

Building a Green Workforce:

Training for Tomorrow's Energy Code Compliance

DOE National Energy Codes Conference

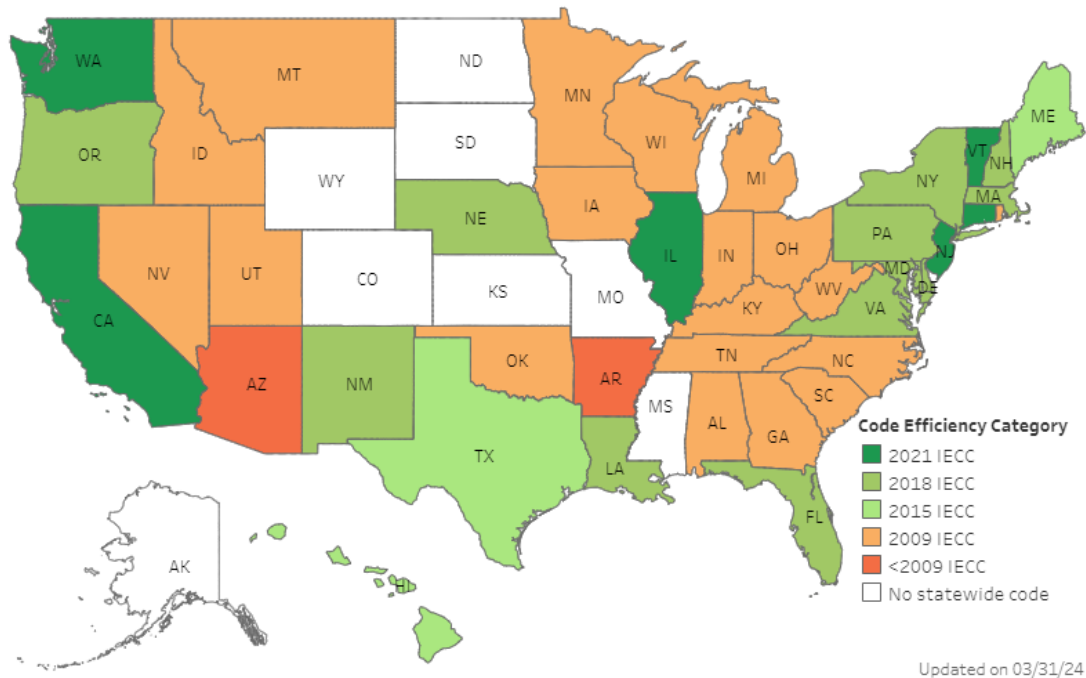
Sacramento | May 7



Many states and local governments are updating energy codes from outdated standards to the latest model energy code. Education & training supports successful implementation.

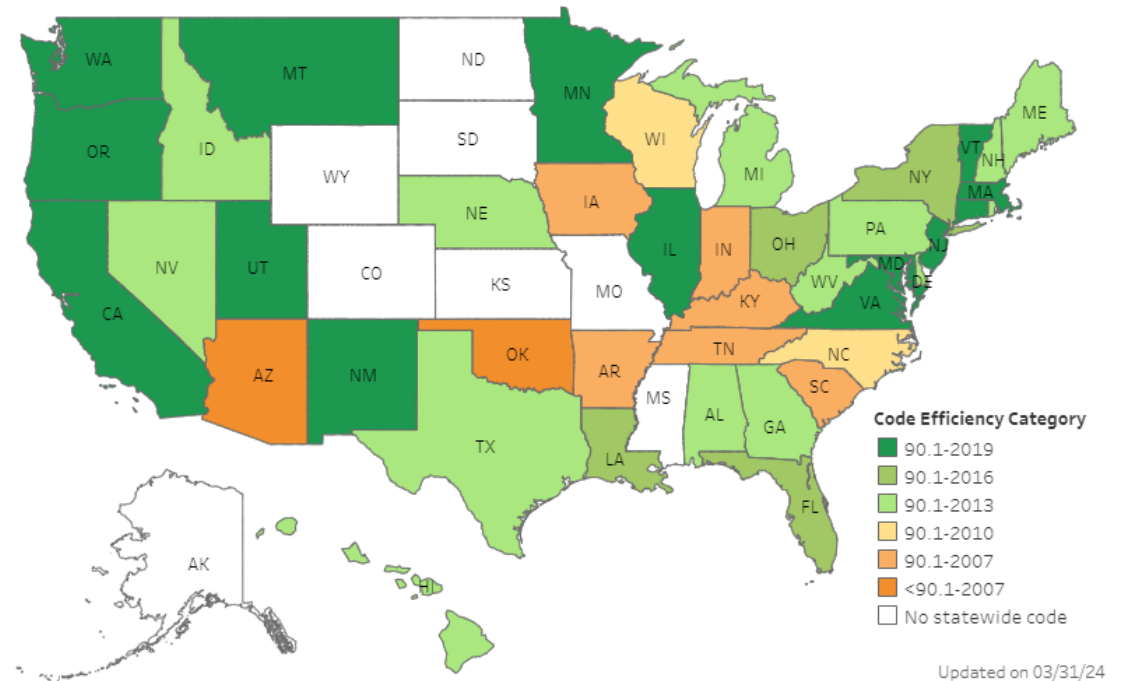
Evolution of state energy code adoption:

Residential Codes: Now



Residential Buildings (IECC)

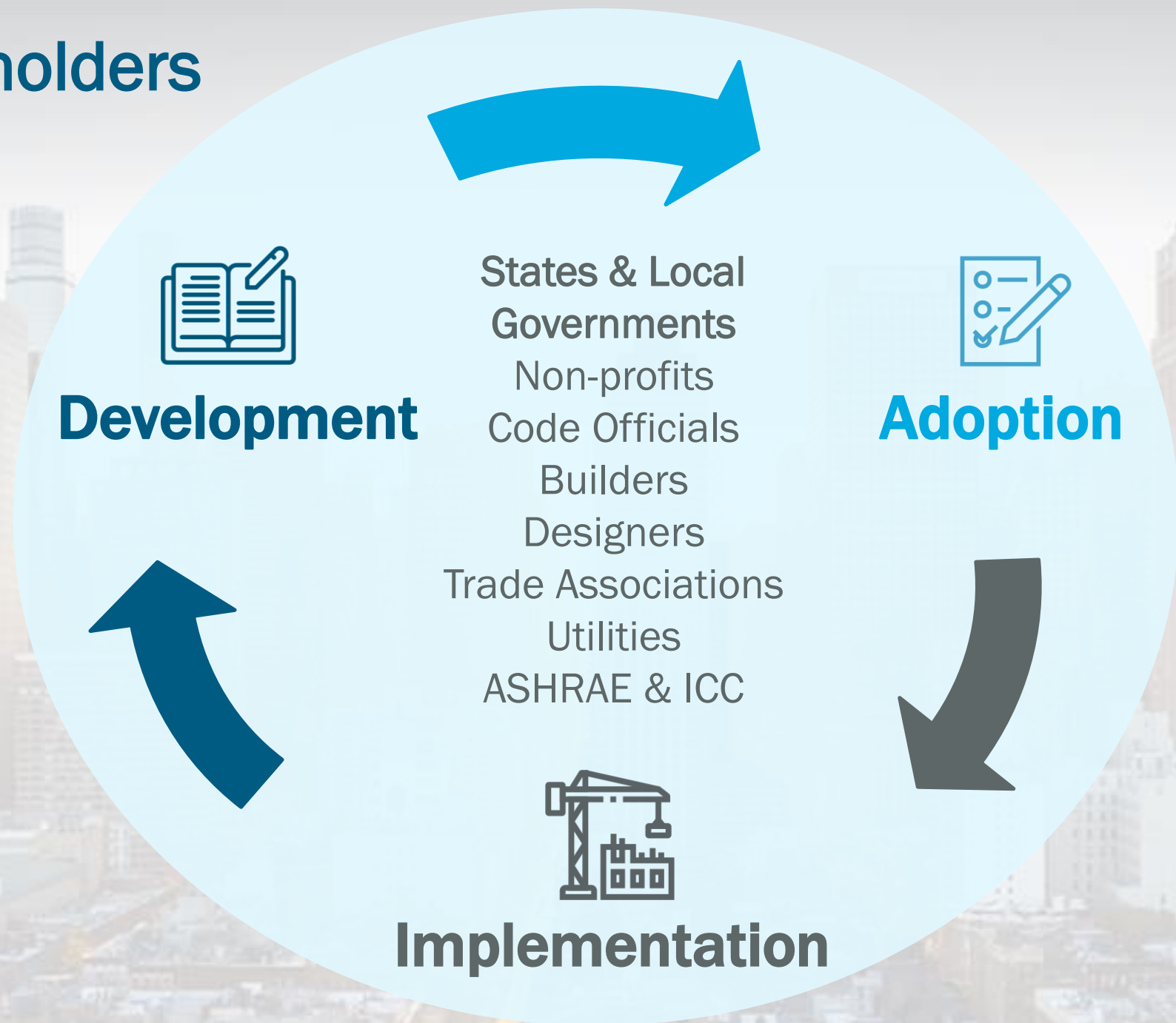
Commercial Codes: Now



Commercial Buildings (Standard 90.1)

22 States in-process or anticipated to adopt a new code

Key Stakeholders

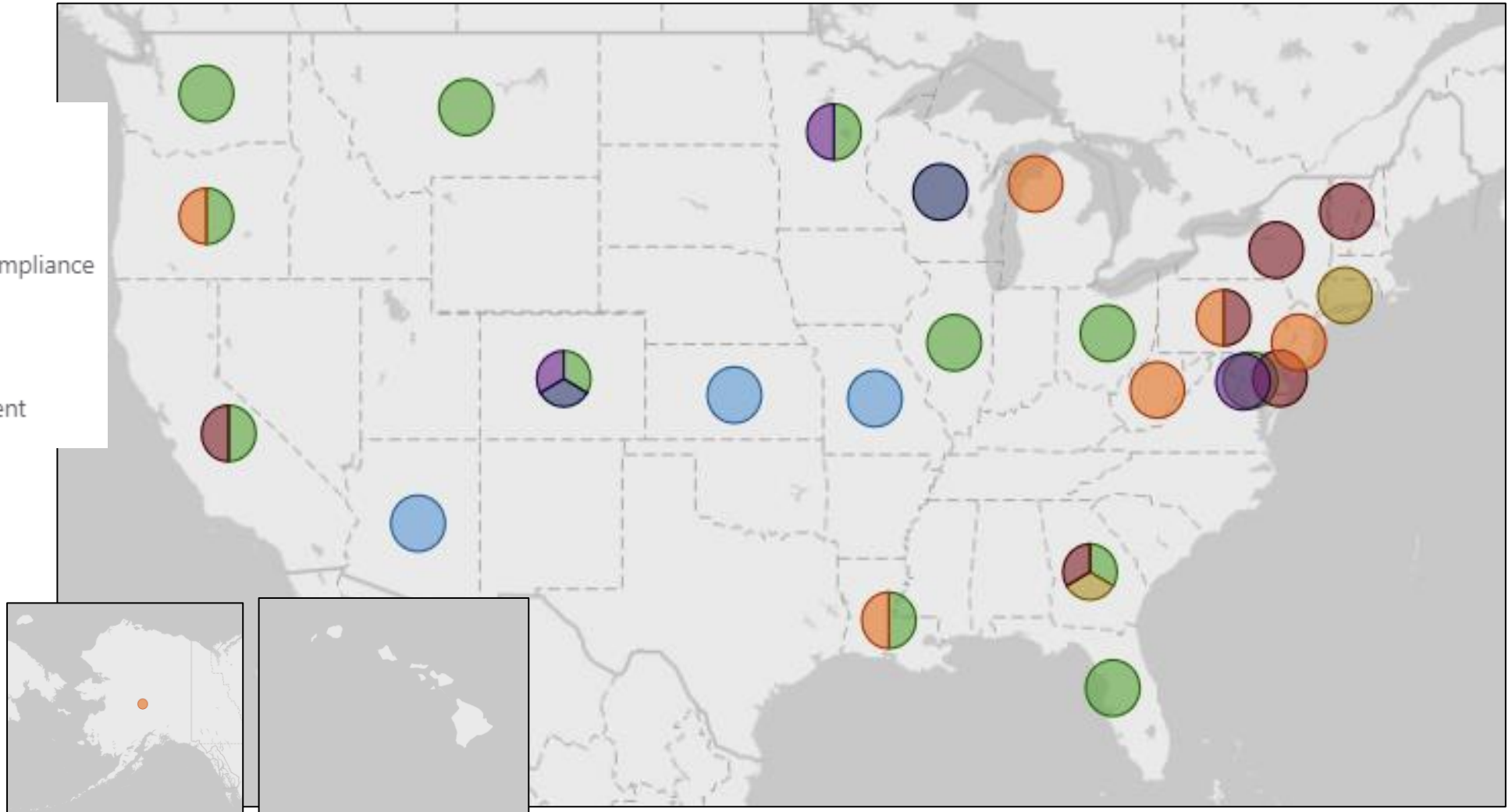


RECI Workforce Projects

> Although each project has a different focus, nearly all include a workforce component

Project Focus

- BPS
- Code Adoption
- EEEJ
- Implementation & Compliance
- Partnerships
- Stretch Codes
- Workforce Development



Lessons from the Field



Erica DiLello, NORESKO



Omar Al-Hassawi, WSU



Randy Plumlee, SPEER



Wrap up and Q&A



A photograph of a construction site with several workers in safety gear (hard hats and high-visibility vests) standing on a concrete floor. In the background, a multi-story building is under construction, heavily encased in wooden scaffolding. The scene is lit with a warm, golden light, suggesting late afternoon or early morning. The overall atmosphere is one of active construction and professional collaboration.

Building a Green Workforce: Training for Tomorrow's Energy Code Compliance

Erica DiLello, LEED AP BD+C, MBA | Project Manager

Sustainability Services

MEET THE PRESENTER

- Erica DiLello, LEED AP®, MBA
 - Codes and Standards team
 - Develop and implement building codes
 - Energy modeling and mechanical design background
 - User-centered solutions



500+
employees;
90+ on SUS Team



\$5 billion
in guaranteed energy
savings



25 million
metric tons of CO₂
emissions reduction



70+ Jurisdictions
in CO were provided
code adoption
technical assistance



4,800+ People
Trained on building
codes



300+ Tickets
On building codes
answered

Colorado Greenhouse Gas Pollution Reduction Roadmap 2.0

Policy Priorities through 2026 | February 2024



Credit: Colorado Energy Office

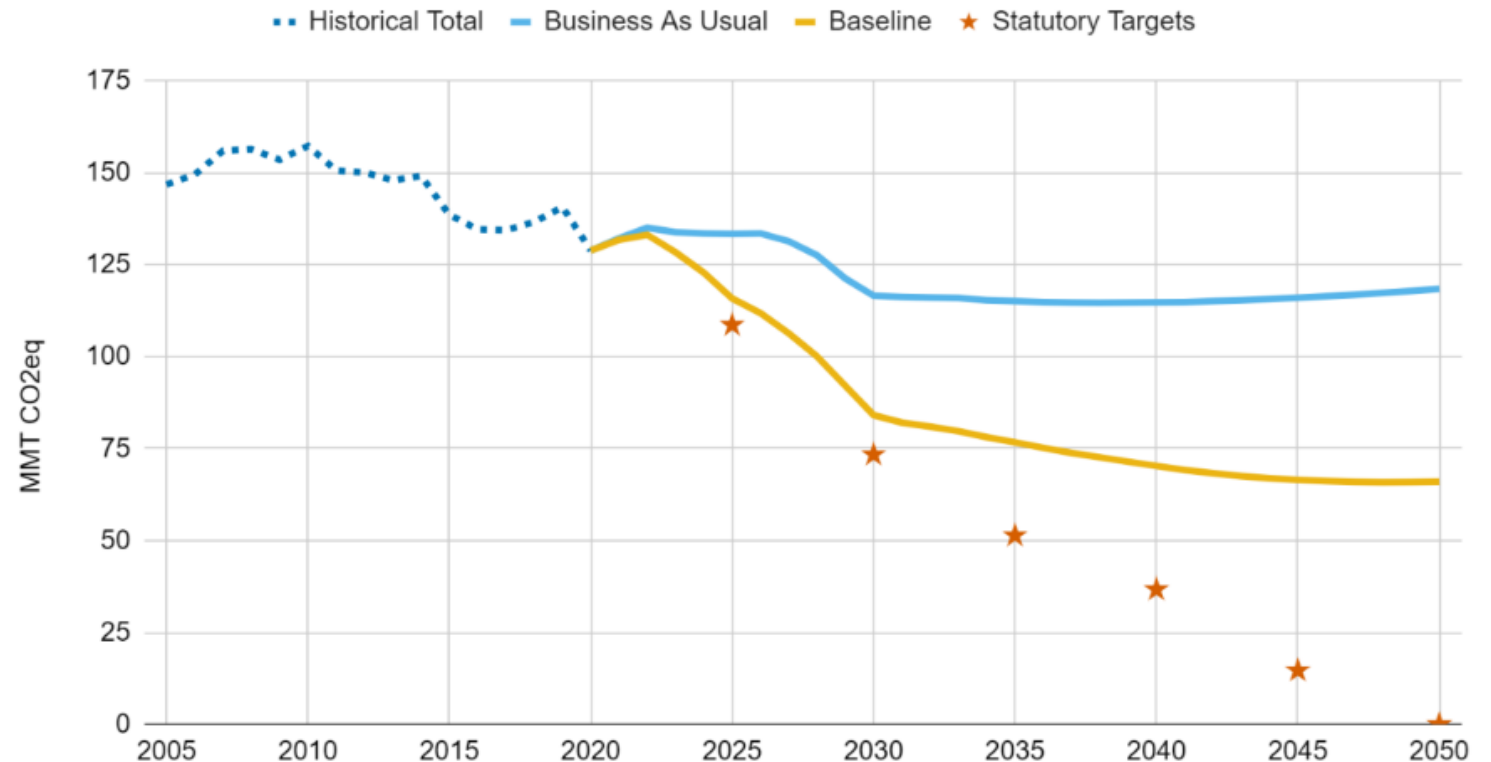
COLORADO STATE GOAL

50% GHG pollution reduction in economy-wide emissions below 2005 levels by 2030 and 90% by 2050

- 80% reduction from electricity generation by 2030
- 60% from oil and gas development
- 40% from transportation
- 20% from industry and buildings

COLORADO'S PROGRESS

- Renewable energy generation in Colorado has grown from 22% in 2019 to 37% in 2023
- Colorado is projected to be more than 80% of the way to meeting its statutory goal of a 50% emissions reduction in 2030 from 2005 levels



Historic statewide emissions, updated baseline emissions projection, and statutory emissions targets

NEAR TERM ACTIONS

LEAD A WORKFORCE DEVELOPMENT PLAN TO SUPPORT CLEAN ENERGY AND CLIMATE ACTION



MODERNIZE CLEAN ENERGY PERMITTING



ACCELERATE HEAT PUMP DEPLOYMENT FOR EQUITABLE ACCESS TO HEATING AND COOLING



MAXIMIZE INFRASTRUCTURE INVESTMENT AND JOBS ACT (IIJA) AND INFLATION



STREAMLINE LOCAL EV CHARGER DEPLOYMENT



INCREASE ENERGY EFFICIENCY AND ELECTRIFICATION FOR STATE'S AFFORDABLE HOUSING PROGRAMS



PURSUE STRATEGIC ELECTRIFICATION OR THERMAL ENERGY PROJECTS TO IMPROVE SAFETY AND AFFORDABILITY OF NATURAL GAS DISTRIBUTION



EXPAND RENEWABLE ENERGY DEVELOPMENT AND TRANSMISSION ON STATE LANDS



EXPAND LOW-INCOME ACCESS TO DISTRIBUTED SOLAR



ADOPT LOW-ENERGY AND LOW-CARBON BUILDING CODES



ESTABLISH STATEWIDE REGULATIONS FOR CARBON MANAGEMENT



REFORM ELECTRIC DISTRIBUTION SYSTEM PLANNING FOR INVESTOR-OWNED UTILITIES TO SUPPORT STATEWIDE GOALS



COLORADO ENERGY CODE LEGISLATION

- No statewide code
- 2019 - Jurisdictions required to adopt one of the three most recent versions of the IECC
- July 1, 2023 - Jurisdictions required to adopt the 2021 IECC and the state's model electric ready and solar ready
- July 1, 2026 - Jurisdictions must adopt the state's model low energy and carbon code (not developed yet)



COLLABORATION





BUILDING CODES IMPLEMENTATION



RESOURCES & TOOLS



Terminology
The terms in this section are not new to the 2018 I-Codes, but provided and handled when pursuing compliance.

Occupancy Classification
The occupancy classification for Addition and Alterations is determined by the and Alterations of the main building the occupancy or alteration is attached to. Compliance is typically shown under International Existing Building Code through either the prescriptive, performance or work area compliance methods as defined in Section 301.

Core and Shell
If the occupancy classification for and Shell building is unknown, the occupancy defaults to the core or then one of the occupancies will be to be covered based on which of most restrictive requirements.

Historic Building
Occupancy classifications for Buildings can change if the building through a change of going through a change of repairs done and the change determine what exceptions building. The IECC requires to historic building should maintain, if not improve the of energy by the renovat building.

Multi-family
R-1: Residential building follows the commercial IECC.
R-2, R-3, or R-4: Con the IECC for 3 or less for 4 or more stories.

2021 Energy Code Plan Review Checklist
Project Information Sheet
Plan Review/Permit # _____ Date _____
Project Address _____
Project Contact Info Name _____ email _____
Building Type Single Family Detached _____ Duplex _____
Multi-Family Apartment _____ Co-located _____
(3 stories or less) New Construction _____ Additions _____
Compliance Approach Prescriptive _____ UA Trade _____
Envelope _____ HVAC _____
Efficiency Pkg option chosen _____
Compliance Software Used (i.e. REM/Rate, Ecotrope, REScheck, etc) _____
Plan Reviewer Contact Info Name _____ email _____
Jurisdiction Name _____
County _____
Substantiating Data Mechanical Load Calculations _____
Duct design _____
Air sealing details _____
Compliance Path documentation UA Trade Off - need _____
Performance - need _____
Energy Rating Index _____
Prescriptive - Show _____
R408 Efficiency _____
Other: Please describe _____
Plan Review and Project Comments: _____

FAQs are intended to provide clarity on compliance. This FAQ focuses on IECC Energy Rating Index (ERI) and Home Energy Rating System (HERS).

- Are these ERI scores connected?
The HERS ERI developed by RESNET, is proprietary.
- How does ERI scoring work?
All ERI scores are developed using ANSI/RESNET 100, with 0 = Net-zero energy and 100 = 2006 IECC.
- Will the scores from each method match?
The IECC ERI score and the HERS ERI score will not match.
- Is ERI testing mandatory?
Depending on the work being done, HERS ERI testing of permitted work will trigger any necessary testing.

Home Energy Rating System (HERS) ERI

- CANNOT be used for IECC compliance.
- References the most current version of ANSI/RESNET/ICC Standard 301. ANSI 301 is under continual maintenance so the HERS ERI also can use published ANSI 301 addenda.
- A HERS ERI can only be developed by a RESNET certified HERS Rater.
- A HERS ERI IS an asset rating NOT a compliance rating. The home DOES NOT need to meet the requirements.
- A HERS ERI uses ANSI/RESNET/ICC Standard ventilation requirements for modeling.
- A HERS ERI provides estimated annual energy cost for the home and insight into how to improve it. Think of a MPG rating for a house.
- A HERS ERI CAN be used to market the efficiency of a home.
- A HERS ERI IS available for appraisers through the RESNET/Appraisal Institute Portal.

Builder and Homeowner Questions

Check for Utility, State, and Federal Rebates
Recently passed legislation has made it more cost effective to build energy efficient homes. Links for details:
• **Inflation Act:** Benefits to be released in the next year.
• **CO Codes Bill:** Up to \$11 million to support clean air investments.
• **Xcel Energy:** Home rebates for HVAC equipment, insulation, smart thermostats, and energy audits.

Build Resilient

- Tight air-sealing in exterior building envelope to reduce wildfire smoke infiltration.
- Use high R-value insulation (ERV/HRV) and low U-value window assemblies to retain the indoor temperature.
- Plan for on-site solar with battery storage to reduce grid dependency.

Heat Pumps for Space Conditioning and Water Heating

- Cold climate heat pump market availability is increasing.
- Less maintenance and higher safety.
- Heat pumps can provide cooling and replace the air conditioning unit for a heat pump installation.
- Ensure proper system sizing to maximize efficiency.

Ensure Electrical Panel has Room for Expansion

- As additional electric loads may be needed over the life of the home from:
• Electric vehicle charging
• Heat pumps
• Solar panels

Install Low-Flow Fixtures to Save Water

- EPA WaterSense recommended fixtures
- Utilize Greywater from:
• Bathroom and laundry-room sinks
• Bathtubs/showers
• Laundry machines

Visit the Code Adoption Toolkit for additional resources, significant code change summaries, and more.

Energy Code Adoption Toolkit
The Colorado Energy Office (CEO) created an Energy Code Adoption Toolkit to assist Colorado jurisdictions through the process of adopting a more current energy code. The toolkit provides information on the benefits of adopting a more current energy code and gives tips on how to navigate the typical adoption process. It also includes several resources that:
• Detail the costs of updating an energy code.
• Describe changes made in the latest version of the International Energy Conservation Code (IECC).
• Provide example language for the adoption of stretch codes that go beyond the IECC.
• Help jurisdictions verify code compliance.
The resources in this Energy Code Adoption Toolkit are designed to put all of the necessary code adoption information in one place, while walking jurisdictions through the process. If you can't find you answer in these resources, you can submit a question to our Code Helpline and our subject matter experts will respond to you via email within three business days.

Colorado Energy Office
Climate & Energy
Building Energy Codes
Energy Code Adoption Toolkit
Transportation
Clean Energy Programs
Buildings
Weatherization Assistance
Federal Funding



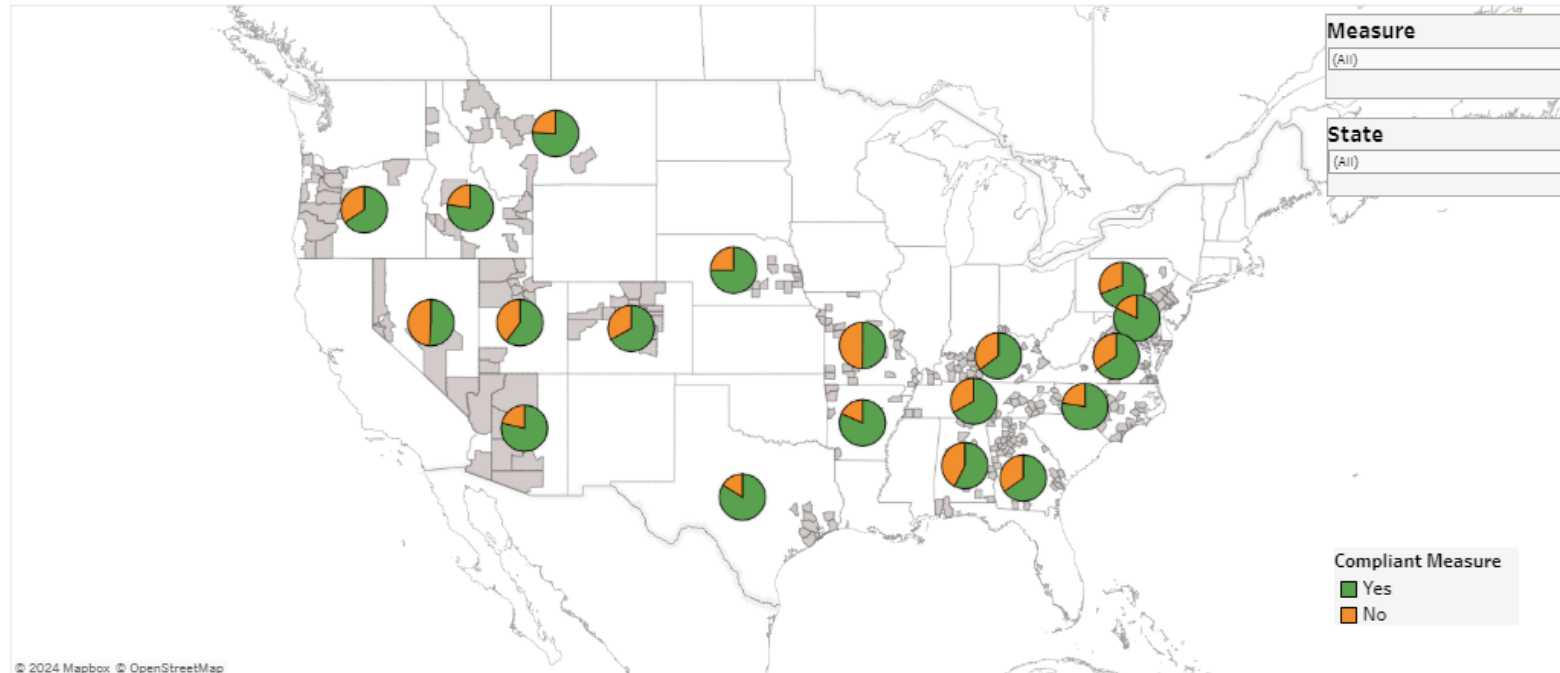
Submit a question on any Building Code!

Image Credit: Colorado Energy Office

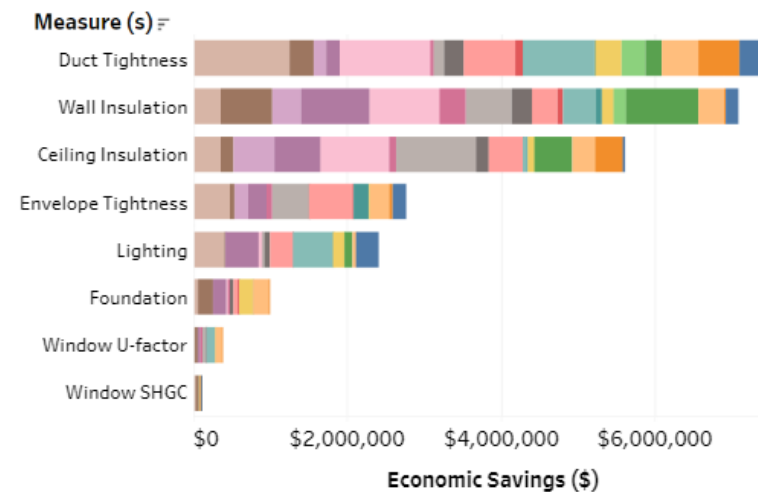
TRAINING TYPES

- Role-Based Training
 - Architects
 - Engineers
 - Contractors
 - Raters
 - Building Inspector
 - Plans Examiner
 - Permit Counter Technicians
- By Request: Virtual or In-Person
- Short Video Clips
- Previous Recordings
- Other States: Learning Management Systems, YouTube Channels, Circuit Rider, DOE Field Study
- Wednesday Webinar Series
 - 4/3/2024 All Things Residential Insulation
 - 4/24/2024 Vapor Management
 - 5/1/2024 Passive House
 - 5/29/2024 Refrigerants
 - 6/5/2024 Mechanical Ventilation for Residential Strategies and Controls
 - 6/12/2024 2021 IECC vs 2024 IECC for Residential
 - 6/26/2024 2021 IECC vs 2024 IECC for Commercial

FIELD STUDY TRAINING



1st Year Potential Savings with 100% Compliance (All)



State	Year..	Energy Code Baseline	# Observations
AL	2018	Amended 2015 IECC	603
AL	2014	Amended 2015 IECC	567
AR	2015	2009 IECC	522
AZ	2020	2018 IECC	481
CO	2020	2018 IECC	554
GA	2018	2009 IECC	571
GA	2015	2009 IECC	802
ID	2018	Amended 2015 IECC	567
KY	2017	2009 IECC	604
KY	2014	2009 IECC	630
MD	2017	2015 IECC	776
MD	2015	2015 IECC	783
MO	2017	2009 IECC	599
MT	2018	Amended 2012 IECC	565
NC	2017	Amended 2009 IECC	615
NC	2015	Amended 2009 IECC	988
NE	2017	2009 IECC	650
NV	2020	2018 IECC	587
OR	2020	2017 ORSC (based on 2015 IECC)	636
PA	2017	2009 IECC	558
PA	2015	2009 IECC	657
TN	2018	Amended 2009 IECC	556
TX	2018	2015 IECC	652
TX	2015	2015 IECC	629
UT	2020	Amended 2018 IECC	640
VA	2018	Amended 2012 IECC	557

<https://public.tableau.com/app/profile/doebecp/viz/ResidentialEnergyCodeFieldStudyDashboard/IntrotoFieldStudies>

SUCCESSSES

- Funding available to train the industry
- Utilities contribute to their demand supply management (DSM) goals
- Ability to train anywhere in Colorado, training thousands of industry professionals
- Tracking success through knowledge swing exams
- Strides towards diversifying how we teach energy codes
- Streamline building code questions



ROADBLOCKS

- Policy limits funding allocation to specific code years
- So much funding, training market can be diluted or overwhelming
- Time & money for jurisdictions/industry
- Desire for code simplification
- Home rule state



THANK YOU!

QUESTIONS?

Erica DiLello

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303-345-8757



Energy Conscious Construction at Washington State University

Omar Al-Hassawi, Ph.D.

Associate Professor, Washington State University

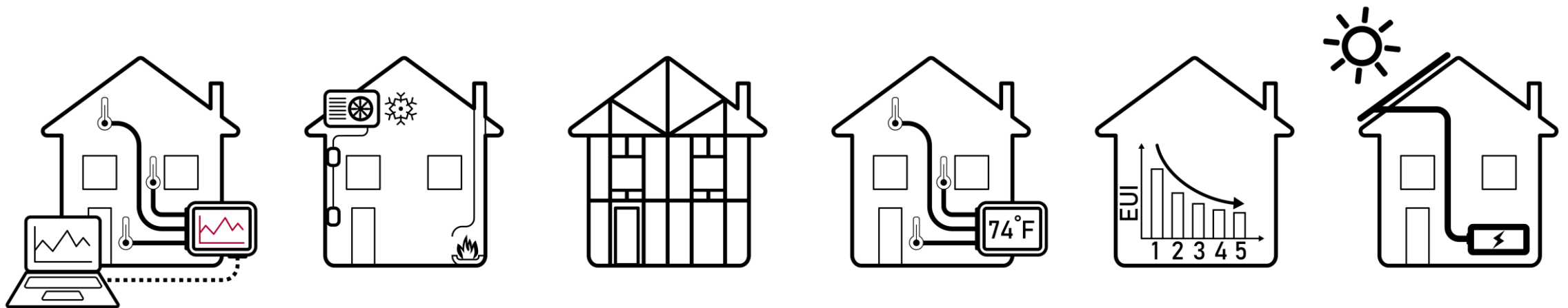
Building a Green Workforce: Training for Tomorrow's Energy Code Compliance



WASHINGTON STATE UNIVERSITY
School of Design and Construction

Background

Competency gaps among current and future professionals at a national level which inhibit from meeting energy efficiency goals.





State and National Context

- Washington State's energy codes, one of the most rigorous nationally, especially with the recent update.
- Washington State's cap and invest program and the Climate Commitment Act to reach net zero carbon emissions by 2050.
- More than half of WA residential buildings were built before 1980.
- Nearly one in three Washington households are cost burdened, spending more than 30% of their income on housing.



University Context

- The VCEA houses:
 - The School of Design and Construction (SDC)
 - The School of Mechanical and Materials Engineering (MME)
 - The WSU Extension Energy Program
- The VCEA is one of six colleges in the nation combining engineering and architecture and the only college combining all major design disciplines for the built environment.
- Current course offerings only address a subset of the gaps and are scattered across different departments and schools.



Reviewed programs lack ...

- Specialization: 95 % of reviewed programs cover a wide range of topics in energy efficient buildings.
- Asynchronous delivery: 90 % of reviewed programs were delivered in person.
- Expedited path to completion: Two thirds of the offerings were long-term degree programs and 75 % of those were MS degrees.



Our proposed programs are ...

- Focused on a building occupancy (residential).
- Delivered fully online asynchronously and self-paced with predetermined deadlines.
- Structured as certificate programs at the undergraduate and graduate levels.
- Structured as an accelerated professionally oriented master's degree program.

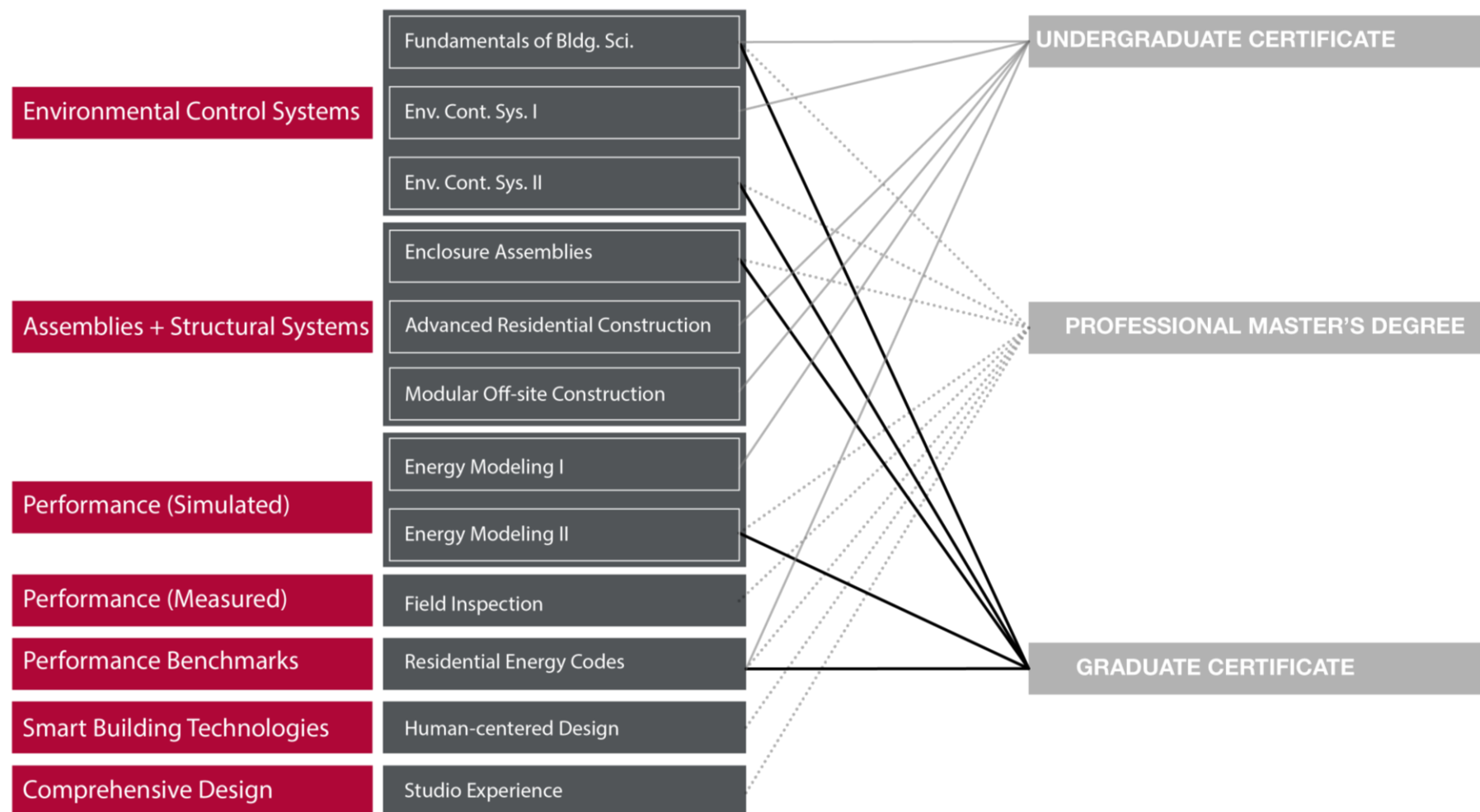


Team of faculty, staff, students, guest speakers, and TAC





Competencies x programs x courses



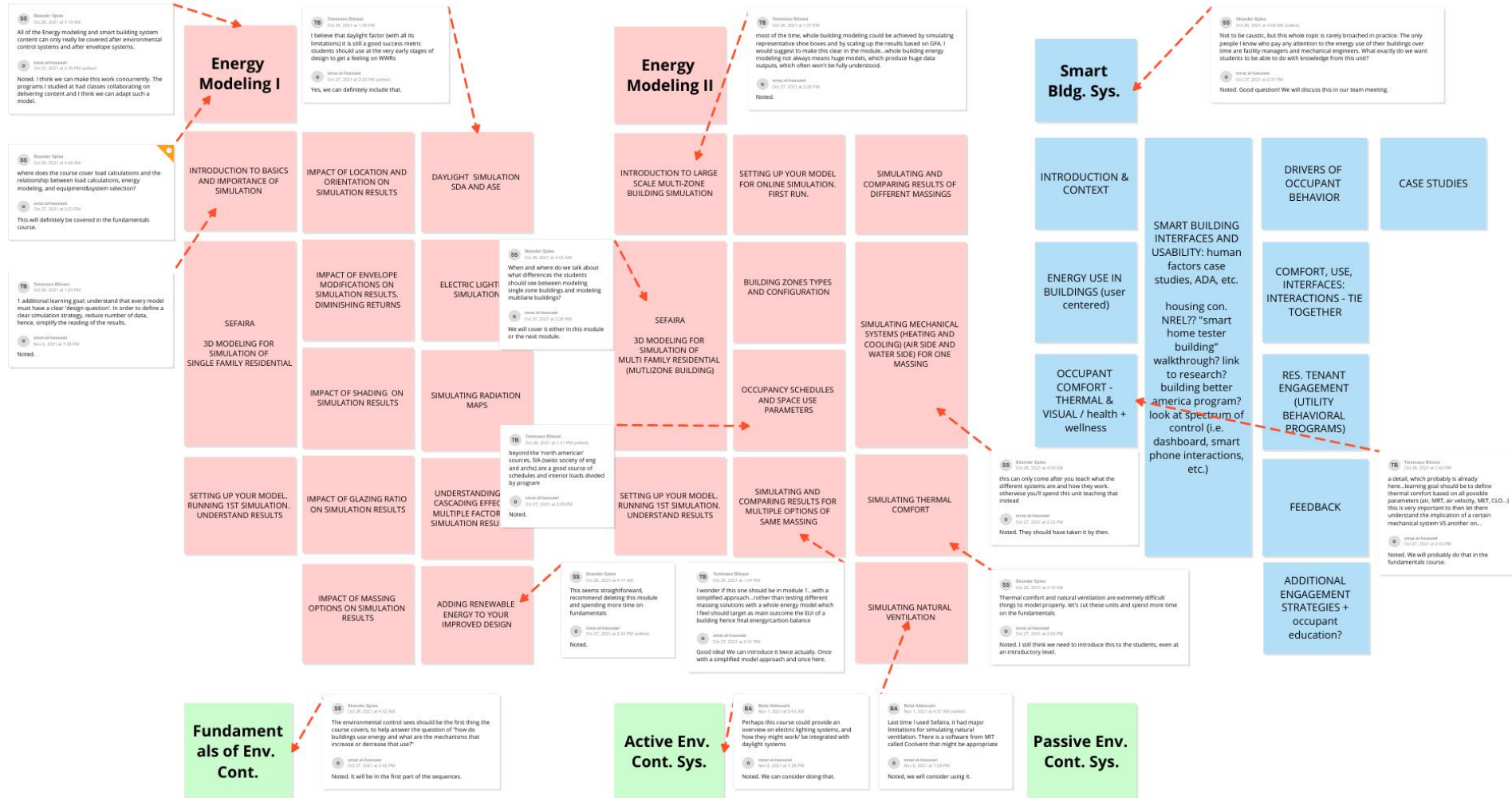


Competencies x programs x courses

Knowledge Gaps	UGC	GC	PM	Courses	UGC	GC	PM
Environmental Controls	x	x	x	Building Science Fundamentals	x	x	x
				Environmental Controls I	x		x
				Environmental Controls II		x	x
Enclosures and Structures	x	x	x	Residential Construction	x		
				Off-Site Construction	x		
				Enclosure Assemblies		x	x
Performance Data (Simulated)	x	x	x	Energy Modeling I	x		
				Energy Modeling II		x	x
Performance Benchmarks	x	x	x	Building Energy Codes	x	x	x
Performance Data (Measured)			x	Field Inspection			x
Smart Technologies			x	Human-centered Design			x
Comprehensive Design			x	Studio Experience			x
					15	12	30



Collaboration with TAC to develop course content





Promotion material

SUPPORT

"Our firm is committed to delivering carbon neutrality in all of our projects, from urban office buildings like the Bullitt Center, to overseas embassies, higher education facilities, and even in single family residential work like Loom House. We use the 2030 Challenge to set firm-wide goals. The ECC Programs provide the types of technical expertise and experience we need in our firm to achieve these goals."

The Miller Hull Partnership

ECC ARE ...

ONLINE CERTIFICATES: Which are offered through WSU's Global Campus making it more accessible for students and practitioners.

THAT ARE SHORT TERM: Giving you the opportunity to obtain in-demand learning outcomes and enter the market sooner with advanced training.

AND INTERDISCIPLINARY: Offering an in-depth specialized curriculum and opening up a diverse range of career opportunities.



WHAT?

The School of Design and Construction's Energy Conscious Construction (ECC) Certificates are a set of interdisciplinary educational programs with emphasis in high-performing energy-efficient residential buildings and covering all phases of the design process from pre-design to construction observation.



WHY?

WA residential buildings consume 23% of all energy. Our state has one of the most progressive energy codes and is committed to reducing greenhouse gas emissions from buildings through the Climate Commitment Act. The ECC programs prepare you for a career in building energy efficiency and address the rise in competency gaps associated with Washington's initiatives and goals for a sustainable future.



WHO?

DEGREE SEEKING: Open to current students in the Volland College of Engineering and Architecture, specifically **undergraduate** students at the junior level as well as **graduate** students.

NON-DEGREE SEEKING: Open to non-degree seeking students from outside WSU with backgrounds in design, construction, and engineering disciplines.



CAREERS

DESIGN & CONSTRUCTION:



Architects, Envelope Specialists, Interior Designers, Landscape Architects, Construction Managers

ENGINEERING:



Mechanical Engineers, Civil Engineers, Structural Engineers, Environmental Engineers

INSPECTION & MAINTENANCE:



Energy Auditors, Building Inspectors, Building Officials, Energy Raters

ECC RECOGNITION:

The Certificates have earned the U.S. Department of Energy's Zero Energy Design Designation for ensuring students have a solid foundation in building science and an opportunity to apply that knowledge in a zero energy design project.



OUR MISSION:

To create a workforce that is experienced in high-performing energy-efficient residential building design and construction, capable of meeting Washington State's progressive climate initiatives while advancing Washington State University's land-grant commitment.

UNDERGRADUATE

ONLINE CERTIFICATE | 15 CREDITS

COURSES	CREDITS
ME 483 Fundamentals Of Bldg. Sci.	3
SDC 451 Energy Modeling I	3
SDC 441 Bldg. Energy Codes	3
ARCH 464 Advanced Res. Const. OR	3
ARCH 495 Modular Off-Site Const.	
ARCH 493 Environmental Cont. Sys. I	3

GRADUATE

ONLINE CERTIFICATE | 12 CREDITS

COURSES	CREDITS
ME 579 Environmental Cont. Sys. II	3
SDC 552 Energy Modeling II	3
SDC 541 Bldg. Energy Codes	3
ARCH 531 Advanced Tectonics	3

COMPETENCY

GAPS COVERED IN THE CURRICULUM



Energy Modeling



Assemblies & Structures



Environmental Cont. Sys.



Performance Benchmarks



SDC.INFO@WSU.EDU
(509) 335-5539
HTTPS://SDC.WSU.EDU/



WASHINGTON STATE UNIVERSITY
School of Design and Construction

YOU can design and create an energy-efficient built environment using the knowledge and skills the ECC provides.



Promotion material

The screenshot shows the website for the School of Design and Construction at Washington State University. The top navigation bar includes 'WASHINGTON STATE UNIVERSITY', 'Quicklinks / Search Q', and a 'Give' button. The main header features the school's logo and the text 'Voiland College of Engineering and Architecture School of Design and Construction'. A left-hand navigation menu lists various programs, with 'Energy Conscious Construction' highlighted. The main content area displays a large image of a modern building with the text 'BUILDING A BETTER TOMORROW Energy Conscious Construction (ECC)' overlaid.

WASHINGTON STATE UNIVERSITY

Quicklinks / Search Q

Give

Voiland College of Engineering and Architecture
School of Design and Construction

Home

Academic Programs

- Architecture
- Construction Management
- Interior Design
- Landscape Architecture
- Energy Conscious Construction**
- ECC Graduate Certificate
- ECC Undergraduate Certificate

BUILDING A BETTER TOMORROW
Energy Conscious Construction (ECC)



Promotion material

SDC-451-ONLIN-DYN-LEC

Student View Immersive Reader

Recent Announcements

2023-Sum-SDC-451-ONLIN-DYN-G01-04493-Energy Modeling I

Edit

Welcome to Energy Modeling I

Instructor Introduction Navigating The Course

Overview

This course aims to introduce students to Building Performance Analysis necessary for testing and evaluating the impact of energy-efficient measures when applied from the early stages of the building design process. The course will instill in

Import Existing Content
Import from Commons
Choose Home Page
View Course Stream
New Announcement
New Analytics
View Course Notifications

To Do

- 2 Grade Discussion 9: Impact of Opaque Envelope Assemblies (2.5 points • Jun 7 at 11:59pm)
- 2 Grade Assignment 5: Envelope Assemblies Simulation Results (7.5 points • Jun 11 at 11:59pm)
- 2 Grade Discussion 10: Impact of Translucent Envelope Assemblies (2.5 points • Jun 11 at 11:59pm)



Energy Conscious Construction (ECC) Certificate Programs

- The undergraduate + graduate certificates were awarded the Zero Energy Design Designation from the U.S. Department of Energy in Summer of 2023.
- Nationally, the ECC certificates are only one of two certificate programs with this designation and potentially the only certificate program that is fully online, and asynchronous.

ZERO
ENERGY
DESIGN
DESIGNATION



U.S. DEPARTMENT OF ENERGY



ECC courses delivered to date

Course no.	Course name	Faculty	Semester	In-person	Online
ARCH493	Environmental Control Systems I	Al-Hassawi	Sp 23	0	7
ARCH531	Envelope Assemblies	Drake	Sp 23	30	0
SDC441/541	Energy Codes, Standards, Rating Systems	Jones (Extension)	Su 23	0	4
SDC451/551	Energy Modeling I	Al-Hassawi	Su 23	0	3
SDC452/552	Energy Modeling II	Al-Hassawi	Su 23	0	4
ME483	Fundamentals of Building Science	McLarty (Mechanical Engineering)	Su 23	0	5
ARCH464	Advanced Residential Construction	Smith (University of Arizona)	Fa 23	0	8
ARCH493	Environmental Control Systems I	Al-Hassawi	Sp 24	0	17
ARCH 495	Modular Off-Site Construction	Smith (University of Arizona)	Sp 24	0	6
ARCH531	Envelope Assemblies	Drake	Sp 24	26	0
				56	54
				110	



Successes and Challenges

Successes:

- One student earned the undergraduate certificate.
- Two students are earning the graduate certificate this summer.
- Five courses are offered this summer (four returning and one new).

Challenges:

- Breaking even and supporting teaching faculty.
- Increasing enrollment numbers per course.
- Hands-on experiences in fully-online courses.
- Completing course content for courses as well as for professionals.



Thank you! Questions?

For further details, please refer to this website



Effective Energy Code Training in Texas and OK

Randy Plumlee

Energy Code Program Manager for SPEER

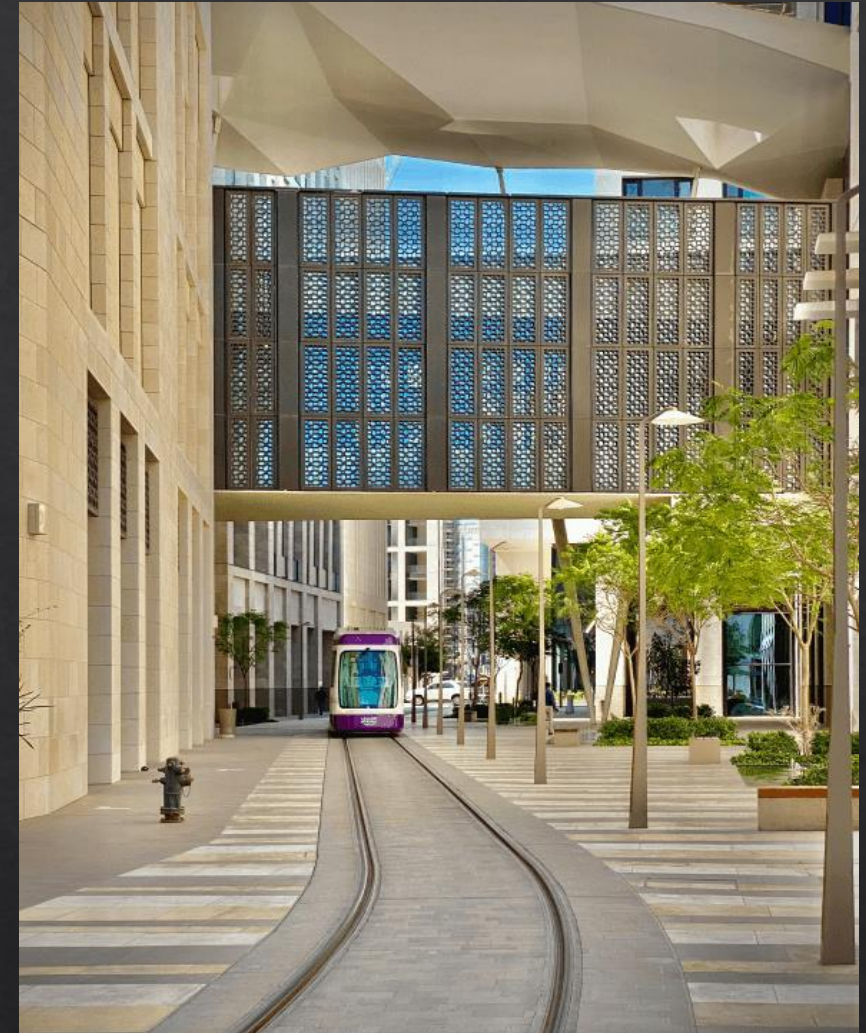
Covering Texas and Oklahoma

2024 National Energy Codes Conference



Brief Background and Experience

- ◆ Obtained an A.A.S. in Residential Building Performance
- ◆ Certified as IECC-R, HERS, BPI, LEED-GR, NGBS
- ◆ 10 years with one of the largest 3rd party verifiers in Texas
- ◆ Managed a Team of energy inspectors that covered DFW, Houston, and Austin
- ◆ Trainings included IECC-R, RESNET HERS and RFI, Energy Star, NGBS, and LEED-Homes
- ◆ Focus trainings around building science principles and consistency
- ◆ **Fun Fact:** Was part of the Field Inspection Team on the first residential LEED-Homes project outside of the United States – the Msheireb Downtown Doha project in Qatar





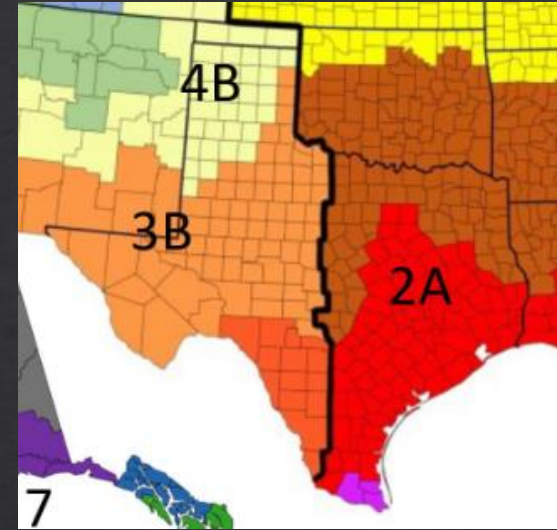
Covering Texas and Oklahoma

- ◇ Both Texas and Oklahoma are home-rule states
- ◇ Texas is very much the wild west with very little consistency between cities with adoption and amendments
- ◇ Oklahoma has the Oklahoma Uniform Building Code Commission (OUBCC)
 - ◇ Reviews, amends and adopts building codes for Oklahoma
 - ◇ Cities have the authority to adopt newer codes, but currently all are equal to OUBCC adopted code of an amended 2018 – weakening to 2009 levels



Energy Code for 10 Largest Texas Cities

- ◆ Houston – 2021 w/ 2024 electrification and EV amendments
- ◆ San Antonio – 2021 w/ amendments
- ◆ Dallas – 2021 w/ amendments
- ◆ Austin – 2021 w/ amendments
- ◆ Ft. Worth – 2015
- ◆ El Paso – 2021 w/ weakening amendments
- ◆ Arlington – 2021
- ◆ Corpus Christi – 2015
- ◆ Plano – 2021 w/ amendments
- ◆ Laredo – 2018 IRC w/ deleted Chapter 11





Focus of our Trainings

- ◆ **Webinars** – 51 – over 2100 attendees
- ◆ **In-Person** – 53 – over 5200 attendees
 - ◆ Over last 2 years
- ◆ **Who's our Audience**
 - ◆ 42% City Building Officials or Staff
 - ◆ 48% 3rd Party Verifiers and Energy Inspectors
 - ◆ 10% Contractors including Insulation, Air sealing, and HVAC Techs
 - ◆ Additional trainings for developers, architectural firms, real estate inspectors

Focus of our Trainings

- ◇ **Topics Include:**
 - ◇ Building Science principles
 - ◇ 2021 IECC Significant Changes
 - ◇ Understanding the different pathways thru code
 - ◇ HVAC Energy Code requirements including Manual J and S
 - ◇ Proper ductwork design and installation practices
 - ◇ Mechanical Ventilation requirements and Testing requirements
 - ◇ Indoor Air Quality (IAQ)
 - ◇ Difference between code and above code inspections and the scope of work for each
 - ◇ Energy Star checklists and field verification
 - ◇ Air Sealing techniques and field verification
 - ◇ Heat pump Technologies

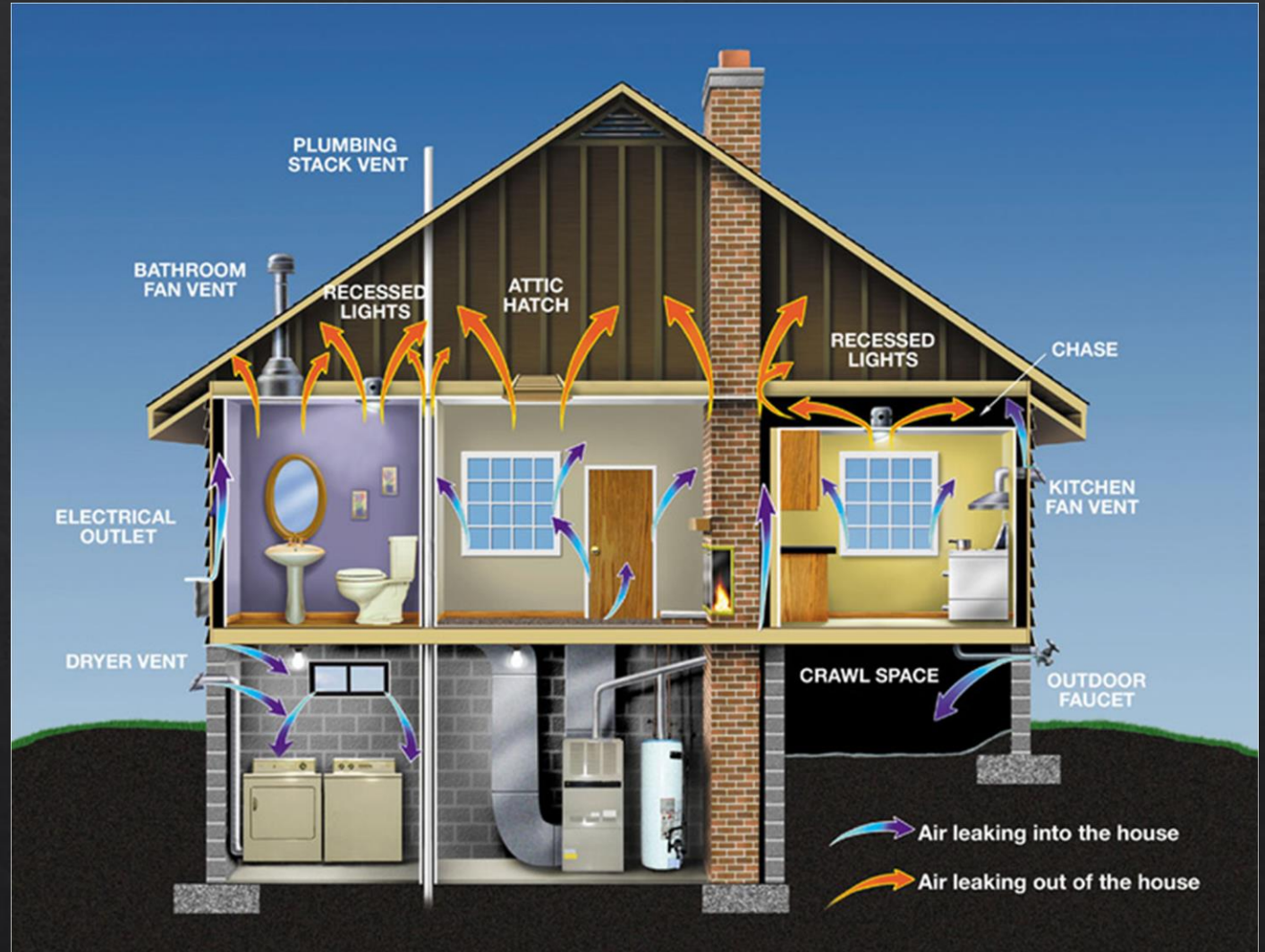
- ◇ **Choice of Topic depends on the Audience**

Challenges with our Trainings

- ◇ Questions of Why and How does any of this make sense –
 - ◇ “Houses need to breath!”
 - ◇ “This is getting too complicated”
- ◇ Push back from city councils, builders, contractors, and trade associations
- ◇ Lack of enforcement due to it not being a health and safety concern – view changes after trainings
- ◇ Lack of understanding in the scope of work between city and 3rd party verifiers
- ◇ Not viewing the 3rd party verifiers as contractors – requiring registration, verification of active certifications, holding correct amounts of liability insurance
- ◇ Collecting half of the equation for HVAC – Manual J but not S – **Explain the importance of both**
- ◇ “We just do whatever X does” – X being the closest major city or OUBCC
- ◇ How to overcome objections – **Case studies, show how it can be a health and safety issue, go down the rabbit holes**

Weatherization Training

- ❖ Train existing weatherization crews on the principles of building science
- ❖ Energy code basics
- ❖ HVAC installation best practices
- ❖ Mechanical ventilation
- ❖ Combustible appliance zone training
- ❖ Understand the why not just the how
- ❖ Help them better understand the importance of what they do
- ❖ Ensure they are aware “improvements” can create a health and safety issue



Assemble the Team



- ◆ Reaching out to 3rd party verifiers for coverage
 - ◆ Getting them involved with cities and builders
- ◆ Work with HVAC contractors to understand energy code requirements and what's being tested
- ◆ Include plan reviewers on energy code training and compliance software reports
- ◆ Assist community colleges with course curriculum based on building science

Building a Green Workforce: Training for Tomorrow's Energy Code Compliance

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[Energy Efficiency as a Resource – YouTube](#)



Questions

Thank you



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Building Energy Codes Program

<https://www.energycodes.gov/>