

**Washington State Department of Community,
Trade and Economic Development**

**2009 Energy Code
30 % Energy Savings**

Chuck Murray

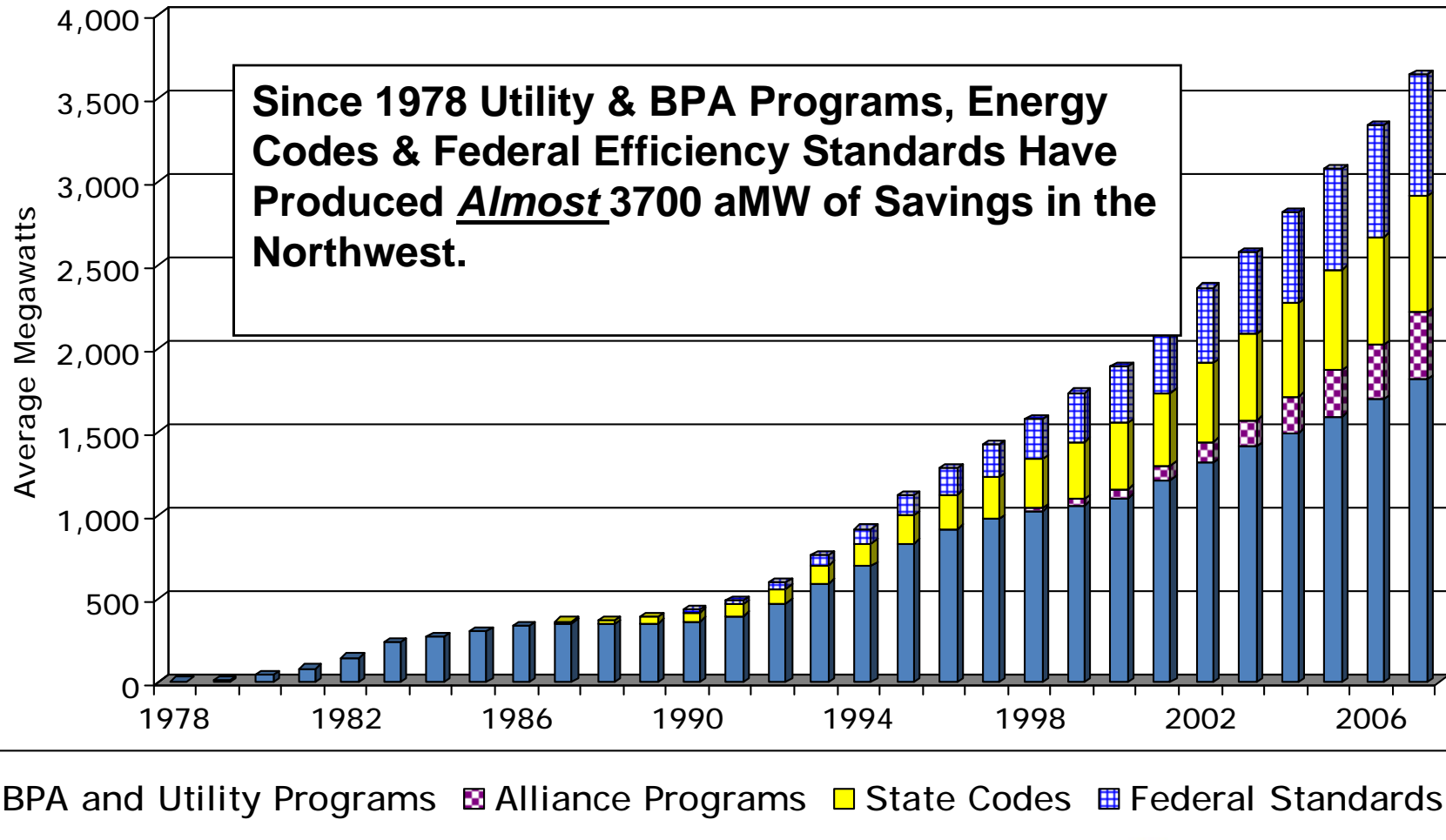
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CTED | Community, Trade and
Economic Development

PNW Energy Efficiency Achievements 1978 – 2007

NW Power and Conservation Council



A Rough History of the Washington State Energy Code

- Mid 1970's – Something on the books
- 1980's – BPA R&D, Early adoption of “progressive” Energy Codes adopted by some local jurisdictions
- 1990 – RCW 19.27A Washington State Energy Code
 - Mandatory State Wide
 - Less stringent code for gas heated buildings
 - Lots of energy code enforcement training makes it meaningful
- 2000 – Following years of only minor changes, a substantive upgrade.
 - Gas heated homes now on par with electric
- 2003, 2006 – improvements
 - About 5 percent per cycle



Code Revision Process

- Washington State Building Code Council
 - The Council establishes the minimum building, mechanical, fire, plumbing and energy code
 - Members appointed by the Governor
- 2009 Code Cycle
 - March 1 – Proposals Due
 - Spring, Summer – Technical Advisory Groups revise proposals, make recommendations to the council
 - Fall – Two public hearings and a final rulemaking
 - July 1, 2010 – New codes implemented



30 % - Where did that come from?

- 1. Federal Energy Code for Buildings – *Current Standard*
- 2. U.S. Department of Energy
 - Developed -30% working on
 - -50%
 - National Code national code
- 3. ASHRAE 90.1
 - -30% By 2010
- 4. 2030 Challenge – 30% now
- 5. The State Climate Action Team Adopted These

**Waxman-Markey
Bill**

**30% 2012
50% by 2016**



Climate Action Team

EE/GB ACTION 3: STATE ENERGY CODE IMPROVEMENTS AND ESTABLISHMENT OF 2030 BUILDING GOALS

This Action includes two major elements:

1. **In the 2009 Washington State Energy Code (WSEC) to achieve a 30 percent energy savings. WSEC. Provide substantial incentives for equipment replacement programs, and provide technical assistance, and update the code every three years prior to the state building code development and adoption process.**
2. **Legislative action is needed to develop a long term State Energy Code, including: state codes and annual technical assistance, and update the code every three years prior to the state building code development and adoption process.**

**Yes,
Support is
Needed**



What's Regulated?

(simple example)

• Building Energy Code

- *Building Insulation*
- *Windows*
- *Air Leakage Control*
- *Duct Installation*
- *Lighting*
- *Equipment Controls*

• Energy Efficiency

Heating

standards as well

**Lost
Opportunities
or
Achievements
?**

Regulated

• Not Regulated

- *Performance*
- *Equipment location (outdoors?)*
- *Building size*
- *Building shape*

- *Video Game Player*
- *Cable Box*
- *Computer Server farms*



Single Family Residential Proposal

Relatively easy to get - 30%

Similar to Energy Star Homes

Need to be creative to get round Federal
Preemption on equipment



Single Family Residential Proposal

- Lighting – 50% of sockets CFL or equivalent
- Duct Leakage Control – Includes Testing
 - New construction
 - At time of equipment replacement
- Building Air Leakage Control – Includes Testing
 - 0.3 Air changes per hour
 - Credits for lower air leakage control



Prescriptive Building Envelope

Not much improvement here

**TABLE 6-1
PRESCRIPTIVE REQUIREMENTS^{0,1} FOR
CLIMATE ZONE 1 AND 2**

Option	Glazing Area ^{1,10} : % of Floor	Glazing U-Factor		Door ⁹ U-Factor	Ceiling ²	Vaulted Ceiling ³	Wall ¹² Above Grade	Wall• int ⁴ Below Grade	Wall• ext ⁴ Below Grade	Floor ⁵	Slab ⁶ on Grade
		Vertical	Overhead ¹¹								
I.	<u>13%</u>	<u>0.34</u>	<u>0.50</u>	0.20	<u>R-38 adv or R-49</u>	<u>R-38</u>	<u>R-21 Int⁷</u>	<u>R-21</u> TB	<u>R-10</u>	<u>R-30</u>	<u>R-10</u> <u>2'</u>
II.	25%	<u>0.32</u>	<u>0.50</u>	0.20	<u>R-38 adv or R-49</u>	<u>R-38</u>	<u>R-21 Int⁷</u>	<u>R-21</u> TB	<u>R-10</u>	<u>R-30</u>	<u>R-10</u> <u>2'</u>
III.	Unlimited	<u>0.30</u>	<u>0.50</u>	0.20	<u>R-38 adv or R-49</u>	<u>R-38</u>	<u>R-21 int⁷</u>	<u>R-21</u> TB	<u>R-10</u>	<u>R-30</u>	<u>R-10</u> <u>2'</u>



Additional Requirements

- **CHAPTER 9**
- **ADDITIONAL RESIDENTIAL ENERGY EFFICIENCY REQUIREMENTS**
- **901. Additional Residential Energy Efficiency Requirements.** Dwelling units permitted under this chapter shall comply with all provision of Chapter 5 of this code and develop 3 credits from Table 9-1.



Table 9-1 Energy Credits

Option	DESCRIPTION	CREDIT(S)
1	<p>HIGH EFFICIENCY HVAC EQUIPMENT 1</p> <p>1.1 Gas, propane or oil-fired furnace or boiler with minimum AFUE of 92%, or 1.2 Air-source heat pump with minimum HSPF of 8.5,</p> <p>Only one efficient hvac equipment option may be chosen for compliance with this section.</p>	1.0
2	<p>HIGH EFFICIENCY HVAC EQUIPMENT 2</p> <p>Closed Loop Ground Source heat pump: with a Minimum COP of 3.3</p> <p>Only one efficient hvac equipment option may be chosen for compliance with this section.</p>	2.0
3	<p>HIGH EFFICIENCY HVAC EQUIPMENT 3</p> <p>DUCTLESS SPLIT SYSTEM HEAT PUMPS, ZONAL CONTROL: In home where the primary space heating system is zonal electric heating, a ductless heat pump system shall be installed and provide heating to at least one zone of the housing unit.</p> <p>Only one efficient hvac equipment option may be chosen for compliance with this section.</p>	1.0
4	<p>HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM:¹</p> <p>All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion.</p> <ul style="list-style-type: none"> • Locating system components in conditioned crawl spaces is not permitted under this option. • Electric Resistance Heat is not permitted under this option. • Direct Combustion Heating Equipment with AFUE less than 80% is not permitted under this option. 	1.0



5	<p>EFFICIENT BUILDING ENVELOPE 1.</p> <p>Prescriptive compliance is based on Table 6-1, option III with the following modifications: window U=.28, floor R-38, slab on grade R-10 full, below grade slab R-10 full. Only one efficient building envelope option may be chosen for compliance with this section. or</p> <p>Component performance compliance: Reduce the Target UA from Table 5-1 by 5%, as determined using EQUATION 1. ¹</p>	0.5
6	<p>EFFICIENT BUILDING ENVELOPE 2.</p> <p>Prescriptive compliance is based on Table 6-1 option III with the following modifications: window U=.25 and wall R-21 plus R-4 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full and R21 plus R-5 below grade basement walls. Only one efficient building envelope option may be chosen for compliance with this section.</p> <p>or</p> <p>Component performance compliance: Reduce the Target UA from Table 5-1 by 15%, as determined using EQUATION 1. ¹</p>	1.0
7	<p>SUPER-EFFICIENT BUILDING ENVELOPE 3.</p> <p>Prescriptive compliance is based on Table 6-1, option III 3 with the following modifications: window U=.22 and wall R-21 plus R-12 and R-38 floor slab on grade R-10 full, below grade slab R10 full and R21 plus R-12 below grade basement walls and R-49 advanced ceiling and vault. Only one efficient building envelope option may be chosen for compliance with this section.</p> <p>or</p> <p>Component performance compliance: Reduce the Target UA from Table 5-1 by 30%, as determined using EQUATION 1. ¹</p>	2.0



Additional Chapter 9

- Air Leakage Control and Heat Recovery
- Water Heating Equipment and low flow devices
- PV
- House Size
 - +1 point if less than 1500 SF
 - -1 point if greater than 5000 SF



Most Likely Scenario - Gas



Energy Star NW - DuPont

- Heating System Indoors
- High Efficiency Equipment
- High Efficiency Water Heating Equipment
 - Cost \$2000 - In mature market
 - Energy Savings \$400 year



Most Likely Scenario - Electric



Energy Star NW - DuPont

- Heating System Indoors
- High Efficiency Equipment
- Mid Efficiency Water Heating Equipment
- Modest Improvement in ACH
 - Cost \$2000(?) - In mature market
 - Energy Savings \$371/year

