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Description:	Presentation by Jim Caldwell - slides looking at workforce development needs for SB 350, and the role California Community Colleges can play in meeting them.
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A Workforce for California SB 350

Integral to Achieving Clean Energy & Carbon Reduction Mandates

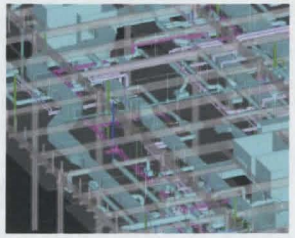
CALIFORNIA COMMUNITY COLLEGES
Doing What MATTERS™
FOR JOBS AND THE ECONOMY

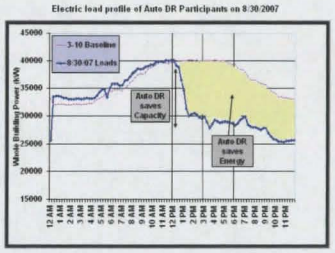
March 2016

Key Questions

What workforce is required to implement SB 350 EE?

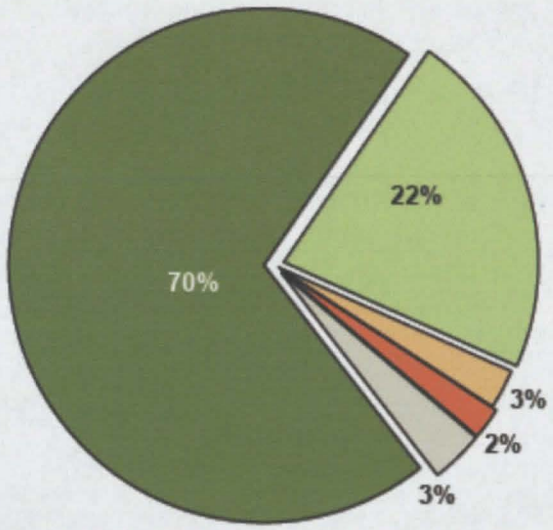
- ✓ What does the EE workforce look like today?
- ✓ What development is needed?
- ✓ How do we get it done?
- ✓ What role is envisioned for Stakeholders?





What does the workforce look like today?

EE Dominates California Advanced Energy Employment



- Building Energy Efficiency (303,117)
- Advanced Electricity Generation (94,873)
- Advanced Fuels (10,707)
- Advanced Grid Technologies (8,583)
- Advanced Transportation (14,554)

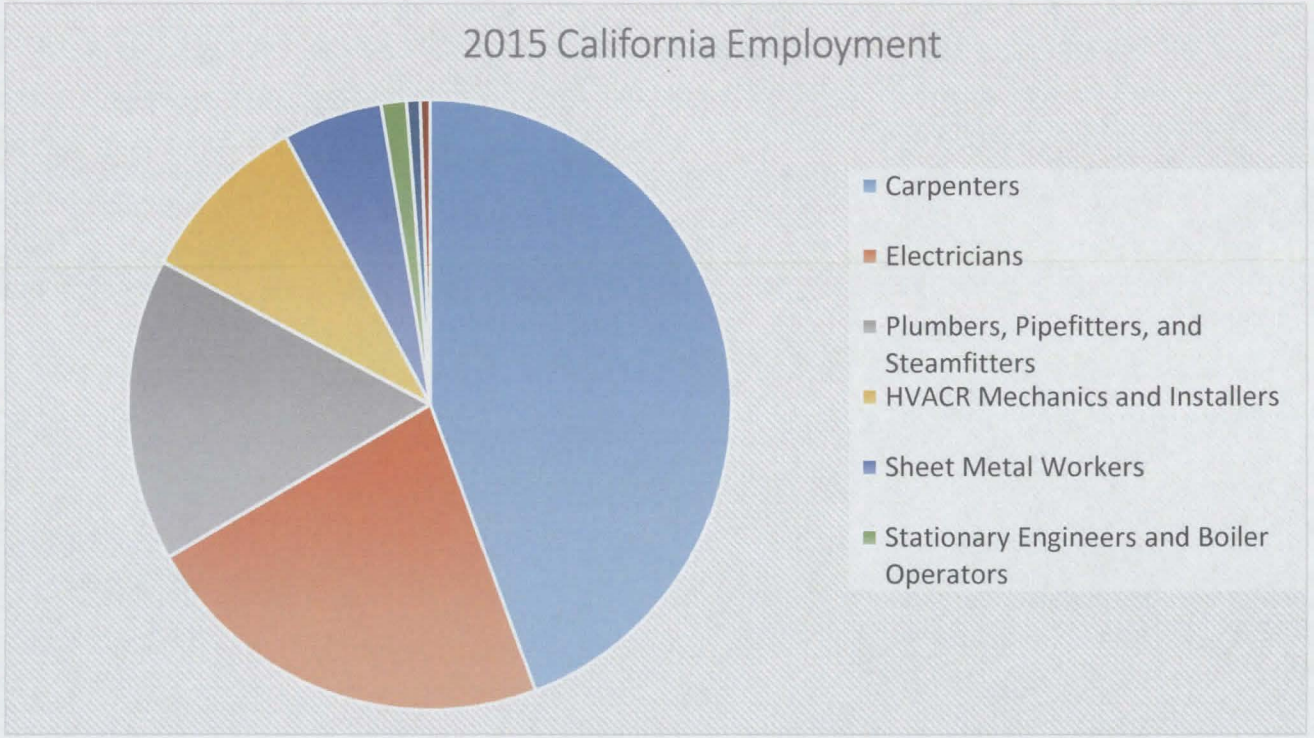
California Advanced Energy Employment Survey 2014, BW Research Partnership and Advanced Energy Economy

Job Growth versus Workforce Quality

- 2015 Advanced Energy job growth estimated at 17%[1]
  - ✓ *Versus the state's 1% overall growth*
  - ✓ *Total Advanced Energy jobs estimated at 500,000*
- Workforce competencies for SB 350 are undefined
  - ✓ *Across the value chain?*
  - ✓ *Entry-level worker pipeline?*
  - ✓ *Incumbent workers?*

1 California Advanced Energy Employment Survey 2014, BW Research Partnership and Advanced Energy Economy

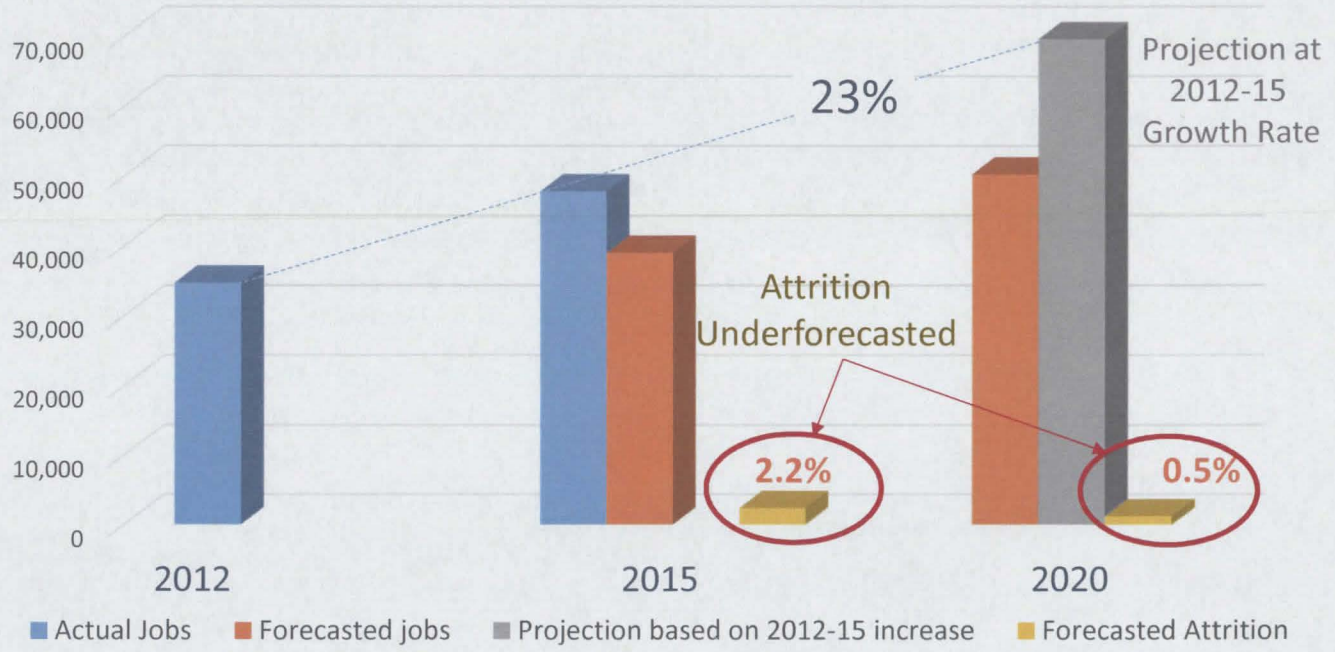
California EE Employment in the Trades



278,000 Workers
Economic Modeling Specialists International 2015

HVACR as a Leading Indicator For Workforce Change

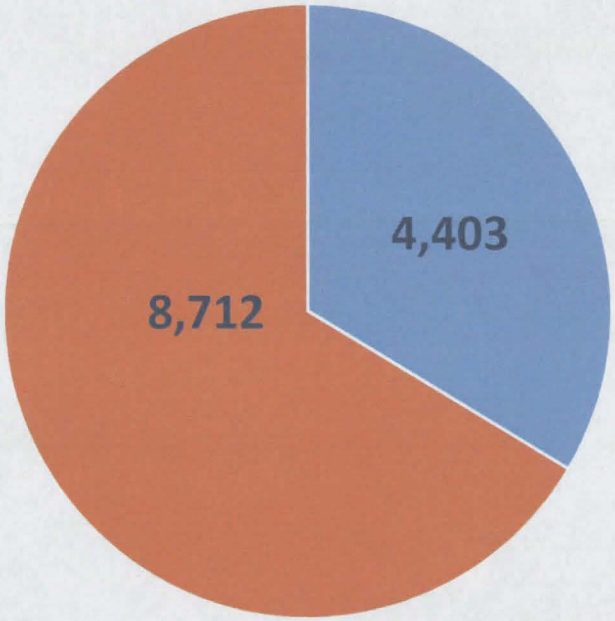
HVACR Worker Growth Outpaces Forecasts



Combined Total of Sheet Metal Workers, HVAC Technicians, and Stationary Engineers
Economic Modeling Specialists International 2015

Entry-level HVACR Workers Are Unprepared

Workers failing to complete accredited programs



Workers completing accredited programs

Based on 2013-15 workforce data

Sources: EMSI Data 2015, Community Colleges Datamart, and SoCal Survey of Regional Training Programs

The HVACR Incumbent Worker Challenge

A very large percentage of 48,000 HVACR workers need new skills:

The need: determine feasibility, and type of required certification for providers of building code compliance and utility incentive programs, organized by building type and building sector[1].

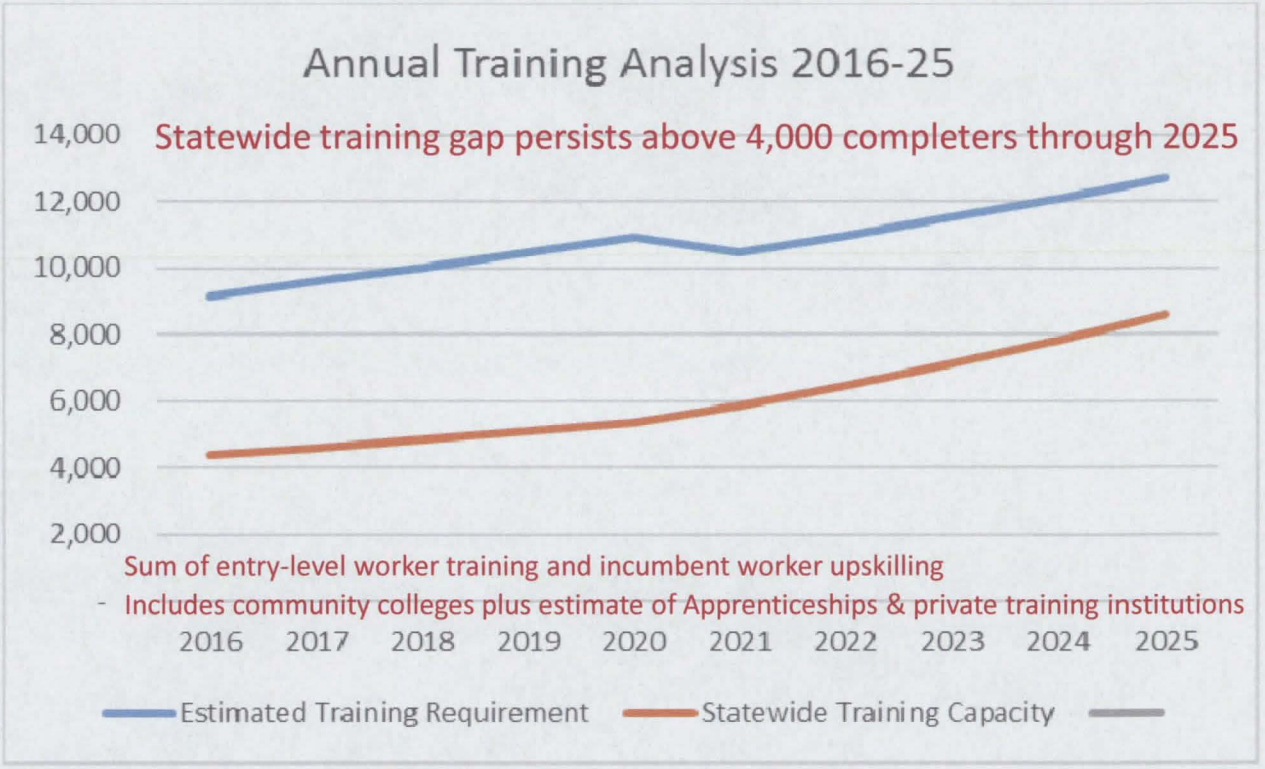
More than 150 industry-recognized, standards-based, and accredited HVACR credentials competencies are available to document worker capabilities[2].

Only 33% of the state's 48,000 HVACR workers hold an industry certification of any kind[3].

It's not clear that HVACR employers actually value industry certifications. A study of 284 HVACR job postings in the San Francisco Bay Area and Los Angeles County showed that NONE of the 150 industry-recognized certifications were listed as required or desirable qualifications for the job.

1 California's Existing Buildings Energy Efficiency Action Plan September 2015
2 Western HVAC Performance Alliance, *WHPA Credentials List* 2012
3 Western HVAC Performance Alliance, *Census of Technicians and Contractors* 2013
4 California Community Colleges Centers of Excellence, *HVACR Labor Market Analysis Using Burning Glass Data* 2013

The HVACR Training Gap: Persisting through 2025



Assumes: Continuation of 2012-15 growth rate through 2020 (at underforecasted attrition rate)
Incremental annual increases in accredited education capacity = 5% 2016-20; 10% 2021-25)

HVACR is Foundational to Multiple EE Careers

Corporate Manager

Owner/Contractor | Product Manager | Senior Engineer | Energy Manager

Trainer | Construction Manager | Sales Representative | Engineer

Commissioning Agent | Facility Manager | Project Manager | Acceptance Tester

Energy Auditor | Energy Analyst | Plan Checker

Entry-level Engineer | Refrigeration Specialist | High Performance Building Operator | Control Systems Technician

HVAC Service Technician | Building Operator

HVAC Installation Technician

SoCal HVACR Collaborative December 2014

HVACR Industry Structural Challenges

The industry is poorly aligned with California's EE Goals:

Few contractors and technicians are highly skilled and qualified to perform quality performance work.

Contractors who comply with HVAC code provisions incur higher costs that are difficult to pass onto customers in a highly competitive market.

Local building officials may not have the resources or knowledge to establish streamlined permitting systems to support quality HVAC installations or penalize contractors who do not comply.

Up to 50% of new HVAC systems and up to 85% of replacement systems are not installed and maintained to a quality level of specification.

Western HVAC Performance Alliance, *Goal 2.3 & 2.4 WHPA Commercial QI/QM Working Group Gaps Report*, December 2013
California Public Utilities Commission, *2010 – 2011 Energy Efficiency Annual Progress Evaluation Report*, September 2012
Energy Market Innovations, Inc., *HVAC Educational Needs Assessment*, submitted to Southern California Edison August 2012

What development is needed?

Alignment and Synchronization

HVACR Challenges Inform All Trades

A synchronized industry solution is needed[1]:

Lack of continuity and coordination characterizes building design, construction, installation, maintenance, and service.

Benchmarking will drive labor market demand[1]:

Most buildings do not have a baseline measurement of current HVAC performance or energy consumption to compare against for the impact of efficiency improvements.

Synchronized workforce development is required[2]:

Efforts are needed across all levels in the building industry on both the incumbent workforce that comprises the vast majority of building sector workers today, as well as those newly entering the industry and moving up.

1 Western HVAC Performance Alliance, *Goal 2.3 & 2.4 WHPA Commercial QI/QM Working Group Gaps Report*, December 2013
2 California's Existing Buildings Energy Efficiency Action Plan September 2015

Stronger Equity and Inclusion Initiatives

Community Colleges focus on inclusion

Open enrollment is the statewide policy
Majority of students receive free tuition, other financial aid provided
New metrics for Equity now standard statewide
Student success policies reflect strong support for inclusion

More needs to be done

Broader industry engagement for inclusion
Inclusion and Equity integral to all initiatives
Enrollment strategies linking to community EE goals
Completion strategies that leverage the full suite of student support strategies

ZeroNetReady Workforce:

A Synchronized EE Industry Initiative

Facilitated by the California Community Colleges
In support of the BOMA International ZeroNetReady Challenge
And California Zero Net Energy Goals

Alliances that Work

Executive Institute for Energy Efficiency, ZNR endorsed by BOMA International

Collaboration with IOUs, WHPA, CALCTP, IFMA, CABEC, and others

Infusion of leading edge knowledge and skills By ASWB Engineering and Energy Solutions

Joint program development with SMWIA, IBEW, and UA

UC Davis EE Center Research into student success, employment, curriculum alignment, new market trends

Major Influencers

PG&E

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

SDGE

Southern California Gas Company

Sempra

LANEY COLLEGE

Better Buildings
U.S. DEPARTMENT OF ENERGY

ADVANCED ENERGY ECONOMY

NRDC

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

BEST
Building Efficiency for a Sustainable Tomorrow

BOMA California

NSF

CALIFORNIA COMMUNITY COLLEGES

UCDAVIS ENERGY EFFICIENCY CENTER

Local Union 250 Pipefitters Welders

SHEET METAL WORKERS INTERNATIONAL ASSOCIATION ORGANIZED JAN. 25, 1888

BIA BUILDING INDUSTRY ASSOCIATION

IFMA
International Facility Management Association

WESTERN HVAC PERFORMANCE ALLIANCE

CABEC
California Association of Building Energy Consultants

DONALD VIAL CENTER on EMPLOYMENT in the green ECONOMY

EIEE Executive Institute for Energy Efficiency

INTERNATIONAL UNION OF OPERATING ENGINEERS

NECA
NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

California Community Colleges | 2.1M Students | 113 Colleges

ZNR: A Paradigm Shift

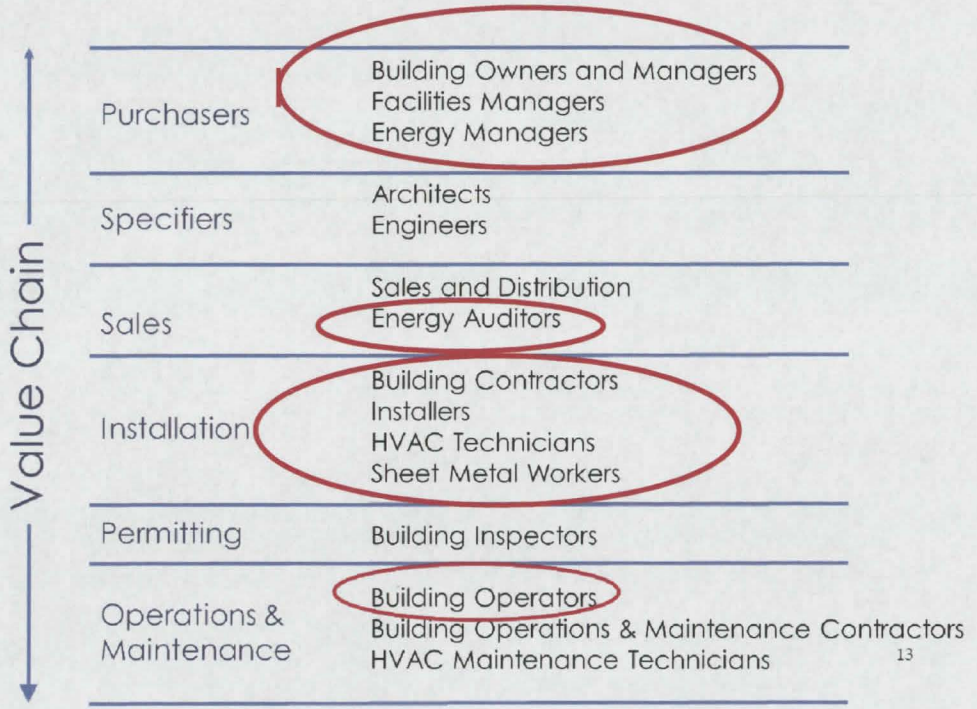
- Industry alignment on common goals
  - ✓ *ZeroNetReady buildings; ZeroNetReady workforce*
  - ✓ *Clear linkages between SB 350 EE mandates and workforce outcomes*
- Measurability
  - ✓ *Common metrics: K-12 thru employment, lifelong learning*
  - ✓ *Equity and diversity metrics across all community colleges*
- Accountability
  - ✓ *Industry steering committee*
  - ✓ *Indexed to SB 350 EE mandates*
- Scalability
  - ✓ *Evidence-based program planning*
  - ✓ *Replicable programs for statewide adoption*

… Facilitated by the California Community Colleges

A Systematic Approach

- Deep Industry Engagement
  - ✓ *Driving leading-edge education and training*
  - ✓ *Linking a ZeroNetReady workforce to market actor priorities*
  - ✓ *Coupling workforce competencies to actual EE achievement*
- Strategic Workforce Development
  - ✓ *Collaboration between Community Colleges and Apprenticeship Programs*
  - ✓ *Research and experimentation with evidence-based models*
  - ✓ *Faculty networks driving innovation*
  - ✓ *Scaling across a statewide network*
- Sustainable Workforce Advancement
  - ✓ *Leveraged/braided funding from multiple sources*
  - ✓ *Standard metrics for reporting and refinement*

Active Programs Now Underway



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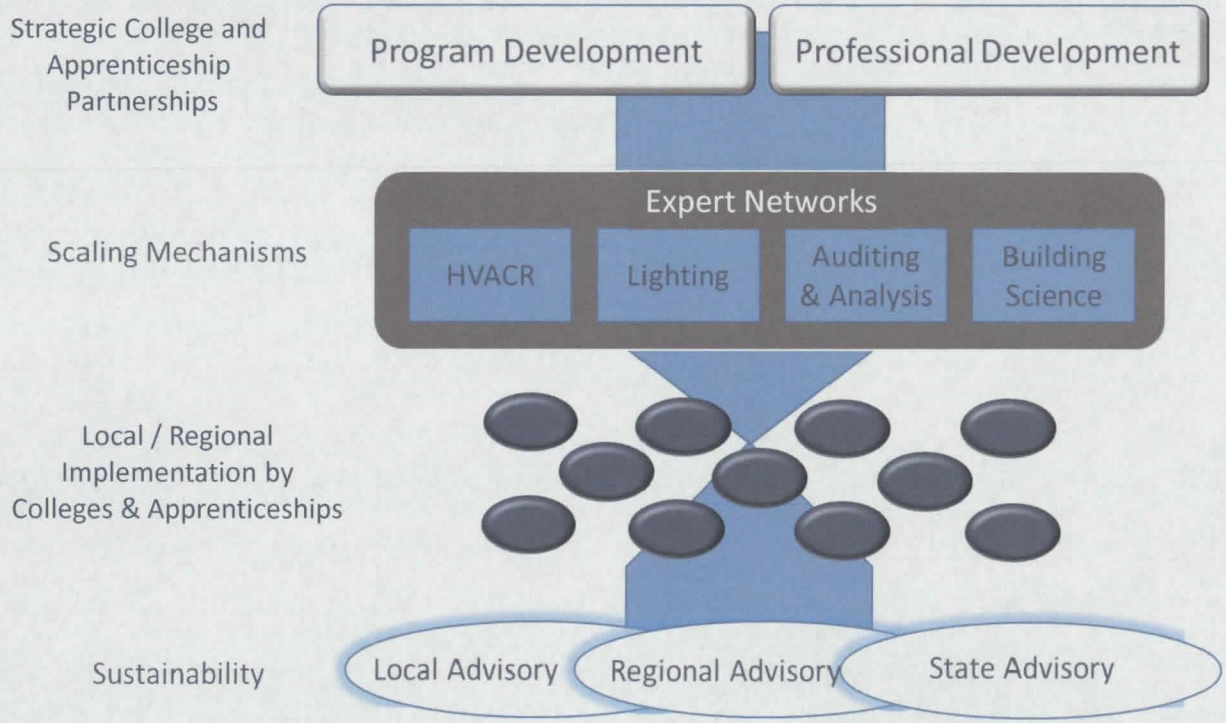
Program Delivery Model

Rapid Prototyping and Statewide Scaling

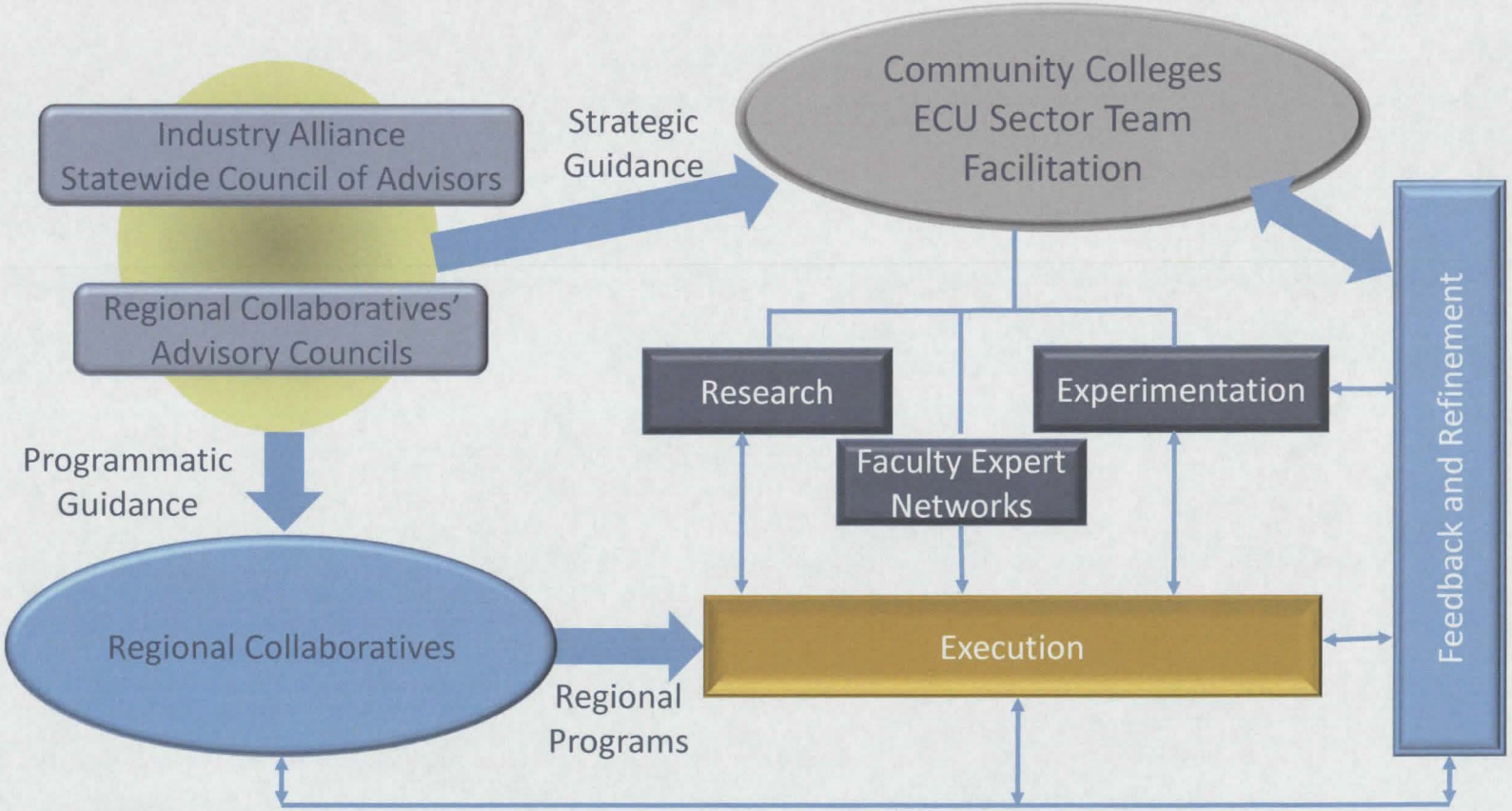


Developing the Evidence

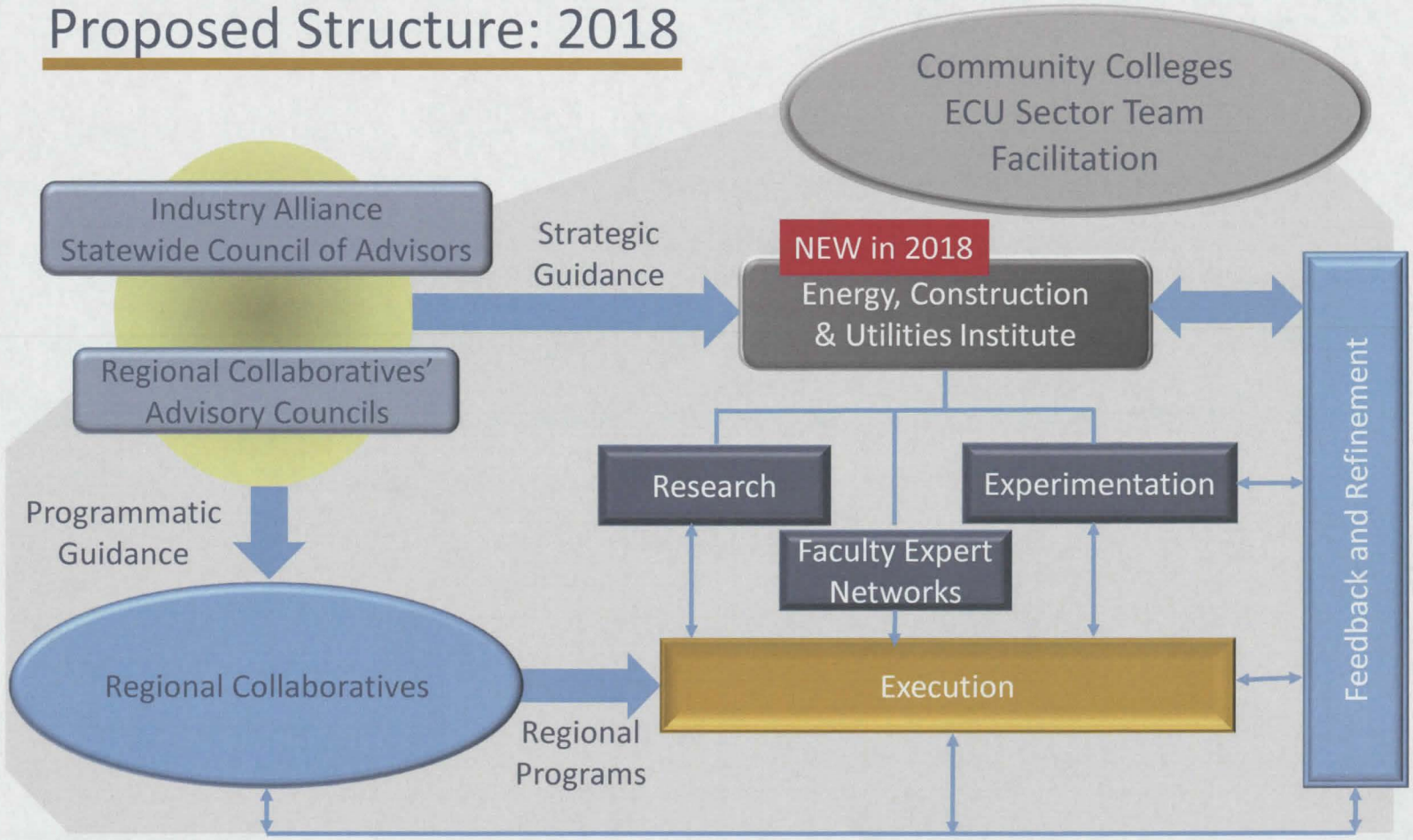
- Research Partnerships
  - ✓ *UC Davis Energy Efficiency Center -- HVAC & Lighting workforce*
  - ✓ *Energy Marketing Innovations -- Industry-valued Credentials*
  - ✓ *RP Group -- Attracting students with high probability of success in EE*
  - ✓ *Centers of Excellence -- Labor market analysis*
  - ✓ *BOMA International -- ZeroNetReady Challenge data collection & analysis*
  - ✓ *WestEd -- Community College LaunchBoard metrics & reporting*

- Experimentation
  - ✓ *Program development with partner colleges & Apprenticeships*
  - ✓ *Statewide program scaling through Faculty Expert Networks*
  - ✓ *Industry engagement in regional collaboratives*
  - ✓ *Faculty professional development in codes, standards, and technology*
  - ✓ *Technology-enabled learning models*
  - ✓ *Communications strategies -- deep stakeholder engagement*

Current Structure



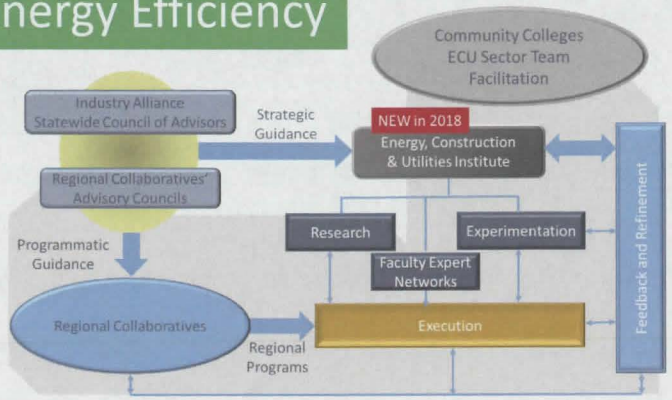
Proposed Structure: 2018



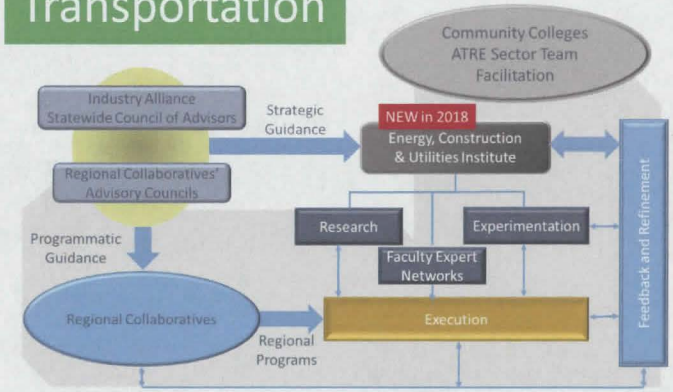
Longer Term Vision

Clean Energy & Pollution Reduction Workforce Institute

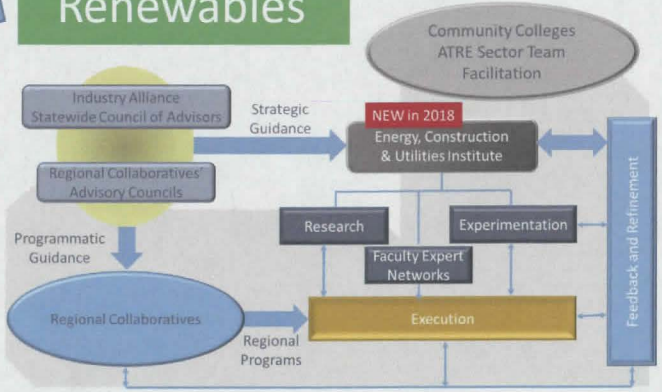
Energy Efficiency



Transportation



Renewables



What Role is Envisioned For Stakeholders?

How shall we engage?

- Providing input to SB 350 deliverables?
- Leveraging Federal resources?
- Developing EE workforce initiatives?
- Creating inclusionary opportunities?
- Expanding industry participation?
- Addressing new funding sources?
- Formalizing reporting and accountability?
- Data sharing?

Thank You

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www.ECUsectorDWM.com

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