

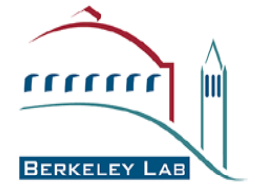


Energy Efficiency Services Sector: Workforce Size, Growth Expectations and Training Needs

Charles Goldman

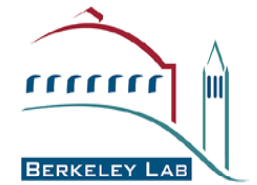
Lawrence Berkeley National Laboratory

Innovating in the Green Economy Conference
January 21, 2010



Study Motivation

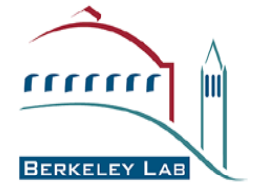
- Many States adopting aggressive energy efficiency policies and goals
 - Federal goals and support – ARRA funding & pending legislation
 - Energy efficiency expected to play a key role in meeting power sector needs & GHG emission reduction goals
- Policymakers: Will there be enough adequately trained people to design, manage, and install the energy efficiency projects needed to meet these goals?
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Research Questions

What are the requirements for an expanding energy efficiency services workforce through 2020?

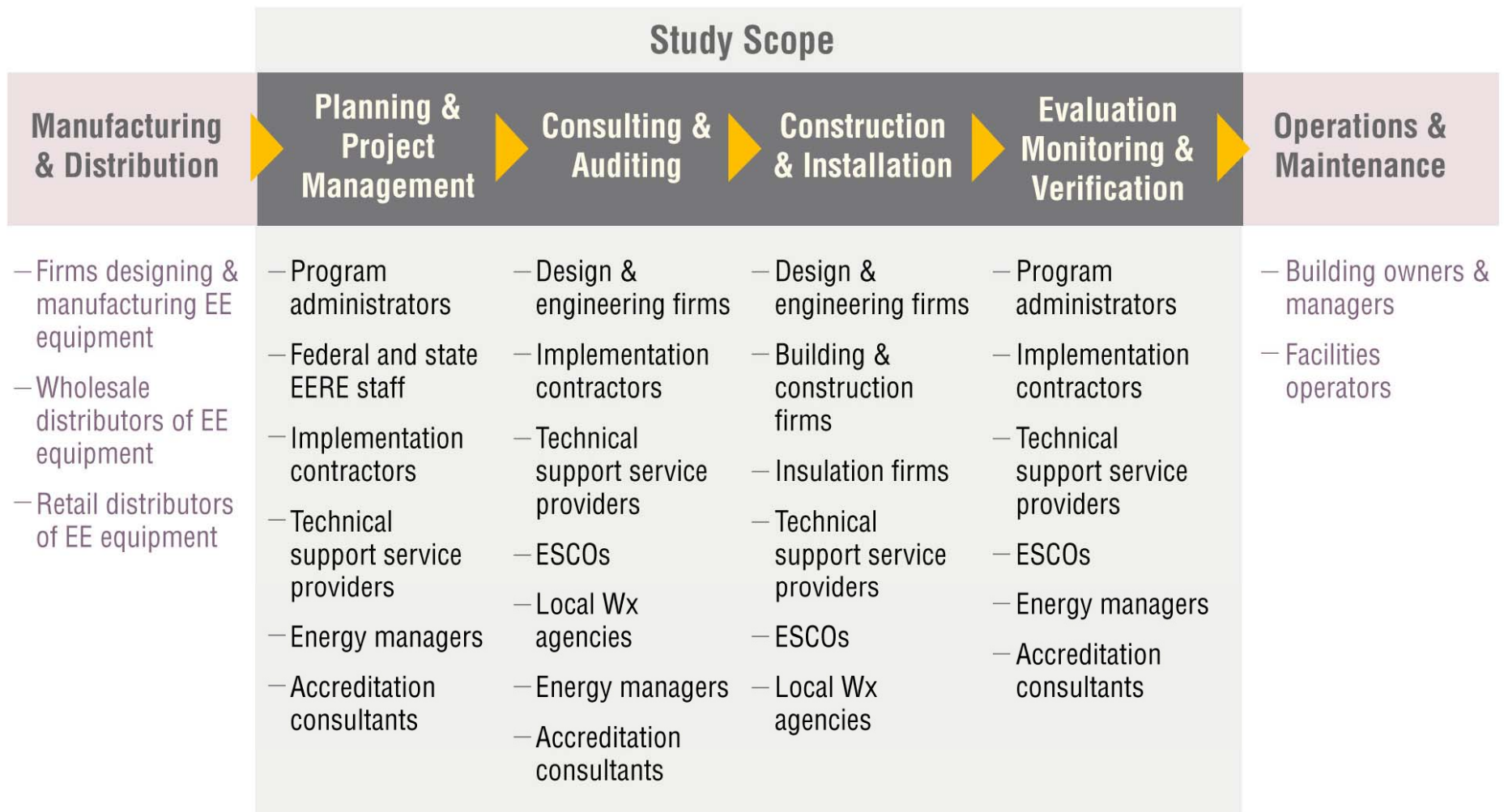
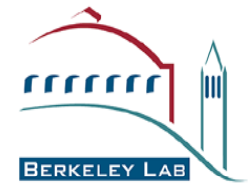
- Where are the energy efficiency services jobs?
 - What is the projected need for more workers?
 - What training will be required?
 - What bottlenecks to expanding the EESS workforce can we anticipate?
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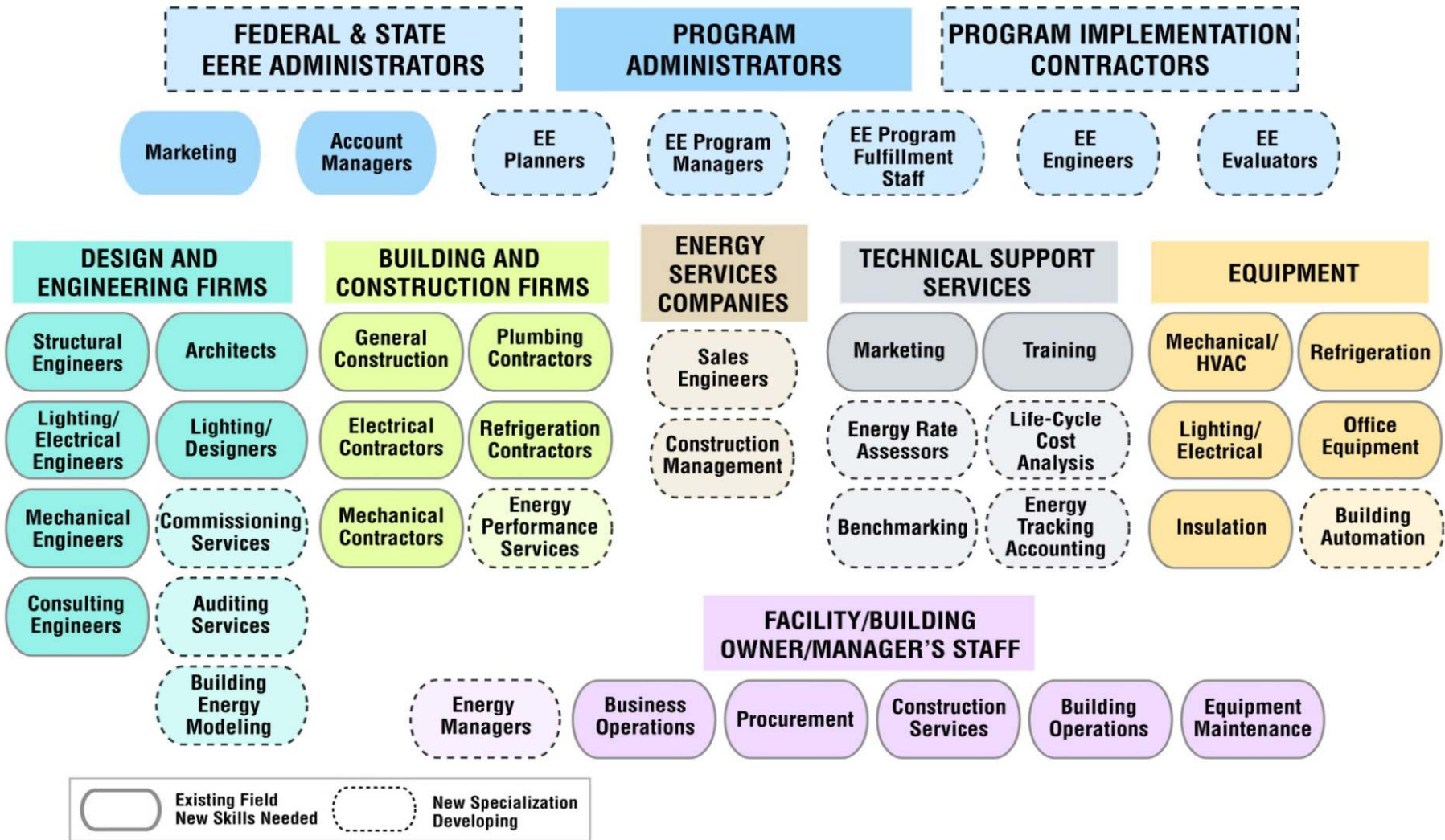
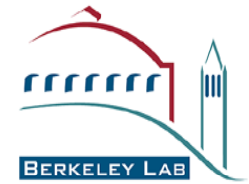
Approach

- **Over 350 interviews in 11 states**
 - Program administrators (n=39)
 - Program implementation contractors (n=34)
 - Energy service companies (ESCOs) (n=9)
 - Building & construction trades/associations/labor unions (n~190)
 - Educational and training organizations (n=33)
 - Other subject-area experts (n~50)
 - **Literature review**
 - **Coordination with N-CA, MA, and Pac NW studies**
 - **Secondary data**
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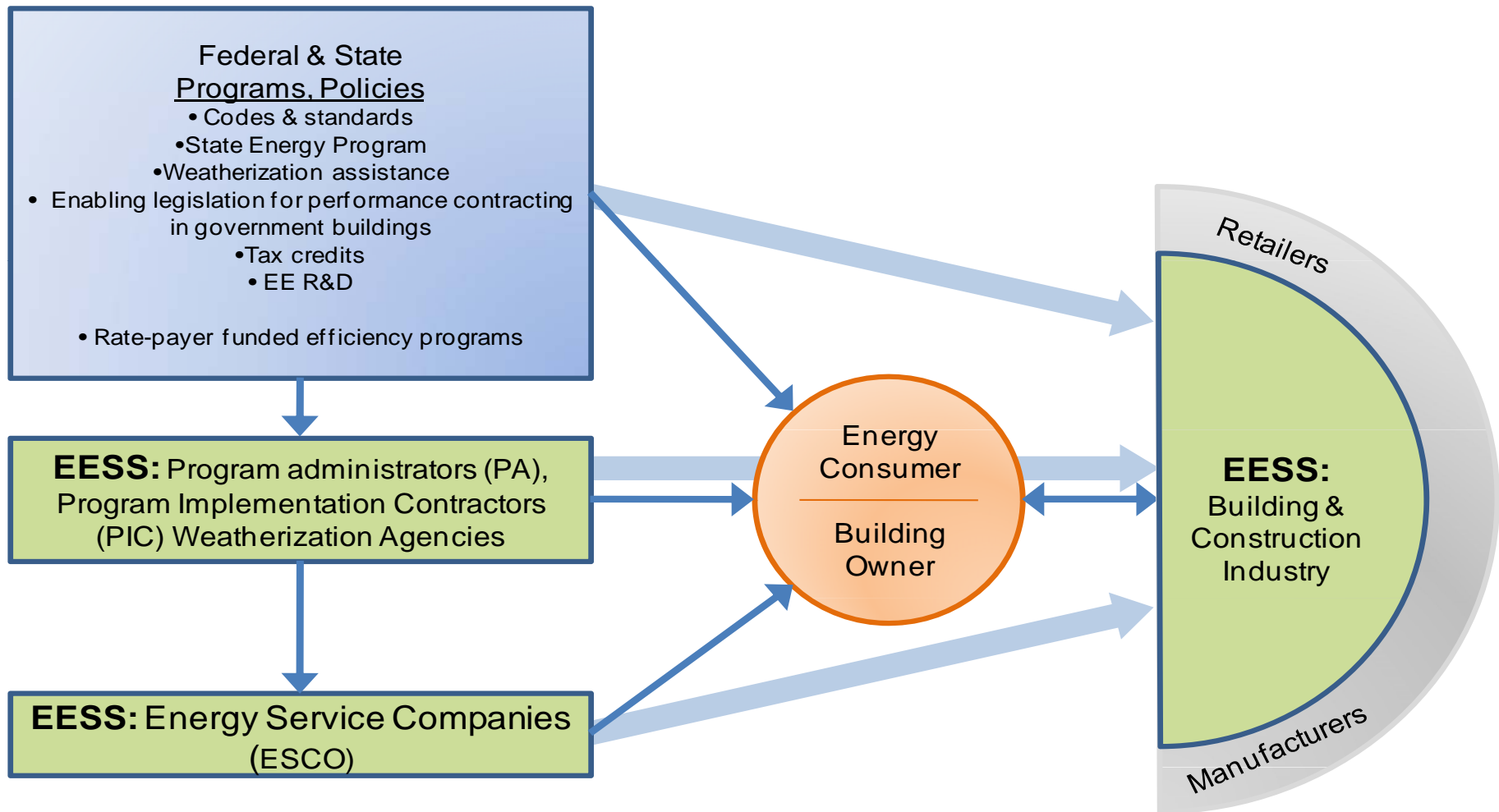
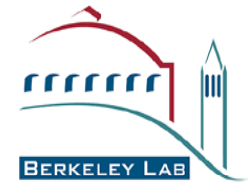
Energy Efficiency Market Value Chain: Types of Firms

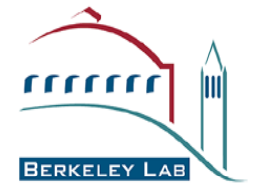


Characterizing the Energy Efficiency Services Sector



Key role of policies and programs





EESS Workforce Size

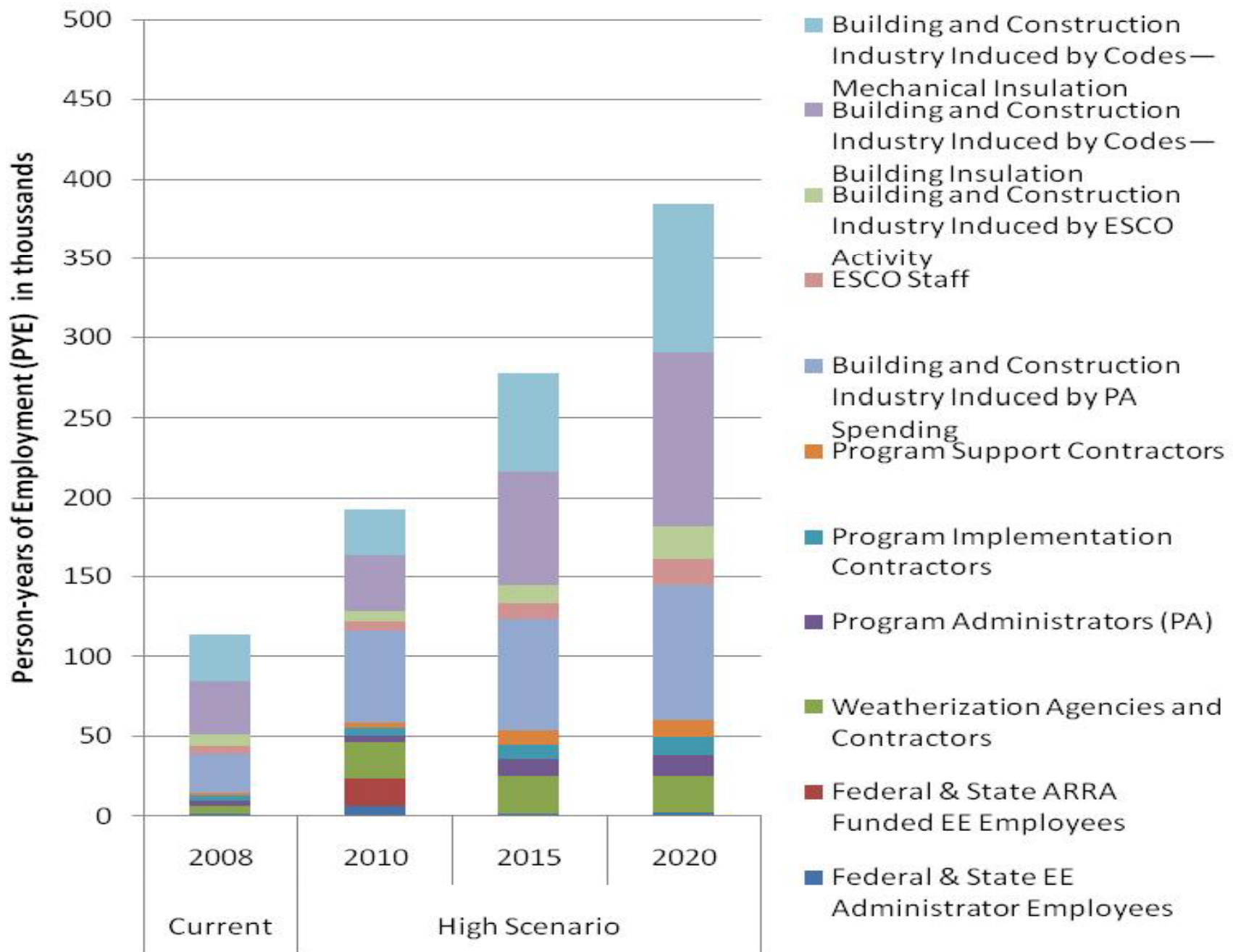
Current Size:

- 114,000 person-years of employment (PYE)
- Approximately 380,000 individuals employed

In 2020:

- Approximately 400,000 PYE (high-growth scenario)
- Up to 1.3 million individuals employed

**→ A projected 2 to 4-fold increase
in employment by 2020**



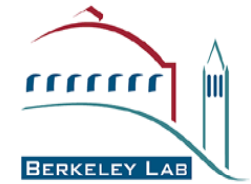
Transforming Existing Jobs



Many jobs in the EESS are not new jobs, but rather existing jobs that will evolve and be transformed as personnel provide high efficiency products and services

Two primary paths for entering the EESS workforce:

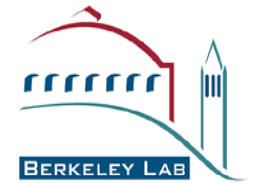
- **Existing occupations** (e.g., HVAC technicians, lighting contractors, construction trades, project managers) which are transformed into more energy efficiency-focused positions via retraining
 - **Emerging occupations** that are somewhat unique to the EESS (e.g., home energy raters, commissioning services, energy/home performance services, energy auditors)
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Key Workforce Challenges

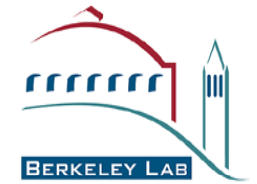
- Shortage of management-level applicants with experience in energy efficiency
 - Shortage of experienced energy efficiency engineers
 - Limited awareness by building and construction tradespeople and contractors that the EESS is poised to expand significantly and their skills will be required
 - Building and construction industry
 - Retirement is a growing concern
 - limited number of skilled trainers for EE
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Retirement concerns vary across the EESS



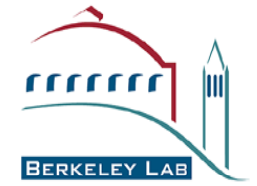
Percent of staff likely to retire next 5 years

- Program Administrators – Minor issue for some (~15%)
 - Implementation Contractors & Program Support Contractors – Not an issue (~5%)
 - ESCOs – Not an issue (~5%)
 - Building Industry – Growing concern (>35%)
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Recommendations

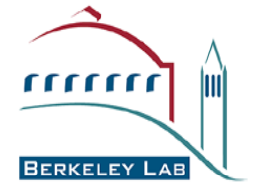
1. **Provide energy efficiency education and support targeted at building and construction trades people**
 2. **Coordinate and track training efforts within states; share best practices across states**
 3. **Increase short-duration, applied trainings to augment on-the-job training and/or introduce new entrants to a field**
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Recommendations (cont.)

4. Increase funding to “train the trainers.”
 5. Increase access to on-the-job and other formal training for mid- and senior-level engineers and managers.
 6. Prepare the next generation of EESS professionals.
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Contact



Charles Goldman

Lawrence Berkeley National Laboratory

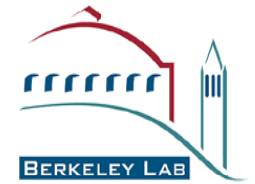
Email: CAGoldman@lbl.gov

Phone: 510-486-4637

Background Slides

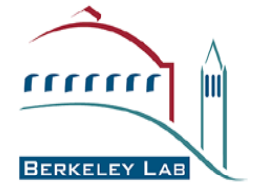


Jobs per \$1M Spending



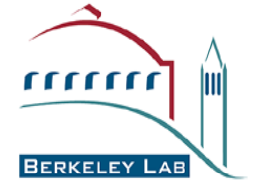
Activity	Estimated 2008 Spending (in Billion\$)	Person-Years of Employment per \$1M
Rate payer-funded energy efficiency	\$5.2	6.2
Low income weatherization	\$0.5	8.9
ESCOs	\$4.9	2.5
Insulation	\$7.1	8.9
Federal and state energy offices	\$0.25	6.5

Challenges for EESS Hiring



- It takes < 3 months to fill entry level positions
 - Finding an engineer trained and experienced in energy efficiency is very difficult
 - Can take 12-15 months to fill
 - One respondent had 80 applicants yet only 5 passed screening
 - Program Administrators feel disadvantaged to Implementation Contractors because of pay differential
 - This trend is most pronounced in regions with high cost of living
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EESS Competes with Defense, Computer and High-Tech for Engineering Talent



- **50-60% of graduating Ph.D. engineers are non-US citizens**
 - **Engineers tend to follow the money**
 - Semiconductor industry has highest wages & largest percent of engineers
 - High tech also retires early and hires new Ph.D.s at higher rate
 - **Defense industry requires US citizens**
 - **EESS needs engineers with good communication skills**
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ESCO Workforce: Job Categories

