

# The Washington State Experience

## Residential Energy Code Compliance

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# WSU Energy Program

Provides energy services, products, education and information for:

- Businesses
- Utilities – public and private
- Governments – state and local
- Tribes
- Federal agencies
- Manufacturing plants
- Educational facilities
- National laboratories

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WASHINGTON STATE UNIVERSITY EXTENSION ENERGY PROGRAM

WSU Extension Energy Program

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Our engineering team delivers consultations, trainings, and in-depth assessments of energy-intensive systems.

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# WSU Energy Program Building Science Team

Staff provides building science expertise for:



- Residential energy code technical assistance
- Voluntary programs, Northwest ENERGYSTAR Homes
- Research and development, Building America
- Community-based upgrade programs
- Industry training and certifications – HERS, BPI, ENERGY STAR, PTCS

# WSU Energy Program

## Energy Code Support

Technical support provided in Washington:

- Training offered throughout WA State
- Phone and email inquiry hotline support
- Energy code compliance tools
- Website
- Building department site visits
- Code development Technical Advisory Groups (TAGs)

# State-Level Legislation and Goals

Washington State law requires that the Energy Code in 2031 be 70% more efficient than the 2006 version.

- RCW19.27A.160

Former Governor Gregoire's Climate Action Team requested that the 2009 WA Energy Code be 30% more efficient than the 2006 version.

- 18% efficiency increase from 2006 to 2009
- 27% efficiency increase from 2006 to 2012

# Compliance Study

A recent study of Washington's residential energy code compliance rates was completed by The Cadmus Group in March 2013.

Compliance was determined by three methods:

- Checklist – PNNL method, 96% compliance level
- Significant Item – 9 significant items with the most impact on energy use and compliance, 97% compliance level
- Modeling – SEEM-predicted energy use determined that houses used 4% less energy than code-compliant homes

# Compliance Study

(continued)

- 66 homes
- 90% confidence that results are within 10% of true population values
- Cost of the study - \$150,000, funded by Northwest Energy Efficiency Alliance (NEEA)

<http://neea.org/docs/default-source/reports/washington-residential-code-compliance-study.pdf?sfvrsn=7>

# Success as a Result of Investment

- NEEA, with support from Bonneville Power Administration, Energy Trust of Oregon and over 100 Northwest utilities, provides \$1.6 million per year for four states
- Some of this funding supports national code and standards development, which affects Washington indirectly

# Success as a Result of Investment

- Funding for WA Residential Energy Code Program is currently \$350,000 per year
- NEEA has consistently funded energy code support for many years
- Previous funding partners:
  - BPA
  - USDOE
  - Utilities
  - Private-sector funders

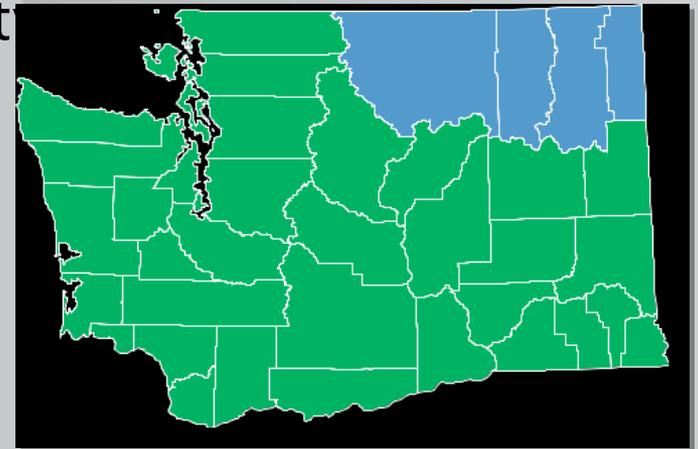
# Reasons for Success

- Stable funding from NEEA and utilities
- Consistency in outreach program and staff
- Investment in relationship building
- Partnerships with industry organizations and associations:
  - Building Industry Association of Washington
  - Washington Association of Building Officials
  - American Institute of Architects
  - Local Home Builders' Associations

# Building Industry Training to Meet Compliance Targets

## Classroom and in-field training

- Provide an on-going training program
- Diversify course offerings to keep industry engaged:
  - Energy Code Overviews
  - Ventilation and Indoor Air Quality
  - Air Sealing
  - Duct and Air Leakage Testing
  - Exterior Foam Sheathed Walls
- Respond to geographic need



# The Last Six Years Have Been Busy

	Total Attendance	Code	Duct	VIAQ	Air Sealing	Other	Bldg. Dept. Visits
2009	157		157	0	0	0	0
2010	2871	1729	1020	0	0	122	0
2011	1652	1099	553	0	0	0	N/A
2012	484	76	102	202	81	0	23
2013	1271	883	78	280	0	0	30
2014	584	346	93	106	0	0	39
2015	472	122	73	64	32	0	25
Totals	7491	4255	2076	652	113	122	117

# Building Department Site Visits

- Discuss energy code issues and questions at individual jurisdictions
- Make a site visit to a house under construction
- Offer targeted training to Building Department staff
- Build relationships
- Have been very well received



# Live Technical Support

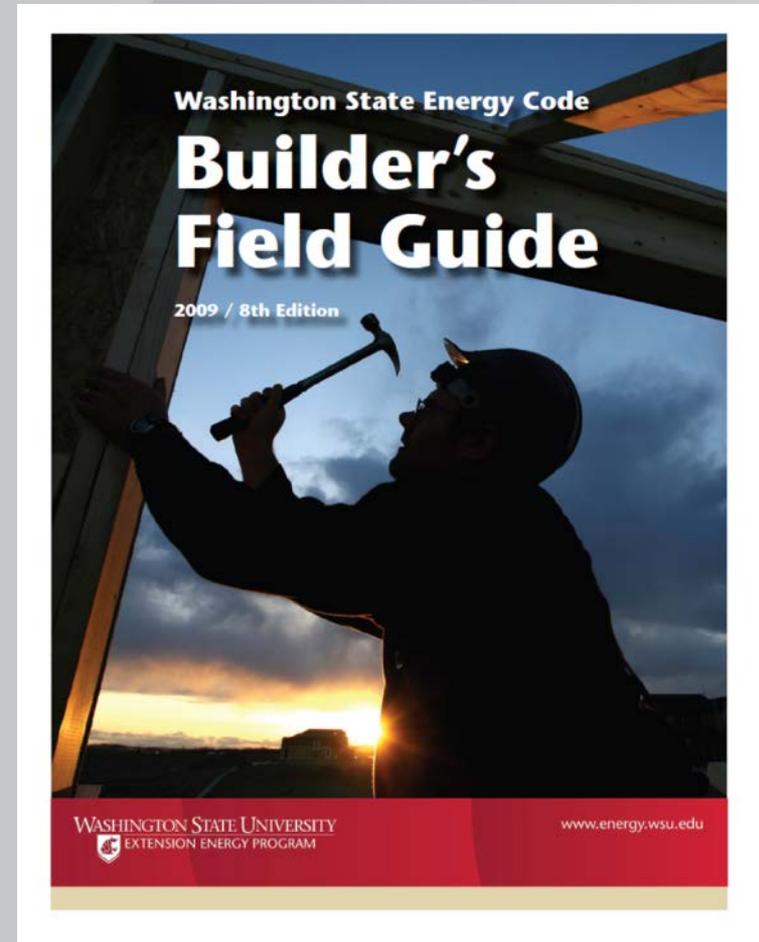
- Phone and email support for energy code questions and related topics-about 2500 per year
- Building department staff are primary clients
  - Assistance with project documentation review
  - Discuss enforcement scenarios
- Other frequent callers
  - Builders
  - Architects and designers
  - HVAC contractors
  - Homeowners
- Staffed by a technical expert every day
- Answers provided same day they are submitted



# Web Resources Available

## WSU Energy Program website:

- Energy Code text available for download
- Builder's Field Guide
- Listserv membership
- Presentations
- WSU Energy Code publications archive
- Related links to supporting organizations:
  - State Building Code Council
  - Northwest Energy Efficiency Council



# Additional Support Documents

- Affidavits
- Certificates
- Calculators
- Videos
- Brochures
- Frequently Asked Questions



# User-Friendly Compliance Forms

- Prescriptive and Component Performance Worksheets
- Staff available to support the tools
- Review of systems analysis software options and outputs

Code Target Values		Proposed Design Values	
Area	UA	Area	UA
Vertical Glazing U = 0.300	330 99.0	362 108.6	
Overhead Glazing U = 0.500	0 0.0	0 0.0	
Doors U = 0.200	42 8.4	42 8.4	
Flat/Vaulted Ceilings U = 0.027	1100 29.7	1100 29.7	
Wall (above grade) U = 0.056	2032 113.8	2000 102.0	
Floors U = 0.029	1100 31.9	1100 31.9	
Slab on Grade F = 0.360	0 0.0	0 0.0	
Below Grade			
2' depth, wall U = 0.042	0 0.0	0 0.0	
2' depth, slab F = 0.590	0 0.0	0 0.0	
3.5' depth, wall U = 0.041	0 0.0	0 0.0	
3.5' depth, slab F = 0.640	0 0.0	0 0.0	
7' depth, wall U = 0.037	0 0.0	0 0.0	
7' depth, slab F = 0.570	0 0.0	0 0.0	
Target UA Total	3300	Proposed UA Total	3300
Target Credits from Chpt. 9	1.0	Proposed Credits from Chpt. 9	1.0

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Chpt. 9 are ≥ 1 than the base case, the building meets the 2009 ASHRAE 90.1-2009 energy code.

Qualifies

# Where Are We Headed From Here?

- Build upon previous successes
- Continue to support building industry in understanding and complying with the energy code
- Incorporate advances in research and technology into standard building practice
- Keep building professionals engaged and laughing

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