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September 9, 2020

MEMORANDUM

TO: Council Members

FROM: Kevin Smit

SUBJECT: Status of State and Federal Appliance Standards, and State Building Codes

BACKGROUND:

Presenter: Bing Liu, Northwest Energy Efficiency Alliance

Summary: It is important to understand the status of federal and state appliance efficiency standards, as well as state building energy codes as we develop the 2021 Power Plan. New codes and standards that have taken effect since the Seventh Power Plan are accounted for in the Council's load forecast and result in a reduction of forecasted regional loads and provide baselines for energy efficiency measures. The Northwest Energy Efficiency Alliance provides a critical role on behalf of the regions' utilities in advancing codes and standards. NEEA has a codes and standards group that provides key analytical and coordination functions for the development of improved state building energy codes as well as both state and federal appliance standards. The result is the acquisition and equitable distribution of low-cost energy efficiency resources to Northwest consumers. The presentation will provide a status of state energy efficiency codes, state and federal appliance standards, and highlight NEEA's role on behalf of the Northwest.

Relevance: The Council has been an active participant with the U.S. Department of Energy in the development and review of federal energy efficiency standards for many years. These appliance efficiency standards play an

important role in achieving our energy efficiency goals in the Northwest by acquiring significant efficiency resources in an equitable and low-cost manner.

More recently, individual states including Washington and Oregon, have developed their own appliance standards in addition to those developed by DOE.

In addition, the Council, since the First Power Plan (1983) has been specifying and promoting improved building energy efficiency codes. In each Power Plan, the Council includes Model Conservation Standards (MCS) which have included detailed recommendations for building energy efficiency codes.

In all these areas the council staff work with and/or rely on NEEA for significant technical leadership that includes field testing, modeling, engineering analysis, and regional coordination.

Workplan: A.1.1 – Develop cost and availability of energy efficiency
C.1.1 – Develop base load forecast
B.1.1 – Coordinate with regional entities to ensure regional goals are achieved.

More Info: Chapter 12 (page 12-19) and Appendix F of the Seventh Power Plan provide background for how Federal Appliance Efficiency Standards are included in the power planning process. Also, an [update](#) on the Federal Standards process and status was provided at the September 2019 Council Meeting.

Bing Liu Bio:

Bing Liu is a Senior Manager at the Northwest Energy Efficiency Alliance, leading the Codes, Standards and New Constructions Department. Bing leads the development and implementation of building energy codes, appliance and equipment standards, commercial and residential above-code programs. Before joining NEEA, Bing was a group leader at Pacific Northwest National Laboratory (PNNL), overseeing the Building Energy Research and Analysis group with 30 researchers. She was also the program manager of the Building Energy Codes Program at PNNL, leading PNNL's research team to support the development and implementation of building energy codes in support of U.S. Department of Energy.

Bing is an internationally recognized technical expert with over 25 years of experience in building codes and standards, large scale building energy simulation, energy efficiency technology analysis, and building performance metering. Bing is a registered Professional Engineer, Fellow ASHRAE, a member of ASHRAE Standard 90.1, Standard 189.1 and technical program chair of ASHRAE 2020 Annual Conference. She was the lead author of award-winning Advanced Energy Design Guide and ASHRAE Distinguished Lecturer. Bing was featured as one of Top 20 Women in HVAC Industry for 2020 by Engineered System Magazine.





Energy Efficiency Codes and Standards

Bing Liu, P.E., Fellow ASHRAE
Sr. Manager
Codes | Standards | New Construction

Present to Norwest Power and Conservation Council
September 16, 2020

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Topics

- Building energy codes and appliance standards
- Status of federal standards
- Status of state codes and appliance standards
- NEEA's role in codes and standards

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Energy Efficiency Codes and Standards

Codes =
Buildings



Standards =
Appliance, lighting,
equipment



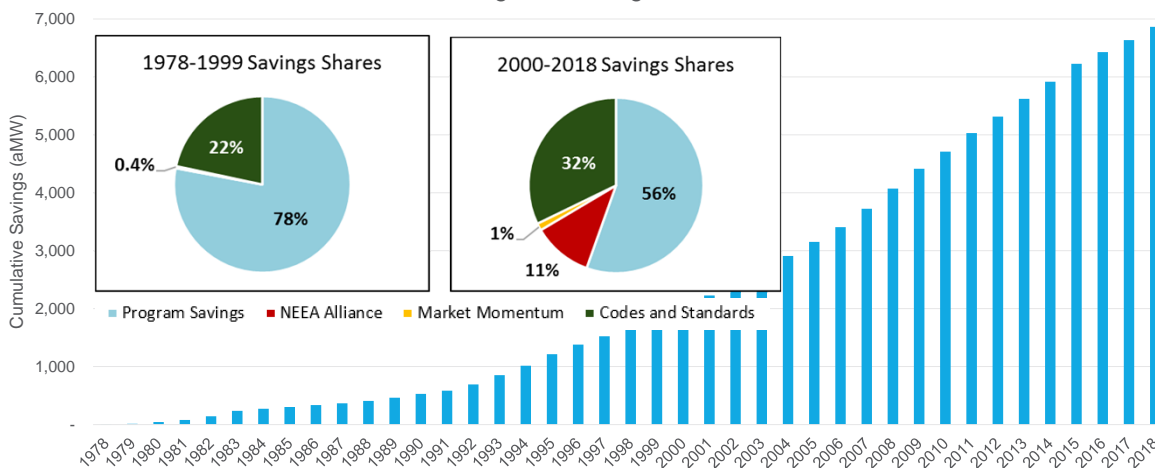
Energy Efficiency Codes and Standards prove to be the best energy saving policy.

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Codes and Standards Contribute 30% of Cumulative Regional Conservation Savings

Cumulative Regional Savings, all Mechanisms



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Source: NWPCC

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Federal Standards Ramp Up...maybe

After missing legal deadlines for 26 standards and 21 test procedures, DOE initiated rulemakings for 30 products since April 2020.

Commercial and industrial products (15)

- Fans*
- Unitary AC & HP (RTUs)*
- Single packaged vertical AC & HP*
- Water source heat pumps*
- Warm air furnaces*
- Clothes washers
- Small electric motors*
- Electric motors*
- Beverage Vending Machines*
- Prerinse Spray Valves*
- Evaporative-cooled package AC
- Water-cooled package AC
- Computer room air conditioners
- Small air-cooled unitary AC & HP

* Products that NEEA has submitted comment letters and provided data to DOE.

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Federal Standards Ramp Up

Residential products (8)

- Refrigerators and freezers*
- Water heaters*
- Consumer boilers*
- Clothes washers*
- Room air conditioners
- Clothes washers and dryers (short-cycle)
- Showerheads
- Pool pumps

Lighting products (5)

- GSL fluorescent lamps and incan. reflector lamps*
- Illuminated exit signs*
- Fluorescent lamp ballasts
- Metal halide lamp fixtures
- Five lamp types

Other products (2)

- Battery chargers*
- External power supplies*

* Products that NEEA has submitted comment letters and provided data to DOE.

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NEEA plays a key role to influence federal standards and test procedures



Submit data driven comments to affect DOE's rulemaking outcomes



Serve as technical expert testifying in the public hearings and contributing to the working group under the negotiated rules



Conduct the lab testing and field research to develop and improve the test and rating standards

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NEEA's Codes Program

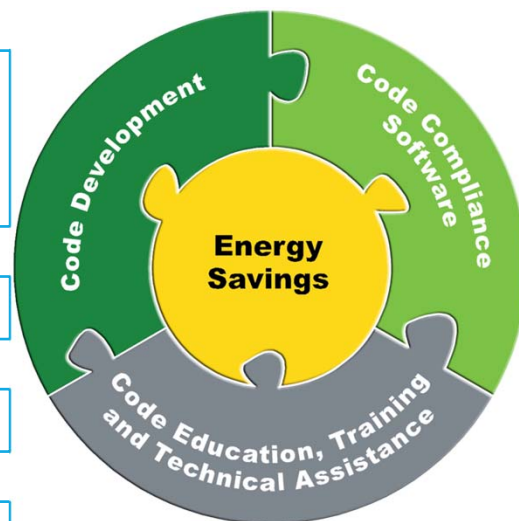
Development and Adoption

- National model codes (IECC, ASHRAE 90.1)
- State codes
- Above-code new constructions

Training, education and technical support

Code compliance field study

Code saving analysis



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Status of State Codes and Standards

- Idaho
 - Adopted the 2018 IECC for commercial
 - Adopted the 2018 IECC with amendments (less efficiency) for residential
 - Effective January 1, 2021
- Montana
 - Currently 2012 IECC
 - In the process to adopt 2018 IECC
 - Estimated effective late 2021 or early 2022

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Status of State Codes and Standards

- Policy drivers in Oregon and Washington
 - Oregon Executive Order 20-04: 60% site energy reduction by 2030 from the 2006 code baseline
 - Washington Legislation: 70% site energy reduction by 2030 from the 2006 code baseline
- Oregon
 - Adopted ASHRAE 90.1-2016 for commercial, effective October 1, 2019
 - In the process to adopt 2021 residential code (likely more efficient than 2018 IECC)
- Washington
 - Adopted the 2018 Washington State Energy Code
 - More efficient than 2018 IECC and ASHRAE 90.1-2016
 - Effective February 1, 2021

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State Appliance Standards - Washington

Added 17 products to state standards in 2019 Legislation (House Bill 1444)

- **Water products**
 - Faucets
 - Showerheads
 - Spray sprinkler bodies
 - Urinals
 - Water closets
 - Water coolers
- **Lighting products**
 - High color rendering index(CRI) fluorescent lamps
 - General service lamps
- **Commercial products**
 - Fryers
 - Dishwashers
 - Steam cookers
- **Other products**
 - Air compressors
 - Computers and computer monitors
 - Residential ventilating fans
 - Uninterruptible power supplies
 - Portable air conditioners

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State Appliance Standards - Washington

Smart-Connected Electric Storage Water Heaters

- Applies to electric storage water heaters
 - Input rating 12 kW or less
 - 40-120 gallon rated storage volume
 - Supplies water at 180 degrees or less
- Applies to products manufactured after July 1, 2021
- Requires CTA-2045 communication port



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State Appliance Standards - Oregon

11 products submitted for Legislative conforming in 2021

- **Commercial products**
 - Fryers
 - Dishwashers
 - Steam cookers
- **Water products**
 - Faucets
 - Showerheads
 - Water coolers
- **Residential and other products**
 - Electric water heater (smart connected)
 - Computers and computer monitors
 - Residential ventilating fans
 - Portable electric spas
- **Lighting products**
 - High-CRI fluorescent lamps

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Questions?

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