



National Institute of
BUILDING SCIENCES



DOE Better Buildings Workforce Guidelines NIBS Commercial Workforce Credentialing Council

Update for Government Credentialing Network April 29, 2015

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Building Technologies Office - Delivering Energy-Efficient Solutions

Emerging Technologies

- High-impact building technologies
- ~Five years to market-ready

Residential Building Integration

- Cost-effective technologies, tools, solutions
- Peak energy performance in new & existing homes

Commercial Building Integration

- Cost-effective technologies, tools, solutions
- Peak energy performance in new & existing commercial buildings

Codes & Standards

- Building energy code language with adoption/compliance strategy
- National appliance & equipment standards



Better Buildings Workforce Program

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BETTER BUILDINGS WORKFORCE

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The Better Buildings Initiative is a broad, multi-strategy initiative to make commercial and industrial buildings 20% more energy efficient over the next 10 years. DOE is currently pursuing strategies across five pillars to catalyze change and accelerate private sector investment in energy efficiency.

The pillars are:

- Developing Innovative, Replicable Solutions with Market Leaders
- Making Energy Efficiency Investment Easier
- Improving Effectiveness of Federal Incentives
- Federal Government Leading by Example
- Developing a Skilled Clean Energy Workforce

A skilled and qualified workforce is key to making American buildings more energy efficient and American companies more competitive. DOE is working closely with the commercial buildings industry and other Federal agencies to develop training tools, materials, and voluntary credentialing guidelines to advance different elements of the [Better Buildings Workforce Framework](#).

Interested in aligning your program with Better Buildings Workforce Guidelines: [Download Job Task Analyses and Certification Schemes at the NIBS resources site](#)

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Current Projects

- » [Better Buildings Workforce Guidelines](#)
- » [Building Re-tuning Training](#)
- » [ANSI Energy Efficiency Standards Collaborative](#)
- » [Energy Performance-Based Acquisition Training](#)

Popular Resources

- » [Better Buildings Workforce Guidelines Fact Sheet](#)
- » [Building Re-tuning Case Study](#)
- » [Better Buildings Progress Report 2012](#)

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www.eere.energy.gov/workforce

National Institute of Building Sciences



Breaking Through Low-Vision Barriers | Expanding Mitigation Awareness

Journal of the National Institute of
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An Authoritative Source of Innovative Solutions for the Built Environment



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Commercial Workforce Credentialing Council

a council of the National Institute of Building Sciences

COMMUNITY SEARCH

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About the Council

The National Institute of Building Sciences (Institute) and the U.S. Department of Energy (DOE) have developed voluntary national guidelines, known as the *Better Buildings Workforce Guidelines (BBWG)*, to improve the quality and consistency of commercial building workforce credentials. The Institute established the Commercial Workforce Credentialing Council (CWCC) to lead development of those guidelines.

Improving the operational performance of commercial buildings requires highly skilled and qualified workers, particularly as building technologies become more advanced. Yet the lack of national guidelines for energy-related professional credentials represents a major barrier to the quality, consistency and scalability of this workforce. The *BBWG* will initially address commercial building workforce training and certification programs for four key energy-related jobs: building energy auditor, building commissioning professional, energy manager and building operations professional.

The purpose of the *BBWG* is to reduce the confusion and uncertainty around workforce credentialing; lower costs; and support better credentials, better workers and better buildings. The *BBWG* set an industry-validated Job Task Analysis (JTA) for each job title, as well as certification schemes (blueprints) and learning objectives for training programs. The *BBWG* are intended to benefit training and certification programs; employers and building owners/managers; governments and utility programs; and workers.

After a thorough and extensive process working with practitioners and stakeholder organizations, the Institute and DOE through the CWCC have completed the JTAs and credentialing scheme. The *Guidelines* are available for download and use under the [Resources](#) tab above.

Better Buildings Workforce Guidelines (BBWG)

The *Better Buildings Workforce Guidelines (BBWG)* including Job Task Analyses and credentialing schemes are now available. See the [CWCC Resources](#) section for more information.

Contact

Should you have any additional questions about the Commercial Workforce Credentialing Council, please contact:

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(202) 289-1092 Fax

For more information on the *BBWG* program, visit DOE [Better Buildings Workforce Guidelines](#).

LATEST NEWS

4/16/2016
SBIC Webinar to Look at History of Solar Energy

4/10/2016
National BIM Standard-United States® Version 3 Release Postponed

3/31/2016
National BIM Standard-United States® Version 3 to Roll out April 15

CALENDAR

4/28/2016
Introduction to Cybersecuring Building Control Systems Workshop (April)

4/28/2016
SBIC Webinar: Solar Energy from 6,000 Years Ago Until Today

4/30/2016
Advanced Cybersecuring Building Control Systems Workshop (April)

5/28/2016
Introduction to Cybersecuring Building Control Systems Workshop (May)

5/28/2016
Advanced Cybersecuring Building Control Systems Workshop (May)

Buildings Need to Perform Better

Buildings are one of the heaviest consumers of natural resources and account for a significant portion of the greenhouse gas emissions that affect climate change. In the U.S., buildings account for:

- 38% of all CO2 emissions¹²
- 73% of electricity consumption¹³
- Green buildings consume less energy. Compared to the average commercial building, the LEED Gold buildings in the General Services Administration's portfolio generally¹⁴:
 - Consume 25% less energy and 11% less water
 - Have 19% lower maintenance costs
 - 27% higher occupant satisfaction
 - 34% lower greenhouse gas emissions

Source: **Green Building Facts** published 17 Oct 2014 by **USGBC**

Growth in “Green” Building

- By 2015, an estimated 40-48% of new nonresidential construction by value will be green, equating to a \$120-145 billion opportunity¹
- U.S. respondents to a 2012 international survey projected that 58% of their building activities in 2015 would be green²
- More than 3.3 billion square feet of building space are LEED-certified (*as of October 17, 2014*)
- 41% of all nonresidential building starts in 2012 were green, as compared to 2% of all nonresidential building starts in 2005.³
- With energy efficiency financing having the potential to soar from \$20 to \$150 billion annually, over one million jobs could be created⁵
- Approximately 61% of all construction projects are retrofit projects²³.
- By 2015, the green share of the largest nonresidential retrofit and renovation activity will more than triple, growing to 25-33% of the activity by value—a \$14-18 billion opportunity in major construction projects alone²⁵.

Source: **Green Building Facts** published 17 Oct 2014 by **USGBC**

Energy Efficiency in Commercial Buildings

Commercial buildings have made significant progress in energy efficiency, with a particular focus on:

- Substantial retrofits to upgrade lighting, HVAC, and windows systems
- Advanced control strategies
- Energy efficient design of new buildings
- Encouraging use of more energy efficient electronic equipment

Commercial buildings may also:

- Have on-site facility managers who understand their role in daily energy management practices
- Have a commitment to improve sustainability
- Seek cost-effective methods for increased use of renewable energy

Value of Energy Management

- Energy efficiency improvements with very favorable payback periods often *do not get implemented* due to other operational priorities
- Energy efficiency projects that are implemented may *not be sustained* due to lack of supportive operational and maintenance practices
- Commissioning or re-commissioning new equipment or systems only addresses a *point in time*
- The only constant in the life of most commercial buildings is *change*
-personnel, space use and configuration, operating hours-

Problem: *Energy efficiency is not integrated into daily management practices.*

Solution: *Staff at all levels within an organization need to be engaged in the management of energy on an ongoing basis.*

Barriers to Improving EE

- **Patchwork of Technical Standards, Codes and Work Specifications**
 - Not incorporated into workforce programs
- **Lack of National Skill Standards for Emerging Energy-Related Jobs**
 - Need comprehensive Job Analyses based on clear technical standards
- **Nonaligned Training Content, Platforms, Programs**
 - Training not always based on a Job Analysis; not up to date with technology and best practices
 - Availability, cost, and quality are also concerns
- **No Infrastructure to Support National Credentials**
 - “Diaspora” of certificate and certification programs (some overlapping or duplicative)
- **Minimal Uptake of Accreditation Standards for Training and Certification Programs**
 - Lack of demand because value proposition is not compelling
- **Lack of Recognition of Quality Workforce Credentials**
 - Employers and policymakers have a difficult time identifying quality workers

Better Buildings Workforce Guidelines

WHAT:

- DOE and NIBS are engaging industry stakeholders to develop voluntary national guidelines for commercial building workforce training and certification programs
- Focus on five key energy-related jobs: **Building Energy Auditor, Building Commissioning Professional, Building Operations Professional, Energy Manager, and Facilities Manager** (focus on Government Facilities and FBPTA)
- Guidelines can be used by existing training and certification organizations to upgrade or modify their existing program offerings or to develop new program offerings.
- Neither DOE or NIBS are developing new training or certification programs through this project—we are engaging industry to develop the guidelines that private market providers will use as the benchmark for quality.

WHY:

- Improve quality and reduce confusion and uncertainty in commercial workforce credentialing programs
- Accelerate energy savings, carbon reductions, and clean energy job creation



Value Propositions

Workers

- Better credentials
- Clearer career paths

Employers

- Better workforce
- Increased customer demand
- Greater profits

Building Owners/Managers

- Confidence and trust in certified contractors
- Higher quality work
- Faster payback

EE Program Administrators or Regulators

- Increased demand for clean energy services
- Job creation
- Criteria to recognize credentials

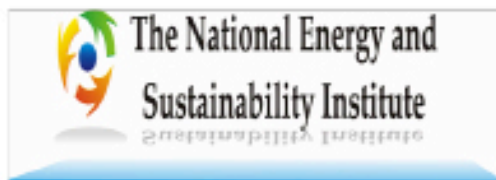
Training and Certification Programs

- Able to distinguish their programs as “Better Buildings” recognized
- Tool to increase demand for workforce credentials

Help Government and the Market Identify High Quality Training and Certification Programs



Certified



ENERGY STAR: From Confusion to Confidence

Which products demonstrate the top energy performance?

Define Performance

Voluntary ENERGY STAR performance specifications, developed with market input

Verify

Products tested by accredited third-party laboratory and reviewed by certification body

Recognize

ENERGY STAR= products benefit from consumer trust in energy performance



CONFUSION► CONFIDENCE

Better Buildings Workforce Guidelines

Who are the skilled and qualified workers in advanced energy occupations?

Define Skills

Voluntary **Better Buildings Workforce Guidelines**, defined by industry and government

Verify

Third-party accreditation of certification or training programs

Recognize

DOE recognition of accredited programs= consumer trust in program quality and workforce performance

CONFUSION► CONFIDENCE

Framework for a Better Buildings Workforce

Technical Standards	Skills Standards	Curricula & Training	Industry-Recognized Certifications	Third-Party Accreditation	Driving Market Demand
Standards, codes, and specifications defining safe, durable, high-quality work	Define the job tasks and the knowledge, skills & abilities workers need to perform them well	Built on clear learning objectives and aligned with technical and skills standards	National, industry & government recognized certifications built on common blueprints when appropriate	Evaluation of program quality and alignment with industry-recognized content	Policy mechanisms and recognition of accredited workforce credentialing programs

Program Area Goal: Support a high-quality commercial buildings workforce

Path to Better Buildings Workforce Guidelines




Voluntary guidelines for industry-delivered Better Buildings Workforce credentials




Five Better Buildings Workforce Job Titles

Project Scope	
Job Titles	Job Descriptions
Building Energy Auditor	The Commercial Building Energy Auditor is an energy solutions professional who assesses building systems and site conditions, analyzes and evaluates equipment and energy usage, and recommends strategies to optimize building resource utilization.
Building Commissioning Professional	The Building Commissioning (Cx) Professional is an individual who leads, plans, coordinates and manages a commissioning team to implement commissioning processes in new and existing buildings.
Energy Manager	An Energy Manager is responsible for managing and continually improving energy performance in commercial buildings by establishing and maintaining an energy program management system that supports the mission and goals of the organization.
Building Operations Professional	The Building Operations Professional manages the maintenance and operation of building systems and installed equipment, and performs general maintenance to maintain the building's operability, optimize building performance, and ensure the comfort, productivity and safety of the building occupants.
Facility Manager (FBPTA focus)	Manages, monitors and coordinates facility operations and supervises and communicates with staff to ensure efficient, sustainable operations and the satisfaction of the facility occupants. Federal Buildings Personnel Training Act ~50,000 Government; ~100,000 Contractors ~ \$31 billion dollars in Federal Facilities O&M Costs

BBWG Materials on CWCC



Commercial Workforce Credentialing Council
a council of the National Institute of Building Sciences



Resources



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Better Buildings Workforce Guidelines (BBWG)


The U.S. Department of Energy (DOE) and the National Institute of Building Sciences (Institute) through its Commercial Workforce Credentialing Council (CWCC) have worked with industry stakeholders to develop voluntary national guidelines aimed at improving the quality and consistency of commercial building workforce credentials for four key energy-related jobs.



Job Titles	Job Descriptions
Building Energy Auditor	The Commercial Building Energy Auditor is an energy solutions professional who assesses building systems and site conditions; analyzes and evaluates equipment and energy usage; and recommends strategies to optimize building resource utilization.
Building Commissioning Professional	The Building Commissioning (Cx) Professional is an individual who leads, plans, coordinates and manages a commissioning team to implement commissioning processes in new and existing buildings.
Energy Manager	An Energy Manager is responsible for managing and continually improving energy performance in commercial buildings by establishing and maintaining an energy program management system that supports the mission and goals of the organization.
Building Operations Professional	The Building Operations Professional manages the maintenance and operation of building systems and installed equipment, and performs general maintenance to maintain the building's operability, optimize building performance, and ensure the comfort, productivity and safety of the building occupants.

To gain access to the Job Task Analyses for each position, related supporting materials and information about the CWCC and the process used to create the Job Task Analyses, you must register and accept the Terms of Use that follow.





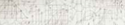

Job Task Analysis Building Energy Auditor
November 2013 - December 2014





Job Task Analysis Building Energy Manager
November 2013 - December 2014






Better Building Workforce Guidelines (BBWG) Scheme



January 12, 2015





Job Task Analysis Building Commissioning Professional
November 2013 - December 2014



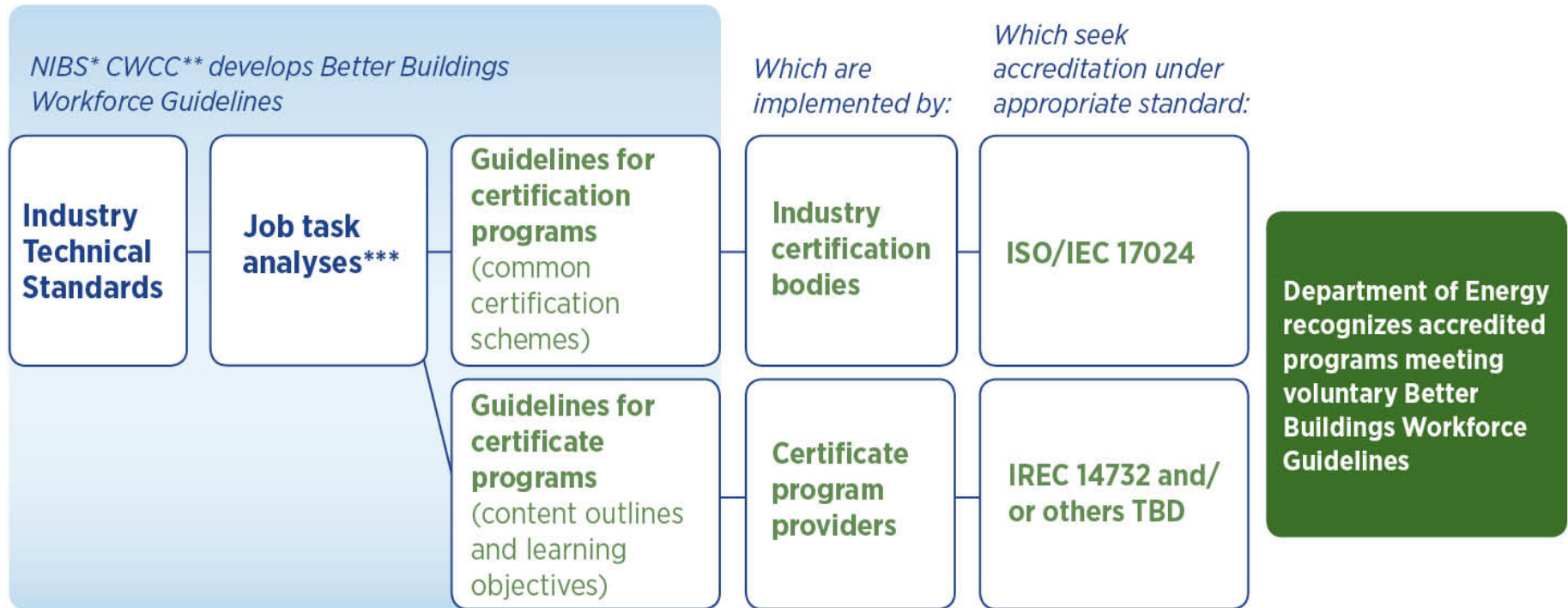



Job Task Analysis Building Operations Professional
November 2013 - December 2014



Better Buildings Workforce Guidelines

A Government and Industry Partnership to Advance Commercial Workforce Quality



*National Institute of Building Sciences

**Commercial Workforce Credentialing Council

*** Building Energy Auditor; Building Commissioning Professional; Energy Manager; Building Operations Professional; Facility Manager (Government and FBPTA focus)

BBWG – A DOE Recognized Program



RECOGNIZED PROGRAM

MEETS U.S. DEPARTMENT
OF ENERGY GUIDELINES

Criteria for recognition:

- 1) ANSI/IAS accredited per BBWG JTAs & schemes
- 2) Fill out online form with basic information on program on Workforce Partnership website

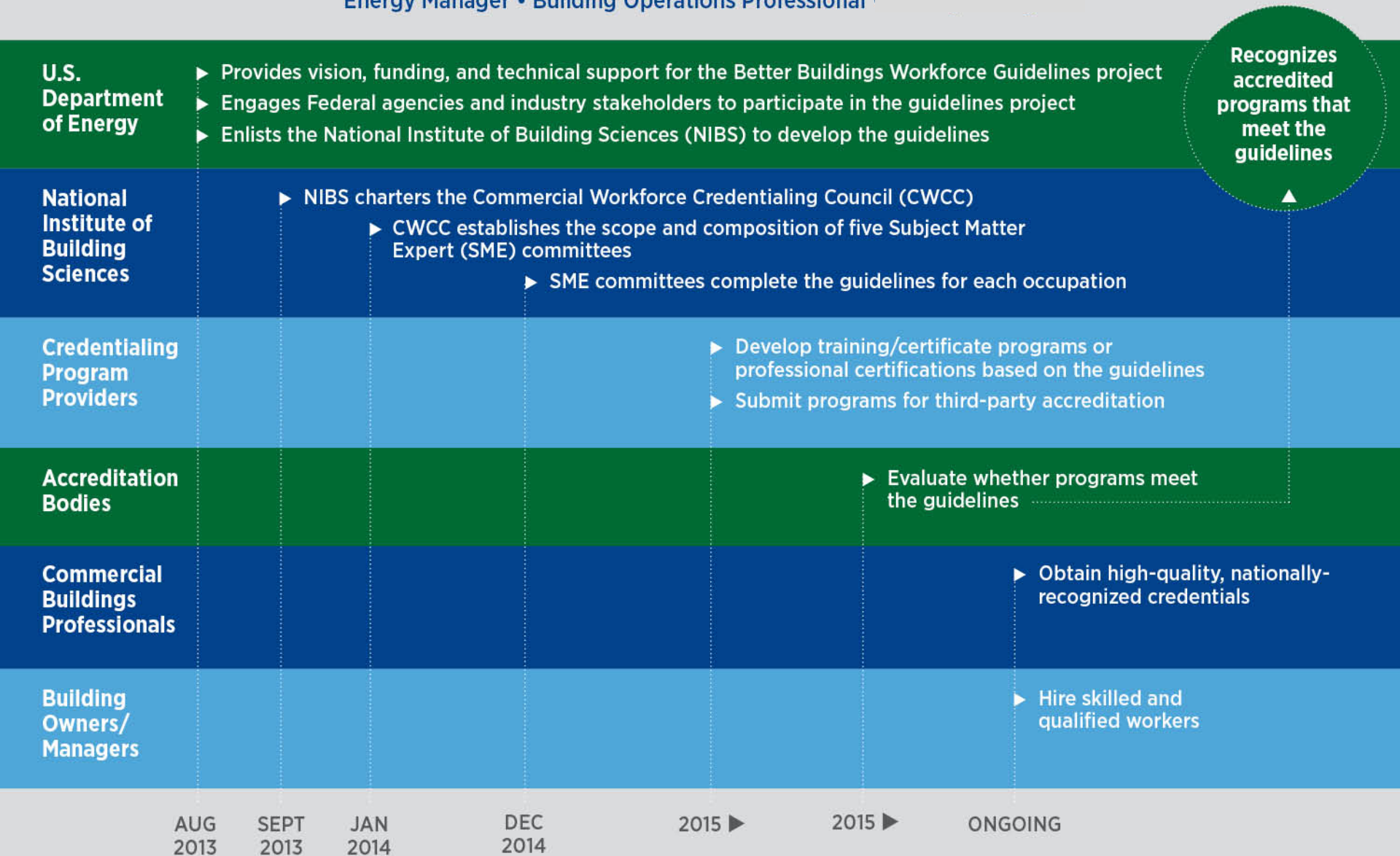
DOE recognition:

- 1) Provide logo and wording for use by certification bodies
- 2) List certification body on Workforce Partnership website
- 3) Recognize at Better Buildings Summit and in BB press release materials

Path to Better Buildings Workforce Guidelines

INITIAL JOB TITLES

Building Energy Auditor • Building Commissioning Professional
Energy Manager • Building Operations Professional



Additional Market Pull

City Energy Project: Audit and Commissioning Ordinances



Federal Buildings Personnel Training Act

Public Law 111-308
111th Congress

An Act

To provide for the training of Federal building personnel, and for other purposes.

Dec. 14, 2010
[S. 3250]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Federal Buildings Personnel Training Act of 2010”.

Federal
Buildings
Personnel
Training Act of
2010.
40 USC 581 note.

SEC. 2. TRAINING OF FEDERAL BUILDING PERSONNEL.

(a) IDENTIFICATION OF CORE COMPETENCIES.—Not later than 18 months after the date of enactment of this Act, and annually thereafter, the Administrator of General Services, in consultation with representatives of relevant professional societies, industry associations, and apprenticeship training providers, and after providing notice and an opportunity for comment, shall identify the

Deadlines.
Notice.
Comment period.



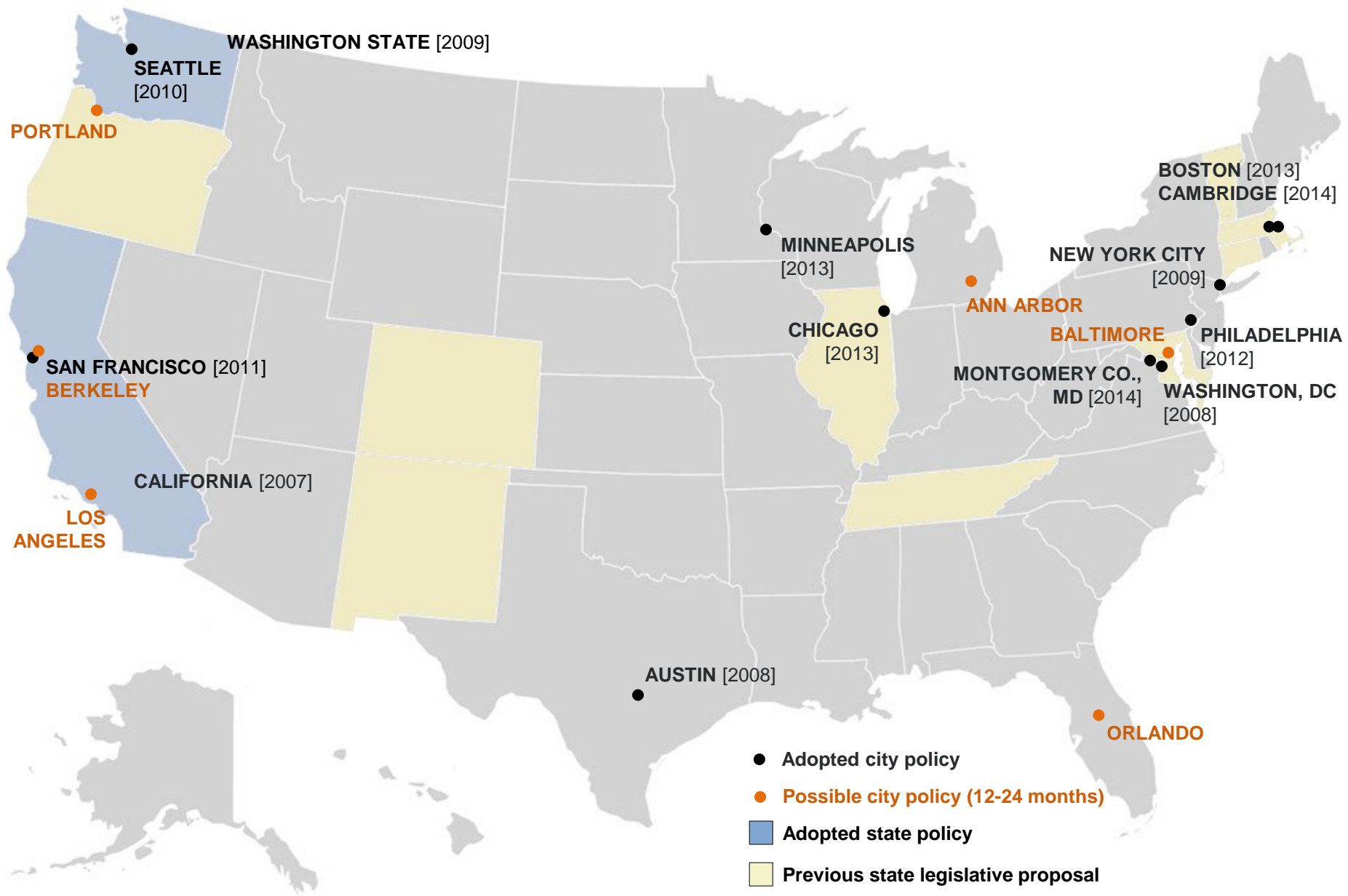
Employers, Building Owners,
Certification Programs and more

City Policies in brief

CITY/STATE	ADOPTED	BENCHMARKING		REPORTING AND DISCLOSURE			AUDIT AND UPGRADE	
		Comm	MF	To Local Gov't	Public Website	Deal	Audit/RCx	Upgrade
California	2007	5k SF+	-	✓	-	✓		
Austin	2008	10k SF+	5+ units	✓	-	✓	✓	✓
DC	2008	50k SF+	50k SF+	✓	✓	-		
Washington State	2009	10k SF+	-	-	-	✓		
New York City	2009	50k SF+	50k SF+	✓	✓	-	✓	
Seattle	2010	20k SF+	20k SF+	✓	-	✓		
San Francisco	2011	10k SF+	-	✓	✓	-	✓	
Philadelphia	2012	50k SF+	-	✓	✓	-		
Minneapolis	2013	50k SF+	-	✓	✓	-		
Boston	2013	35k SF+	35+ units	✓	✓	-	✓	
Chicago	2013	50k SF+	50k SF+	✓	✓	-		
Montgomery Co. MD	2014	50k SF+	-	✓	✓	-		
Cambridge	2014	25k SF+	50+ units	✓	✓			

Data courtesy
Institute for Market
Transformation





Skilled Trades & Energy Efficiency

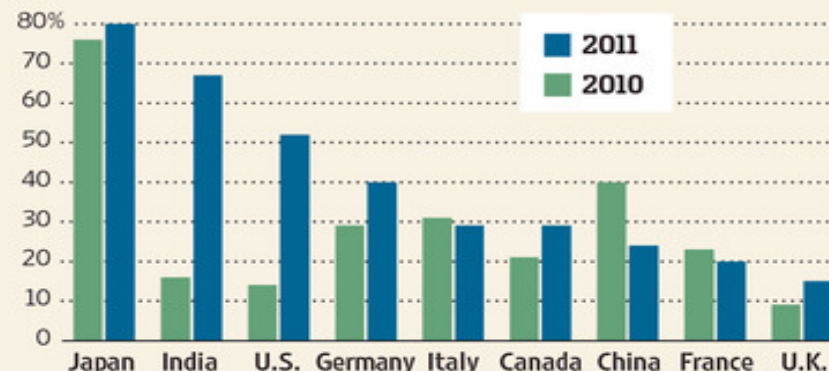
- US EE & RE Firms: mismatch of skills of available workers, exacerbated by retirements
- President's Jobs Council: "Lack of alignment between what employers need and what skills are taught and delivered is becoming a critical problem for business and the nation."
[2011 Year End Report, p. 13]
- U.S. higher education system not producing skilled workers

Energy-related job categories particularly lacking skilled workers

- ***CEWD—Utility Sector***
- ***EE and RE Sector***

Where Jobs Go Wanting

Percentage of employers reporting difficulty filling positions by country, 2010 vs. 2011



The Help That's Most Wanted

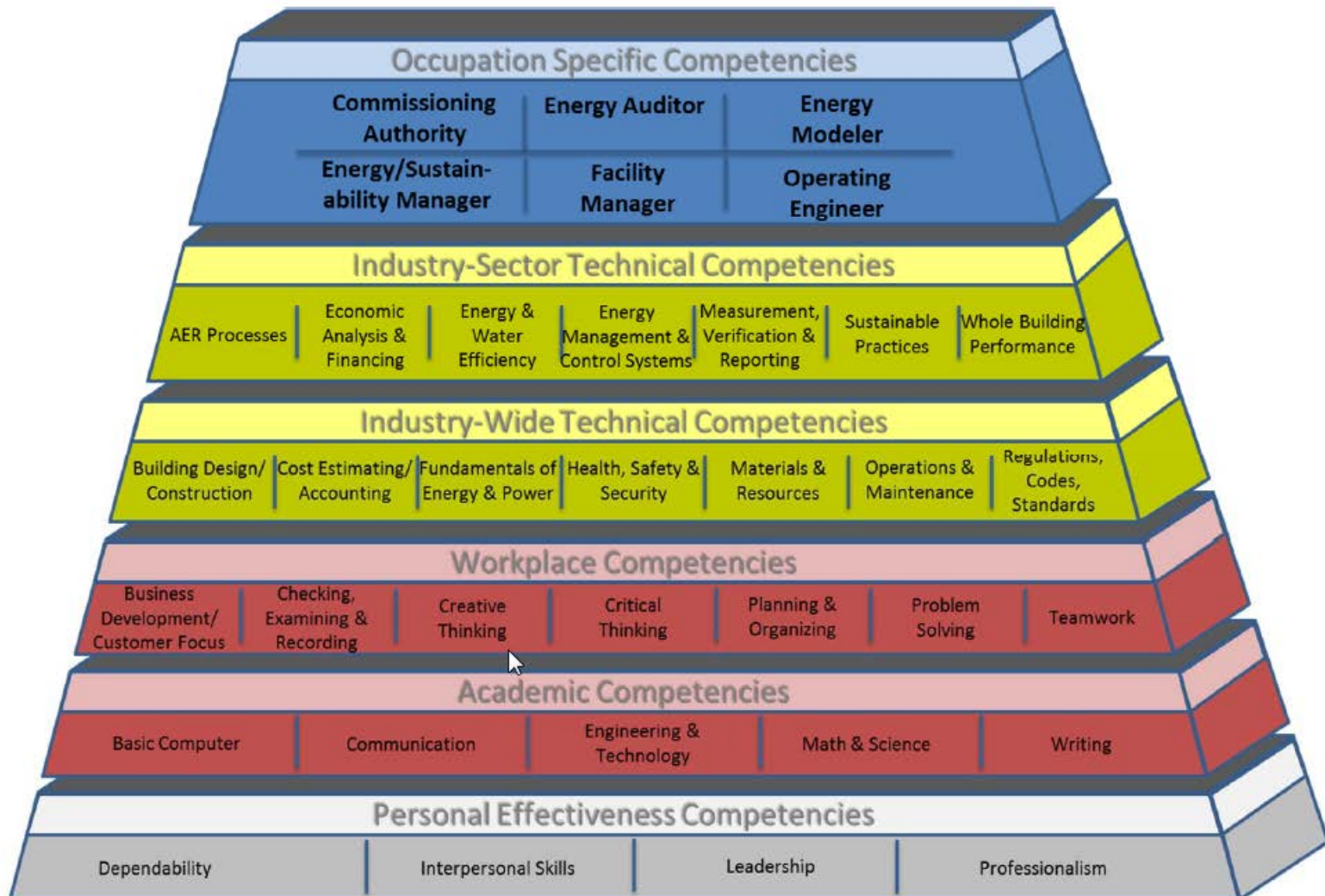
Hardest jobs for U.S. employers to fill

2011		2006	
1	Skilled trades	1	Sales representatives
2	Sales representatives	2	Engineers
3	Engineers	3	Nurses
4	Drivers	4	Technicians
5	Accounting & finance staff	5	Accountants
6	IT staff	6	Administrative assistants /personal assistants
7	Management/executives	7	Drivers
8	Teachers	8	Call-center operators
9	Secretaries/administrative assistants	9	Machinists
10	Machinists/machine operators	10	Management/executives

Source: ManpowerGroup

Energy Jobs Competency Model

Advanced Energy Retrofit Competency Model



Outreach Programs

- 1. Commercial Buildings Energy Efficiency Workforce Labor Market Analysis**
- 2. Curriculum Outlines and Learning Objectives**
- 3. Community College Program Development**
 - Mapping CO and LO to Course Modules and Competency Model**
- 4. Analysis of energy related training and certification programs in California**

Status and Rollout Plan



Completed

- License Agreement Finalized
- BB Logo & Guidelines Finalized
- DOE Recognition Criteria Finalized
- Revised BBWG Fact Sheet Finalized
- Post on NIB's website, DOE site updated
- DOE/NIBS press release



Next Steps

- Identify best path forward on BOP JTA
- Complete supporting materials for community colleges and identify best path forward on certificate program recognition
- Continued engagement with GSA and other federal agencies to include preferential language in contract
- Ongoing engagement with cities developing energy efficiency legislation



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Questions?

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