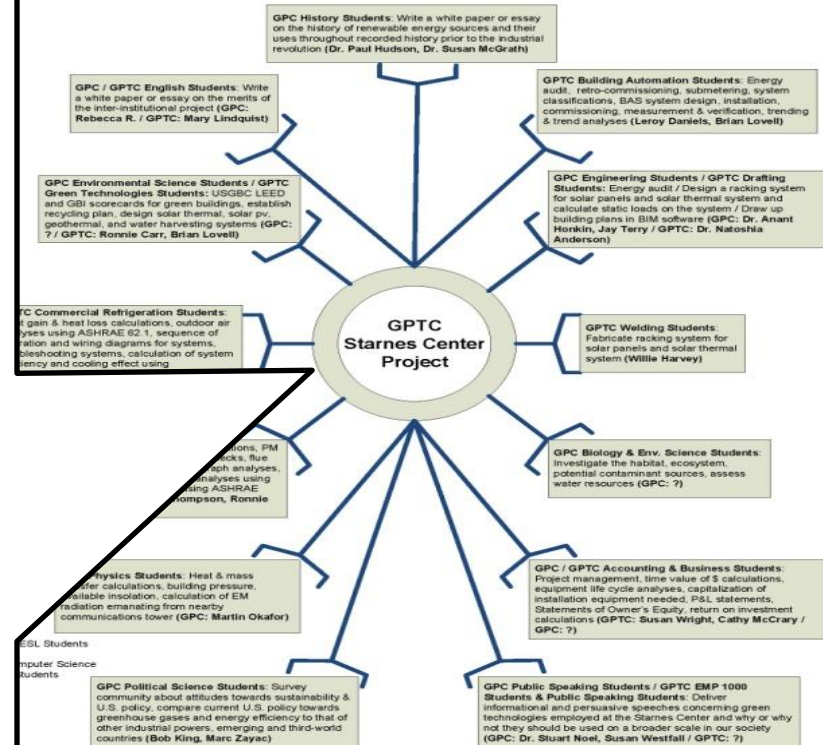


Project Student Outcomes

Assignments for Each Discipline of Students (examples):

- **Building Automation:** automation systems assessment, design, installation
- **History:** essay on history of renewable energy sources and uses prior to industrial revolution
- **Accounting:** capitalization of installation equipment needed; cost analysis; ROI; overall project management
- **Engineering:** Level III energy audit and energy conservation measures

Proposed Student Populations and Learning Outcomes for Involvement in the GPTC Starnes Center Retrofit Project



Living Labs @ GPTC: Outcomes

- **Students:** learning improvements (on core principles re: subject areas gained thru student assessments)
- **Students:** many gained employment with corporations involved in GPTC living lab curricular work
- **Faculty:** cross-collaboration/team teaching and improved relevancy of curriculum
- **Campus:** building efficiencies better understood and acted upon
- **Campus:** \$\$ to expand to other parts of campus
- **Area Companies:** Students with improved technical and soft skill sets (and credentials in fast growing industry areas)

Living Labs @ GPTC Lessons Learned

- **Absolutely dependent upon relationship between faculty and facilities director**
- **Take the low-hanging fruit first** – Energy audits, building usage patterns, equipment runtime, data-logging, heat gain calculations: all non-invasive/non-threatening to facilities representatives
- **Capture and present data:**
 - Campus energy savings
 - Student outcomes (pre and post cognitive assessments)
- **Form and present to *comprehensive* campus-wide leadership group (need their buy-in)**
 - Motivated Instructors
 - Facilities Director
 - Division Chair
 - Dean or VPAA
 - HR Director

Living Labs @ GPTC Lessons Learned Continued



- **Address Liability / Safety Issues**
 - Student work needs to be clearly documented /defined within course materials
 - Supervision of students at all times
 - Institution of safety course prior to student participation
- **Celebrate success**– Celebrating the students' efforts through on-going end-of-semester presentations open to students, faculty, and industry

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

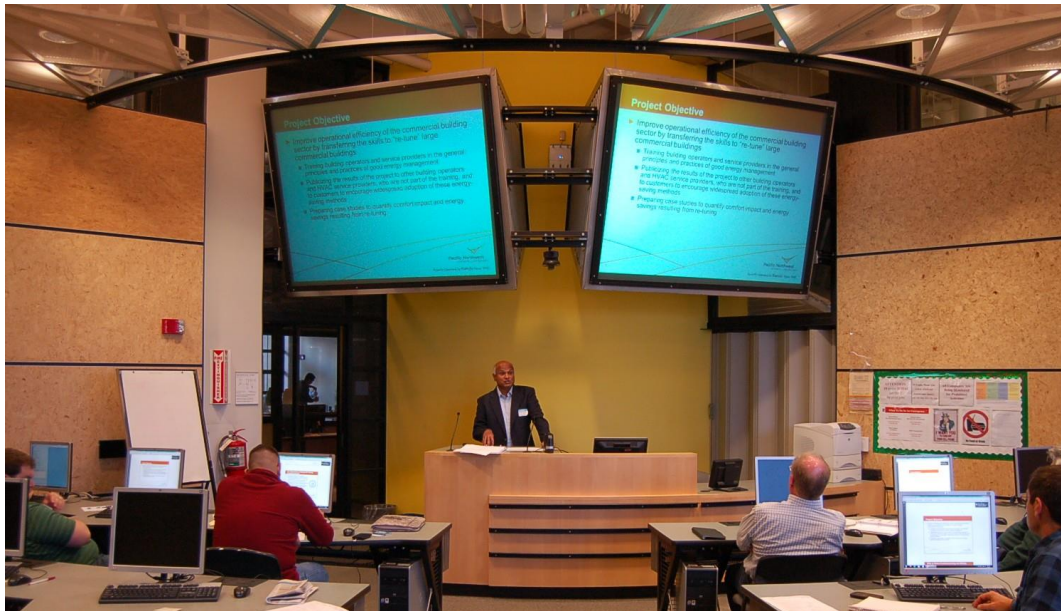


National Science Foundation
Advanced Technology Education

BEST Center slides contributed by
Center Principal Investigator
CTE Dean Peter Crabtree
Laney College, Oakland, CA

The goals of the BEST Center

1. Build and transform the instructional capacity of community colleges in the field of building systems technician education
2. Engage industry stakeholders in a national collaboration with community colleges to support high quality instructional programs for new and incumbent building technicians
3. Strengthen the national STEM pipeline for educating building technicians and engineers, starting in high school



Tools for Success

Useful Resource Links & Contact Info.

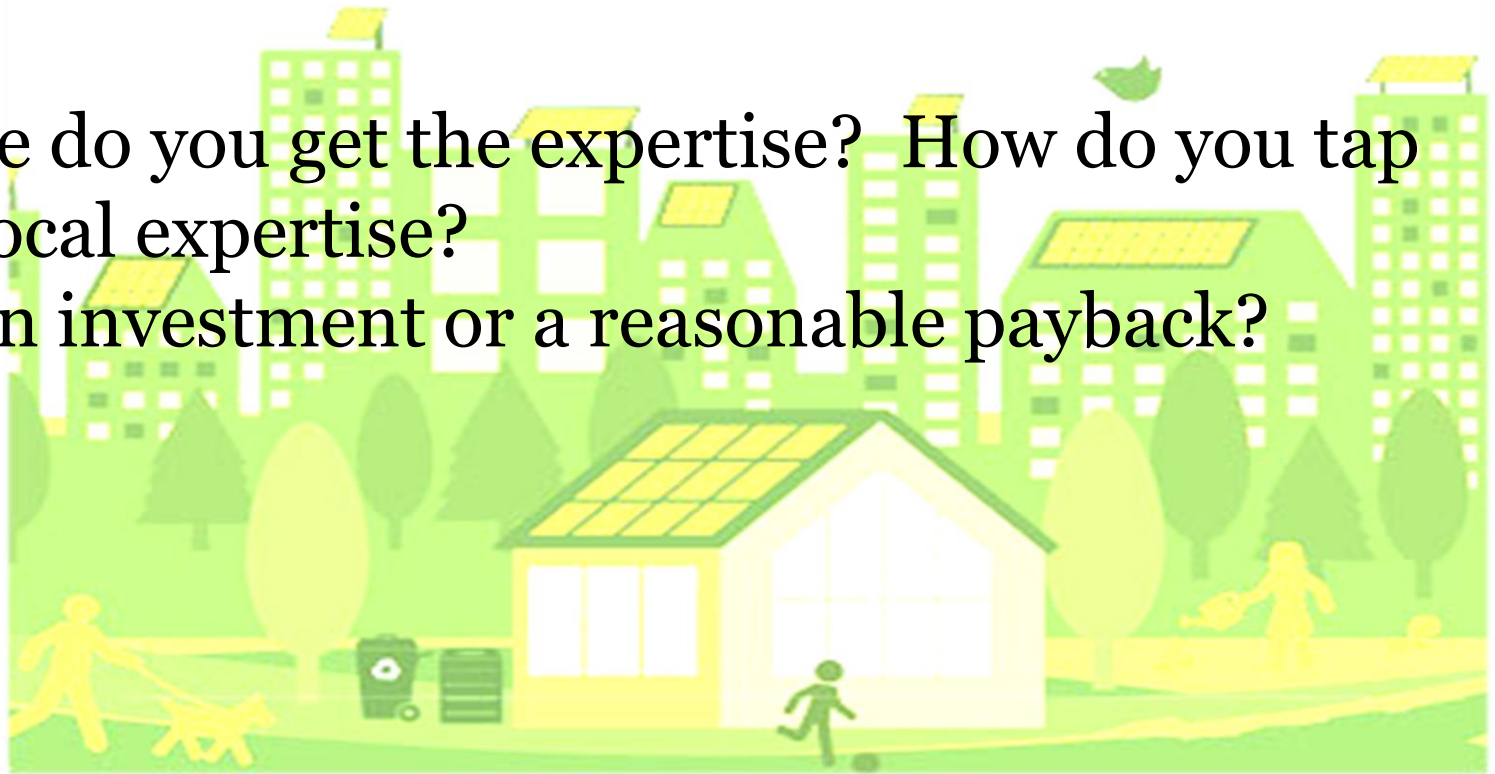
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www.theseedcenter.org
- The NSF BEST Center
www.bestcte.org
- The Collaborative Operating System
www.thecos.org
- Project-Based / Scenario-Based Learning
www.learnpbl.org
- The Watt Doctors, LLC
www.thewattdoctors.com
brian.lovell@thewattdoctors.com



Panel Discussion



- Where do you get the expertise? How do you tap into local expertise?
- Is it an investment or a reasonable payback?





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Audience Questions



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**A Conversation with Vancouver's Deputy
City Manager, Sadhu Johnston**
September 20, 2013 1:15 pm – 2:15 pm ET
www.securityandsustainabilityforum.org/events