

ILLUME



Connecticut

Secondary Research and Best Practices
Findings: Education and Workforce
Development

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AGENDA

INTRODUCTION AND RESEARCH APPROACH

WORKFORCE DEVELOPMENT FINDINGS AND RECOMENDATIONS

EDUCATION FINDINGS AND RECOMMENDATIONS

OPEN DISUCSSION

WRAP UP

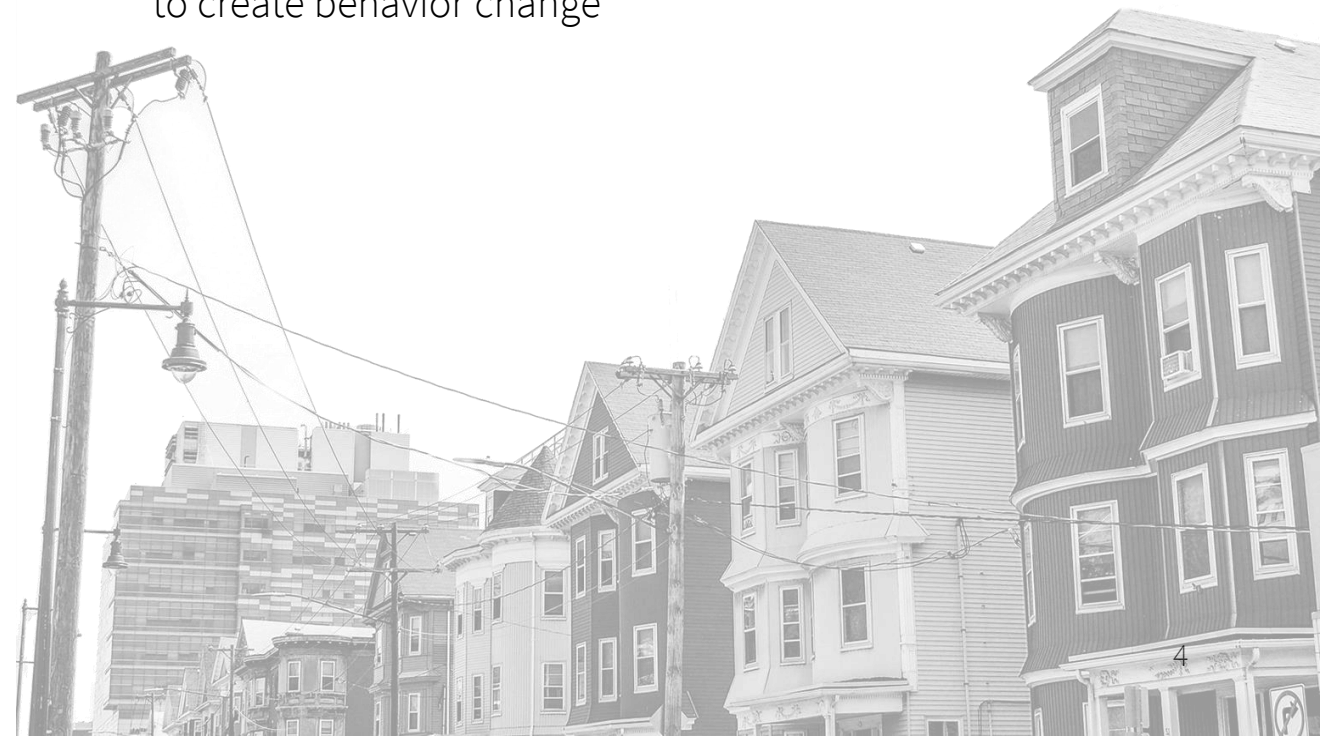
Interim Project Share-Out: Identify Best Practices

Activities:

- Outline what other regions/states are doing
- Identify any lessons learned
- Understand how programs are trying to change behaviors and identify activities that could lead to behavior change related to energy savings
- Assess whether these activities show energy savings
- Find out how other programs are trying to claim savings from education/training efforts

Findings:

- Demonstrate how CT efforts align with these best practices and opportunities to improve alignment
- Provide guidance on how to structure programs to create behavior change



What to Expect from Today

In today's call, we will present findings and best practices from across our secondary research on successful programs in the context of workforce development, technical High School programs, and K-12 Education programs.

We focus on what programs are doing to achieve energy savings through behavior change, and what and how they are tracking their achievements to demonstrate success.

We identify gaps between what we're seeing elsewhere and what Connecticut is doing.



WORKFORCE DEVELOPMENT



Clean Energy Works Oregon
Energy Trust of Oregon:
Efficiency Sales Professional Certificate Program

National: DOE's Better Buildings Solution Center

ReFresh Milwaukee

Ameren IL: Market Development Initiative

NYSERDA: Workforce Development Industry Partner Initiative

Massachusetts: Green Jobs Academy

Connecticut: Workforce Development

SoCalREN: ACES Pathway Program
LADWP
CA IOUs: WE&T

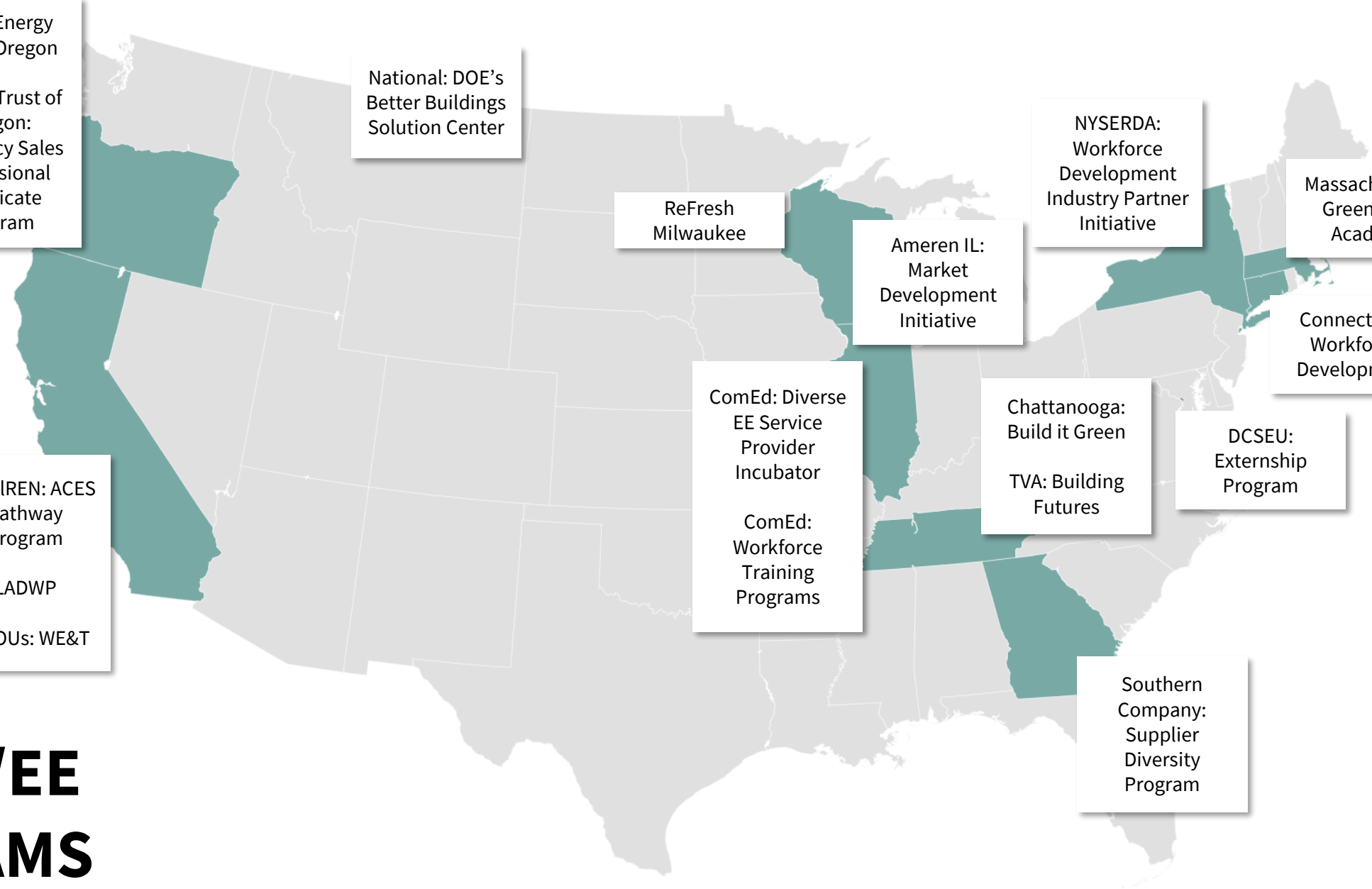
ComEd: Diverse EE Service Provider Incubator
ComEd: Workforce Training Programs

Chattanooga: Build it Green
TVA: Building Futures

DCSEU: Externship Program

Southern Company: Supplier Diversity Program

UTILITY/EE PROGRAMS REVIEWED



Reviewed Utility Program Best Practices



✓ POST TRAINING DATA
 Tracking progress/effect of training – how many get a new job, how many get a promotion, how many get a raise

✓ DIVERSITY
 Diversity should be a goal of the program and diversity indicators should be tracked

✓ COMMUNITY PARTNERSHIPS
 Work with the community and agencies within the community

✓ REGIONAL NEEDS
 Systematically review the labor market to know what positions need to be created. Learn about how the community can be best served (i.e. language, resources)

✓ RECRUIT WIDELY
 Broaden recruitment efforts (BOTH students/high schools AND existing contractors)

✓ GOVERNMENT PARTNERSHIPS
 Work with local and state governments as a partner to achieve their policy goals

General Workforce Development Best Practices

LABOR MARKET	RECRUITMENT	TRAINING STRUCTURE	TRAINING CONTENT	TRACKING
<p>Respond to actual labor market demand by working closely with industry</p> <p>Map regional labor markets by skills, jobs, and careers.</p>	<p>Remove income as a barrier to training by offering financing, loans, scholarships, or work-study/internships</p> <p>Describe outcomes of the program and the value it will bring to their careers (i.e. skills they will learn, possible financial benefits)</p> <p>Provide the public with a clear way of seeing the skills needed for different jobs and career pathways – how does the training align with those needs?</p>	<p>Offer trainings with flexible schedules or classroom options i.e. online or at night</p> <p>Use the state’s existing workforce education and training infrastructure; align goals of training programs with state’s</p> <p>Utilize post-training reinforcement of ideas</p>	<p>Practically applicable</p> <p>Clear objectives that are intrinsically motivating to participants</p> <p>Goal of the training should be communicated to participants</p> <p>Offer trainings for technical, nontechnical skills, and that go beyond just one technology</p> <p>Align certified skills with employer-recognized skill standards</p>	<p>Assesses success of training based on outcomes: job placement rates, improvements in wages and benefits, productivity</p> <p>Certify skills through testing</p>



What we Found

High-level Findings from Utility Programs

Utilities and State EE efforts range in the goals and metrics tracked for their workforce development programs.

Two programs stood out

- NYSERDA's Workforce Development Industry Partner Initiative
- ComEd's Diverse EE Service Provider Incubator.

Both programs track the impact of training on energy use and build strong community ties. ComEd is exemplary in its diversity goals and achievements.

A note on metrics...

We have cataloged the metrics that each organization tracks for their workforce development programs. **These metrics** help the organizations prove they are reaching their goals.

EACH GOAL SHOULD BE OPERATIONALIZED THROUGH A TRACKED METRIC.

Metrics Tracked

METRIC	UTILITIES WHO TRACK	CT	NYSERDA	COMED
Demographic information	11		X	X
Completion of program*	10	X	X	X
Employment post training	10		X	X
Enrolled participants*	9	X		X
Community partnerships	7		X	X
Career/position at start of training*	6	X		X
Certifications*	5	X	X	X
DBE contracts	4			X
Impact of training on energy use	4		X	X
Number of trainings/hours in training	4	X		
Quality of Work	2			
Additional professional development	1			
Trainers trained	1		X	
Participating small business revenue growth	1			X
Track energy savings	0			

*Metrics that CT and/or NYSERDA and ComEd track

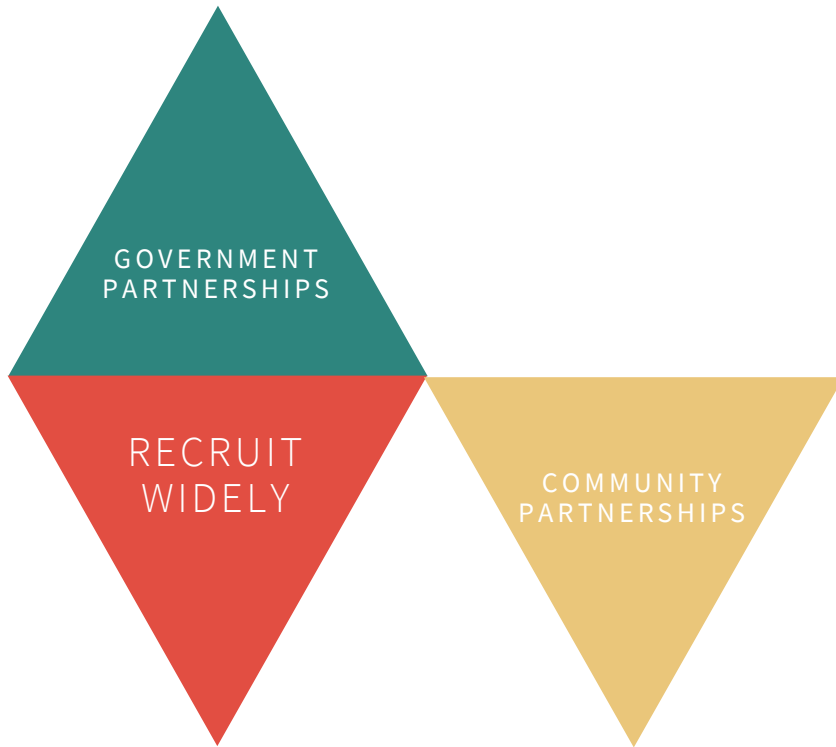
What is CT doing?

The Companies spoke with contractors to learn about where they needed trainings. They **took contractor needs into consideration** when creating the trainings for the 2019 – 2021 plan.

We found that generally the trainings in CT collect five of the 15 metrics, **they were not consistently tracked.**

CT, like many of the programs we reviewed, **does not track follow-up information** that can allow for monitoring training success.

CT Achievement of Best Practices



POST TRAINING DATA

Tracking progress/effect of training – how many get a new job, how many get a promotion, how many get a raise



DIVERSITY

Diversity should be a goal of the program and diversity indicators should be tracked



COMMUNITY PARTNERSHIPS

Work with the community and agencies within the community



REGIONAL NEEDS

Systematically review the labor market to know what positions need to be created. Learn about how the community can be best served (i.e. language, resources)



RECRUIT WIDELY

Broaden recruitment efforts (BOTH students/high schools AND existing contractors)



GOVERNMENT PARTNERSHIPS

Work with local and state governments as a partner to achieve their policy goals

Case Study: NYSERDA Training Industry Partnerships



✓ POST TRAINING DATA
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✓ RECRUIT WIDELY
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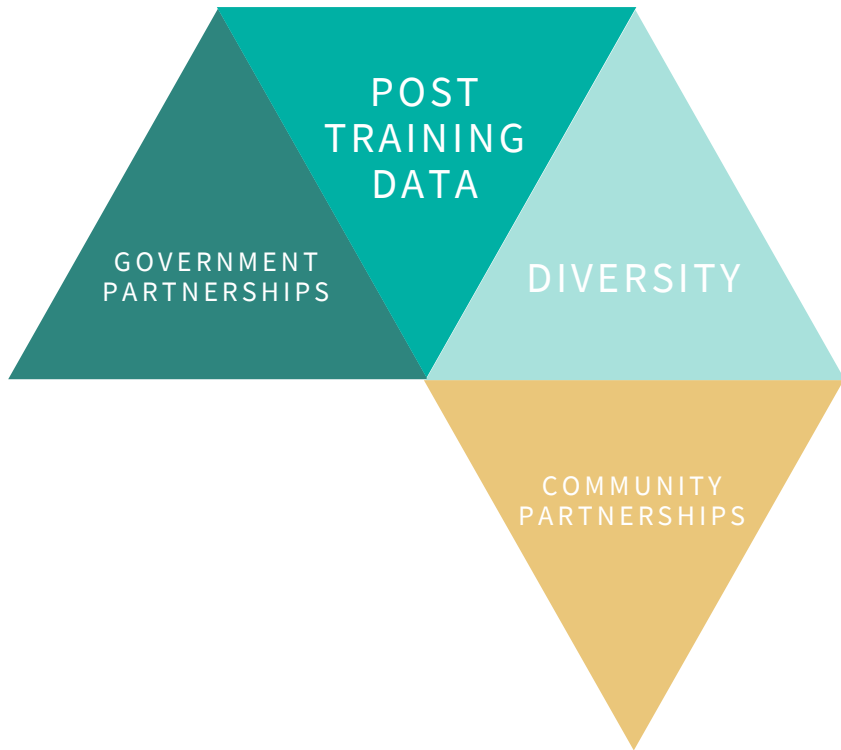
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Work with local and state governments as a partner to achieve their policy goals

Case Study: ComEd Diverse Energy Efficiency

Service Provider Incubator



✓ POST TRAINING DATA ✓

Tracking progress/effect of training – how many get a new job, how many get a promotion, how many get a raise

✓ COMMUNITY PARTNERSHIPS ✓

Work with the community and agencies within the community

✓ RECRUIT WIDELY ✓

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✓ DIVERSITY ✓

Diversity should be a goal of the program and diversity indicators should be tracked

✓ REGIONAL NEEDS ✓

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✓ GOVERNMENT PARTNERSHIPS ✓

Work with local and state governments as a partner to achieve their policy goals

Workforce Development Recommendations

RECOMMENDATION

IMPLEMENTATION CONSIDERATIONS

Develop metrics to accurately track progress towards goals

Tracking the effects of trainings could include measuring:

- Job placement rates
- Salary post training
- Jobs completed

Eventually, create trackable metrics by goal

Codify tracking standards

Consistently track metrics across programs.

Provide training partners or trainers with a standard data collection template.

Conduct study on energy efficiency labor market in Connecticut

Program implementers may want to consider conducting annual “pulse” interviews with program actors/trade allies to learn

- Where are there holes in the labor market,
- Where there is labor demand,
- What the existing labor supply is,
- Which groups are underrepresented and what they need to participate,
- What barriers exist to participate in trainings.

Increase diversity of participants within trainings

Add goals to the program to start actively recruiting businesses and/or trainees who are underrepresented in the industry.

BMP Recommendations for Project Submittals (Workforce Development Example)

Utility Requires the following for each program that is proposed for possible funding:

- Clear statement of program goals and how goals are related to utility program goals.
- Look for: design, deliverables, and tracking related back to goals

Vendors should provide information on:

- Expected number of sessions
- Description of content
- Trainer qualifications

Evaluability:

- Specific tracking metrics that will be collected and how they relate to / reflect the training goals, and to the overarching goals.
- How vendor will track / gather data on each metric.
- How vendor will value metrics, assess success of the training, and report back to the utilities.

Extra scoring point will be awarded for programs that use strategies such as:

- Feedback
- Community partnerships
- Ensure diverse recruitment practices
- Evidence of market knowledge

A close-up photograph of a hand holding a silver pen, poised to write on a notebook. The notebook is open, and the page is blank. The lighting is soft and focused on the hand and pen. A semi-transparent dark grey horizontal band is overlaid across the middle of the image, containing the word "EDUCATION" in white, uppercase, sans-serif font.

EDUCATION

What we did

19

PROGRAMS
REVIEWED

Programs with an energy
education focus

18

OTHER PROGRAMS
REVIEWED

On energy systems
management and
benchmarking in schools,
recycling, and behavioral
programs on health and
finance

18

PAPERS,
PRESENTATIONS,
AND EVALUATIONS

From ACEEE, BECC,
academic papers, and utility
and utility administrator
sites

2

INTERVIEWS
WITH SMES

Of ILLUME staff with recent
experience researching and
evaluating utility education
programs

Where we looked



Two Focuses of Education Program

K-12
classroom
education

eeSmarts



Job training for
High School
students

GreenSTEP



TECHNICAL HIGH SCHOOL TRAINING:
GreenSTEP

What we found

High level findings

High-school – job training programs

- Some programs offer incentives to participate, such as **apprenticeships, paid internships, or college credit.**
- Programs collaborate with industry employers to design **career training for in-demand careers**, and to represent the employers at **career fairs**, promoting the option of entering a trade career.
- Successful programs lead to various measurable outcomes, including **taking certification tests, doing further training, or job placement.**
- It is often difficult to maintain contact with students for follow up after trainings.



What is CT doing?

Educate the Students: GreenSTEP



GreenSTEP:

- Offers 8 different workshops for 17 technical high schools, with programming for each grade in the 4 years of high school
- Administered by CREC since August 2019
- 2,800 students participated in at least one workshop in the 2019/2020 academic year
- Organizes a career fair in grade 11 with employer panels, industry representatives, and more resources
- Promotes participation in the CT Science and Engineering Fair in grade 10

High School Program Best Practices

CURRICULUM CONTENT

Ensure the materials reflect the needs of the market and help students in the job market

Clearly communicate learning objectives

Ensure objectives are motivating to students

Focus on hands-on education to provide practical experience

TEACHER AND STAFF TRAINING

Provide teacher training to ensure more consistent content delivery

Provide career support to guide students before, during and after trainings

CAREER SKILLS

Provide general professional skills, such as teamwork, interpersonal communication, and time and work management

Create an internship program to provide on the job training

Emphasize how marketable certifications can strengthen academic and job applications

LABOR MARKET

Host job fairs and meet and greets with potential employers

Review the labor market by coordinating with current industry employers and update trainings as needed

Invest in the diversity of the students via targeted efforts to reach distressed communities

Align certifications exams with employer-recognized skill standards

EVALUABILITY

Retain contact information for graduates of the program

Track job placement and certification rates

Recommendations

What could CT programs start to do?

Low barrier
to implement

Increase
program
impact

Improve
evaluability



1. When safely possible, prioritize in-person learning for **hands-on field training**, to ensure that students learn practical and relevant skills that are applicable in the workforce.
2. Ramp up **data tracking standards** for future evaluations and program improvement opportunities. Focus on **certification pass/fail rates** and **post-high school contact information**
3. Partner on a **job placement or internship program** to incentivize high school upper classmen to continue with their training and be able to quantify jobs created directly because of the program. Pair skills training with teamwork, problem-solving, and interpersonal skills training for **career readiness**
4. Refine the **diversity and inclusion goal** of reaching distressed communities and build out a program target to show measurable impact to these students and teachers

Case Study: BGE Smart Energy Workforce Development

High school job training to Smart Energy interns to full time jobs

- BGE runs an **8-week summer internship program** that offers eligible participants **Utility Trainee** positions after high school graduation.
 - Participants include juniors and seniors from vocational technical high schools interested in trades that include automotive technology, carpentry, computer-aided design, construction, electrical, engineering, and plumbing.
- Pre- and post-program support includes **professional readiness** and **team building skills** before the internship, and a **free test prep course for the mandatory Construction and Skilled Trades test (CAST)** after the internship, through a partnership with the South Baltimore Learning Center. During the **paid internship**, transportation is provided for students via chartered transportation of bus passes.
- The program shows success based on **placement in full time jobs**. Between 2016 and 2020 there have been **180 students in the program**, and **15 hires of former interns at the utility**.

BMP Recommendations for Project Submittals (Technical High School Example)

Utility Requires the following for each program that is proposed for possible funding:

- Clear statement of program goals and how these goals relate to utility program goals.
- Look for: design, deliverables, and tracking related back to goals

Vendors should provide information on:

- Expected number of graduates
- Description of content
- Trainer qualifications

Evaluability:

- Specific tracking metrics that will be collected and how they relate to / reflect the training goals, and to the overarching goals.
- How vendor will track / gather data on each metric.
- How vendor will value metrics, assess success of the training, and report back to the utilities.

Extra scoring point will be awarded for programs that use strategies such as:

- Champion at the school or school district
- Connections with future employers (job fairs; internships; etc.)
- Evidence of market knowledge
- Linkage of training to certifications or needed skills in the market

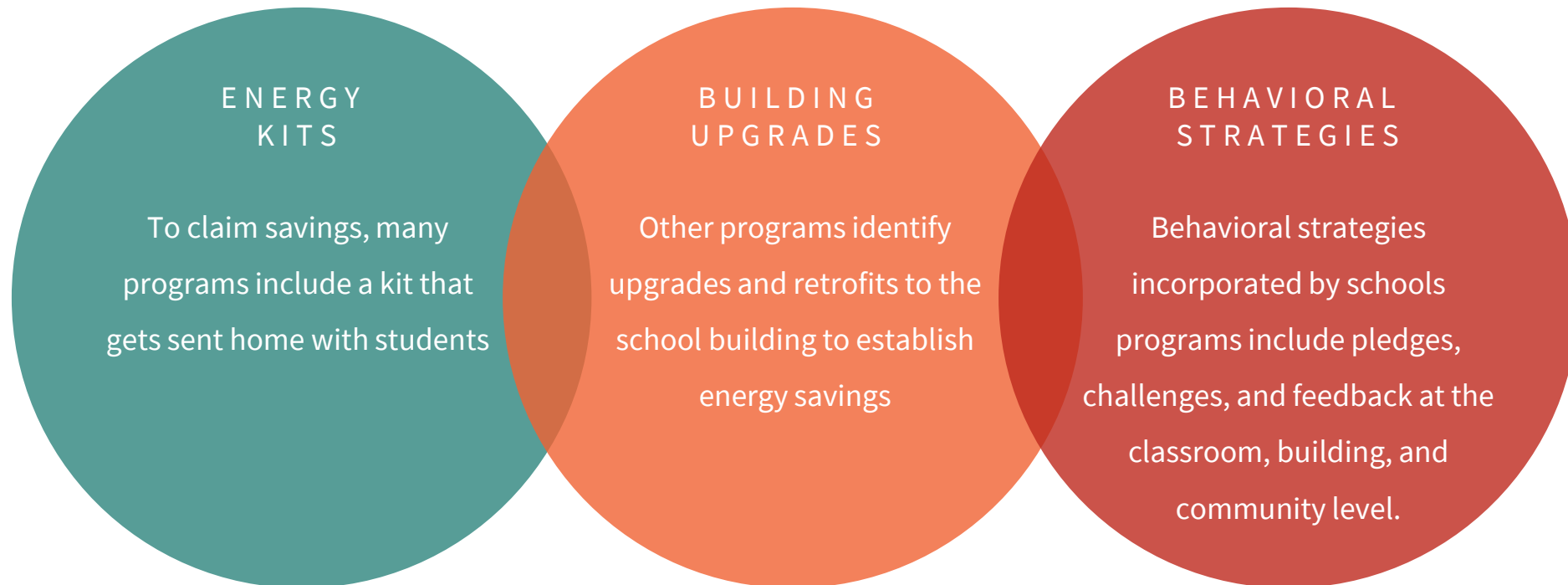
What we found

High level findings

K-12 Education

- The majority of education programs that claim savings do so through a kit component that gets sent home with students.
- Some programs leverage school infrastructure and opportunities to connect classroom learnings with building operations, whether through energy audits, conservation challenges, or renewables.
- Professional development is frequently a component; 6 programs we reviewed include PD as a primary component.
- Programs incorporate a variety of behavioral strategies, including pledge forms and challenges to encourage behavior change outside schools.
- Successful programs often incorporate custodial staff, administrators, as well as teachers and students
- There is some evidence that students score higher on math and science tests after focusing on math and science in energy lessons

K-12 Education Program Components Tied to Energy Savings



Many programs integrate curriculum around energy and energy efficiency alongside these strategies. Currently, the CT eeSmarts program does not incorporate these strategies



Behavior Change Strategies in Schools Programs

Building-level:

- School/classroom challenges
- Teacher/Student pledges
- Energy feedback at classroom or building level
- Awards/honors

School-to-home:

- Pledges (energy conservation)

Community:

- Challenges
- Pledges
- Awards/honors

Goals of eeSmarts

The primary goal of eesmarts is to **facilitate students' understanding of energy-efficient technologies**, the difference between renewable and non-renewable energy sources, and how electricity is generated, transmitted, and distributed to residential and C&I buildings across the electric grid.

Other priority objectives of the eesmarts Platform include:

- To engage municipal officials, educators, administrators, and facilities personnel to work toward more energy-efficient and sustainable schools;
- To expand outreach and ensure the equitable distribution of energy education resources statewide, especially to urban and hard-to-reach communities;
- To facilitate collaboration and connections among educators and energy and environmental advocates; and
- To inspire students (K-12 and higher education) to be agents of change in their schools, colleges, universities, and communities and to promote energy efficiency and its positive effects on protecting our environment.

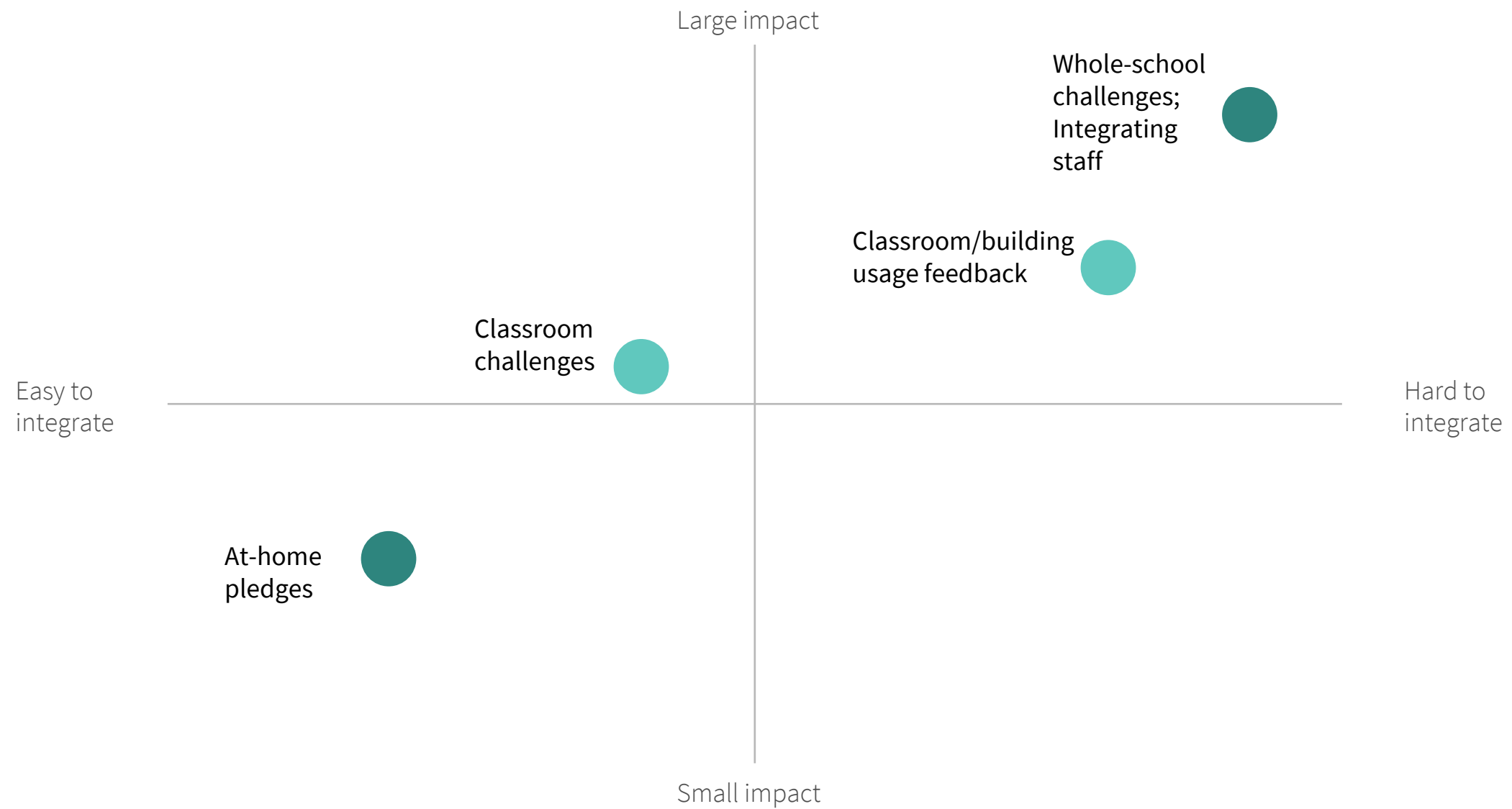
What is CT doing?

Educate the Students: eeSmarts

eeSmarts:

- Bright Kids, administered by the National Energy Foundation, is an energy efficiency and safety education program for grades K-3:
 - 25 presentations to 1,115 students in 10 schools in 2019
 - 44 presentations to 1,162 students in 13 schools in 2020
- The Energized Guyz: Powered Up assembly program on energy efficiency for grades 4 and 5, administered by the National Theatre for Children:
 - 25 presentations to 3,396 students in 25 schools in 2019
- Professional development workshops for teachers during February, July (Summer Institute), or November breaks:
 - 163 participants in 2019, and 251 participants in 2020
- Materials for teachers for classroom lessons, videos, and hands on activities available on Schoolology
- However, there are gaps in tracking data throughout the program lifecycle

Potential impact of behavioral strategies



Recommendations

What could CT programs start to do?

1. Ramp up **data tracking standards** for future evaluations and program improvement opportunities
 - Prioritize collection of better **contact information** for participating teachers and parents/families of students, potentially via postcards included with energy kits
 - Track the **lifecycle of each program** component, from outreach to teacher requests to completed requests to feedback
2. Continue with **multiple training approaches** for students including assemblies and in-classroom learning
 - Provide more take home materials to emphasize **energy concepts at home** and involve parents and families in the curriculum
 - Create materials for ongoing goals to **lengthen the curriculum** and window of opportunity for energy savings and efficiency education
3. Where possible, support **collaboration between teachers, students, administrators, and custodial staff**
4. Refine the **diversity and inclusion goal** of reaching distressed communities and build out program targets to show measurable impact
5. Incentivize energy saving behaviors while fostering **community level awareness** with public pledges, regular challenges, and motivational feedback for participants



Case Study: Wisconsin KEEP

Began with a focus on teacher education and expanded over time

Curriculum and resources + Professional Development + Take home energy audit kit + School building/facilities energy efficiency

More than 7,300 teachers have participated in KEEP courses and workshops since 1997.

Professional Development:

- The 10 professional development courses qualify for teachers' continuing education credits
- Up to 70% of the tuition is subsidized by Wisconsin utilities.

Curriculum resources:

- KEEP's activity guides align to the Common Core and Next Generation Science Standards.

Connecting school-to-home:

- Creation of a full-time school to home energy education specialist position. A
- Home energy activity pledge form: asks students to confirm what energy efficiency activities they might already do in their home and ask families to make pledges of additional energy conservation.



Case Study: Wisconsin KEEP

Results

2015-2016 pre- and post-teacher workshop survey results revealed that:

- Teachers were **using conservation behaviors** they had learned in their own homes. They were also visiting their utility provider's website and Focus on Energy's website to increase their own knowledge.
- Teachers became **proponents of the energy curriculum**, agreeing more strongly that energy should be included in the curriculum and encouraging colleagues to teach about energy.
- Teachers reported that the courses were effective in that they were confident teaching the energy curriculum.

A DNV KEMA evaluation of the School to Home program estimated that:

- Installation of the devices in the kits **saved 45 MWh of energy**.
- The program led to **increased participation in other utility programs** such as home energy audits, rebates, and pilot rates.



Case Study: ASE PowerSave Schools

Engage student leadership and save energy in schools

The program model is to **recruit two teachers to train a team of students to do an energy audit at the school and work with administration and schools staff to make behavioral changes or building upgrades.** The emphasis is on **hands-on projects** and integrating energy efficiency into science and math lessons. Teachers are provided with classroom lessons and students learn how to analyze data, calculate potential energy and cost savings, and present findings. Student leaders make **energy efficiency recommendations that become action plans** for their schools, like insulating pipes in overheated classrooms, and replacing appliances and lightbulbs.

The program also promotes **community outreach events** to share accomplishments with families and the wider community, as well as career activities like speaker presentations and research projects for students to explore green careers.

Average program savings are measured through school utility manager software, and **range from 5-15% in the first year, 10-20% in the second year,** compared to a predicted baseline use (counterfactual).

In the 2011-2012 school year, **65 schools saved more than 3 GWh of energy,** equivalent to more than \$500,000. 50% of the financial savings is returned to the school and 50% is returned to the district. However, an independent evaluation of PSP programs in two school districts in one Northeastern state, the team found **no significant improvements in overall energy conservation**

General K – 12 Best Practices

CURRICULUM CONTENT

Content should be interactive, with hands-on participation, relevant to the learning objectives, and age-appropriate.

Within lessons, provide opportunities to review and reinforce content.

Integrating with Common Core or NGSS may improve students' grades in their regular courses.

Provide follow-up activities to offer opportunities to reinforce learning.

TEACHER TRAINING

Investing in teacher training increases consistency of content delivery

Offering continuing education credits to teachers can provide support for their professional development.

SCHOOL COMMUNITY

Collaboration between teachers, students, administration, and custodial staff is linked to evaluable energy savings.

Where possible, integrating energy staff and energy management systems.

Successful programs have a champion at the school or district level

Building a team of teachers, administrators, and staff encourages community support and public commitment to achieving savings

SCHOOL -TO - HOME CONNECTION

Evaluable home energy savings are driven by promoting a school to home connection

Family energy savings and feedback can be managed via opt-in postcards included in home energy kits sent home to parents

FEEDBACK, METRICS, EVALUABILITY

Family energy savings and feedback can be managed via opt-in postcards included in home energy kits sent home to parents

Commitments and pledges go hand in hand with rewards and recognition, creating a positive feedback loop

Progress reports and other forms of data and feedback encourage program momentum.

BMP Recommendations for Project Submittal (K-12 Education Example)

Utility Requires the following for each program that is proposed for possible funding:

- Clear statement of program goals and how these goals related to utility program goals.
- Look for: design, deliverables, and tracking related back to goals

Vendors should provide information on:

- Expected curriculum content including lesson materials
- Approach to reaching hard to reach schools and communities
- Integration of the entire school staff, including administrators, teachers, custodial staff, and others.

Evaluability:

- Specific tracking metrics that will be collected and how they relate to / reflect the training goals, and to the overarching goals.
- How vendor will track / gather data on each metric.
- How vendor will value metrics, assess success of the training, and report back to the utilities.

Extra scoring point will be awarded for programs that use strategies such as:

- Feedback
- Champion at the school or school district
- At-home challenges to extend learning beyond the school
- Linkages with common core

Questions?

WE'VE GOT ANSWERS

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