# Energy Efficiency Services Sector: Workforce Education and Training Needs

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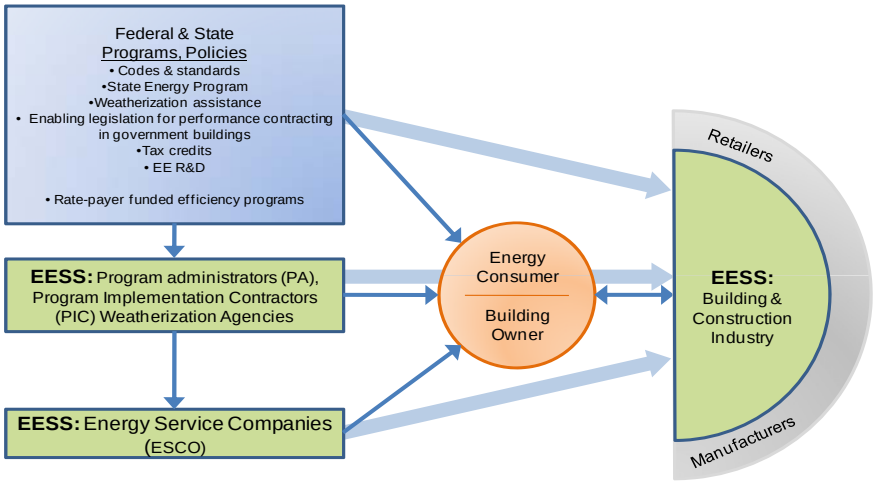
# The EESS is Driven by Policy

*Historically, a majority of the activity in the EESS is spurred directly and indirectly by government policies and ratepayer-funded programs.*



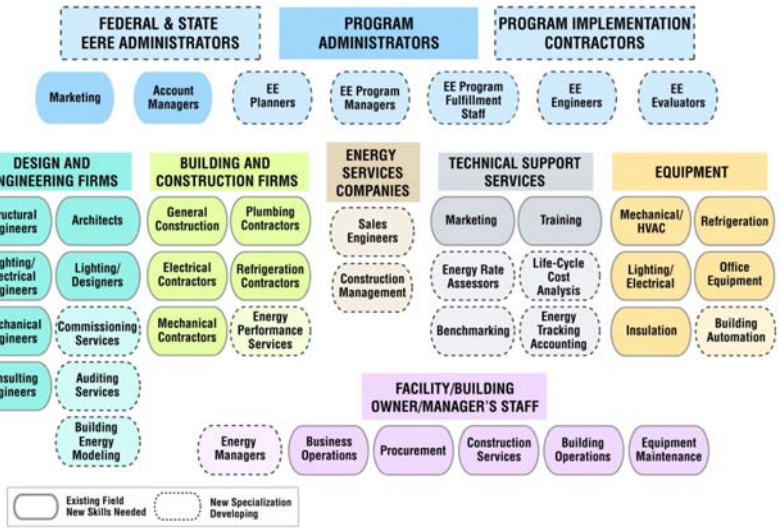
# Defining the EESS

**This study includes the portion of the EESS market supply chain that focuses on deployment and installation of energy efficiency products and measures. Within this, we further limit our scope to those EE products and services whose demand is driven *primarily* by the energy savings.**

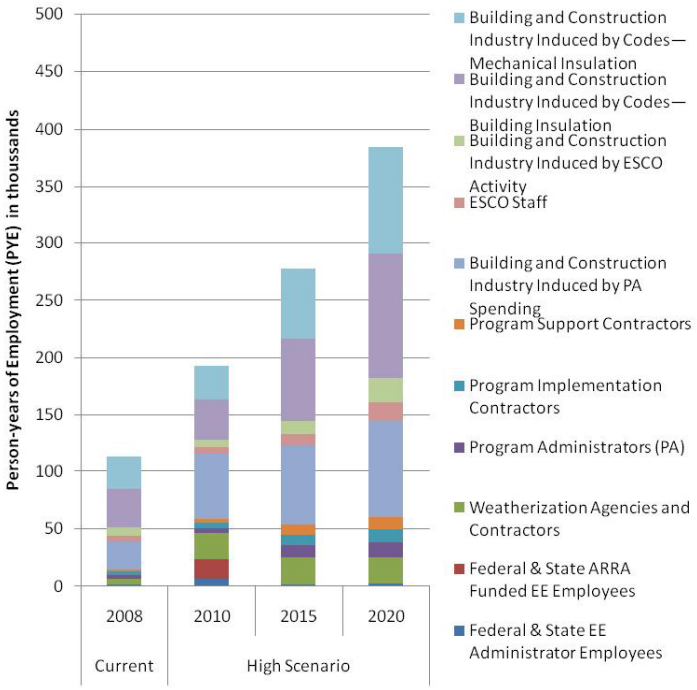
**Study Scope**

| Manufacturing & Distribution | Planning & Project Management | Consulting & Auditing | Construction & Installation | Evaluation Monitoring & Verification | Operations & Maintenance |
|---|---|---|---|---|---|
| – Firms designing & manufacturing EE equipment<br>– Wholesale distributors of EE equipment<br>– Retail distributors of EE equipment | – Program administrators<br>– Federal and state EERE staff<br>– Implementation contractors<br>– Technical support service providers<br>– Energy managers<br>– Accreditation consultants | – Design & engineering firms<br>– Implementation contractors<br>– Technical support service providers<br>– ESCOs<br>– Local Wx agencies<br>– Energy managers<br>– Accreditation consultants | – Design & engineering firms<br>– Building & construction firms<br>– Insulation firms<br>– Technical support service providers<br>– ESCOs<br>– Local Wx agencies | – Program administrators<br>– Implementation contractors<br>– Technical support service providers<br>– ESCOs<br>– Energy managers<br>– Accreditation consultants | – Building owners & managers<br>– Facilities operators |

# Commercial-Institutional EESS



**Energy Efficiency Services Sector Workforce Size: Current and projected levels of employment in PYE**




# EESS Workforce Size

**Current Size:**

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

**Projected Size in 2020:**

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

→ **A projected 2-fold (low-growth scenario) to 4-fold (high-growth scenario) increase in employment by 2020**

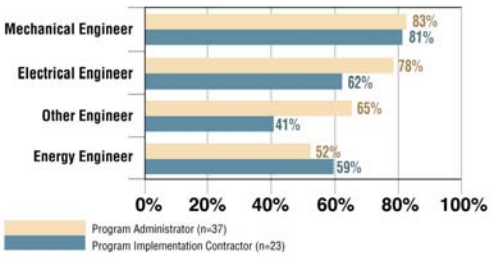
# Key Challenges for EESS Workforce Growth

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

# Enough Engineers?

*The most likely source for new EESS engineers is to transition engineers from other fields into energy efficiency. But until energy engineering is recognized as an engineering discipline this may be difficult.*

- Few engineers enter the field with EE experience
- The demand for engineers with knowledge of efficiency is currently met by hiring other types of engineers and training them on the job
- Many industries compete for engineering talent, and engineers often do not know the EESS field exists




Preferred Engineers for Program Administrators and Implementation Contractors

# Enough Managers?

*30% of survey respondents indicated that it is as difficult to find experienced EE managers as engineering talent.*

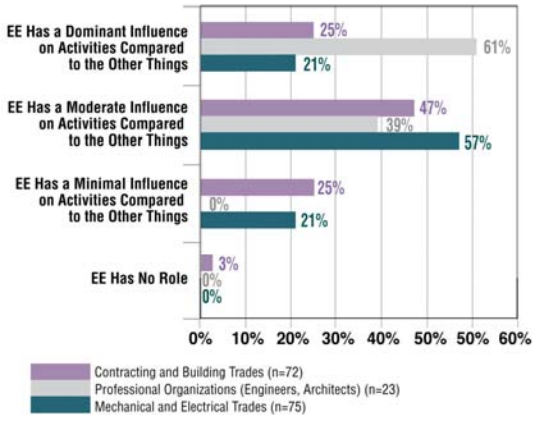
- The primary limitation on implementation contractor firm growth, or expanded program offerings for some administrators, is the lack of management-level applicants with EE experience
- Experienced managers are vital mentors for the next generation of managers and staff

# Ready for Growth?

*Relatively low level of awareness in the building and construction industry about growth potential in the EESS*

- Pgm. Administrators estimated that their staff will grow ~19% by 2010
- Implementation Contractors estimated that their staff will grow ~64% by 2010

→ In contrast, less than 50% of 160 respondents that represented building and construction industry associations and trades could even estimate the percent of the current workforce that was involved in EE

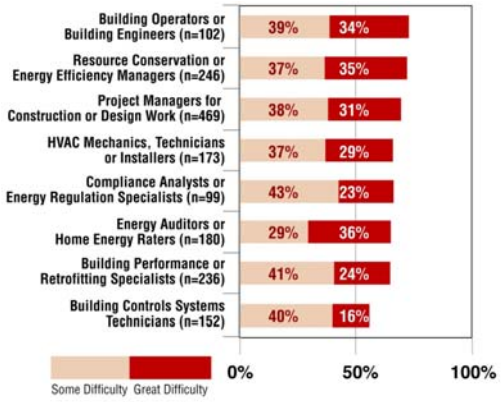



The influence of energy efficiency on the building industry.

# Difficulty Hiring?

***Respondents believe there are challenges hiring into the EESS for ANY position other than entry level.***

- Managers and engineers with experience in energy efficiency especially difficult to find
- Filling experienced positions often occurs by hiring from other firms
- Labor union respondents also report some difficulty recruiting qualified applicants into apprenticeship programs




Difficulty in hiring for the 8 efficiency-specific occupations in California.

# A Variety of EE Trainings are Emerging and Growing

- Residential Energy Services Network (RESNET)
- Weatherization Assistance Program (WAP)
- Association of Energy Engineers (AEE)
- Building Performance Institute (BPI)
- Association of Energy Services Professionals (AESP)
- Some community colleges
- Some four-year programs
- Union apprentice programs (though EE-specific curriculum appears limited)

# Recommendations

- EE Workforce Education and Development as separate programmatic element in EE program plans
- Conduct EE Workforce Training & Needs Assessment
- Target EE training for the Trades (65-70% of EESS workforce)
  - Need is more severe in states that are ramping up energy efficiency
  - Integrate building and industrial process efficiency into existing apprenticeship curricula & target community colleges/vocational schools
- Increase short-duration, applied trainings on EE topics to augment on-the-job training
- Increase funding to "train the trainers"
  - Growth rates strain current capacity; lack of qualified trainers likely in future
- Prepare the next generation of EESS Professionals
  - Few colleges offer EE-specific curriculum
  - Universities/colleges: Develop building science centers and EE policy/planning centers

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Energy Efficiency Services Sector: Workforce Education and Training Needs
http://eetd.lbl.gov/EA/EMP/reports/lbnl-3163e.pdf

Extra Slides

# Jobs per $1M Spending

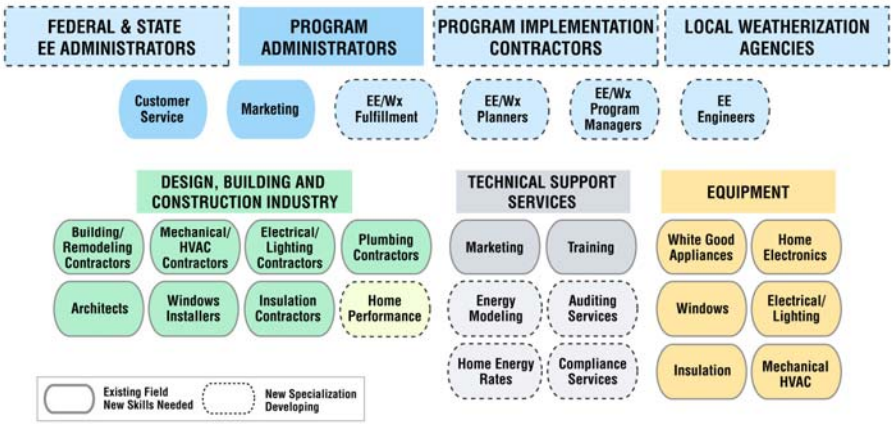
| Activity | Person-Years of Employment (PYE) per $1M |
|---|---|
| Ratepayer-funded Efficiency Activity | 6.2 |
| Low Income Weatherization | 8.9 |
| Energy Service Companies (ESCOs) | 2.5 |
| Insulation | 8.9 |
| Federal and State Govt EERE Offices | 6.5 |

**Our results compared to other studies**

| Study | Job Type | Person-Years of Employment (PYE) per $M |
|---|---|---|
| UMASS-PERI and (2008) | Green Jobs (direct) | 9.4 |
| Apollo (2004) | Energy Efficiency | 9.2 |
| ACEEE (2008) | Energy Efficiency ("premium" efficiency) | 9.8 |
| ASES (2007) | Energy Efficiency (direct) | 3.8 |
| Clean Energy Fund (2009) | Energy Efficiency | 4.7 |

# Residential EESS

Lighter-colored boxes with dotted outlines show job categories that have emerged primarily as a result of the development of the EESS, and darker-colored solid boxes show firms and job categories that also exist outside of the EESS.




# Aging Workforce?

***Retirement is not currently a concern for program administrators or implementation contractors; however, the building and construction industry is facing substantial changes in the workforce due to retirements between 2015 and 2025***

**Percent of staff likely to retire in 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 and Construction Industry – **Growing concern (>35%)**


**Building Industry Workforce Older than 50**

## Many EE Education & Training Programs Oversubscribed

- **Universities:**
  - Respondents indicated that existing energy-efficiency-related programs are currently approaching capacity and universities typically take many years to develop new programs
- **Community colleges**
  - Can more easily ramp up than universities, but many still have waiting lists for their programs
- **Association of Energy Services Professionals (AESP)**
  - Enrollment in training programs projected to increase from ~350 in 2008 to between 1,000 and 2,000 in 2010
- **BPI**
  - Certified ~300 people in 2005; certifications are expected to approach 12,000 by 2011-2012.

→ **Respondents expressed concern that rapid program expansion could lead to reduced quality of training**

## Transforming Existing Jobs

***Many jobs in the EESS are not new jobs, but rather jobs that need to evolve to provide more energy efficient versions of current (and future) 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)