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Commercial Code Enhancement (CCE) Initiative

DOE Energy Codes Conference

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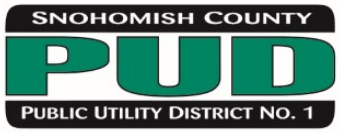
Northwest Energy Efficiency Alliance



NEEA'S Participating Funders



CCE Initiative Concept

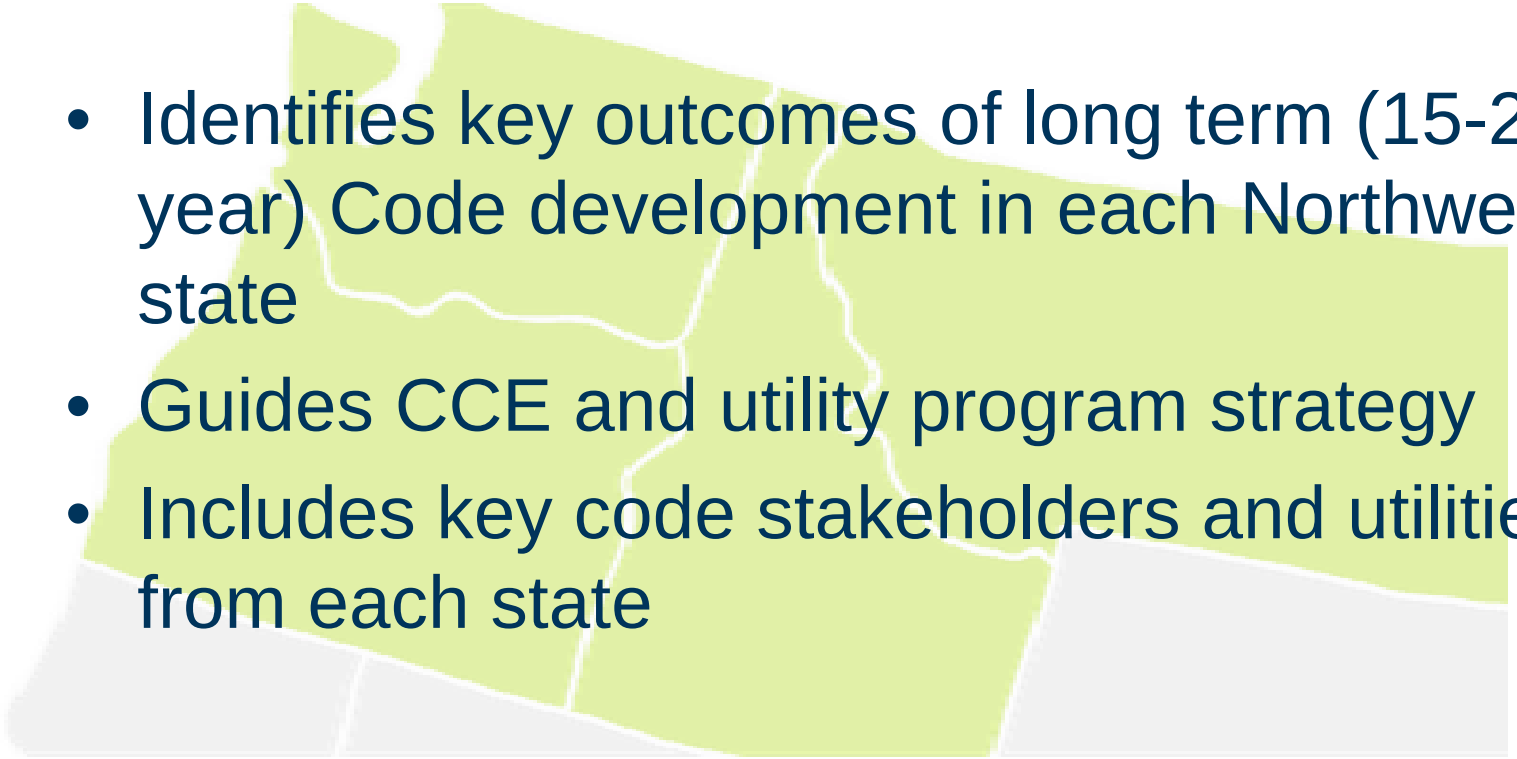
A regional framework with state specific plans supporting the adoption of **progressively effective** energy codes.

- *Utilities need to capture savings before measures become code.*
- *Market should lead code.*

CCE Implementation

- Develop State Coordination Plans
- Apply Technology and Practice Assessment
- Determine and implement Market Intervention Strategies
- Periodically convene initiative utility work group

State Coordination Plans



- Identifies key outcomes of long term (15-20 year) Code development in each Northwest state
- Guides CCE and utility program strategy
- Includes key code stakeholders and utilities from each state

Stakeholder Team

- Utility Representatives
- Code Advocates
- Code Officials
- State Energy Office
- Integrated Design Labs
- NEEA Staff
- Industry Experts

Market Situation

- What is the state of new construction?
- What are typical practices vs. unique practices?
- Who are the market leaders?
- What are the relevant professional associations?

Code Development and Adoption Process

- Code Cycle
- Code Proposals
- Code Adoption
- Possibilities for Reach Code
- Opposition and Causes for Delay
- Code Training
- Enforcement and Compliance

Policies that Influence Energy Codes

- Oregon – Executive Order (No. 17-20) New commercial construction is to comply with ASHRAE 189.1, be solar ready and electric vehicle ready by October 1, 2022.
- Washington - In 2009 Senate Bill 5854 directed the Washington State Building Code Council to develop energy codes that achieve a 70 percent reduction in building energy use by 2030 compared to the 2006 Washington State Energy Code.

Goals

- Identify a long term objective(s)
- Describe the specific targets for each code cycle
- Establish the desired outcomes of key stakeholders and utilities

Utility Program Alignment

- What are the goals of your current CNC programs?
- What are long term goals in CNC?
- How are your programs influenced by state/local policy and legislation, PUC or IRP?

Code Timeline

	Current					Next Cycle	
State	Adopted	Effective	Level	Normal cycle	Proposals due	Next adoption	Next Effective
MT	Sep 2014	Nov-14	2012 IECC	Varies	May-18	Q3 2018	Q1 2019
IECC-C	Q4-16	Sep-17	2018 IECC-C*	3 years	Q1-19	Q4-19	Q3 -20

Utility Timeline

- When do you revise your programs?
- What is your vetting process for new program measures?
- How do you see your programs intersecting with code development?

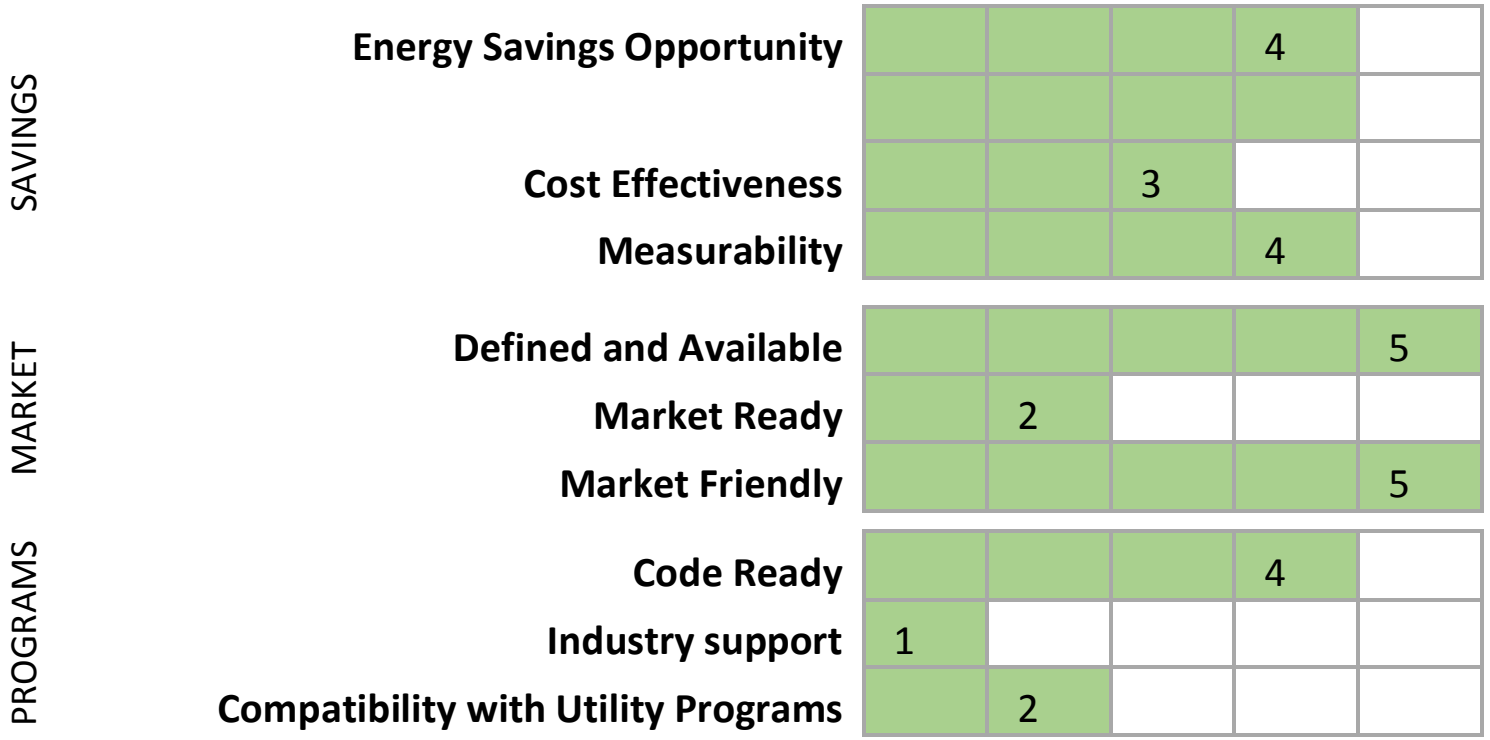
Identifying New Measures

- How can we look to Utility programs as a data source for future code measures? e.g. ETO
- How can CCE be a “pipeline” for new Utility program offering? e.g. 2021 IECC
- How do we know when measures are code ready?

IDL Scanning

- Design labs reviewing database and prioritizing potential measures for utilities in each state

Technology and Practice Assessment (TPA)



Market Intervention Strategies

- Demonstration Projects
- Case Studies
- Technical Briefs
- Promotion
- Education and Training

AN HVAC TOTAL SYSTEM PERFORMANCE RATIO REQUIREMENT IN WASHINGTON CODE WILL ENSURE EFFICIENT SYSTEMS AND ACCURATE EFFICIENCY MEASUREMENT

As proposed by the City of Seattle, developed by Pacific Northwest National Laboratory (PNNL), and evaluated and endorsed by the Northwest Energy Efficiency Alliance (NEEA), an HVAC Total System Performance Ratio (TSPR) requirement in the 2018 Washington State Energy Code would require building designers to use more efficient HVAC systems that are evaluated based on whole-system performance.

PROBLEMS WITH CURRENT HVAC ENERGY CODE

Today's Washington State Energy Code perpetuates the use of less efficient HVAC systems by treating high- and low-performing HVAC systems equally. This is because a) current code only evaluates the efficiency of equipment within the same category (e.g., electric furnaces are only evaluated against electric furnaces as opposed to alternate and potentially more efficient heating options); and b) current code separately evaluates each individual equipment type within the HVAC system (e.g., chiller, boiler, heat pump, fan and cooling towers), instead of evaluating the HVAC system performance holistically.

While other high-impact systems, such as the building envelope and lighting, are already governed by code requirements that address these nuances, current HVAC code requirements impose minimal market pressure for building designers to consider the overall efficiency of the system.

PROPOSED SOLUTION: AN HVAC TOTAL SYSTEM PERFORMANCE RATIO

Based on HVAC systems proven to perform well in five specific building types (office, education, retail, library and fire station), a Total System Performance Ratio compares the annual heating and cooling energy provided to the building to that of the annual cost of energy consumed by the building.*

$$\frac{\text{annual heating and cooling energy provided to the building}}{\text{annual cost of energy consumed by the building}} = \text{Total System Performance Ratio}$$

The higher the Total System Performance Ratio, the higher the efficiency of the HVAC system. To meet a state code requirement that incorporates this ratio, mechanical engineers must avoid inefficient system types and configurations that are currently code-compliant.

Under this proposed solution, the code documentation will include an approach for engineers to calculate the performance ratio using hourly building energy simulation. Alternately, engineers will have the option to input the characteristics of the building and its mechanical systems into a software tool, currently under development by PNNL, as a module of the US Department of Energy's Asset Rating Tool. The tool will set a minimum allowable Total System Performance Ratio target for each building type based on its characteristics and climate zone.

BENEFITS

- Restricts the use of inefficient HVAC systems, leading to reduced energy use
- Educates engineers on HVAC system energy use and cost-effective systems that save energy
- Does not require complex energy modeling
- Reduces operating costs once building is finished and occupied

*Energy costs will be provided by the Washington State Department of Commerce.

Evaluation

Two types of evaluation will be conducted as part of CCE:

- Impact Evaluation – Measuring the delivery and adoption of proposals in a given code cycle. Impact Evaluation will take place following each completed code cycle.
- Process Evaluation – Evaluating the effectiveness of CCE activities in identifying upcoming code proposals with each state stakeholder group, as needed.

In addition, a roadmap is being developed to track and measure progress and impacts in each State.

Program Key Activities

	Current	Next Steps
State Coordination Plans	• Final Drafts completed for ID, OR, WA • First Draft to MT	• Update SCP's, as needed
Technology & Practice Assessments (T&P)	• Identifying future code measures	• Review with utilities and technical experts • Use to fill out road map
Proposal Development and Support	• Supporting two WA measures	• Identify IECC proposals • Data mine utility programs

Regional Bi-Annual Meetings

Roadmap

- Interactive tool that will prioritize and forecast advanced measures in future code cycles
- This tool can be updated through ongoing conversations with CCE participants as new code is adopted or new ideas come into consideration

Initiative Outcome – Progressively Effective Commercial Building Energy Codes

- **Market practice leads** and informs code
- **Strategic partnerships** between utilities, jurisdictions and the design and construction industry
- **Greater simplicity** of codes
- **Lower energy use**

Impact: Alignment

Thank You

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TOGETHER We Are Transforming the Northwest