Codes Market Progress Evaluation #1

Market Research Report

prepared by

quantec

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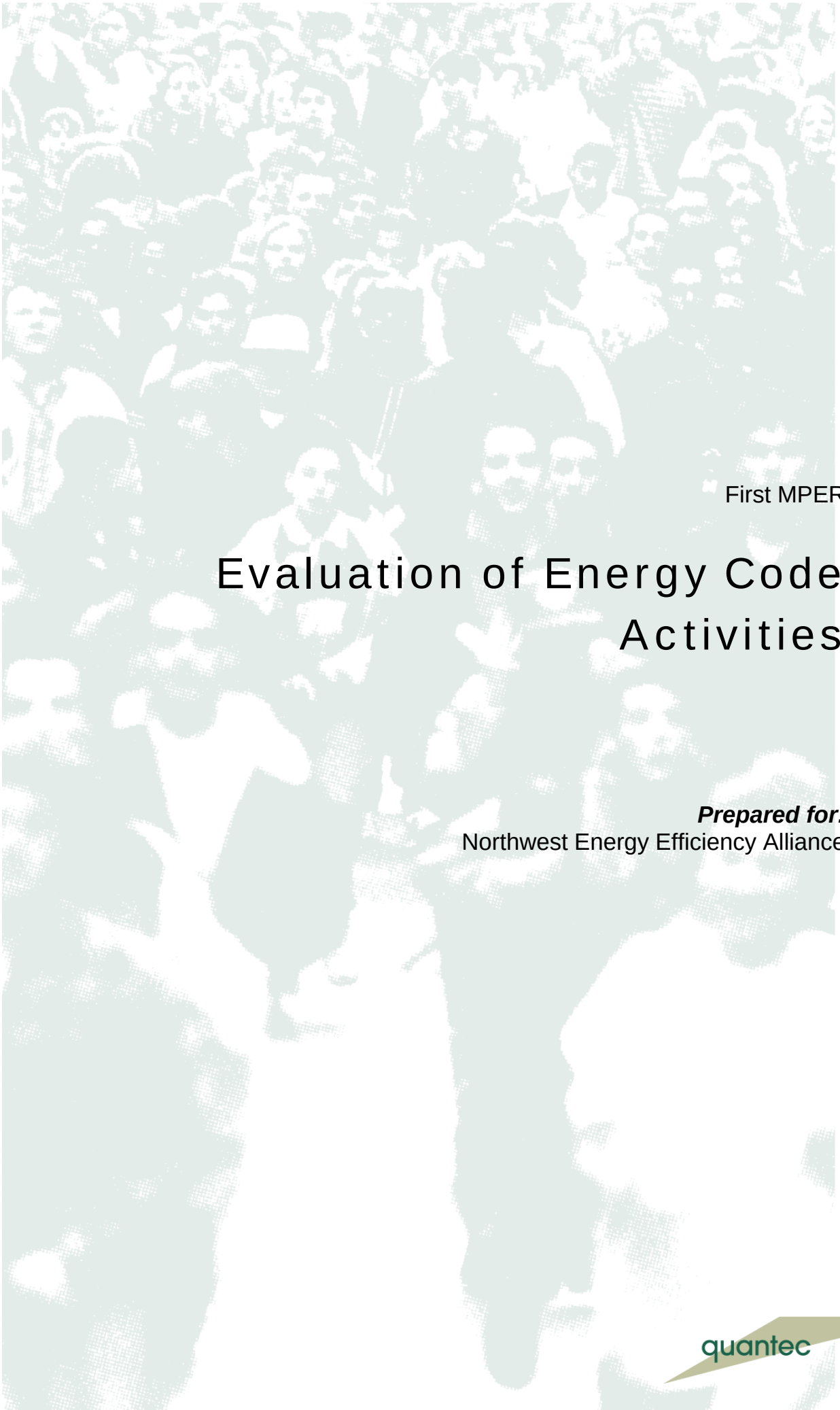
NORTHWEST ENERGY EFFICIENCY ALLIANCE
www.nwalliance.org

529 SW Third Avenue, Suite 600
Portland, Oregon 97204
telephone: 503.827.8416
fax: 503.827.8437



First MPER

Evaluation of Energy Code Activities

Prepared for:
Northwest Energy Efficiency Alliance

quantec

Prepared by:
Lauren Miller Gage
Michelle Levy
Ken Seiden
Quantec, LLC

In Association with:
Stuart Slote
Optimal Energy, Inc.

Quantec Offices

720 SW Washington, Suite 400
Portland, OR 97205
(503) 228-2992
(503) 228-3696 fax
www.quantecllc.com

1722 14th St., Suite 210
Boulder, CO 80302
(303) 998-0102
(303) 998-1007 fax

3445 Grant St.
Eugene, OR 97405
(541) 484-2992
(541) 683-3683 fax

28 E. Main St., Suite A
Reedsburg, WI 53959
(608) 524-4844
(608) 524-6361 fax

6 Ridgeland Rd
Barrington, RI 02806
(401) 289-0059
(401) 289-0287 fax

20022 Cove Circle
Huntington Beach, CA 92646
(714) 287-6521

Contents

Executive Summary 1
Overall Findings and Recommendations 6

I. Introduction I-1
Project Overview I-1

II. Evaluation Methodology II-1

III. Project Description and Update III-1
Status of Energy Codes in the Four Northwest States III-2

IV. Attitudes Regarding Energy Codes IV-1
Energy Code Knowledge IV-1
Is the Energy Code Confusing? IV-3
Obstacles IV-6
General Attitudes about Energy Codes IV-8
Other Code Issues IV-12
Conclusions IV-12

V. Project Effectiveness V-1
Alliance Coordination Efforts V-1
Technical Support Efforts V-2
Education and Training Efforts V-10
Training Satisfaction V-12
Conclusions V-14

VI. U-0.35 Windows Requirement VI-1
Availability VI-1
Incremental Cost VI-2
Trends VI-3
Compliance VI-4
Conclusions VI-6

VII. State-Specific Programs VII-1
Idaho Association of Building Officials Small Adopters Program VII-1
Idaho Plan Review Program VII-2

VIII. National and Regional Code Activities VIII-1

National Codes: Support for Northwest-Promulgated IECC and IRC Code Change Proposals VIII-1
National Committees VIII-3

IX. National and State-Level Equipment Standards IX-1

X. Conclusions and Recommendations X-1

Appendix A. Data: Designer/Builder by State A-1

Appendix B. Data: Building Official by State B-1

Appendix C. Data: Washington State-Specific C-1

Appendix D. Data: Idaho State-Specific D-1

Appendix E. Data: Oregon State-Specific E-1

Appendix F. Data: Montana State-Specific F-1

Appendix G. Survey Instruments G-1

Appendix H. List of Acronyms H-1

Tables & Figures

Executive Summary 1

I. Introduction I-1

II. Evaluation Methodology II-1

Table II.1: Summary of Data Collection Activities II-1
Table II.2: Mystery Shopper Responses by City II-2
Table II.3: Table Dealer/Distributor Responses by City II-3
Table II.4: Designers/Builders' Survey Characteristics II-4
Table II.5: Builder Responses by City II-5
Table II.6: Building Officials' Sample Characteristics II-6
Table II.7: Mapping of Data Collection Activity to Chapters II-7

III. Project Description and Update III-1

Figure III.1: Alliance Funding for Energy Codes and Standards in 2004 ..... III-1
Table III.1: Status of Energy Codes in the Northwest States – January 2005 ..... III-2

IV. Attitudes Regarding Energy Codes IV-1

Figure IV.1: Building Officials' Knowledge of Residential Codes, by State IV-1
Figure IV.2: Building Officials' Knowledge of Non-Residential Codes, by State IV-2
Figure IV.3: Residential and Non-Residential Designer/Builder Energy Code Knowledge IV-3
Table IV.1: Building Officials Finding Any Part of the Energy Code Confusing IV-3
Table IV.2: Designers/Builders' Ease of Compliance, by Sector IV-5
Table IV.3: Designers/Builders Find Energy Code Confusing? IV-6
Table IV.4: Yes Response to Obstacles to Enforcement IV-6
Figure IV.4: Designer/Builder Obstacles to Code Compliance, by Sector IV-7
Figure IV.5: Building Officials' Energy Code Attitudes, all States IV-8
Figure IV.6: Building Officials' Energy Code Disagreement, by State IV-9
Figure IV.7: Designer/Builder Perceptions of Energy Codes, All States IV-10
Figure IV.8: Designers/Builders' Disagreement with Perception Statements, by State IV-10
Table IV.5: Support for Code Changes IV-12

Table IV.6: Support for Supplemental, Third Party Certification, by State and Type IV-12

V. Project Effectiveness V-1

Table V.1: Building Officials Using Technical Support V-3
Table V.2: Designers/Builders Using Technical Support V-3
Figure V.1: Building Officials, All States: Did you contact technical support for V-3
Figure V.2: Designers/builders, All States: Did you contact technical support for V-4
Figure V.3: Designers/builders: Reasons for Not Using Technical Support V-4
Figure V.4: Building Officials: Reasons for not using Technical Support V-5
Figure V.5: Satisfaction with Technical Support: Residential Designers/builders (n=17), All States V-6
Figure V.6: Satisfaction with Technical Support: Non-Residential Designers/builders (n=58), All States V-6
Table V.3: Web Site Organizations and Links V-7
Figure V.7: Designers/Builders' Satisfaction with Web Sites, All States V-8
Figure V.8: Changes to Practices – Building Officials, by State V-11
Figure V.9: Format Effectiveness – Building Officials, by State V-13

VI. U-0.35 Windows Requirement VI-1

Figure VI.1: Incremental Cost Estimates, Clear Glass and U-0.35 Windows, Eastern Washington VI-3
Figure VI.2: Dealer Perceptions of EE Window Trends VI-4
Figure VI.3: Percent of EE Windows Installed, Eastern Washington VI-5
Figure VI.4: Reasons for Purchasing Non-EE Windows, Eastern Washington VI-5

VII. State-Specific Programs VII-1

VIII. National and Regional Code Activities VIII-1

IX. National and State-Level Equipment Standards IX-1

X. Conclusions and Recommendations X-1

Appendix A. Data: Designer/Builder by State A-1

Appendix B. Data: Building Official by State B-1

Appendix C. Data: Washington State-Specific C-1

Appendix D. Data: Idaho State-Specific D-1

Appendix E. Data: Oregon State-Specific E-1

Appendix F. Data: Montana State-Specific F-1

Appendix G. Survey Instruments G-1

Appendix H. List of Acronyms H-1

Executive Summary

The Northwest Energy Efficiency Alliance has supported code activities in the Northwest states since 1997, principally by funding staff positions or organizations responsible for code adoption and education. The Alliance has also established contracts with ten principal organizations, including four different entities in Washington State, and two each in Idaho, Montana, and Oregon. The overarching goals of the Alliance's work are to encourage the adoption of more stringent residential and nonresidential energy codes, and to improve energy code program adherence and effectiveness by providing the necessary infrastructure (including technical support and training/education) for building code enforcement personnel as well as those in the design and construction community.

Alliance funding can be grouped into three categories: adoption, compliance and regional/national efforts. In 2004, $883,000 was spent on this project; 68% of the funding for code compliance, 18% on code adoption, and the remaining 14% for regional/national coordination.

Energy codes function to lock into place energy efficiency measures and/or techniques that are commonly used within the building construction industry. Often, more efficient technologies and practices are codified or standardized after being promoted by utilities and other energy efficiency programs for a number of years. In theory, energy codes can produce a shift in the average efficiency of the market. They accomplish that shift by eliminating the option of having an efficiency less than that mandated by the code, primarily impacting those participants most influenced by first cost pressures and likely to be least efficient in the "normal" market distribution. This effect can produce significant savings even when the code minimum is set at the market average efficiency.

Energy codes provide two important benefits:

- They eliminate the possibility of back-sliding to less efficient practices
- They provide a minimum efficiency standard that can then be used as the basis for future code upgrades

In early 2004, the Northwest Energy Efficiency Alliance documented its efforts to support energy codes and to participate in the federal standards setting process through 2003. That report and its up-to-date record of code efforts were used as the starting point for this evaluation. Later in 2004, The Northwest Energy Efficiency Alliance engaged Quantec, LLC, and its sub-contractor, Optimal Energy, to evaluate the Alliance's efforts to support energy codes and its participation in the federal energy standards process. This report represents the first Market Progress Evaluation Report (MPER).

Code Update

Each Northwest state conducts its own energy code adoption and support. Major changes in codes by state include:

- ***Idaho***: In March 2004, with passage of House Bill 756, the Idaho energy codes were progressively updated to the 2003 International Energy Conservation Code (IECC). Although the IECC is the prevailing code in Idaho, the following codes are also referenced: The International Residential Code (IRC), which may be used as an alternate path for residential applications; the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 - 2001 with Addendum G, which may be used as an alternate commercial path; and the International Mechanical Code (IMC) and International Fuel Gas Code (IFGC), which both have some relevance to energy.
- ***Montana***: As of September 2004, Montana adopted the 2003 IECC with Montana Amendments, effective December 2004, making this Montana's first statewide energy code for all buildings types.
- ***Oregon***: In Oregon, the residential energy code was last updated in 2003, and the nonresidential code also was updated in 2003. In 2004, the Oregon Building Codes Division was directed by the Governor's office to limit the frequency of state code updates, including energy codes.
- ***Washington***: In November 2004, the Washington State Building Code Council adopted a number of changes to the Washington State Energy Code effective July 1, 2005. Significant changes include, among others, updating mechanical efficiency requirements to the most recent federal standards, provisions for new technology and building science in wall assemblies, updating wall and window thermal efficiency requirements, and revisions to lighting allowances.

Attitudes Regarding Energy Code

Historically, building codes have been focused on health and safety; therefore, the movement toward energy codes has been perceived by some building officials to be an unwelcome and burdensome change from that initial focus. [1] This evaluation focused on the perceptions of energy codes by:

- Code enforcement personnel, including code officials, plan reviewers and inspectors (called " building officials" throughout this report)
- Building industry professionals including architects, engineers, builders and contractors (called "designers/builders" in this report)

Overall, building officials showed positive attitudes toward energy codes. Most building officials perceive the residential and non-residential energy codes as valuable additions to

[1] Harris, Jeff. Northwest Energy Efficiency Alliance, and Mahone, Doug, Heschong-Mahone Group. 1998. Energy Codes and Market Transformation in the Northwest: A Fresh Look.

state building codes, and the majority of respondents felt energy codes improve the quality of life for the community. Positive attitudes notwithstanding, from an implementation standpoint, building officials consistently agreed that builders and designers need more training.

Designers/builders also show a high propensity to believe that energy codes (both residential and non-residential) are valuable parts of state building codes. The vast majority believes that building professionals (i.e., themselves) are not adequately informed, showing agreement with building officials' perceived need for more designer/builder training. Within the jurisdictions where they principally work, designers/builders see an issue with consistency of enforcement, as only 20% felt there was uniformity. Almost 50% of respondents agreed with the statement that there are advantages to working in certain parts of the state.

The majority of concerns raised by designers/builders focused on the complexity of the energy code and lack of training for end users (builders, sub-contractors, designers, and the public). Building officials agreed that end users lack training on energy codes, and there was a general perception by both groups that frequent changes in the energy code have made it difficult for building officials and building professionals to keep current on them. Inconsistencies in energy code requirements across states, as well as inconsistent enforcement within states, were also sentiments expressed often by designers/builders in this evaluation.

Technical Support Efforts

Throughout the Northwest states, Alliance code contractors implement several energy code "infrastructure" activities that provide technical support to designers/builders, and building officials. These activities include telephone, email, in-person technical support, and the maintenance of Web sites.

For those people using it, Alliance-supported technical support has been well received consistently across the Northwest states. General satisfaction with technical support was high, with slightly higher ratings for staff knowledge and professionalism than for response time and usefulness of information. Based on the sample of building officials and designers/builders we surveyed, building officials use the service more often than designers/builders. Those designers/builders working in the non-residential sector were slightly more critical of technical support, particularly response time and usefulness of information.

With the most common reason for not using technical support consistently being "did not know it existed," it would appear that promotion of these services and targeted outreach could be improved. Only Washington code contractors a list of technical support users, suggesting a need for improved tracking of who is using these services to aid in the evaluation of their effectiveness.

Alliance-Supported Web Sites

Alliance code contractors from each state help to maintain Web sites designed to provide general energy and building code information, including energy code information. Only designers/builders were asked about Web site usage in this evaluation.

Similar to technical support, the majority (71%) of those survey respondents who had not used their state's Web sites for energy code information did not know about them[2]. Designers using their state's Web sites for energy code information were queried on their satisfaction with the quality of information presented on the sites and the ease of navigation. In general, designers were satisfied with the Web sites, with the majority of respondents being "somewhat" satisfied with the quality of information (61% of 96) and ease of navigation (57% of 95). The proportion of those that were "very" satisfied was slightly smaller, 30% for quality of information and 26% for ease of navigation.

Generally, we found that, although most felt very or somewhat satisfied, the Web sites received a slightly lower rating than other aspects of technical support. This finding was supported by the evaluation team's quick review of the Web sites. In several cases, it was difficult to navigate the sites and it was not clear where the key information could be found, if at all.

Education and Training Efforts

The Alliance coordinates with its code contractors in each of the Northwest states to provide significant education and training opportunities for building officials and designers/builders. These efforts are more active following significant energy code changes, but classes are also occasionally offered between code changes. Education efforts focus on two main categories, the energy code itself and how to ensure compliance aimed primarily at building officials; and energy code *compliance,* aimed at building, design and construction professionals.

The trainings were reportedly successful in improving building official and designer/builder knowledge of the energy code, across states. Trainings also resulted in changes to professional practices for the majority of participants.

On the whole, all participants in energy code training expressed high levels of satisfaction with the classes. Across states, almost every building official that attended training felt that the trainer was very or somewhat knowledgeable of the energy code. Similarly, 94% of participants felt that the format of the presentation was very or somewhat effective. Designers and builders also expressed a high level of overall satisfaction with all aspects of the training events.

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[2] The portion of survey respondents using their state Web sites varied widely between states (25% in Montana, 30% in Idaho, 52% in Washington, and 70% in Oregon). Readers should be cautious with interpreting these statistics, as the make-up of the survey sample may influence this proportion.

Respondents provided numerous comments about the need for builder and sub-contractor trainings. Therefore, we recommend that future trainings be expanded to provide increased training opportunities for this segment. Other comments indicate the need for a tiered approach to trainings to not only meet the needs of those with different levels of energy code experience, but also to meet the specialized needs of the building community, such as those working in HVAC, mechanical, and electrical. Feedback on training and technical support also suggests a need for some simplified handouts.

Eastern Washington U-0.35 Windows Requirement

The results of this evaluation indicate that compliance with the U-0.35 window requirement in the Washington State Energy Code, adopted in 2002, is near 100%. This result based on a triangulation of builders saying they rarely install windows less efficient than U-0.35, dealers saying they rarely sell them, and Mystery Shopping results showing that customers are able to get U-0.35 or better windows in any style. In the rare instances where less efficient windows were sold or installed, the circumstances always fell under a category not covered by the energy code.

Availability was not an issue for the builders, with all saying that they have never experienced any problems procuring U-0.35 windows for their building projects over the past 2 years. Barriers to compliance, therefore, seem minimal, with retailers actively educating customers on the benefits of energy efficient windows, including, but not limited to, their cost effectiveness. Although incremental cost data point to a differential in cost between EE and Non-EE windows ranging from <5% to 25%, this was not a barrier to compliance. All the dealers interviewed said that cost was only an issue in cases not falling under the code.

National Codes

The IECC has requirements for both residential and non-residential buildings and the IRC addresses residential buildings. Currently, both Idaho (without amendments) and Montana (with amendments) have adopted a version of the IECC and IRC and are likely to adopt updates. Therefore, the minimum requirements contained in the national model energy codes will directly impact energy codes in Idaho and Montana.

The adoption of a national code as the basis for each state's energy code has large potential benefits for the Northwest. Currently, Washington and Oregon have state-promulgated energy codes. While having a unique state energy code has the benefit of maintaining state control and provides for innovation, it also carries large costs since all supporting documents, training information, and technical interpretations have to be created and paid for entirely by a single state. Adopting a similar (national) code spreads these administrative costs across many states. Also, adopting a national code is not restrictive since the basic structure can be adopted and then amended as necessary to achieve state-specific goals.

Given that two of the four Northwest states (Idaho and Montana) have adopted a version of the IECC, and given the likelihood that Idaho and Montana will adopt updated

versions of the national model energy code, the Alliance should continue supporting efforts by members of the Northwest Energy Code Collaborative (NECC) to develop and support proposals for adoption into updated versions of the IECC and IRC.

Overall Findings and Recommendations

On the whole, the evaluation team finds that the Alliance's Codes and Standards activities are serving a valuable purpose and, in many cases, targeted areas would not receive adequate funding without the Alliance. Specifically, the Alliance has provided effective education, technical, and energy code adoption support.

Tracking Clients

A key finding of this evaluation is that there is an information gap related to industry awareness and knowledge of available services, and Alliance code contractors' lack of information about their clients. Although many services are being provided to key market actors, the code contractors are not effectively tracking these data. Based on this, we believe there is value in developing a simple contact-tracking database (e.g., in Microsoft Access) that, at a minimum, includes Name, Organization, Sector, Profession, E-mail, Address, and Phone number. This database can be relational, thereby linking contacts with trainings attended (date, location, topic) and use of technical support (date used, question asked). A more organized and uniform method of data collection will allow state code contractors and the Alliance to more effectively track and evaluate who has received services and which groups may be in need of more support. It will also foster an improved understanding of the major concerns and questions posed by the recipients of services.

Training Builders and Designers

Although those who attended training were satisfied with its quality, a recurring sentiment from both building officials and designers/builders was that these training sessions are not reaching enough of the building community, primarily contractors, builders, installers, and designers. There is a general sense that this lack of training for these market actors is affecting compliance.

There also appears to be difficulty in reaching this group. One Alliance code contractor in Washington mentioned that they have held several trainings for builders that were cancelled for lack of attendance. Therefore, it appears there is a need for the Alliance to consider two important points:

1. Should the trainings continue to focus on designers and engineers?
2. If builders/sub-contractors are targeted, what is the most effective way to conduct outreach?

We believe that the need to train builders and sub-contractors should be specifically addressed by the Alliance and there should be brainstorming of how best to improve awareness and knowledge in this market.

Technical Support

Overall, the technical support provided by Alliance code contractors has been well received by users. The primary area in need of improvement is the state Web sites. Having a site that is easily accessed by users may improve outreach to potential clients, improve energy code knowledge and understanding, and reduce the burden on phone and e-mail-based technical support.

Generally, we find that there is a wide variance among the Alliance-sponsored state-specific sites. One possible option is for the Alliance to establish a set of guidelines for Web site design, content, and layout, and encourage the states to change the names of their sites to more user-friendly (i.e., easy-to-remember) names. Otherwise, there should be some discussion with regard to the purpose and navigability of the existing Web sites. For example, a link for energy codes should be on the main page of the site. From there, it should be easy to access residential and non-residential codes or other information such as compliance forms, frequently asked questions, and technical support.

Improving Public Outreach

One consistent comment from survey respondents was the need for improved public outreach, which many felt would improve energy code compliance. This was supported by the fact that client requests for non-compliant products were seen as an obstacle to compliance. Several designer/builders were looking for simplified materials to help "sell" energy codes to the end-user.

Services Follow-Up

Another area of improved outreach could be to follow-up with training or tech-support clients. It may be useful to send a follow-up e-mail thanking them for their time and providing basic information, such as e-mail address for follow-up questions, links to Web sites, the link to a survey to provide feedback, upcoming training opportunities, etc.

Improving Code Consistency

One area of code confusion illuminated by this evaluation is the issue of code consistency, both in intra-state enforcement and inter-state energy code variation. Several comments pointed out that the variation in energy codes between the Northwest states sometimes presents complications. In addition, quite a few building officials noted the difficulty associated with having a unique code in Oregon and Washington. The Alliance should continue to foster the development and adoption of more consistent energy codes at the national, regional and state level.[3]

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[3] In March 2005, the Alliance issued an RFP requesting proposals to develop a Northwest Energy "Reach" Code. The reach code is intended to establish code adoption goals significantly beyond existing codes. The work envisioned in the RFP would serve as a guideline for regional and state code adoptions for the next five to seven years and is intended to guide code adoption strategy at the state, regional and national level.

I. Introduction

Project Overview

The Northwest Energy Efficiency Alliance has supported code activities in the Northwest states since 1997, principally by funding staff positions at organizations responsible for code adoption and education. The Alliance has also established contracts with ten principal organizations, including four different entities in Washington State, and two each in Idaho, Montana and Oregon. The overarching goals of the Alliance's work are to encourage the adoption of more stringent residential and nonresidential energy codes, and to improve energy code adherence and effectiveness by providing the necessary infrastructure (including technical support and training/education) for building code enforcement personnel as well as those in the design and construction community.

The Northwest Energy Efficiency Alliance engaged Quantec, LLC, and its sub-contractor, Optimal Energy, to evaluate the Alliance's efforts to support energy codes and its participation in the federal energy standards process. This report represents the first MPER.

Energy Codes and Energy Efficiency

Energy codes (and equipment standards) function to lock into place energy efficiency measures and/or techniques that are commonly used within the building construction industry. Often, more efficient technologies and practices are codified or standardized after being promoted by utilities and other energy efficiency programs for a number of years. Energy codes (and equipment standards) provide two important benefits:

- They eliminate the possibility of back-sliding to less efficient practices
- They provide a minimum efficiency standard that can then be used as the basis for future code upgrades

In theory, energy codes and standards produce a shift in the average efficiency of the market by eliminating the option of a lower-than-code efficiency level. This primarily impacts those market actors most influenced by first cost pressures and who are most likely to purchase low-efficiency technologies in market distribution channels. Codes have the ability to produce significant energy savings even when the code minimum is set at the average market efficiency.

In many ways, experience with energy codes efforts has shaped how market transformation works at a regional level. Traditionally, the relationship between energy codes and market transformation has been viewed in the context of energy codes as an exit strategy for specific ventures, while experience in the Northwest indicates a more complicated relationship. Energy codes can and should be viewed as both an important component of market ventures and as an important target market of their own. Energy

codes also interact with other market ventures in complex and important ways. For example, energy codes require that interior lighting consumption does not exceed a maximum lighting power density allowance (in watts per square feet), which steers designers and contractors to install relatively energy-efficient lighting equipment and controls that are promoted through other Alliance and utility energy efficiency programs.

From the Alliance's perspective, the goal of market transformation is to "bring about significant and lasting changes in markets for energy-efficient technologies and practices." Energy codes and equipment standards play a significant role in achieving this goal and will likely remain key factors of energy savings for the region.

In terms of energy savings, Mike Kennedy, Inc. recently completed a study for the Alliance that estimated savings from regional non-residential energy codes made between 1996 and 2004.[4] The study quantified changes that have already been adopted with planned enforcement dates on or before July 2005 and projected savings through 2025. Estimated savings for 2005 are 4.44 aMW and 0.29 million therms; cumulative savings through 2025 are estimated at 96.1 aMW and 7.16 million therms.

Report Contents

Quantec and its sub-contractor, Optimal Energy, conducted an evaluation of the Alliance's efforts to support energy codes and its participation in the federal energy standards setting process. This report details the findings from these evaluation efforts, presented as follows:

- Chapter II describes the evaluation methodology
- Chapter III provides a project description and update
- Chapter IV shows general attitudes toward energy codes from building professionals as well as code enforcement personnel
- Chapter V assesses overall project effectiveness with Alliance coordination efforts, technical support, and education and training
- Chapter VI provides results from the evaluation of Eastern Washington's U-0.35 windows requirement, including any issues with compliance, availability, incremental cost, and market trends for high-efficiency windows
- Chapter VII outlines Alliance state-specific activities, including the Idaho Association of Building Officials Small Adopters Program, Idaho Site Educators Program, the Idaho Plan Review Program, and Washington and Oregon Field Compliance Efforts
- Chapter VIII details the Alliance's role in National and Regional Code activities

[4] Kennedy, Michael. January 28, 2005. Non-Residential Energy Savings From Northwest Energy Code Changes 1996-2004, for the Northwest Energy Efficiency Alliance, Portland, OR.

- Chapter IX provides a brief review of the Alliance's role in National and State-Level Equipment Standards
- Chapter X presents detailed conclusions and recommendations based on the information in this evaluation

II. Evaluation Methodology

The cornerstone of the process evaluation of the Alliance's energy codes and standards efforts was a series of interviews and surveys of market actors and stakeholders. These evaluation activities are summarized in Table II.1 below, followed by a discussion of the role each activity played in this evaluation.

Table II.1: Summary of Data Collection Activities

Data Collection Activity	Completed Interviews	Interview Mode	Sample Source
Activity 1: Interview Alliance staff, code contractors and sub-contractors	26	In Person/Phone	Census
Activity 2: Mystery Shopping in Eastern Washington	11	Phone	Builder Surveys, Phone Book
Activity 3: Interview Window Dealers and Distributors	10	Phone	Builder Surveys, Phone Book
Activity 4: Interview Design and construction professionals	222	Web Survey	Census of Code Contractor Contact Databases
Activity 5: Interview Eastern Washington builders	15	Phone Interviews	Phone Book, ECONorthwest Sample
Activity 6: Interview building officials	214	Web Survey	Census of Code Contractor Contact Databases
Activity 7: Interview code contractors	4	In Person	Alliance and Code Contractors
Activity 8: Other contacts/unique contracts	13	In Person	Alliance and Code Contractors
Activity 9: National contacts	7	Phone	Alliance and Code Contractors

Activity 1: Interview Alliance Staff, Code Contractors, and Sub-Contractors

Optimal Energy conducted 26 interviews with Alliance staff, code contractors, and sub-contractors. The interviews provided critical insights into the efficacy of program implementation efforts and covered the following topics, as appropriate:

- Project History Update
- Alliance Coordination Efforts
- Technical Support Efforts
- Education and Training Efforts
- The Alliance's Role in National Codes
- National and State-Level Equipment Standards

- Idaho Site Educator Sessions
- IDABO Small Adopters Program
- IDABO Plan Review Program
- Washington/Oregon Field Compliance

These interviews sought to document relevant code-related activities and glean the direct benefits that the Northwest derives from this Alliance support. Questions focused on those code/standard areas where the Alliance has been most clearly involved.

Activity 2: Mystery Shopping

Eastern Washington was a primary region of focus in this evaluation. Quantec explored a number of important issues regarding windows in residential new construction under the Washington State Residential Energy Code, including energy code compliance, availability, incremental cost, and any perceived barriers associated with this aspect of the code.

To assess the availability and incremental cost of U-0.35 energy-efficient window styles in Eastern Washington, Quantec conducted a "Mystery Shopper" phone survey of 11 windows dealers and distributors in six Eastern Washington locales (Spokane, Wenatchee, Pasco, Cheney, Kennewick, and Pullman). The sample was derived from a random selection of stores from the yellow pages of these Eastern Washington cities, supplemented with names of windows dealers mentioned in the Eastern Washington builder phone interviews (Task 5).

Table II.2: Mystery Shopper Responses by City

City	Responses
Spokane	5
Wenatchee	1
Pasco	1
Cheney	1
Kennewick	2
Pullman	1

Salespeople were asked whether they carry efficient (U-0.35 or less) windows, if there are any window types that are unavailable with a high-efficiency option, and for comparative pricing on two sample window styles. In addition, the Mystery Shopper inquired about any additional costs associated with special orders, either for energy code-compliant, high-efficiency windows, or standard "clear glass," non-compliant windows.

Activity 3: Interview Window Dealers and Distributors

Quantec also conducted detailed telephone interviews with ten window dealers and distributors in Eastern Washington (Spokane, Spokane Valley, Kettle Falls, Malaga,

Yakima, and Kennewick). Similar to the Mystery Shopper activity, a sample of window dealers and distributors was derived from a random selection of stores from the yellow pages and from the Eastern Washington builder interviews.

Table II.3: Table Dealer/Distributor Responses by City

City	Responses
Spokane	5
Spokane Valley	1
Kettle Falls	1
Malaga	1
Yakima	1
Kennewick	1

The interviews assessed additional topics that are not covered in Activity 3, including change in demand, price and availability for high efficiency windows.

Activity 4: Interview Builders, Construction Managers, Sub-Contractors, and Design and Construction Professionals

The evaluation team developed an interactive Web-based survey for designers/builders who had attended training or received technical support from the various state agencies that provide Alliance-funded code support. The survey was designed to evaluate end-user satisfaction with Alliance-sponsored training and technical support activities, as well as to assess this group's knowledge and understanding of their state's energy code, aspects of the code that are unclear or confusing, and general perceptions about code requirements and enforcement.

The sample was derived by asking all of the Alliance-funded state code contractors for contact information for individuals who had attended training or received technical support. Each state provided contact information but was unable to provide employer data. Therefore, Quantec, by hand, separated the contacts based on e-mail addresses[5] and organization, if provided.

Table II.4 below outlines the number of e-mail contacts provided for designers/builders (the vast majority of contact information contained e-mail addresses) as well as the number of responses received, by state. Although Montana did not initially provide contact information (due to the fact that the code was new and initial trainings had not yet been conducted), surveys were handed out at trainings in paper format. Table II.4 also breaks the respondents into general characteristics: builder or designer (architects and engineers) and residential/non-residential.

[5] All e-mail addresses to a city or state were assumed to be building officials (e.g., email.gov). Because of the possibility of cross-over between groups (e.g., a building official provided a personal e-mail address for contact) the survey was emailed to both groups at the same time, allowing respondents to click on the appropriate survey link.

Table II.4: Designers/Builders' Survey Characteristics

	Idaho	Montana	Oregon	Washington	Total
Contacts Provided	170	0	564	30	764
Respondents	20	99	83	20	222
Builder	2	25	12	8	47
Designer	18	74	71	11	174
Residential	5	23	9	17	54
Non-Residential	15	76	74	3	168

Although the Montana and Oregon samples yielded a substantial number of responses, the small sample size in Washington resulted in few responses, and the response rate for Idaho contacts was low. In the case of Washington, our respondent level as a portion of total contacts is quite high (67% response rate). Unfortunately, classroom training of designers and builders in Washington had not been conducted recently; therefore there were very few contacts in this group. Quantec contacted the Building Industry Association of Washington several times in an attempt to have our survey link sent to their members, but we were unsuccessful.

Overall, respondent characteristics show that only 20% of the responses were from builders or specialized sub-contractors, while 80% were from designers. Alliance code contractors indicated that this was expected due to the training focus on designers and engineers. Approximately one-quarter of the sample is from the residential sector, which is also expected given the focus on non-residential trainings.

A small incentive was offered to promote responsiveness to the surveys. The surveys focused on two important topics of interest:

1. ***Satisfaction and use of Alliance-sponsored technical support services***. Technical support services provide telephone, email, and in-person information regarding energy codes. Survey questions were designed to explore how useful builders and designers found these "infrastructure" activities, including timeliness of responses, usefulness of information, and knowledge and professionalism of staff.
2. ***Satisfaction with education and training***. Alliance code contractors provide education and training opportunities throughout the Northwest for builders, designers, engineers, and building officials. To assess effectiveness and satisfaction with these efforts, training attendees were asked about their experiences with energy code education and training sessions, the quality of the information, its effect on their practices, and what can be improved.

The Web-based survey also included unique questions specific to various states and stakeholders.

Activity 5: Survey Eastern Washington Builders for Windows Compliance

To evaluate builders' experiences with the U-0.35 windows requirement for residential new construction, phone surveys were conducted with a sample of 15 builders and general contractors from Eastern Washington. Survey respondents were asked about their use of the different code compliance paths, the proportion of windows installed in their 2004 projects that were U-0.35 or better, incremental cost, availability issues, and barriers to compliance. The sample for this activity was derived in part from a list of single family builders from a recent ENERGY STAR® Homes evaluation conducted by ECONorthwest, supplemented by a random selection of builders from Eastern Washington yellow pages. These builders proved to be a difficult group to reach, with only 15 successful phone interviews from 101 attempts (15% completion rate).

Table II.5: Builder Responses by City

City	Responses
Spokane	6
Walla Walla	3
Veradale	1
Sunnyside	1
Yakima	4

Activity 6: Interview Building Officials

The evaluation team developed a survey for building officials in order to assess their awareness and attitudes toward energy codes and their knowledge and practices in applying the energy codes. The surveys also examined building officials' perceptions of the barriers to energy code compliance. In addition, building officials that received technical support or participated in the education and training efforts were queried about their satisfaction with these initiatives.

Table II.6 below outlines the number of contacts provided by the Alliance code contractors and the number of responses. In Washington and Oregon, Quantec worked with the respective building officials association (Washington passed out paper surveys at a meeting and Oregon sent an e-mail to their members). In Idaho and Montana, Quantec sent paper surveys to trainings. Table II.6 also outlines the sample by job type, showing an approximately even split of building officials and plan reviewers/inspectors.[6] With response rates ranging from 64% to 96% across the four states, the results are considered to be representative of those building officials who received energy code training.

[6] The survey asked the respondents to check all that apply: Building Official, Plan Reviewer and Inspector. All responses where building official was checked (regardless of whether they also conduct plan reviews or inspections) were labeled as building officials. The rest were considered plan reviewers/ inspectors.

Table II.6: Building Officials' Sample Characteristics[7]

	Idaho	Montana	Oregon	Washington	Total
Contacts Provided	52	54	69	106	281
Respondents	50	44	44	76	214
Building official	29	16	28	33	106
Reviewer/Inspector	21	28	16	43	108

Activity 7: Code Contractors

In addition to Alliance-funded code contractors, the evaluation team interviewed a sample of four state code contractors (from the Montana Department of Labor and Industry, the Oregon Building Codes Division, the Oregon Department of Energy and the Washington Department of Community, Trade and Economic Development) not under contract to the Alliance. The interviews were conducted in person and via telephone, and assessed similar topics to Activity 1.

Activity 8: Other Key Contacts/Unique Contracts

The Quantec team assessed other specific projects through interviews with key contacts in Idaho, Oregon, and Washington. We interviewed the following Idaho building officials in more detail to explore the three efforts developed to support their work:

1. The evaluation team interviewed local jurisdictions about the code adoption and enforcement support from IDABO ***Small Adopters Program***.
2. The evaluation team queried ***Site Educator Session*** participants regarding the usefulness and value of the interpretation materials developed as well as the Site Educator on-site sessions conducted.
3. In coordination with the Association of Idaho Cities, the evaluation team interviewed personnel from large (e.g., Boise) and smaller jurisdictions that have employed the ***Plan Review*** process.

Activity 9: National Actors

The evaluation team interviewed seven key national contacts with expertise in national- and state-level standards and energy codes, including the International Energy Conservation Code (IECC) and International Residential Code (IRC). Questions focused on an assessment of the Alliance's role in influencing the adoption of 2004 changes to the IECC and IRC, and consideration of both state- and national-level standards.

[7] Respondents were removed from the sample if they did not provide their state or they were not a building official, plan reviewer, or inspector.

Table II.7: Mapping of Data Collection Activity to Chapters

Data Collection Activity	III. Project History Update	IV. Standards and National Activities	V. Energy Code Attitudes	VI. Project Effectiveness	VII. U-0.35 Requirement	VIII. State-Specific Programs
Activity 1: Interview Alliance Staff, Code Contractors and Sub-Contractors	X	X	X	X		X
Activity 2: Mystery Shopping					X	
Activity 3: Interview Window Dealers and Distributors					X	
Activity 4: Interview Design and Construction Professionals				X	X	X
Activity 5: Interview Eastern Washington Builders					X	
Activity 6: Interview Building officials*	X	X	X	X		X
Activity 7: Interview Code contractors*	X	X	X	X		X
Activity 8: Other Contacts/Unique Contracts*	X	X				X
Activity 9: National Contacts	X	X				

* Some of these respondents are also Alliance code contractors or sub-contractors

III. Project Description and Update

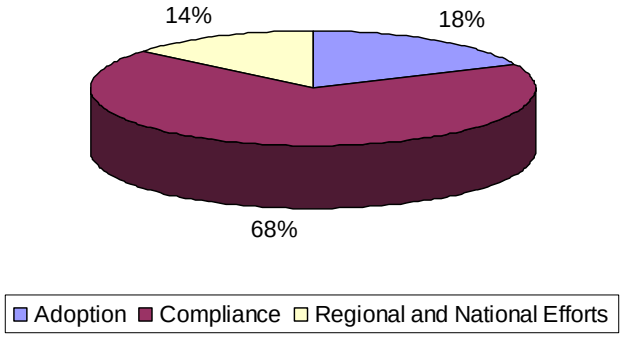
In 2004, the Northwest Energy Efficiency Alliance documented its efforts to support energy codes and to participate in the federal standards setting process through 2003.[8] That report and its up-to-date record of code efforts were used as the starting point for this evaluation.

Alliance funding can be grouped into three categories:

1. ***Adoption***, including the creation at the state level of new code proposals and support of the political process through which codes are adopted, as well as efforts in Idaho to encourage jurisdictions without energy codes to adopt them.
2. ***Compliance***, includes a broad range of education and training efforts (e.g., classroom trainings for building officials, architects, and builders; design assistance for architects; and developing training manuals and reference materials) and infrastructure activities (e.g., maintaining staff at the state agencies responsible for the day-to-day work of supporting the energy code).
3. ***Regional and National Efforts***, including activities that are of value to all states (e.g., providing education/materials or technical development that may lead to more uniform energy codes). To date, much of the current regional effort is aimed at revising the International Energy Conservation Code (IECC) and International Residential Code (IRC), to make these more compatible with the Oregon and Washington state codes. The Alliance also funds participation in several national committees, including the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the National Fire Protection Association (NFPA) and the National Fenestration Rating Council (NFRC).

Figure III.1 illustrates how Alliance funds were expended in 2004.

Figure III.1: Alliance Funding for Energy Codes and Standards in 2004



[8] Optimal Energy, Inc., 2004. Documentation of the Northwest Energy Efficiency Alliance Efforts to Support Energy Codes and Participate in the Federal Standards Setting Process. Optimal Energy, Inc., for the Northwest Energy Efficiency Alliance, Portland OR.

Status of Energy Codes in the Four Northwest States

Each Northwest state conducts its own energy code adoption and support. Table III.1 provides a snapshot of the current status of energy codes in the Northwest states. Summaries of each state follow.

Table III.1: Status of Energy Codes in the Northwest States – January 2005

State	Residential	Commercial	Update Schedule
Idaho	2003 IECC	2003 IECC (includes ASHRAE/IESNA 90.1-2001, Addendum G)	Three-year cycle. 2003 IECC effective Jan. 2005.
Montana	2003 IECC	2003 IECC (includes ASHRAE/IESNA 90.1-2001, Addendum G)	Three-year cycle. Building Codes Bureau adopted 2003 IECC effective Dec. 2004.
Oregon	State Developed (more stringent than 2000 IECC)	State developed (exceeds ASHRAE/IESNA 90.1-1999 levels)	Three-year cycle. Residential update effective April. 2003. Commercial Oct. 2003.
Washington	State Developed (more stringent than 2000 IECC for most homes)	State developed (meets or exceeds ASHRAE/IESNA 90.1-1999 levels)	Annual cycle. Residential and Commercial updates effective July 2005.

Idaho Energy Code Update

In 2003, the Idaho Legislature adopted the 2003 IECC with an effective date of January 1, 2005. In March 2004, with passage of House Bill 756, the Idaho energy codes were updated to include, in addition to the 2003 IECC, the International Residential Code (IRC), ASHRAE 90.1 - 2001 with Addendum G, the International Mechanical Code, and the International Fuel Gas Code. The 2003 body of codes must be adopted no later than January 1, 2005, by all jurisdictions with building codes in Idaho. As with the 2002 adoption of the 2000 IECC, the 2004 adoption allows local jurisdictions to amend state adopted codes by ordinance that are more stringent.

In 2004 and 2005, the Alliance provided $255,000 in funding to organizations in Idaho to conduct code adoption, compliance and external coordination. These funds were used to support a staff person at the Idaho Division of Building Safety (ID DBS); staff members at the Association of Idaho Cities (AIC); and AIC sub-contractors from the Idaho Association of Building Officials. The Division of Building Safety focuses on energy code (IECC and IRC) compliance training, code technical assistance, and support. Alliance funding supports codes in Idaho by maintaining the energy code experience and expertise that has been developed at ID DBS, AIC, and other organizations that enable Idaho cities and counties to effectively implement Idaho-adopted residential and non-residential energy codes.

Idaho Division of Building Safety **(ID DBS).** As part of the Idaho Energy Code Collaborative, the Division of Building Safety works to coordinate training and technical

assistance with other collaborative members – Idaho Association of Building Officials, Snake River Chapter of ICBO, the Association of Idaho Cities, and other interested parties.

Energy code support activities include:

- Providing telephone assistance regarding technical and programmatic energy code questions
- Providing on-site technical support to jurisdictions
- Distributing technical and general education information to assist jurisdictions in retaining energy code stability
- Providing technical compliance training to internal parties at DBS, Idaho building officials, builders, architects and engineers and other major groups that interact with energy codes on a regular basis
- Assisting IDABO with energy code training efforts – specifically providing assistance in training peer review contractors for the third party plan review project
- Maintaining the Energy Code Information Network (ECIN) web site
- Developing and introducing legislation for the adoption of new energy codes

Association of Idaho Cities (AIC). AIC and its sub-contractors provide assistance to Idaho cities and counties in adopting and effectively implementing Idaho's residential and non-residential energy codes.

After the legislature adopts a code update, local jurisdictions must adopt an ordinance for the Idaho code to become effective. Recently, AIC has provided adoption assistance with a focus on updating city and county codes to the 2003 IBC. AIC, and its sub-contractor Kenergy, work to ensure that local jurisdictions have the necessary information and resources to effectively adopt ordinances. In 2004, the International Codes Tool Kit for Local Governments, developed by AIC in 2003, was revised including development of a new IECC Model Ordinance.[9] One-on-one technical assistance is provided to those jurisdictions that need to make amendment changes as allowed by law.

AIC sponsors:

- The *New Adopters Program*, which is implemented by its sub-contractor, the Idaho Association of Building Officials. This program provides direct technical and administrative assistance to small jurisdictions that have never previously had building codes, assisting their adoption and enforcement of the IECC. The program works to overcome political resistance to codes mostly in Idaho's rural

[9] See http://www.idahocities.org/vertical/Sites/%7B1441454F-0900-48FF-9202-CD2E787A2350%7D/uploads/%7BE576ADC4-3B9F-449C-AB83-9E5A26E1F871%7D.PDF

areas. The program was discontinued in late 2004 as very few jurisdictions remained without codes.

- *One-day commercial and residential training curricula* to provide code users with good information on the changes between the 2000 and 2003 IECC. AIC also sponsors plan review training to building officials and architects with the intent to create consistency of the plan review process statewide.
- *The Site Educator Program*. Currently, jurisdictions throughout Idaho have differing solutions and interpretations on certain code requirements. The program provides on-site training to develop field inspection consistency across the state in problematic areas such as crawlspace ventilation and HVAC requirements. The training targets building officials, building designers, and general contractors. Trainings typically include a half-day in the classroom and a half-day on a construction site so that participants receive hands-on and peer-to-peer experience in verification of code applications.
- AIC supported plan review assistance for smaller jurisdictions. This is a continuation of the plan review task, which was successful in the larger jurisdictions, but has not been utilized by smaller jurisdictions.
- IDABO developed and administered contracts for design assistance and plan review for local jurisdictions. This task helped reduce the IECC startup impact by minimizing delays in the plan review process and achieved greater consistency among code enforcement agencies throughout Idaho. A cadre of third-party plan reviewers was established and is available to provide assistance to local jurisdictions throughout the state. The Alliance provided money to provide these services for free initially. That money has now been exhausted. Time will tell whether the transition from a program that initially was supported by the Alliance to one that is now a fee-for-service effort will result in a successful market transformation effort.

Montana Energy Code Update

On September 3, 2004, the Montana Department of Labor and Industry adopted the 2003 International Energy Conservation Code (IECC) with Montana Amendments, Montana's first statewide energy code for all building types. Jurisdictions had 90 days from this date to adopt it. The amendments included:

1. With each application for a building permit, the building official may require that plans and specifications be prepared by an engineer or architect licensed by the state, except for owner-occupied, single-family homes
2. Basement wall insulation below uninsulated floors, except for rim joist and perimeter cripple walls, may be delayed until such time as the basement is actually finished for occupancy
3. Lesser R-value may be allowed for log building walls
4. Where the energy labeling sticker is required by Montana law, it shall describe the energy efficiency components of the home and shall be signed, dated, and

permanently attached to the interior electrical panel by the builder or representative

In 2004 and 2005, the Alliance provided $84,000 in funding to two organizations in Montana to conduct code adoption, compliance, and external coordination: one staffer at the Montana Department of Environmental Quality, and a person at the Montana Local Government Energy Office.

Montana Department of Environmental Quality (MT DEQ). The Montana Department of Environmental Quality is a state agency that provides technical support on Montana's energy codes. Alliance funding supports energy codes in Montana by maintaining and augmenting the experience, expertise, and administrative infrastructure that has been developed by the MT DEQ and allows it to expand its efforts to assist Montana cities and counties in effectively implementing residential and non-residential energy codes.

MT DEQ provides technical support in the form of telephone conversations, on-site field assistance, and plan reviews to code departments, builders, architects, contractors and engineers. It also develops code related materials for distribution to these same groups. MT DEQ provides training and outreach activities to builders, student builders and homebuyers.

Montana Local Government Energy Office. The Montana Local Government Energy Office took the lead in the effort to gain adoption of the IECC and the International Residential Code by the Montana State Building Codes Council. The Alliance contractor was appointed chair of the Council during the adoption process and continues working in this very influential position.

Oregon Energy Code Update

The Oregon residential energy code was updated in 2003; the non-residential code also was updated in 2003. In 2004, the Oregon Building Codes Division (BCD) was directed by the Governor's office to limit the frequency of state code updates, including energy codes.

In 2004, the Alliance provided $277,000 in funding to two organizations in Oregon to conduct code adoption, compliance and external coordination, including: (1) four staffers at the Oregon Department of Energy and (2) one person at the West Wall Group, to participate on the National Fenestration Rating Council Board.

Oregon Department of Energy (ODOE). The Oregon Department of Energy assists Oregon cities and counties in adopting and effectively implementing residential and non-residential energy codes. Alliance funding also supports the participation of the ODOE in the ASHRAE 90.1 committee that develops Standard 90.1. ODOE conducts the following activities:

- Supports the Oregon Building Codes Division's development of code change proposals. ODOE works with the Board's Energy Committee and Technical

Working Group to shepherd energy code proposals through the adoption process and overall, has been very successful in its efforts.[10]

- Provides technical support in the form of telephone conversations, on-site field assistance, and plan reviews to code departments, builders, architects, contractors and engineers. It also develops code related materials for distribution to these same groups. ODOE also provides training and outreach activities to builders, student builders and homebuyers.
- Developed and maintains CodeComp and Whole Building Approach are two computer program methods of demonstrating compliance with Oregon's energy code. The programming for CodeComp software was updated in 2004 based on changes and updates to Oregon energy codes.
- *Circuit Rider Program.* The circuit rider is an expert on energy codes who provides reliable, consistent information and interpretations to building officials and builders/builders. The circuit rider is available to review plans and help with specific code-related issues that a jurisdiction may encounter.
- *Training Related to New Energy Codes*. With the adoption of a revised Oregon Structural Specialty Code (October 1, 2003) training was necessary for those associated with the construction industry (primarily architects, engineers, local building department staff and material suppliers). The 2004 effort focused on the central and eastern parts of the state.

West Wall Group, a private firm, manages the Alliance's Commercial Windows Initiative. Alliance funding supports WWG's participation on the Board of Directors of the National Fenestration Rating Council, which develops rating and certification procedures and analytic methodologies for residential and non-residential windows. NERC ratings are referenced in codes across the country.

Washington Energy Code Update

On November 12, 2004, the Washington State Building Code Council adopted a number of changes to the Washington State Energy Code effective July 1, 2005. Significant changes included, among others, updating mechanical efficiency requirements to the most recent federal standards, provisions for new technology and building science in wall assemblies, updating wall and window thermal efficiency requirements, and revisions to lighting allowances. Many of the changes approved were previously adopted by the City of Seattle.

In 2004, the Alliance provided $267,000 in funding to four organizations in Washington to conduct code adoption, compliance and external coordination, including: (1) four staff members at the Washington State University Energy Program; (2) two staffers at the

[10] Slote, Stuart A., Douglas Baston and Philip Mosenthal, "Documentation of the Northwest Energy Efficiency Alliance Efforts to Support Energy Codes and Participate in the Federal Standards Setting Process", 2003. Prepared for the Northwest Energy Efficiency Alliance.

Washington State Building Code Council; (3) one person at the Northwest Energy Efficiency Council; and (4) one person at the Lighting Design Lab to participate on the ASHRAE/IESNA (Illuminating Society of North America) lighting subcommittee.

Washington State University Energy Program (WSU). The WSU Energy Program is charged with the technical support and training for the Washington State Energy Code (WSEC) building officials, designers and builders. WSU assists Washington cities and counties in adopting and effectively implementing residential and non-residential energy codes. Funding for WSU supports energy codes in Washington by maintaining the experience, expertise and administrative infrastructure that has been developed by the WSU Energy Program.

WSU participates in State Building Code Council meetings as well as the energy Technical Advisory Group (TAG). WSU provides technical support for revisions and amendments to the WSEC. WSU works to increase energy code effectiveness by facilitating the incorporation of clarifying and simplifying revisions into the WSEC. WSU also promotes progressive energy codes by participating in code development activities at the state and national levels, including review and adoption of the IECC and IRC.WSU supports existing codes through training, providing supporting materials, and phone and on-site support.

WSU is the main provider of residential code training in Washington. In 2004, in this capacity, WSU:

- Updated and improved upon on-line energy code training,
- Provided on-site training for code enforcement personnel, and
- Provided speakers for residential building organizations emphasizing code and beyond-code energy efficiency building techniques.

Washington State Building Code Council. The Washington State Building Code Council (WA SBCC) is the official state agency charged with the development, interpretation, and technical support of the Washington State Energy Code. The WA SBCC aids Washington cities and counties in adopting and effectively implementing residential and non-residential energy codes.

WA SBCC provides administrative support for Technical Advisory Group (TAG) meetings and public hearings; provides information and resources to public and private organizations regarding adoption, enforcement, technical assistance, and interpretation of the energy code; and provides referrals to appropriate resources for designers and builders as well as code compliance information on specific projects.

Northwest Energy Efficiency Council. The Northwest Energy Efficiency Council (NEEC) is a regional, non-profit organization that provides services to energy-related businesses. With Alliance support, an NEEC staffer was a member of the State Building Code Council until 2005, including Chair for many years, and helped secure adoption of numerous energy code updates.

NEEC conducts overview trainings on the Washington nonresidential energy code (NREC). These half-day workshops target building officials, the professional design community, and other interested parties. In 2004, NEEC sponsored a series of more targeted workshops focusing on the commissioning requirements of the code and the Chapter 14 mechanical systems requirements. These workshops were two to three hours in length and were targeted to the code enforcement and professional design community.

NEEC provides phone call assistance on questions regarding the NREC from building officials, the design and construction industry, and other interested parties. NEEC produces and distributes the NREC Technical Reference Manual and NREC compliance forms to interested parties upon request.

Lighting Design Lab (LDL). The Alliance provides support to the Lighting Design Lab to participate in the development of lighting standards and guidelines through membership in the ASHRAE/IESNA lighting subcommittee. These are referenced in codes throughout the country.

IV. Attitudes Regarding Energy Codes

Historically, building codes have been focused on health and safety; therefore, the movement toward energy codes has been perceived by some building officials to be an unwelcome and burdensome change from that initial focus.[11] Code enforcement personnel (called "building officials" throughout this section, include building officials, plan reviewers and inspectors) and building industry members (called "designers/builders" in this section, which includes approximately 80% designers and 20% builders/sub-contractors) were queried about their knowledge of energy codes, and their perceptions regarding those codes.

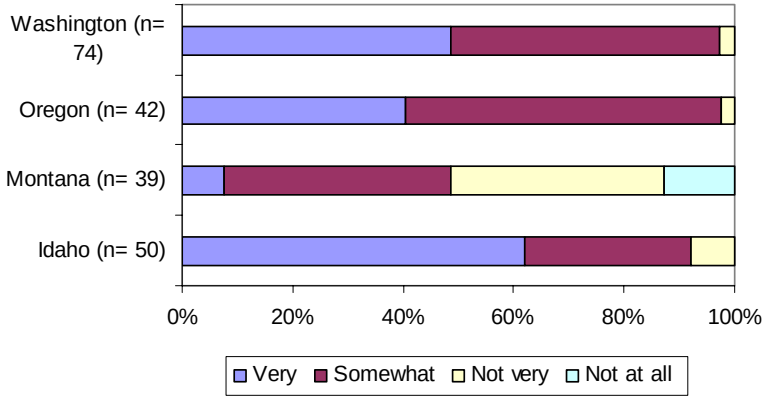
The primary focus of this section is attitudes of building officials, but designers/builders were queried regarding similar topics and their responses are reported where relevant.

Energy Code Knowledge

Building Officials

To determine how informed building officials feel regarding the energy code, they were asked about their knowledge of residential and non-residential energy codes. In all states except Montana, more than 90% of respondents said they were either very or somewhat knowledgeable of the residential energy code. Because Montana has a new energy code and many building officials were trained for the first time immediately prior to responding to this survey, it is expected that the building officials would be less comfortable (15% of respondents saying they are "not at all" comfortable with the code). Figure IV.1 outlines these results.

Figure IV.1: Building Officials' Knowledge of Residential Codes, by State[12]

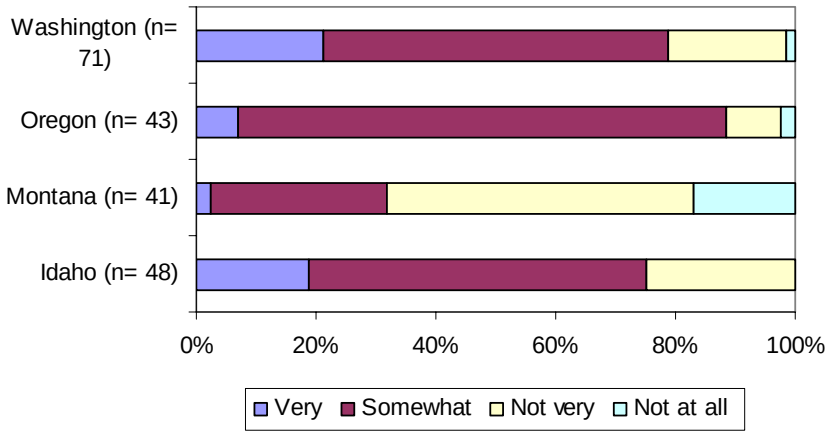


[11] Harris, Jeff. Northwest Energy Efficiency Alliance, and Mahone, Doug, Heschong-Mahone Group. 1998. Energy Codes and Market Transformation in the Northwest: A Fresh Look.

[12] Although building officials were asked to respond to both residential and non-residential codes, some respondents did not provide answers to both, leading to different sample sizes, as noted.

Building Officials stated that they are less well informed on the non-residential energy code, with only 30% of Montana building officials very/somewhat knowledgeable and more than 70% in the other states. Another indicator of building officials' lower comfort level with non-residential codes is the relatively small percentage of respondents who said they were "very" knowledgeable on this topic. This finding is somewhat expected due to the relative complexity of the non-residential code. Figure IV.2 outlines the state-specific, non-residential findings.

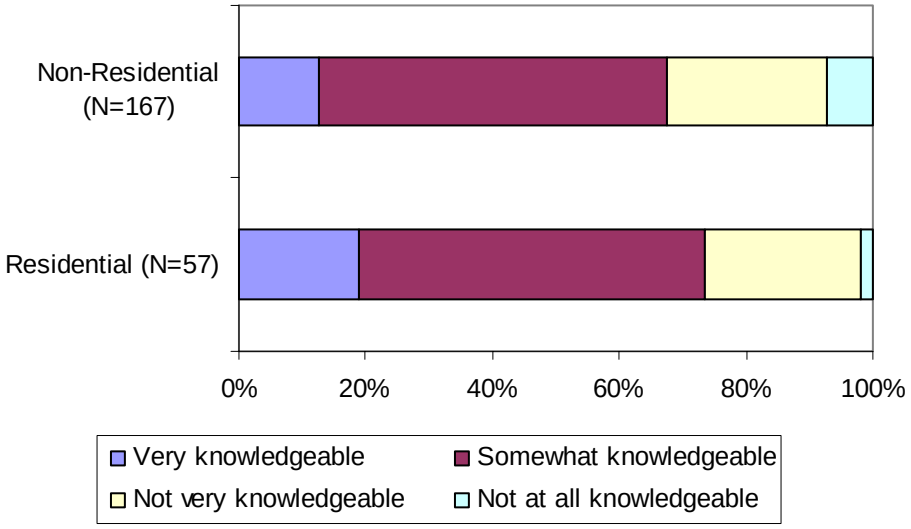
Figure IV.2: Building Officials' Knowledge of Non-Residential Codes, by State



Designers/Builders

For designers and builders, the survey was dynamic (i.e. if a respondent indicated that they primarily worked in the residential sector, the rest of the survey asked questions only about that sector). As a group, designers and builders proved very difficult to reach; as a result, survey responses were limited for this segment. Due to small designer/builder sample sizes, results in this chapter are only reported by state where data was sufficient. Responses to questions about designer/builder energy code knowledge are presented in aggregate in Figure IV.3, below.

Figure IV.3: Residential and Non-Residential Designer/Builder Energy Code Knowledge



The majority of designers/builders working in both sectors stated that they are "somewhat knowledgeable" of the energy code. Although a higher portion of non-residential respondents felt "not at all" knowledgeable, and a smaller portion of non-residential respondents felt "very" knowledgeable than those in the residential sector, differences in energy code knowledge between sectors were slight.

Is the Energy Code Confusing?

Building Officials: General Code Confusion

When building officials were asked if they found any parts of the residential and non-residential energy code confusing, more responded that they find portions of the non-residential code confusing than the residential. This was true for all states, as shown by Table IV.1 below. As with code knowledge, this finding is somewhat expected due to the relative complexity of the non-residential code.

Table IV.1: Building Officials Finding Any Part of the Energy Code Confusing

	Idaho	Montana	Oregon	Washington
Residential	20%	32%	8%	23%
Non-Residential	37%	37%	50%	60%
Sample (Res/NR)*	49/46	37/35	40/40	69/67

* Although building officials were asked to respond to both residential and non-residential codes, some respondents did not provide answers to both, leading to a different sample size, as noted on the figure labels

Residential. All respondents were asked to provide comments on confusing parts of the code. In Montana, many respondents noted that the residential crawl space code was confusing. In Washington, ventilation requirements and furnace sizing were noted to be problematic, as well sub-slab insulation. In Idaho, three responses noted that much of the code was confusing ("all of it," "layout is hard to read," "too many to list") and four noted that crawlspace ventilation was an issue.

Non-Residential. As shown in Table IV.1, a high portion of Oregon and Washington building officials responded that the non-residential code is confusing. In Oregon, there were five comments about general complexity, such as "most of it is unclear" and "there is not a clear path to follow." At least five respondents noted confusion about mechanical and HVAC requirements, while three specifically noted the 1313 (lighting) requirements. In Washington, again there were general frustrations, such as "all," "where do I start," and "a little of all of it." Two mentioned the role of the Nonresidential Energy Code (NREC) inspector, and ten noted the confusion over mechanical systems. Individual respondents mentioned many other portions, including component performance, masonry options, motor/lighting, commissioning requirements, air infiltration, economizers, and large buildings.

In Montana, lighting was mentioned by four respondents (including lighting load and switches), mechanical by three, and several others noted the nascent nature of the energy code. Idaho respondents noted both lighting and mechanical as confusing. One respondent did note, "Recent training has helped a lot."

Building Officials: Enforcement Confusion

In addition to general confusion regarding the energy code, open responses were solicited regarding confusion about either residential or non-residential code enforcement; responses are provided by state.

Oregon. In Oregon, a significant number of responses were provided, including general comments on the difficulty of making sure installations are conducted correctly. For example, one respondent cited "certain aspects such as envelope sealing because they are difficult to see. We do not have the manpower to do a specific inspection for this." While another said that "what is shown on plans is often different than what is on code compliance forms." One respondent said that the fact that the Oregon code differs from the neighboring states poses a problem.

Specific residential enforcement issues noted included slab, joint, and register insulation, as well as window U-values versus glazing. One respondent noted that "the code is clear, the installers are the main problem I have encountered." Among the non-residential enforcement issues, one respondent stated that there is not consistency from one project to another, which makes his job difficult. Several building officials noted that lighting is difficult to enforce; several others noted mechanical and slab insulation. More generally, there were a few comments on compliance forms, (e.g., "local code officials do not check compliance forms well enough" and commercial requirements for "forms submitted in plans for all mechanical requirements").

Montana. For both residential and non-residential, the following issues were noted: insulation techniques, compliance, lack of education by builders, proper installation, mechanical and staff resources. For non-residential, several noted that "all of it" is confusing, and lighting was also mentioned several times. For residential, crawl spaces, lighting, and insulation were the most-often noted responses.

Idaho. Several comments were provided, specifically regarding the knowledge and cooperation of builders. One stated, "Getting designers and contractors to educate themselves is a real challenge. I would encourage training specific to them be given more time and money." Several building officials noted non-residential lighting as problematic. Residential comments were provided on many subjects, including crawlspaces (conflict between IRC and IECC for ventilating crawl spaces).

Washington. Similar to comments from Oregon, Montana, and Idaho, many respondents noted confusion in the lighting and mechanical sections of both the residential and non-residential code. In addition, one respondent noted the difficulty of obtaining the NREC inspector name and credentials. A few noted the difficulty in determining the U-factor on windows when the sticker has been removed.

For residential, insulation was noted in nearly all of the 14 relevant responses. Examples included existing roof decks and quality of insulation products and their installation. In terms of non-residential, lack of knowledge by designers on lighting budgets, ventilation, and insulation were each mentioned by individual respondents.

Designers/Builders

Designers/builders were asked how easy it has been to comply with the code in their sector. Across states and sectors, the majority of responses fell into the "somewhat easy" category, with no significant differences between states.[13]

Table IV.2: Designers/Builders' Ease of Compliance, by Sector

	Res.	Non-Res.
Very easy	29%	17%
Somewhat easy	63%	67%
Somewhat difficult	2%	13%
Very difficult	5%	3%
Respondents	*41*	*142*

When asked whether they found the energy code confusing, approximately 30% of both residential and non-residential designers/builders responded affirmatively, as shown in Table IV.3, below.

[13] Due to small sample sizes, these responses are not displayed by state.

Table IV.3: Designers/Builders Find Energy Code Confusing?

	Res.	Non-Res.
Yes	15	47
% of Total respondents	30%	30%
Respondents	50	157

In the residential sector, several Oregon respondents elaborated, noting slab insulation and window replacements as confusing parts of the code. Designers/builders, also from Oregon, noted crawlspaces, fresh air inlets and the treatment of "green" products. In Montana, crawlspaces and the determination of the path to compliance were noted by six respondents.

For the non-residential sector, several Oregon designers/builders noted lighting controls. In Washington, confusion over industrial buildings and duct insulation were the only noted items. Idaho respondents were looking for clarity, including the tables in IECC, methods for non-prescriptive compliance, and examples of wall/floor assemblies that are "pre-certified" to meet requirements. In Montana, crawlspaces, lighting, and mechanical requirements were the most-often cited issues.

Obstacles

Building Officials

Building officials were asked if political support or lack of resources (e.g., manpower) were obstacles to enforcement of energy codes. Across all states, obstacles were more often noted in the non-residential sector than in residential, as illustrated by Table IV.4 below. In all states but Idaho, lack of political support was noted to be less of an issue than lack of resources.

Table IV.4: Yes Response to Obstacles to Enforcement

	Idaho	Montana	Oregon	Washington
Lack of Political support				
Residential	20%	41%	9%	21%
Non-Residential	72%	68%	41%	46%
Lack of Resources				
Residential	16%	36%	18%	25%
Non-Residential	52%	75%	59%	51%
Total n	50	44	44	76

When asked to specify any additional obstacles to enforcement, several respondents offered their perceptions. In Idaho, the most-often provided response was lack of builder education. Also, several building officials noted that time for energy codes is limited because the priority is health and safety. In Oregon, several noted that there is a lack of

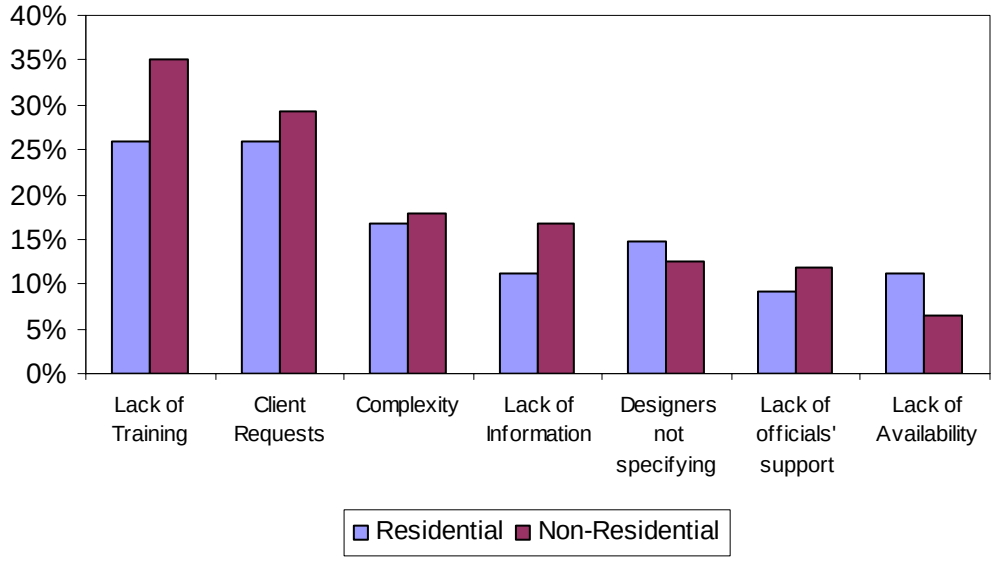
knowledge and training, and several more noted the confusing code language. For example, one specified, “Code language is hard to read and understand, poorly organized, too many footnotes,” and another stated, “Oregon’s energy code is complicated, cumbersome, and a pain to deal with.” In Washington, quite a few respondents noted the lack of education and training on the part of contractors, sub-contractors (mechanical was specifically mentioned), and homebuilders. While one noted that it’s “hard to keep up with all of the changes made every year,” several others noted that there are not big obstacles and the energy code has become standard practice.

Designers/Builders

Designers/builders were asked to identify those obstacles that they perceive to be an issue for code compliance. By sector, the non-residential respondents felt that lack of training and lack of information were bigger obstacles than residential respondents.

Across states, the issues of designers not specifying to the energy code, lack of building official support, and lack of availability were thought to be the least problematic. Figure IV.4 below outlines the responses for all states in aggregate, by sector.

Figure IV.4: Designer/Builder Obstacles to Code Compliance, by Sector



When residential designers/builders were asked about other obstacles to compliance, one Oregon respondent said that “some structural code requirements conflict with energy code requirements” and another noted differing local interpretation by jurisdictions. In Washington, one respondent noted a “lack of help and support from WSU,” and another noted the complicated performance requirements. In Montana, cost was noted, as well as energy code inconsistencies.

Non-residential designers/builders provided more feedback. In Oregon, several noted the difficulty in design compliance, specifically with regard to the lighting requirements.

This was supported by two comments regarding the retail lighting code requirements. In Washington, one comment indicated that industrial requirements were difficult and another mentioned outside air requirements in package rooftop equipment. In Idaho, cost and the allowable wattage per square foot were noted. In Montana, conflicts with "other building, fire, ADA codes, and federal standards" were pointed out.

General Attitudes about Energy Codes

Building Officials

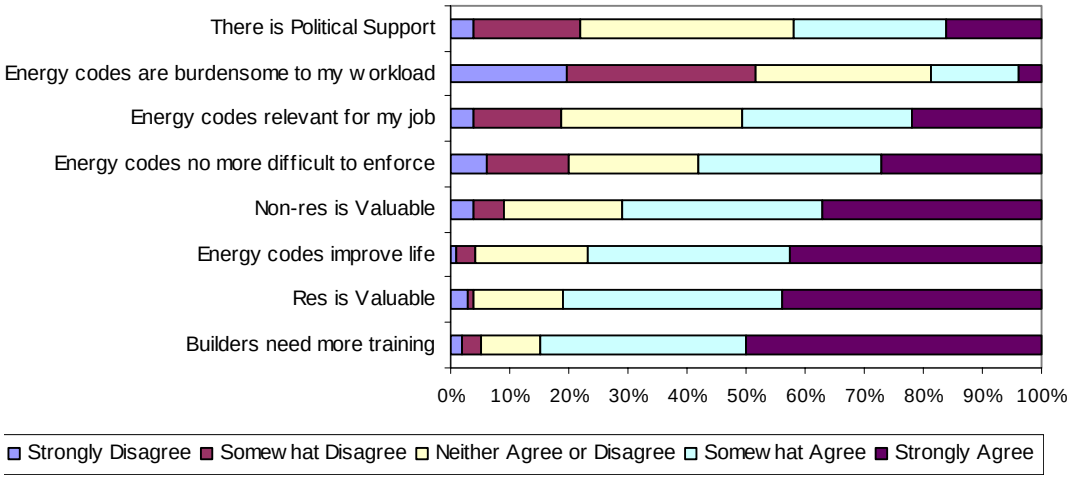
Overall, building officials showed positive attitudes toward energy codes. There was consistently high agreement (and low disagreement) with the statements that builders and designers need more training and that residential and non-residential energy codes are valuable additions to state building codes. Additionally, the majority of respondents felt energy codes improve the quality of life for the community.

Approximately 20% of all respondents *disagreed* with the following statements, as shown in Figure IV.5:

- There is political support in my jurisdiction for enforcement of energy codes
- Energy codes are related to my primary job function
- The energy codes are no more difficult to enforce than other building codes

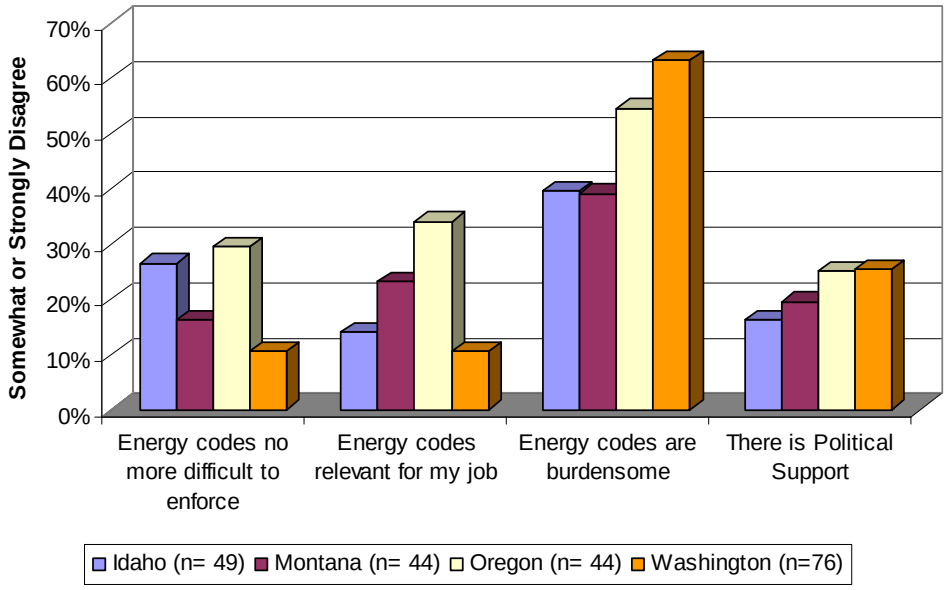
As an indicator of the perceived effort required for energy code enforcement, 20% of all respondents *agreed* with the following statement, "On a day-to-day basis, energy codes are burdensome to my workload."

Figure IV.5: Building Officials' Energy Code Attitudes, all States



Between states, there was some variation in the responses to the statements regarding energy codes. In Idaho and Oregon, a higher portion felt that energy codes are more difficult to enforce than other building codes. In Idaho, however, those same building officials felt that energy codes were more relevant for their job, while in Oregon, more than 30% felt that energy codes were not relevant. Washington building officials had the highest disagreement with the statement that there is political support in their jurisdiction, followed closely by Oregon.

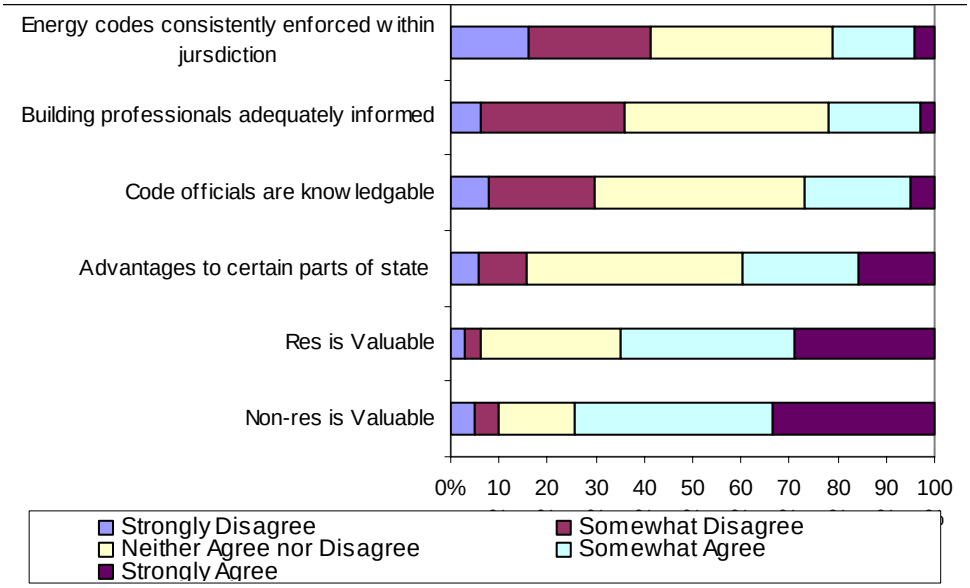
Figure IV.6: Building Officials' Energy Code Disagreement, by State



Designers/Builders

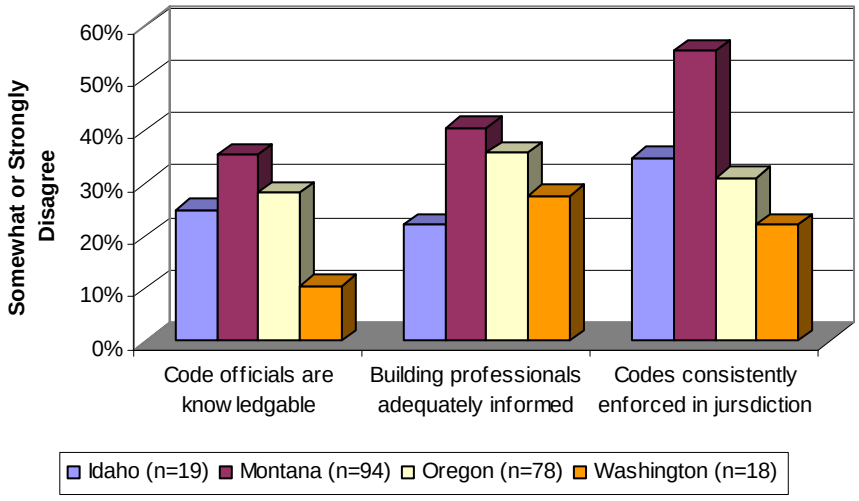
When asked about their agreement with similar statements, designers/builders also show a high propensity to believe that energy codes (both residential and non-residential) are valuable parts of state building codes. Almost 50% of respondents agree with the statement, "There are advantages to working in certain parts of the state due to differing levels of energy code enforcement." Approximately 30% of respondents disagree with the statement that code officials are knowledgeable, while more disagree that building professionals (i.e. themselves) are adequately informed. Within their jurisdictions, designers/builders see an issue with consistency of enforcement, as only 20% felt there was uniformity. Figure IV.7 shows these perceptions for all states.

Figure IV.7: Designer/Builder Perceptions of Energy Codes, All States



For the individual states, it is valuable to view those respondents that disagree with each statement (either somewhat or strongly). All states expressed consistent agreement with the statement that residential and non-residential energy codes are valuable additions to building codes, as well as there being advantages to working in certain parts of the state. The results did show some differences in perceptions between states, as shown in Figure IV.8.

Figure IV.8: Designers/Builders' Disagreement with Perception Statements, by State



Areas for Improvement: Compliance

Building Officials

When building officials were asked how to improve compliance, the overwhelming response was a call for improved builder and designer training. Specific comments provided by building officials from each state are noted as follows:

Idaho. Of the 25 responses provided, 17 specifically mentioned additional training, primarily for builders and contractors. Several mentioned licensing and mandatory continuing education for contractors. Additional ideas presented include builders "selling" energy efficiency to their clients, more exposure to non-residential codes, more public awareness, software to show cost-effectiveness of insulation, fewer options (more prescriptive requirements).

Washington. Washington building officials provided more than 50 responses to how to improve compliance, and 30 were directly related to expanded knowledge for the public, builders, and sub-contractors. Several noted the value of additional hand-outs to provide to builders and homeowners and designers. Several mentioned the need for close, cheap training. Other comments included the need for making the "sell" for energy codes (rational and simple were suggested) as well as a "check-list" for residential and "updated and easy-to-use energy code forms for non-residential."

Montana. More than half of Montana's 30 comments addressed the need for builder and consumer training and awareness. Additional comments included having codes that were "easy reading," additional manpower, and better understanding of installation practices.

Oregon. Of 30 respondents, about one-third noted the need for additional training for contractors and public awareness. There were several comments regarding the lack of consistency across jurisdictions. For example, "It would help greatly if all jurisdictions consistently enforced the code. I have heard many times 'we don't have to do this anywhere else in Oregon.'" Also, a few noted that having similar energy codes to neighboring states would be helpful. Additional comments include:

- Have inspections performed by energy code specialists (not associated with building inspections).
- Commentary to go along with energy code similar to ICC commentary for building code (both energy codes).
- Commercial: Establish a requirement for a permit applicant to fill out an energy compliance report that would be due before final permit could be approved.
- Require the non-residential energy forms to be submitted at the time of application rather than accepting them as a deferred item.
- Electrical inspectors should enforce the energy code lighting requirements.

Other Code Issues

The survey was used as an opportunity to see if building officials would support certain code changes. They were asked, "Would you support code requirements to verify that a building has been commissioned for lighting and mechanical systems?"[14] Responses were consistent across states, with the majority of building officials in support of commissioning requirements. When asked whether they would support a third-party certification for inspections or plan reviewers, building officials were split (52% to 48%). This idea was most-supported in Washington and least-supported in Idaho.

Table IV.5: Support for Code Changes

	Idaho	Montana	Oregon	Washington
Code Requirements for Commissioning				
Yes	36 (77%)	33 (75%)	27 (63%)	55 (74%)
Respondents	47	44	43	74
Supplemental, third party certification for inspectors or plan reviewers				
Yes	19 (39%)	14 (48%)	19 (44%)	49 (65%)
Respondents	49	29	43	75

Of those supporting the third-party certification, the majority support both residential and non-residential inspectors and plan reviewers. Washington has a lower propensity to support residential third-party reviewers. Table IV.6 outlines the state-specific responses.

Table IV.6: Support for Supplemental, Third Party Certification, by State and Type

	Idaho	Montana	Oregon	Washington
Residential				
Inspector	79%	86%	68%	55%
Plan Reviewer	84%	93%	79%	59%
Non-Residential				
Inspector	84%	57%	79%	82%
Plan Reviewer	79%	100%	95%	80%

Conclusions

Generally, it appears that designers and builders see the value in the energy code, both residential and non-residential. Building officials also expressed positive attitudes toward energy codes overall. The majority of concerns raised focused on the complexity of the energy code and lack of training for end users (builders, sub-contractors, designers, and

[14] The question was followed by the explanation, **"**Commissioning is a quality assurance process to ensure that a building's equipment and control systems are working as intended."

the public). This sentiment was expressed by both officials and designers/builders. There was a general perception that frequent changes in the energy code have made it difficult for building officials to keep up with the current requirements, especially for builders.

Due to the common perception of code complexity, particularly with the non-residential energy code, it would appear that there is a need for improved educational efforts that more adequately address these concerns.

Inconsistencies in energy code requirements across states, as well as inconsistent enforcement within states, were also sentiments heard often in this evaluation. A few respondents cited difficulty keeping track of the different state energy codes, as some people travel to many states as part of their work. Others felt resentment that people in other parts of their state were not responsible for the same level of compliance.

At the end of the survey, respondents were given the opportunity to provide any additional comments they had pertaining to the energy code. Several responses summarized some of the general feelings about energy codes.

Washington

The energy code, like other codes, is not perfect. I find the more I understand about the intent of the code, the better I am at enforcing the code and explaining it to the builder, which makes them more willing to comply with the code.

I appreciate the great resources that are available now. I hope they continue to exist for myself and for the contractors/homeowners in my area.

I think there is a wealth of energy and VIAQ information directed at professionals, inspectors and builders but not enough getting to the end users.

I love the simplicity of the residential code except for the ventilation code.

Oregon

The non-residential code is getting large and cumbersome. It takes an expert to interpret it in some areas. And some areas are unnecessarily vague (see 1313.5 re CFL screw-based). A goal of future changes should be to simplify, clarify, and shorten

When energy code requirements change, contractors and code officials should be required to have update classes. Code officials do get a brief overview of the requirements but to my knowledge contractors do not and are not required for their Certification.

The concept of third party energy inspectors is long overdue. It is the best way to ensure compliance.

Idaho

Need more builder and designer training.

Contractor cooperation [has been problematic].

Bonus rooms and crawlspaces [have been difficult to enforce].

[Training could be improved with] on-site training and more photographs showing correct & incorrect examples.

Montana

Ignorance & apathy of contractors make it difficult to enforce the energy code.

Just starting this (energy code is new in Montana).

Training like this one most helpful. [In the future, trainings] should include Bozeman.

Just learned about REScheck at this training. It will be great!

V. Project Effectiveness

This section presents the evaluation team's findings regarding the overall effectiveness of the Alliance's Energy Codes Program. Areas evaluated include coordination efforts between the Alliance and the ten principal organizations it funds, technical support efforts, maintenance of state Web sites, and training efforts.

Alliance Coordination Efforts

The Alliance Code Program Manager's primary responsibility is to manage the Alliance's code contractors' work on energy codes and standards through contracts with ten organizations, averaging between $750,000 and $1 million annually. He coordinates and facilitates the (roughly) quarterly meetings of Alliance-funded code contractors and interested parties, known as the Northwest Energy Codes Group (NECG). Individual meetings are held with each code contractor as necessary, once or twice each year. Code contractors are required to submit a monthly status report noting the status of and progress made on activities outlined in their contract. Other Alliance staff members assist the code manager on an as-needed basis with technical matters regarding energy codes.

The NECG meetings provide the Alliance an opportunity to meet collectively with its code contractors and are intended to be an informal opportunity to exchange information. Therefore, the meetings are "marketed" to a limited audience. The evaluation team attended regional meetings, to present the scope of work and the survey results from this evaluation project, and thus were able experience the regional meetings in person.

The evaluation team interviewed Alliance staff regarding their management and participation in the Alliance's energy codes project. Research questions focused on the effectiveness of the working relationships between the Alliance staff and the code contractors, as well as opportunities for the Alliance to better coordinate its market transformation activities in support of energy codes and standards in the Northwest states and nationally.

Interviews with code contractors focused on contractor interactions with the Alliance, including communication, funding review, reporting requirements, and the regional meetings. The evaluation team did not interview staff who submit the formal accounting of the budgetary aspects required by the Alliance.

Conclusions and Findings

Alliance Management. Alliance code contractors overwhelmingly stated that they have a good working relationship with the code program manager, that he is an effective manager, and that they greatly appreciate that he does not micromanage projects. Many Alliance code contractors specifically noted that the code program manager's approach to working with his code contractors is very open and he conducts himself in a straightforward manner, which is also appreciated. Several code contractors said they

have felt nothing but support from Alliance staff for their work efforts. Many code contractors appreciate that the code program manager doesn't approach them with strong opinions; several noted they appreciated his ability to think strategically and that he is not afraid to ask hard questions about their efforts.

Yet, with some additional time, the code program manager could further his strategic support of Alliance sub-contractors efforts, including fostering management improvements, such as improved coordination among the participants in the Idaho Energy Code Collaborative, and providing support for political processes and strategic planning. Discussion with the Code Program Manager revealed that he is currently spending about 20% of his time on energy codes, but that he could spend more time which would allow him to increase the his level of knowledge of energy codes and standards by attending code contractor trainings, going on site visits, etc. Incorporating these additional activities would likely improve his ability to interact with and manage Alliance sub-contractors.

Quarterly/Regional Meetings. Alliance code contractors unanimously stated they value the quarterly meetings as a forum to exchange information and work on issues of common interest and that these regional meetings are an effective way to share information and promote and formalize regional coordination (where appropriate) among the Northwest states. Code contractors overwhelmingly said that the meeting facilitation provided by the Code Program Manager is sufficient for these meetings. While Alliance code contractors were in general very satisfied with the meetings, they made suggestions on how to increase their use and to make them more productive, including provision of meeting summaries and action items, status of energy codes in each state and increased sharing of example work products such as training documents and marketing ideas.

Reporting Requirements. No code contractors had any issues with the Alliance's reporting requirements. The evaluation team reviewed numerous monthly reports submitted by Alliance code contractors. Overall, they varied in their level of detail regarding the activities conducted and the extent to which code contractors make progress on the activities listed in the Alliance contract. The team found that some reports were quite detailed and adequately reported on these items, while others were quite summary and the extent to which progress is being made was more difficult to discern.

Technical Support Efforts

Throughout the Northwest states, Alliance code contractors implement several energy code "infrastructure" activities that provide technical support to designers and builders (referred to here as designers/builders), and code enforcement personnel (building officials). These activities include telephone, e-mail and in-person technical support, and the maintenance of Web sites. The Alliance considers these activities critical to the maintenance of strong regional energy codes. The Quantec team conducted a Web-based and paper survey of building officials and designer/builders to assess perceived value, accessibility, and overall satisfaction with the services. In addition, users were asked to provide suggestions for improving the services.

It is important to note once again the limited number of designers/builders responses; results are reported by state where data are sufficient. Overall, a higher proportion of building officials used technical support than the designers/builders.[15]

Table V.1: Building Officials Using Technical Support

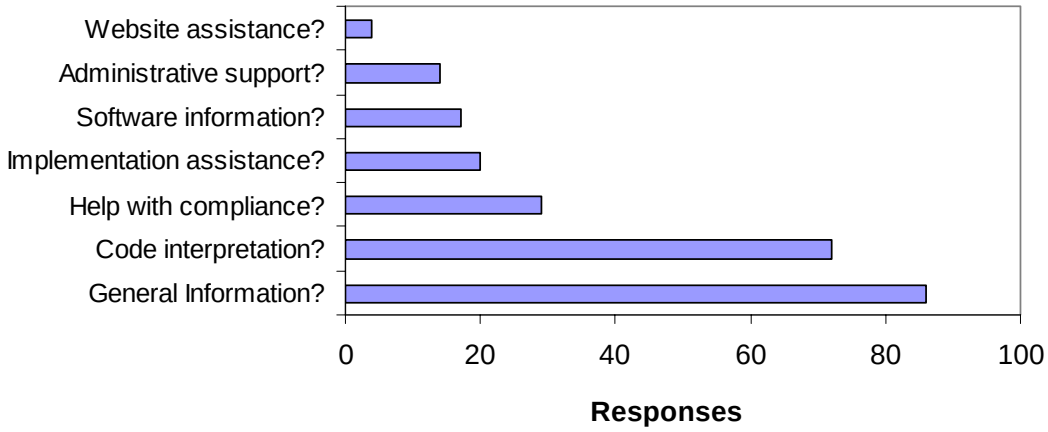
	Washington	Montana	Oregon	Idaho	Overall
Using Tech Support	76	22	27	27	152
Total Responses	94	45	46	52	237

Table V.2: Designers/Builders Using Technical Support

	Washington	Montana	Oregon	Idaho	Overall
Using Tech Support	12	36	29	4	81
Total Responses	22	99	82	23	226

For those respondents who contacted technical support, approximately 55% did so by telephone, approximately one-third by e-mail, and the remainder in person. This was true for both designers/builders and officials. Recipients of technical support used the services for a variety of reasons, the most common being to obtain general codes information and code interpretation assistance. The distribution of technical support inquiries for officials is presented in Figure V.1, and for designers/builders in Figure V.2, below. These distributions did not differ by state.

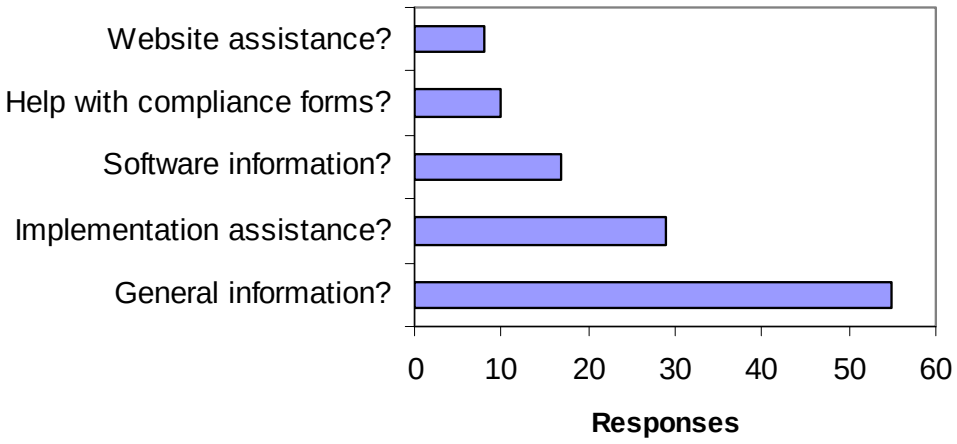
Figure V.1: Building Officials, All States: Did you contact technical support for . . . [16]



[15] Only Washington provided a sample of technical support user contacts, which led to the higher portion of the sample that had used technical support

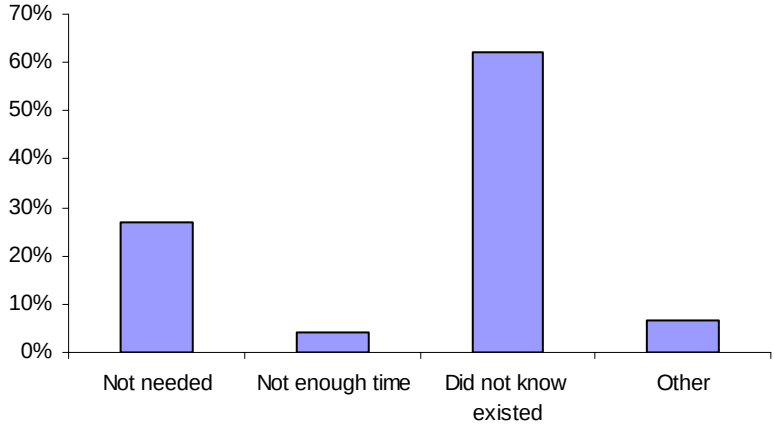
[16] Total N is approximately 150. Chart shows number of responses rather than percentages because respondents could check multiple.

Figure V.2: Designers/builders, All States: Did you contact technical support for . . . [17]



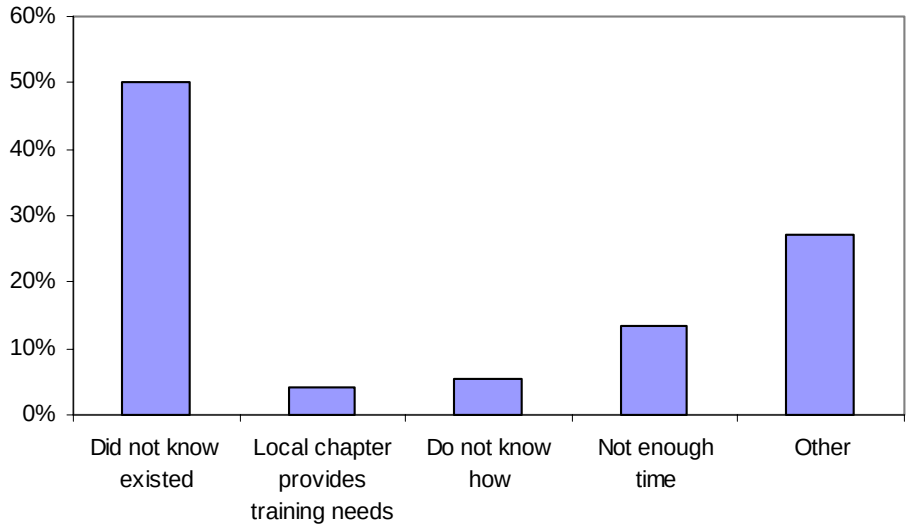
Of the respondents who had not used technical support, the predominant reason given was that they did not know it existed. This was true for both designers/builders and building officials. Reasons for not using technical support are presented below in Figure V.3 for designers/builders, and Figure V.4 for officials.

Figure V.3: Designers/builders: Reasons for Not Using Technical Support



[17] Total N is approximately 80. Chart shows number of responses rather than percentages because respondents could check multiple.

Figure V.4: Building Officials: Reasons for not using Technical Support



Satisfaction

Recipients of technical support were asked to rate their satisfaction with the response time, knowledge and professionalism of staff, and quality of information received. For building officials, satisfaction with technical support was very high across all states. More than 80% of respondents were very or somewhat satisfied with all aspects of technical support.[18] Very little variation was seen between states.

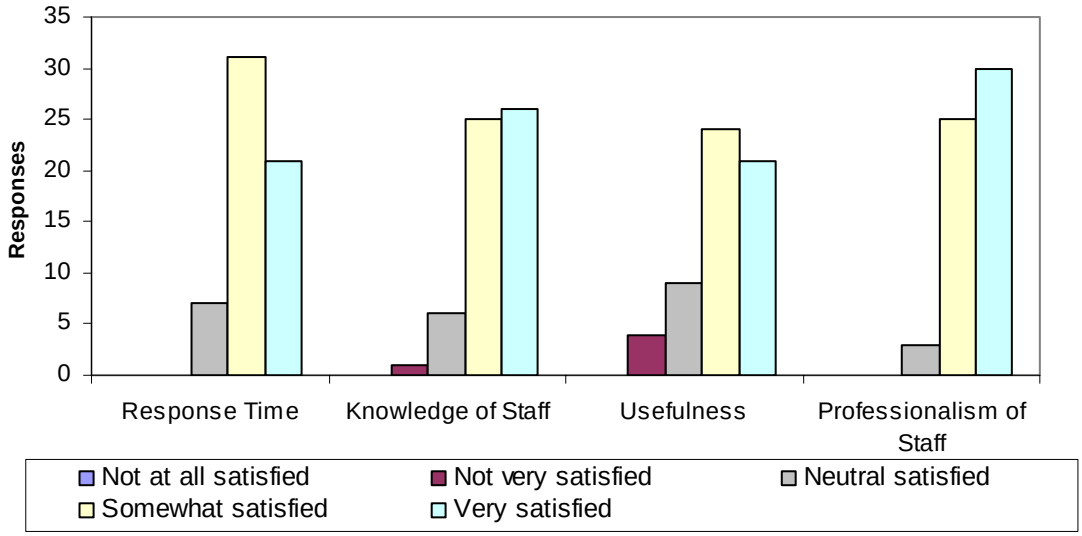
Of those designers/builders surveyed, the vast majority was either very or somewhat satisfied with all aspects of technical support. This was true for both sectors.

Across states, designers/builders working in the non-residential sector seemed to be slightly more critical of response time, usefulness of information, and staff knowledge. Satisfaction ratings from residential and non-residential designers/builders are presented in Figures V.5 and V.6, respectively. Overall, 84% (of 137) building officials and 86% (of 79) designers/builders said that they planned to use tech support again in the future.

[18] Due to a glitch in the online survey instrument, satisfaction responses could not be distinguished between "very" and "somewhat" satisfied.

Figure V.5: Satisfaction with Technical Support: Residential Designers/builders (n=17), All States

Figure V.6: Satisfaction with Technical Support: Non-Residential Designers/builders (n=58), All States



When asked for suggestions on how to improve technical support, very few comments were provided. One building official from Oregon requested acknowledgement "that reviewers and inspectors are checking thousands of issues in addition to energy code and help keep the level of attention necessary in perspective."

Alliance-Supported Web Sites

Alliance code contractors from each state help to maintain Web sites designed to provide general energy and building code information, including energy code information. In the interest of survey length, only designers/builders were asked about Web site usage. The designers/builders were asked whether they used the Web sites and, if so, to rate their satisfaction with the sites' quality of information and ease of navigation. Users were also asked to note any additional services or information they would like to see included on the sites. The following table shows the organization and link to each of the Web sites.

Table V.3: Web Site Organizations and Links

State	Organization	Web site link
Oregon	Department of Energy	http://egov.oregon.gov/ENERGY/
Idaho	Department of Building Safety	http://www2.state.id.us/dbs/
	AIC	http://www.idahocities.org
Montana	Department of Environmental Quality (www.energizemontana.com)	http://deq.state.mt.us/energy/
	Department of Labor and Industry	http://dli.mt.gov/
Washington	Washington State University Energy Program	http://www.energy.wsu.edu/
	Washington State Building Code Council	http://www.sbcc.wa.gov/
	Northwest Energy Efficiency Council	http://www.neec.net/resources/resources.html

The level of designer/builder Web site utilization varied across states. Relatively few Montana designers/builders (25% of 101) had used their state's Web sites for energy code information, likely due to the recent adoption of the IECC code in that state. Those Montana designers/builders who had used a Web site almost always used the Montana Department of Environmental Quality Web site, *energizemontana.com*. One person had used the Montana Environmental Information Center Web site, and one had used the Montana Department of Labor and Industry Web site. In Oregon, nearly 70% (of 82 respondents) had used the ODOE site, and more than half (of 21 respondents) in Washington had used the WSU Energy Program site. In Idaho, 7 of 23 respondents had used the Idaho Division of Building Safety Web site.

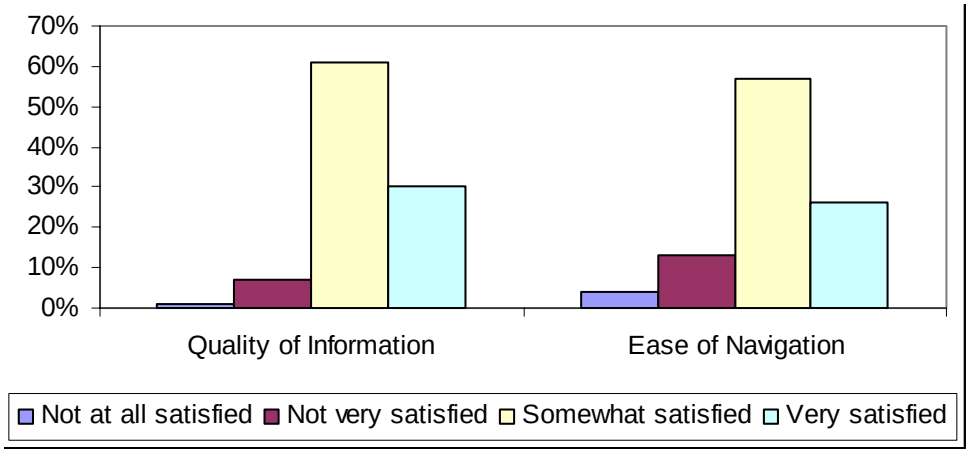
Similar to technical support, the majority (71%) of those survey respondents who had not used their state's Web sites for energy code information did not know about them. A small proportion of respondents cited limited access to the Internet and a preference for telephone assistance. In Montana and Oregon, several designers/builders stated that they did not use the Web sites because they are not needed for their jobs.

Satisfaction

Designers/builders using their state's Web sites for energy code information were queried on their satisfaction with the quality of information presented on the sites and with the ease of navigation. In general, designers were satisfied with the Web sites, with the majority of respondents being "somewhat" satisfied with the Quality of Information

(61% of 96) and Ease of Navigation (57% of 95). The proportion of those that were "very" satisfied was 30% for Quality of Information and 26% for Ease of Navigation.

Figure V.7: Designers/Builders' Satisfaction with Web Sites, All States



These findings did not differ significantly between states, with the exception that Oregon was the only state with any respondents "not at all satisfied" (one with quality of information, four with ease of navigation). All of the other "not very satisfied" responses (one of 11 from Washington and three of 25 from Montana) were in reference to ease of navigation.

In addition to rating their satisfaction with the information and navigability of the web sites, the designers/builders were asked to provide suggestions on types of additional information that would be useful to them. In Oregon, one respondent commented that the information may be available, but it's not logically linked; another asked for interactive forms, rather than printing them. In Washington, one respondent asked for clearer links to compliance forms; in Montana, one noted that non-residential information is not available on-line.

Generally, we found that, although most felt "very" or "somewhat" satisfied, the Web sites received a slightly lower rating than other aspects of technical support. This finding was supported by the evaluation team's quick review of the Web sites. In several cases, it was not obvious from the home page where energy code information could be found.

- ***Montana***. http://www.energizemontana.com - immediately redirects users to http://deq.state.mt.us/energy/. The user must scroll-down to see the link to "2005 Montana's Statewide Energy Code for Residential Buildings." There is no link to Non-residential code. The evaluation team could not find a link to energy code information on the Montana Department of Labor web site (http://dli.mt.gov).
- ***Idaho***. From the Idaho state Web site (http://www2.state.id.us/dbs/) the user simply mouse over the "Energy Conservation" option and is provided with an "Energy Codes" option. The resulting page has links to download RESCheck and COMCheck software, but the evaluation team could not find information on the

actual code. On AIC's Web site, http://www.idahocities.org, the user must click the link for "AIC Programs" then the link for "Energy," then scroll down to see a link for the "International Codes Tool Kit for Local Governments."

- ***Oregon***. The Oregon site (http://egov.oregon.gov/ENERGY/) seemed to be the easiest to navigate. The home page had a link for Building Codes and Compliance forms, which took the user to a page with additional detailed links for Residential Code, Non-Residential Code, Compliance Forms, Technical Support, Publications, CodeComp Software, Questions & Answers and Code Web Sites.
- ***Washington***. The Washington site (http://www.energy.wsu.edu/site/info.cfm) has both an easy-to-see "Energy Info" and "Energy Code" link on its front page. The user can easily find the text of the residential code, participate in an on-line tutorial and use the links to be directed to the other Washington sites, (http://www.sbcc.wa.gov/ and http://www.neec.net/resources/resources.html.

Compliance Forms

Survey respondents were asked if they used their state-issued compliance forms and, if so, to provide suggestions on how they might be improved.

The majority of Oregon designers/builders surveyed had used the compliance forms provided by the state. In all other Northwest states, however, most of the designers/builders surveyed had not used compliance forms, with only 7 of 19 from Idaho, 8 of 18 from Washington, and 9 of 91 from Montana having used the forms. Once again, the recent code adoption in Montana likely accounts for the small fraction of designers/builders from that state who have used the forms.

Consistently across states, approximately half of those people who had used compliance forms could not think of a way to improve them. In Oregon, the most common suggestion was "clearer instructions" followed by "less complicated requirements" (18 and 11 of 83, respectively). The remaining states each had fewer than ten respondents using compliance forms, but those individuals providing suggestions most commonly felt that making them "easier to obtain" and giving them "less complicated requirements" would improve the forms. In addition, one respondent from Washington asked for the ability to use another software program and, in Oregon, one wanted "the deletion of the pull down menu for the lighting code." Another stated, "There is no reason to duplicate the information on the lighting fixture list for fixture/lamp info."

Technical Support – Conclusions

For those people using it, Alliance-supported technical support has been well received consistently across the Northwest states. General satisfaction with technical support was high, with slightly higher ratings for staff knowledge and professionalism than for response time and usefulness of information. This sample indicates that building officials use the service more often than designers/builders. Those designers/builders working in the non-residential sector were slightly more critical of technical support, particularly response time and usefulness of information.

Web sites were not as often used in Idaho and Montana as they were in Oregon and Washington. Although overall satisfaction with both ease of navigation and quality of information were high, the vast majority of comments were related to navigability and not content. The evaluation team found that the Web sites did not have 'catchy' names[19] (with the exception of energizemontana), and in some cases it was difficult to get to energy code-related material on the sites.

With the most common reason for not using technical support consistently being "did not know it existed," it would appear that promotion of the services and targeted outreach could be improved. Only Washington code contractors could provide a list of technical support users, indicating a need for improved tracking of who is using these services. Without a database of users of these services, it is difficult to evaluate their effectiveness.

Education and Training Efforts

The Alliance coordinates with its code contractors in each of the Northwest states to provide significant education and training opportunities for code enforcement individuals (building officials) and building industry professionals (designers/builders). These efforts are more active following significant code changes, but classes are also occasionally offered in the absence of code changes. Education efforts focus on two main categories, code *enforcement,* aimed primarily at building officials and design professionals; and code *compliance,* aimed at building and construction professionals. Enforcement classes focus on the code itself while compliance classes try to provide practical design and construction methods that are sure to meet code.

This evaluation focused on the practical effects of these trainings as well as on general satisfaction with the classes themselves. Questions aimed at assessing the practical effects included, "How did training improve your overall code knowledge?" and, "How did training impact your professional practices?" Satisfaction questions asked for feedback on staff knowledge, training format, and whether or not participants recommend training to colleagues. Samples were drawn from Alliance code contractor lists of training and technical support users.

Training Effects

Overall, the trainings were successful in improving building official and designer/builder knowledge of the energy code, across states. Trainings also resulted in changes to professional practices for the majority of participants.

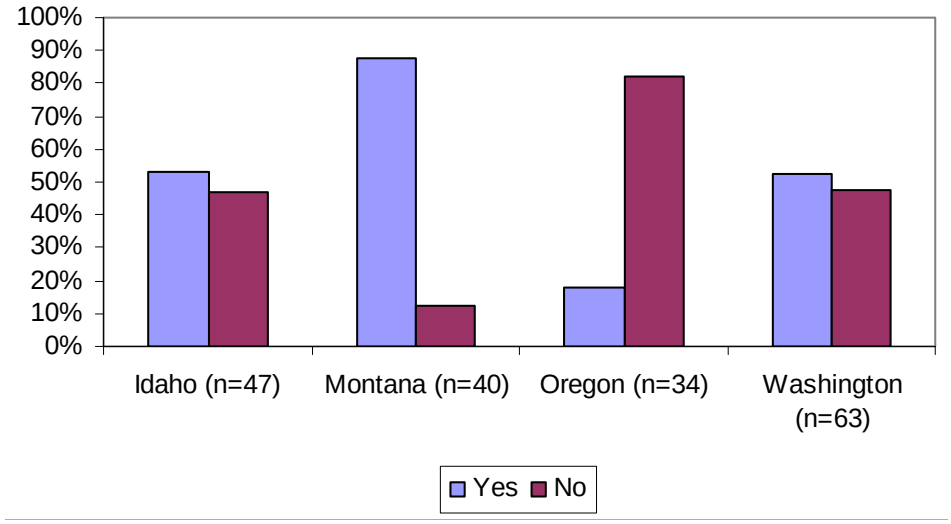
Building Officials. As a result of training, 77% (of 196) said their knowledge of the energy code had improved either significantly or somewhat; 21% said a little, and only 1% said not at all. Montana building officials felt the most improvement with 71% saying their knowledge had improved "significantly," a finding that is not surprising considering

[19] If accessibility is a goal, then names that are easy to remember should enable more users to remember the name and access the site.

the nascent nature of that state's code. The remaining states were relatively consistent in knowledge improvement, with 21%-33% of respondents in those states feeling that their knowledge had "significantly" improved and 44%-48% feeling "somewhat" improved. For detailed state-specific results for building officials, see Appendix B.

To assess the practical effect of the training, participants were asked whether the training had resulted in any changes to their professional practices and whether or not they recommended it to their colleagues.[20] Most participants (54% of 184) had changed their practices, and the majority (64%) had recommended training to colleagues. These results varied by state. With Montana building officials, 88% (of 40) anticipated that they would change their practices, which is an expected response from a group of individuals newly exposed to the energy code. Approximately half of the building officials from Idaho and Washington said that they had changed their practices as a result of training, but only 18% (of 34) of those from Oregon said so. These findings are consistent with the fact that Montana has recently adopted a new energy code and Oregon has not significantly changed its energy code recently. State-by-state findings are presented in Figure V.8.

Figure V.8: Changes to Practices – Building Officials, by State



When asked to explain how the training changed their practices, several people gave general responses about how their general knowledge of the energy code had improved. One building official from Washington replied, "Better understanding of auditing procedures," another from Idaho said, "Closer examination of components." An Oregon building official added, "I learned things I needed to know for plan review," and one from Montana stated that now, "Review will include lighting and mechanical requirements."

[20] Montana survey respondents were asked hypothetical versions of these questions, "*Will* the training result in any changes to your professional practices?" and "*Would* you recommend the training to any colleagues?"

Designers/Builders. As with the building officials, the overall result of energy code training for designers and builders has been positive in both improvement of general energy code knowledge and changes to professional practices.

As a result of training, 87% (of 151) of the designers/builders surveyed said their knowledge of the energy code had improved either significantly or somewhat, 11% said a little and 2% said not at all. The results indicated that those designers/builders working in the residential sector felt slightly more positive about their knowledge improvement, with 63% feeling a significant improvement vs. 51% of the non-residential designers/builders feeling significant improvement. This finding may be attributable to the complexity of the non-residential code.

For designers/builders in both sectors, the majority (66% of 151) reported that the training had changed some of their professional practices, and 76% said they *would* (Montana respondents) or *already had* recommended (all other states) the training to colleagues. These findings did not differ significantly by sector, but did vary quite a bit by state. In Montana, 87% (of 94) designers/builders said that they were planning to change their professional practices. Once again, this response rate was expected due to the recent code adoption in that state. In Oregon, the vast majority of respondents said that training did *not* result in changes to practices, again most likely due to the long existence of the Oregon energy code. Approximately half (of 15) Idaho designers/builders had recommended training to colleagues, whereas a much smaller portion of Oregon (10 of 31) and Washington (1 of 9) designers/builders had recommended training, perhaps due to the fact that the energy codes in those states have been in existence for a longer time.

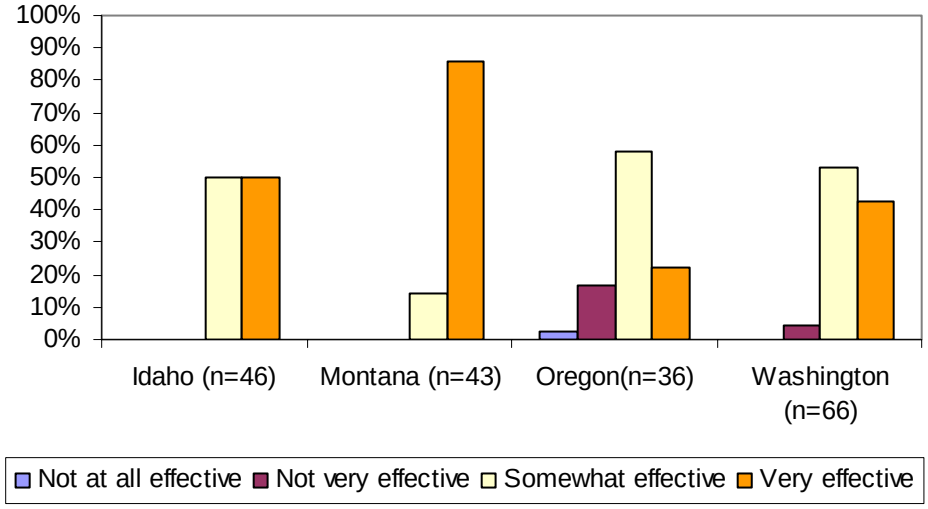
Training Satisfaction

Those survey respondents attending training on the energy code were asked to provide feedback on their satisfaction with the classes, including staff knowledge, format of the training, and usefulness of handouts.

Building Officials

On the whole, all participants in energy code training seemed satisfied with the classes. Across states, almost every building official (99% of 192) that attended training felt that the staff was very or somewhat knowledgeable of the energy code, with 81% saying staff was “very” knowledgeable. This distribution did not significantly vary by state. Similarly, 94% of participants felt that the format of the presentation was very or somewhat effective. Attendees in Montana seemed to be the most satisfied with the format, with about 86% of respondents saying it was very effective.

Figure V.9: Format Effectiveness – Building Officials, by State



Oregon building officials seemed more dissatisfied with training format than those in other states, with the smallest percent of respondents (of all states) feeling that the format was "very" effective, and the highest proportion saying it was "not very effective." See Figure V.9 for state-specific format effectiveness ratings.

Several participants provided suggestions on how the format could be improved to more effectively convey the information. These responses included several requests for more "real life" examples, such as this comment from an Oregon building official, "Need hands-on examples, or examples that can be completed/followed as training examples of the non-residential process, tables and requirements," and this from Idaho, "[I would like] hands-on real site situations."

A few building officials seemed to feel that the level of the trainings were not always appropriate to the audience, like this comment from Washington, "Start at square 1 so you don't lose new people. Provide advanced training for others," this from Idaho, "too much information, too little time," and this from Oregon, "Class was not in-depth enough, and didn't go into the why of the code changes." Other comments included several requests for on-site training, and more visuals.

Most training attendees who received supplemental handouts (83% of 169) felt that the handouts were useful. A few of the comments given on format mentioned that some additional handouts would be useful, such as builder guides.

Designers/Builders

As with building officials, designers and builders expressed overall satisfaction with all aspects of the training events. When asked to rate the knowledge of the training staff, 30 of 33 residential designers/builders and 85% (of 118) non-residential designers/builders said "very knowledgeable," with the remainder saying "somewhat." Between states and

by profession (builders and designers), this was relatively consistent. The format of the presentation was almost always classroom-style in all states except Oregon, where half were on-site. Overall, participants were happy with the training format, with the vast majority (96% of 151) saying it was very or somewhat effective.

Suggestions for format improvement included several on specialization of topics, including this comment from one Montana designer, "Break it up into areas of expertise - electrical designers should spend whole time talking about electrical," a sentiment that was echoed by others in Montana and Oregon.

As with building officials, there was a recurring desire for more real-world examples and better graphics. Two designers/builders from Montana cited a need for better explanation of abbreviations.

Finally, 94% of designers/builders felt that the handouts given at trainings were useful. The very few (5) comments on how handouts might be improved cited a desire for more details, more organization, and more explanation of energy code intent.

Conclusions

The results of this evaluation indicate that, in general, satisfaction with training has been very good in all states, including staff knowledge, format effectiveness, and usefulness of handouts.

A Need for Improved Outreach

As discussed above in the Attitudes Regarding Energy Codes section, there were numerous comments about the need for builder and sub-contractor trainings. Therefore, we recommend that future trainings be expanded to include this segment. Other comments indicate the need for a tiered approach to trainings to not only meet the needs of those with different levels of code experience, but also to meet the specialized needs of the building community, such as those working in HVAC, mechanical, and electrical. Feedback on training and technical support also suggests a need for less technical handouts.

The most common reason given for not attending training, for both building officials and designers/builders, was that they did not know about them. This finding indicates that, in general, there is a need for more targeted outreach of the groups the Alliance would like to be serving.

State Variation in Satisfaction

The findings from the evaluation indicate that although general satisfaction with training was high across states, some aspects (such as format and training effect) saw a higher level of satisfaction from building officials and designers/builders in Idaho and Montana, where the code is relatively new, and less satisfaction in Washington and, in particular, Oregon. Perhaps the higher levels of dissatisfaction in Oregon might be attributable to the

complexity of the energy code. This result indicates that it might be beneficial for the Alliance to encourage Oregon code contractors to update the format of Oregon training sessions to reflect this state's code complexity.

VI. U-0.35 Windows Requirement

In 2002, the Washington State Residential Energy Code adopted a new U-0.35 windows requirement for residential buildings in Climate Zone 2 (Cascades and Eastern Washington) to be used with the prescriptive compliance path most commonly used by builders.

Using interviews with builders and general contractors (n=15), window distributors (n=10), and a Mystery Shopper survey (n=11), the residential U-0.35 windows requirement was evaluated for levels of compliance, availability of compliant window types, incremental cost, and any obstacles to compliance that may exist.

Throughout this section, windows meeting U-0.35 or exceeding (less than U-0.35) the requirement will be referred to as EE (energy efficient); those windows greater than U-0.35 will be called non-EE.

Availability

The results of this evaluation indicate that availability is not a barrier to compliance with the U-0.35 windows requirement. All the residential builders surveyed stated that they had never experienced any difficulty procuring high-efficiency windows for their building projects. This was illustrated by one builder who said, “This isn’t new; you could always get high-efficiency windows.”

Mystery Shopper interviews likewise indicated that customers are able to get any window style in high-efficiency glass. Salespeople at each store repeatedly told the Shopper that any request could be accommodated. In addition, salespeople at most stores seemed very knowledgeable about energy efficiency and actively promoted “low-e”[21] windows to the surveyor in almost every call. Salespeople were eager to explain the benefits of energy-efficient windows, including energy savings, noise reduction, and reduced UV exposure to furniture, etc. One salesperson explained, “Dollar for dollar, [EE] is your best buy. It pays for itself and has the additional benefit of blocking out 60% of UV.” Another strongly recommended EE even on replacement windows not covered under the code, saying, “If you don’t buy low-e, the new window won’t be much better than the window you’re replacing.”

Dealer interviews did reveal two styles of windows that are not available with a high-efficiency option: garden windows and mini-blind windows. Dealers stated that while these two window styles are not U-factor rated, they are available in insulated, “low-e”[22]

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[21] Often, the survey respondents used “low-e” synonymously with ENERGY STAR®-rated or U-0.35

[22] Low emissivity (Low-e) is an optically transparent coating that allows most natural light to enter, but reflects a significant portion of long and short-wave heat energy. Low-e is a primary method for windows to meet ENERGY STAR requirements.

glass. The two dealers mentioning these windows explained that customers installing these unusual windows often trade off other energy efficiency areas of their home to meet code.

Incremental Cost

The Quantec evaluation team initially proposed to document the incremental cost associated with moving from a U-0.40 to a U-0.35 window. However, this information was largely unavailable through the Mystery Shopper exercise, because manufacturers do not make windows to fall into discrete U-0.40 or U-0.35 categories. Rather, windows are manufactured to meet a minimum U-factor rating of 0.35 to be certified as ENERGY STAR® and meet energy code requirements. Depending on the window brand, style, and size, ratings can fall anywhere between U-0.27 and U-0.35.[23] "Standard" windows, or non-EE, are usually referred to as "clear glass" windows that are not manufactured to be efficient and usually carry U-factor ratings upwards of U-0.49. Incremental cost data, therefore, were obtained for two sample window styles – a picture window and a single-hung window – for the difference between a standard, uninsulated window and a U-0.35 compliant window. The Mystery Shopper gathered price quotes on these four window styles from 11 window supply stores in Eastern Washington. It is noteworthy that because the availability of non-EE windows is comparatively low, incremental cost data from the standard windows were difficult for salespeople to estimate.

Two of the stores surveyed could not provide incremental cost data because they do not sell standard windows at all. The incremental cost for a 3'x 4' single-hung, vinyl framed EE window, from the rest of the stores surveyed, was in the 10%-15% range. The 5'x 4' picture window carried a higher incremental cost at many stores, with five responses falling into the 20%-25% range, two in the 10%-15% range, and one in 5%-10%. Salespeople at a few stores explained that this is due to the large area of glass in a large picture window, which causes a higher degree of heat loss, making it more expensive to insulate.

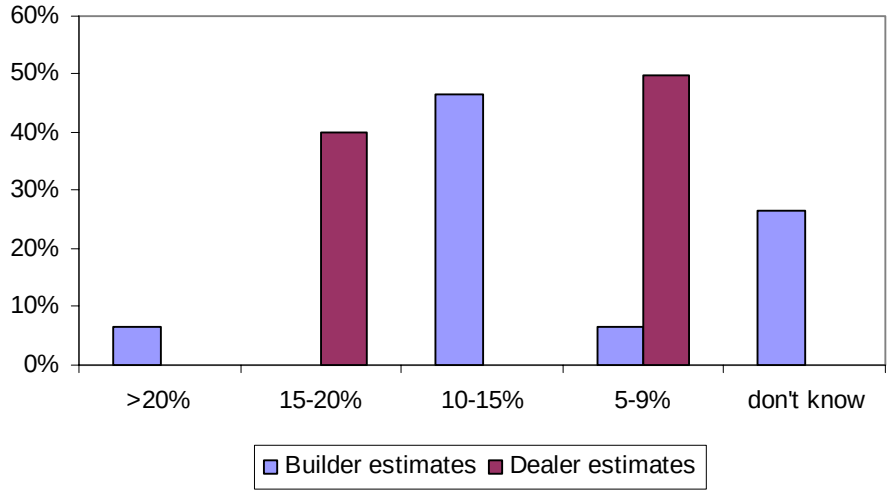
Although incremental cost data point to a differential in cost between EE and Non-EE windows, all stores providing the information did so hesitantly, most stating that to buy a "clear glass" window would not meet the energy code and would end up costing more money in the long run.

Because of the difficulty of distinguishing between U-0.40 and U-0.35 windows, the builders interviewed for this activity were asked to provide estimates of incremental cost between "clear glass" windows and those with a U-0.35 efficiency rating. Most of the respondents estimated the incremental cost at 10%-15%. Four builders did not know the incremental cost, and two builders could not answer, stating that they never price clear windows on their projects. Similarly, windows dealers were asked to estimate incremental cost. Most commonly, dealers estimated incremental cost at 5%-10%, with

[23] U-0.27 was the lowest rating available at the stores surveyed.

some saying 15%-20% and some saying less than 5%. Builder and Dealer estimates of incremental cost are presented below in Figure VI.1.

Figure VI.1: Incremental Cost Estimates, Clear Glass and U-0.35 Windows, Eastern Washington

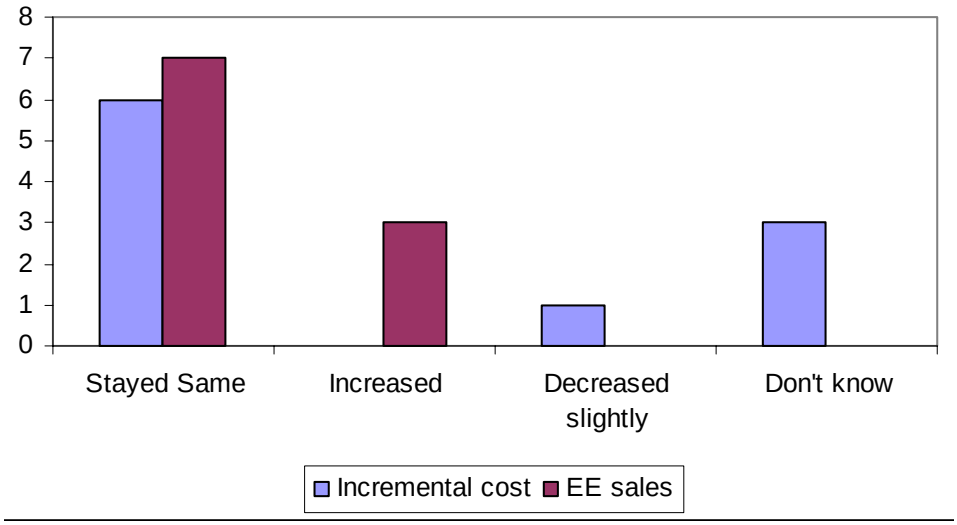


Trends

To assess the influence the 2002 Washington State Residential Energy Code may have had on high-efficiency window sales, dealers were asked about trends in availability, sales, and incremental cost over the last two years. Only three of the ten stores reported an increase in high-efficiency window sales to Eastern Washington customers over the time frame; the rest reported no change. Many of the dealers reiterated that they've been dealing in energy-efficient windows for years and not much has changed in the last two years.

When asked to comment on cost trends over the past two years, one dealer thought that the incremental cost of EE windows had come down slightly, but all the others either reported no noticeable change or did not know. Dealer perceptions on EE window trends over the past two years are presented in Figure VI.2.

Figure VI.2: Dealer Perceptions of EE Window Trends



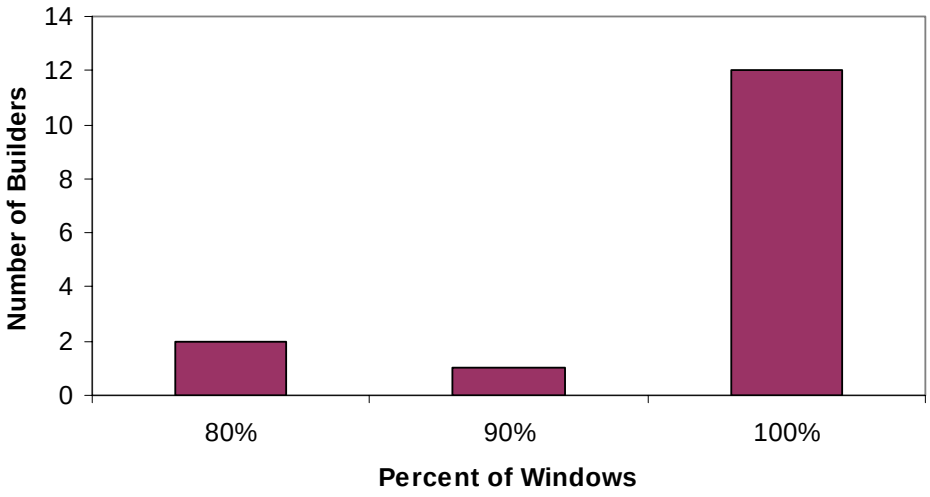
Compliance

Compliance with the energy code was informally assessed with respondents' estimation of the percent of windows sold or installed that meet the new specifications.

First, builders were asked about their general experiences with the U-0.35 code requirement. All the builders surveyed expressed that complying with the energy code was not burdensome and that procuring high-efficiency windows had never been a problem. One builder stated that he has been working with EE windows for years and has not noticed any significant changes in the past two years.

As part of the evaluation for compliance, builders were asked to estimate the percentage windows on their 2004 projects that were EE. The significant majority of builders in this sample installed EE windows exclusively, with two builders reporting saying that 80% of their windows were EE, and one builder reporting a 90% EE installation rate in 2004. In those cases where non-EE windows were used, two builders cited a remodel project where the customer opted for non-EE windows due to incremental cost, and one explained that he used a trade-off approach with a particularly large window that experiences high heat loss. Figure VI.3 illustrates the frequency with which builders installed EE windows on their 2004 projects.

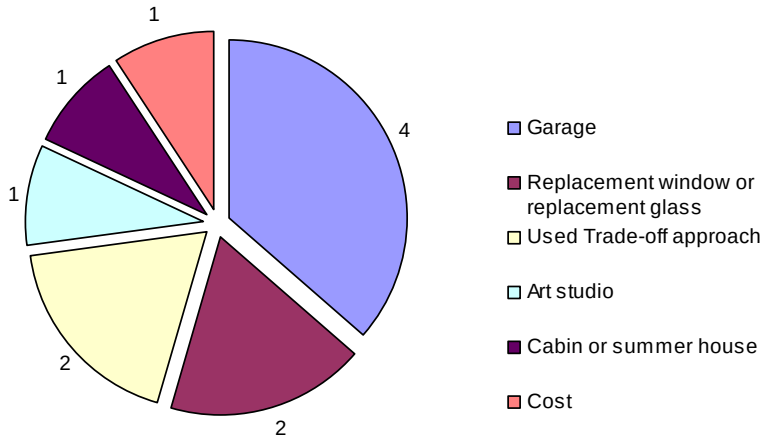
Figure VI.3: Percent of EE Windows Installed, Eastern Washington



Because builders work with relatively few windows each year, dealers were asked to estimate the frequency of EE window sales. Two dealers interviewed stated that they sell 100% EE windows in their store, and six stated that they sell greater than 95%. Two stores thought the proportion of EE window sales fell in the 85%-90% range.

A significant finding is that none of the reasons provided for non-EE windows sales are instances of non-compliance. The most common reason customers bought non-EE windows was for use in a garage, followed by replacement windows and using a trade-off compliance approach. The U-0.35 requirement is only for new construction projects using the prescriptive compliance approach. Although one respondent listed cost as a reason for non-EE window sales, all dealers said cost was only an issue in cases not falling under the code, such as use in a summer cottage or art studio. Circumstances given in the dealer interviews for non-EE window sales are presented in Figure VI.4.

Figure VI.4: Reasons for Purchasing Non-EE Windows, Eastern Washington



Conclusions

The results of this evaluation indicate that compliance with the U-0.35 window requirement in the Washington State Energy Code is near 100%. This result is a triangulation of builders saying they rarely install windows above U-0.35, dealers saying they rarely sell them, and Mystery Shopping results showing that customers are able to get EE windows in any style. In the rare instances where non-EE windows were sold or installed, the circumstances always fell under a category not covered by the energy code.

Availability was not an issue for the builders, with all saying that they have never experienced any problems procuring U-0.35 windows for their building projects. Barriers to compliance, therefore, seem minimal, with retailers actively educating customers on the benefits of energy efficient windows, including but not limited to cost effectiveness.

Although incremental cost data point to a differential in cost between EE and Non-EE windows ranging from <5% to 25%, this was not a barrier to compliance. All the dealers interviewed said that cost was only an issue in cases not falling under the code.

In short, for the samples in this evaluation, the U-0.35 windows requirement in the Eastern Washington State energy code does not appear to be problematic for builders or window supply stores, and compliance appears to be very high, if not 100%.

VII. State-Specific Programs

Idaho Association of Building Officials Small Adopters Program

This task is a continuation of a program allowing the Idaho Association of Building Officials (IDABO) to provide direct technical and administrative assistance to small jurisdictions that had no building codes to assist with their adoption and enforcement of the International Building Code, including the IECC. The program is intended to overcome political resistance to codes mostly in Idaho's rural areas by providing technical and financial assistance to help cities or counties make the decision to adopt the International family of codes.

The Alliance has supported the program for four years. To date, five of six jurisdictions have adopted the IECC codes as a result of the support received from IDABO. The program was discontinued in late 2004 as very few non-code jurisdictions remain.

To assess the effectiveness of the program, the evaluation team interviewed IDABO representatives. IDABO indicated that the program had limited success and that getting local jurisdictions that were slow to adopt an energy code to participate was a difficult "sell." In some instances, the code has been adopted but not successfully implemented. This is due in part to the fact that some jurisdictions that adopt the code do not receive the support needed to implement it. As a result, IDABO plans to modify the program to support code implementation and code adoption.

Idaho Site Educator Program

In January 2004, a new program was piloted to provide on-site education to building jurisdictions. This pilot has been very well received by Idaho code jurisdictions throughout the state. The one-day site visit seeks to enhance statewide plan review and inspection consistency and quality control through a process of direct education and a formalized process of information gathering and sharing. Many of the larger rural communities have chosen to play host to multiple surrounding jurisdictions, increasing the participation in this activity. It is anticipated that by 2005 this will become a primary method for assuring code implementation quality and consistency in Idaho.

Many IECC and IRC technical issues surfaced in 2004 and needed to be addressed through a coordinated effort. Issues such as proper crawlspace insulation and ventilation techniques, slab-edge insulation methodologies, commercial lighting control systems, and commercial roof assembly air barriers all required a coordinated effort to provide education and consistency throughout Idaho. The 2003 codes require residential HVAC load calculations including duct design and present a challenge to moving the industry into better practices. Currently, jurisdictions throughout Idaho have differing solutions and interpretations on certain code requirements.

The Association of Idaho Cities (AIC) and its contractors developed an initial list of areas where interpretation was a question and/or compliance is an issue. Training was developed with targeted groups in mind such as building officials, building designers and the general contractors. Trainings are flexible and typically include a half-day in the classroom and a half-day on a construction site so that participants receive hands-on and peer-to-peer experience in verification of code applications. This format changes as experience is gained to suit the needs of each local jurisdiction. Before coming on site, the trainers solicit suggestions from participants for areas that should be addressed through this sort of training. Where possible, the trainers solicit and review building plans before attending the site visit.

The goal of this assessment was to determine whether the information developed is used by and useful to local building officials. Interviews with the code contractors provided information for this evaluation task along with interviews of local jurisdictions that received the service. Talking to local building officials assessed the value of the support materials developed. The evaluation team attended a session presented by one of the trainers and over a dozen local building officials held at the Idaho Energy Conference in November 2004 that focused on the Site Educator program. Several jurisdictions that have received the service were interviewed to gain an understanding of how the program was presented at their office and whether the information provided proved useful to them. The format of the session was also discussed.

Each site educator participant interviewed agreed that the tailoring of a program that addressed specific energy code issues was very useful and would result in better and more uniform inspection and enforcement of the Idaho energy code.

Direct, on-site education of local building officials at their office and on-site at a recently permitted (or in the progress of being permitted) project is proving to be an excellent way to help demystify issues regarding the Idaho energy code. This approach to educating building officials is a good complement to the classroom training sessions conducted.

Generally, we find that the site educator program should continue to be offered in Idaho until local jurisdictions decide the service is not needed.

Idaho Plan Review Program

IDABO developed and administered contracts for design assistance and plan review for local jurisdictions. This task helped reduce the IECC startup impact by minimizing delays in the plan review process and achieved greater consistency among code enforcement agencies throughout Idaho. A cadre of third-party plan reviewers was established and is available to provide assistance to local jurisdictions throughout the state. The Alliance provided money to provide these services for free initially. That money has now been exhausted. Time will tell whether the transition from a program that initially was supported by the Alliance to one that is now a fee-for-service effort will result in a successful market transformation effort.

Due to limited funding and a large number of plan reviews conducted through the program in some jurisdictions, equity issues arose between different jurisdictions. As a result, the Alliance decided to rebalance the funds, limiting the amount available to some jurisdictions after increasing funding for some.

Interviews were conducted with local jurisdictions that have participated in this program and the individuals who provide this service. Based on this feedback, the evaluation team assessed the program's usefulness, shortcomings, and ways it can be improved. The evaluation team attended one half-day training session at the Idaho Energy Conference in November 2004 on how to conduct commercial plan reviews for the 2003 IECC.

Although successful in the larger jurisdictions such as Boise and Nampa, the plan review assistance has not been utilized by smaller jurisdictions. We believe this is partly due to this task being perceived as "just another form to fill out" by smaller jurisdictions.

The program has had limited success due to limited funding and is now essentially set up as a third party program, with some plan reviewers hired by local jurisdictions or developers to do plan reviews.

VIII. National and Regional Code Activities

National Codes: Support for Northwest-Promulgated IECC and IRC Code Change Proposals

The IECC and the IRC are developed by committees of the ICC. The IECC has requirements for both residential and non-residential buildings, and the IRC is a comprehensive residential code. Updates to the national model codes occur on an 18-month cycle. Currently, both Idaho (without amendments) and Montana (with amendments) have adopted a version of the IECC and are likely to adopt updates. Therefore, the requirements contained in the national model energy code will directly impact energy codes in Idaho and Montana.

The Alliance coordinates the Northwest Energy Codes Group (NECG), which provides a forum for the four Northwest states to share ideas and work together on issues. Through the NECG, Alliance code contractors provided technical comments on the US Department of Energy package of proposed residential changes to the 2003 IECC, which were ultimately incorporated into the 2004 Supplement to the 2003 IECC and 2003 IRC.[24] The national impact from the 2004 IECC changes in residential requirements, based on current Oregon and Washington energy codes, is large.[25]

Changes influenced by Northwest advocacy and the energy codes in place in Oregon and Washington, and survey results showing the residential energy codes in these two states are implemented well and effective included:

- Increased requirements for Zone 4, Marine Climate (Western Oregon and Washington) residential prescriptive thermal wall performance.
- Support for increased residential prescriptive thermal wall performance requirements in the rest of the country.
- Increased window U-value and floor insulation requirements in Zone 4, Marine Climate (Western Oregon and Washington) based on Oregon and Washington's experience.
- Requirements for sealed air handlers and filter boxes were added, which is estimated to save approximately 1%-2% of energy use in new US residences.[26]

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[24] US Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Energy Codes Program. July 2004. Setting the Standard, Number 2. http://www.energycodes.gov/news/sts/pdfs/sts_update_july04.pdf

[25] According to analysis conducted by the American Council for An Energy-Efficient Economy, see http://aceee.org/buildings/policy_legis/bldgcodes/iecc.pdf

[26] Personal Communication with Craig Conner, Building Quality, June 2005.

- Relying on Oregon's long-standing simplified approach to thermal envelope requirements as the best example of the value of such an approach, which supported US DOE's proposal to greatly reduce the complexity of the code.
- Support for increasing duct insulation requirements to R-8 (and the R-6 exception) as realistic and doable.
- The Oregon and Washington residential energy codes also provided a "sanity check" on many proposals considered for the 2004 IECC, as well as many small language changes, which helped to make the national model residential energy code more readable and thus more usable.

The NECC also helped develop proposals that are currently under consideration in the next update to the IECC (2006).[27]

The adoption of a national code as the basis for each state's energy code has large potential benefits for the Northwest. Currently, Washington and Oregon have state-promulgated energy codes. While having a unique state code has the benefit of maintaining state control and provides for innovation, it also carries large costs since all supporting documents, training information, and technical interpretations have to be created and paid for entirely by a single state. Adopting a national energy code spreads these administrative costs across many states. Also, adopting a national energy code is not restrictive since the basic structure can be adopted and then amended as necessary to achieve state-specific goals. Another economic benefit is that little or no work is required to show compliance with EPAct,[28] a federal requirement. At this time, both states are weighing the advantages of being supported by a national infrastructure against the loss of independence and the ability to be a leader in innovative code changes. Washington is the more likely of the two to move sooner to the IECC due to political momentum in the state to adopt the full suite of international codes.

The evaluation team interviewed the following individuals for this activity: an Alliance code contractor (from the WSU Energy Program) who provided review and critical insights into the US DOE proposal on behalf of the Northwest states; a former PNNL staff person who was instrumental in the development of the proposal; and several people who served on the IECC Committee. Interview questions focused on the content and critique of the proposal, the role Alliance code contractors played in these efforts, how effective these efforts were, and what could be done to improve the Alliance's efforts in national energy code adoption.

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[27] In March 2005, the Alliance issued an RFP requesting proposals to develop a Northwest Energy "Reach" Code. The reach code is intended to establish code adoption goals significantly beyond existing codes. The work envisioned in the RFP would serve as a guideline for regional and state code adoptions for the next five to seven years, and is intended to guide code adoption strategy at the state, regional and national level.

[28] For background on US DOE's determination process, see http://www.energycodes.gov/implement/determination_process.stm

Findings and Conclusions

All four people familiar with the IECC process and the Alliance code contractors indicated that information provided by the Alliance code contractors and their critique of the US DOE draft were instrumental in helping shape the final proposal, and aided in its approval by the IECC and IRC committees.

In general, the Quantec team concludes that the current Alliance strategies to develop code change proposals and promote their adoption by the IECC and IRC committees have been very effective.

Support for energy code change proposals that are consistent with Northwest state energy codes can be considered a strategic, defensive posture in that, the more the International codes include requirements that are favorable to the Northwest states, the more likely they will be considered for state adoption. Additionally, since the IECC and IRC are adopted by a majority of states throughout the country, the inclusion of Northwest-developed code change proposals will have a national impact well beyond the Pacific Northwest.

National Committees

National standards that directly impact the level of energy efficiency in buildings throughout the country are promulgated by associations such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), National Fire Protection Association (NFPA), and the National Fenestration Rating Council (NFRC). The Alliance supports Northwest participants on voting committees of these groups to ensure the perspective of the Northwest states is well represented.

Alliance input to ASHRAE, NFPA, and NFRC standards will have long-term national market impacts and result in electricity and fossil fuel savings for residential and commercial customers.

Continued Alliance participation with ASHRAE, NFPA, and NFRC will increase the potential for technical exchanges with national engineering communities, as well as provide opportunities for future collaborative ventures, educational programs and research efforts. Improvement to standards will also help support the objectives of Alliance projects such as ENERGY STAR® New Homes, ENERGY STAR® Residential Windows, Super Good Cents Manufactured Homes, Commercial Sector Initiative, Commercial Windows Initiative, Lighting Design Lab, Local Government Associations and code support.

Alliance Project Involvement

ASHRAE/IESNA 90.1 Committee. Participation on this committee supports energy codes in the Northwest by providing voting representation on the ASHRAE 90.1 committee, which influences non-residential energy codes throughout the country by setting the ASHRAE 90.1 Standard. Since the Federal Energy Policy Act of 1992

(EPAct) prohibits energy codes from exceeding the national standard for certain classes of electric equipment, the effect of the ASHRAE Standard 90.1 on electric energy savings has reached far beyond those states that have adopted it. The ASHRAE 90.1 Standard is the default non-residential energy code throughout the United States and is referenced in the IECC, which has been adopted by Idaho and Montana. Improving the Standard will permanently improve energy codes both in the Northwest and throughout the country.

Committee membership directly benefits the Northwest by bringing information to the region in a timelier manner than is possible now. For example, in participating in ASHRAE committee meetings in 2002, ODOE was exposed to the committee's extensive research, recommendations, and proposals on Interior Lighting Power Density. That information was incorporated into an Oregon energy code change that was approved for implementation in 2003. Without exposure to this important information at the committee level, there would have been at least a three-year delay in getting it adopted in Oregon.

Additionally, based on Oregon's direct experiences in implementing commercial fan power requirements, ODOE submitted a successful proposal to ASHRAE to change its requirements. ODOE then made a proposal to change the Oregon requirements based on the ASHRAE revisions.

ASHRAE Technical Committee (TC) 6.3. The Alliance contractor from WSU previously chaired this committee and continues to participate in program and research activities. The TC conducts outreach on the pending adoption of Standard 152; Method of Test standard test for determining HVAC thermal distribution system performance. Upon completion of its term as chair of the technical committee in 2004, WSU became chair of the committee's research subcommittee. WSU has also been actively involved in the development of Standard 62.2 "Standards for Acceptable Ventilation and Indoor Air Quality - Residential, 90.2." This involvement includes publication of indoor air quality and ventilation research, attendance at committee meetings and providing public comment on the Standard.

A considerable accomplishment by WSU was the writing of ASHRAE 2004 Systems and Equipment Handbook Chapter 9 "Design of Residential Forced-Air Heating and Cooling Systems," which now includes a new section on duct leakage with great detailed drawings showing how to design ducts within the building pressure envelope.

NFPA 501 Standard. NFPA 501 Standard on Manufactured Housing includes thermal efficiency minimum requirements (i.e., energy code) for HUD manufactured housing. Proposed improvements to NFPA-501 2004 will increase the Alliance manufactured housing market transformation efficiency efforts in the Pacific Northwest and throughout the country. Since 1999, WSU has represented the Alliance as a voting member of NFPA-501 Manufactured Housing Standard. From 2002-2004 WSU provided technical support to a Pacific Northwest National Laboratory (PNNL)/US DOE effort to further improve NFPA-501.

NEEA/PNNL/US DOE proposals have been incorporated in NFPA-501 1999, 2002 and 2005 editions, and forwarded to HUD for adoption in the Manufactured Housing and Construction Safety Standards (MHCSS). Once adopted and implemented by HUD MHCSS, the energy improvements will apply to 200-300,000 single-family homes each year in the US. Proposals 4-6 related to ducted HVAC systems are estimated to yield 0.07 Quads of energy saving per year.[29]

WSU represented the Alliance interests in 1999-2000 as a voting member of the NFPA501-2000 mechanical technical sub-committee, working closely with the NWPCC for guidance. This effort has resulted in improvements to ventilation systems, R-8 crossover duct insulation levels, improved in-plant practices associated with air leakage envelope and ductwork.

ASHRAE/IESNA 90.1 Lighting Subcommittee. The Lighting Design Lab led an effort on behalf of the ASHRAE/IESNA Lighting Subcommittee that culminated in changes to the Illuminating Engineering Society of North America's interior lighting power density requirements that first were approved by the Lighting Subcommittee, and then the ASHRAE/IESNA 90.1 Committee in June 2004. These requirements are already in use in Oregon and have been adopted by Washington. The requirements will be employed in jurisdictions throughout the country that adopt ASHRAE/IESNA Standard 90.1-2004. LDL has also participated in the development of ASHRAE guidelines for office buildings.

NFRC Board and Nonresidential Certification Subcommittee. West Wall Group (WWG) has represented the Alliance on the NFRC Board of Directors for eight years and is co-chair of the nonresidential certification subcommittee. WWG participation has provided the Alliance with a voting member on matters relating to window issues and affords WWG contact with key contacts in the window industry throughout the country. The NFRC work also helps supports WWG work in the Alliance's Commercial Windows Initiative, specifically in the refinement of rating procedures and certification procedures and analytic methodologies.

The evaluation team conducted interviews with each Alliance contractor participating on the above committees regarding their experiences in participating in each organization, the activities conducted by each committee, and the benefits that the Northwest derives from this Alliance support.

Conclusions and Findings

The Northwest participants in national committees have successfully represented Northwest interests. Participation in national committees has been an effective way to provide the Northwest states with advance information on changes being considered in national standards. Increasing the stringency of the national standards puts pressure on all

[29] J.W. Andrews. 2003. Future Directions for Thermal Distribution Standards. Brookhaven National Laboratory.

states to increase the stringency of their energy codes, which in the long run, can aide in developing support for updates to Northwest states' energy codes.

Alliance support that funds participation on these committees is appropriate and has resulted in direct benefits to the Northwest states and beyond. The Alliance should continue to fund such efforts and look for additional ways to mine these and other such national committee activities that can provide value to the Alliance's market transformation efforts.

IX. National and State-Level Equipment Standards

National Equipment Standards

From 2001 through 2003, the Alliance provided funding to the Oregon Department of Energy (ODOE) to participate in the federal standards-setting process. As a result, the Northwest was able to provide independent data and comments in the national standards-setting process. This funding was discontinued in 2004 due to the slow pace of activity at the federal level. While the recent pace of activity at the federal level has been slow, currently, US DOE is in the process of considering updated standards for residential furnaces.

A strong Northwest voice in national standards activities is valuable in that it provides independent data to inform the federal standards-setting process. To the evaluation team's knowledge, there is only one person in the Northwest (through the Northwest Power and Conservation Council) actively involved in participating in and tracking the national standards setting process. Given the potential for significant benefits from the adoption of national equipment standards, the Quantec Team recommends the Alliance consider funding at least one person to actively participate in the national standards-setting process and track its progress over time. Previously, participation in this process does not require a full-time commitment, and therefore would require limited funding from the Alliance.

State-Level Equipment Standards

States can regulate equipment that is not explicitly within the domain of the federal government. To date, no Northwest state has enacted state-level standards, but California adopted a comprehensive set of standards in 2004 for a whole range of small consumer products and appliances. As a result, if Northwest states fail to enact state standards on par with those adopted by California, manufacturers could move, or "dump" product that becomes precluded from being sold in California to other nearby states.

The energy-saving potential of enacting state-level equipment standards is quite large. To date, the Alliance has not provided support for the development, adoption or implementation of equipment standards efforts at the state level. Washington adopted equipment standards legislation May 6, 2005.[30] The Quantec Team believes that there is significant value in Alliance support of such efforts. Yet, because of the potential for extensive funding requirements, the Alliance should conduct research to determine the status of the Northwest states' equipment standards efforts, and determine how best to support such efforts.

[30] http://www.leg.wa.gov/pub/billinfo/2005-06/Htm/Bills/Session%20Law%202005/1062-S.SL.htm

X. Conclusions and Recommendations

On the whole, the evaluation team finds that the Alliance's Codes and Standards activities are serving a valuable purpose and in, many cases, targeted services would not receive sufficient funding without the Alliance. Specifically, the Alliance has provided effective education, technical, and code adoption support.

Tracking Clients

A key finding of this evaluation is that there is an information gap related to industry awareness and knowledge of available services and code contractors' lack of information about their clients. With the exception of Montana, Alliance code contractors from each state provided contact lists the evaluation team for this study.[31]

Although many services are being provided to key energy code actors, the code contractors are not effectively tracking these data. For example, it was a substantial exercise to determine when trainings occurred and what their objectives were. In addition, contact information for served-clients was difficult to collect. Only Washington provided contact information for technical support users. Although Idaho recently provided information about the profession (e.g., builder, designer, building official) of their training attendees, no state broke out their lists of contacts by profession. Such information is of value not only for formal evaluations but also for the Alliance to better track the groups being served by its programs, which will help with future targeting efforts.

Based on this, we believe there is value in developing a simple contact-tracking database (e.g., in Microsoft Access) with the following data:

- Name
- Organization
- Sector
- Profession (provide options to minimize data entry)
- E-mail
- Address
- Phone number

This database can be relational, thereby linking contacts with trainings attended (date, location, topic) and use of technical support (date used, question asked).

[31] Although these lists typically contained contact information for recipients of training and other services, the evaluation team later found that they also contained names of people who had not attended training. It was unclear where these names came from, due to the lack of data tracked.

Training

Overall, the training services were well received by those that attended. Most who attended stated that their knowledge improved, that they had made changes to their professional practices due to the training, and they were satisfied with the quality of information presented, format and usefulness of handouts.

Several suggestions were provided to improve the trainings, such as "real-life" or "hands-on" examples. In addition, there were comments regarding the need to tailor the messages to the specific audience. For example, some asked for simpler trainings, and "less jargon." Others asked for more advanced training. It was obvious that there was a sense that one-size-does-not-fit-all. The evaluation team, therefore, recommends that the Alliance consider a more tiered approach to training, with some sessions framed as introductory and some as more specialized and technical in nature. The Alliance should continue to support a multi-dimensional training format that provides both classroom and onsite, in-the-field training. The latter has proven an effective approach to reaching building officials in Idaho, Oregon and Washington.

The most-often cited response to why they had not attended training was that they were not aware of the service[32]. Alliance code contractors should continue to brainstorm ways to better market their services to potential clients.

Training Builders and Sub-contractors

Although those who attended training were satisfied with the quality, there was a significant response to the lack of training for builders and their sub-contractors. There is a general sense that this is affecting compliance, enough so that quite a few building officials recommended a certification requirement for this group.

In line with this sentiment by building officials and designers/builders, only 20% of the survey sample was specialty contractors or builders. Although this is a small sample, this distribution matches the population of those trained by the Alliance project.

There also appears to be difficulty in reaching this group. One code contractor in Washington mentioned that they have had several trainings for builders cancelled for lack of attendance. Therefore, it appears there is a need for the Alliance to consider two important points:

1. Should the trainings continue to focus on designers and engineers?
2. If builders/sub-contractors are targeted, what is the most effective way to conduct outreach?

[32] This finding is based on a sample that does not necessarily represent the overall population of officials and designers/builders.

We believe that the need to train builders and sub-contractors should be specifically addressed by the Alliance and there should be brainstorming of how best to improve awareness and knowledge for these market actors.

Technical Support

Overall, the technical support provided by Alliance code-contractors has been well received by users. Across all states, there is satisfaction with the professionalism and knowledge of the staff and usefulness of information. Response time was the element that had the lowest satisfaction ratings. The most significant issue associated with technical support was the lack of awareness of the service by non-users.

In the realm of technical support, the primary area needing improvement is the state Web sites. Having a site that is easily accessed by users may improve outreach to potential clients, improve code consistency, and reduce the burden on phone and e-mail-based technical support.

Generally, we find that there is a wide variance among the Alliance-sponsored state-specific sites. One possible option is for the Alliance to develop a unified Web site as a clearinghouse or conduit for Northwest state energy codes, with a catchy-named site that can be remembered (e.g., NWEnergyCodes.com). This site can be managed to provide links for each state and easy access to the type of information users are looking for (residential/non-residential, text of energy codes, recent presentations for energy codes, future training schedule, upcoming changes to code, etc.).

Regardless, there should be some discussion with regard to the purpose and navigability of the existing Web sites. For example, a link for energy codes should be on the main page of the site. From there, it should be easy to access residential and non-residential codes or other information such as compliance forms, frequently asked questions, and technical support.

In general, the evaluation team found that most of the sites' homepages were text-heavy and could benefit from better organization and categorization of key topic areas (e.g., colorful buttons with concise titles such as "energy code," "compliance forms," "upcoming training," etc.). In addition, a few sites lacked necessary basic information, such as the non-residential energy code.

Improving Public Outreach

One consistent comment from survey respondents was the need for improved public outreach, which many felt would improve code compliance. This was supported by the fact that end user requests for non-compliant products were seen as an obstacle to compliance. Several designer/builders were looking for simplified materials to help "sell" energy codes to the end-user.

Services Follow-Up

Another area of improved outreach could be to follow-up with training or tech-support clients. It may be useful to send a follow-up e-mail thanking them for their time and providing the following basic information:

- E-mail address for follow-up questions
- Phone number and e-mail address for technical questions
- Quick description of relevant Web sites and hyperlinks
- Link to a survey to provide feedback
- Upcoming training opportunities

This e-mail will serve several purposes, including: provides electronic documentation of services provided by the state, facilitate feedback, and direct participants to electronic resources (possibly discouraging phone calls).

Perceptions

In terms of attitudes toward energy codes, this evaluation found that building officials and designers/builders felt that both residential and non-residential energy codes are valuable additions to the state building codes. As discussed above, the primary obstacle to code compliance was a lack of training of the designers/builders. Other issues, such as lack of available products, lack of building officials' support and designers not specifying to code were seen as the least-significant issues.

We believe that the evaluation has been a valuable first step in narrowing the focus of feedback from building officials and designer/builders. Some of the areas that were questioned only briefly may deserve increased level of scrutiny in the future, including complexity of codes, intra- and inter-jurisdictional compliance consistency, and format considerations to maximize survey participation (Web-based, follow-up to trainings, on-site for builders, and other hard-to-reach groups).

Improving Energy Code Consistency

One area of code confusion illuminated by this evaluation is the issue of code consistency, both in intra-state enforcement and inter-state code variation. Several comments pointed out that the variation in energy codes between the Northwest states sometimes presents complications. In addition, quite a few building officials noted the difficulty associated with having a unique code in Oregon and Washington. The Alliance should continue to foster the development and adoption of more consistent energy codes at the national, regional and state level.

As noted in the National Codes section of Chapter IV, there are both benefits and costs to implementing a unique state code, as Oregon and Washington have done. Benefits include increased control and innovation, but costs are high since all supporting documents, training information, and technical interpretations have to be created by and

paid for by a single state. Adopting a similar national or regional model energy code as the basis for a state energy code distributes these costs across many states.[33]

From the Alliance perspective, there would be tremendous advantages to having the same energy code adopted as the basis for each state energy code in all four Northwest states. Currently, training and education efforts must be developed separately for each state. In addition, it is difficult to share code change proposals and amendments between the states as their impacts on other parts of the building code have to be analyzed separately. A similar energy code used as the basis for each state's energy code would improve both the cost effectiveness and overall efficiency of all the Alliance's code support efforts. There is potential for significant cost savings in administration for the different energy code and version and different levels of complexity.

Given that two of the four Northwest states (Idaho and Montana) have adopted a version of the IECC, and given the likelihood that Idaho and Montana will adopt updated versions of the national model energy code, the Alliance should continue supporting efforts by members of the NECC to develop and support proposals for adoption into updated versions of the IECC and IRC.

National Code Support & Outreach

There are additional steps that the Alliance can take to help increase the likelihood that the Northwest-supported proposals are adopted into IECC and IRC updates:

- Facilitate the dissemination of its proposals to interested parties
- Network with potential supporters

Organizations to consider coordinating with include:

- Northwest state building official organizations, including the Idaho Association of Building Officials, the Oregon Building Officials Association and the Washington Association of Building Officials
- Other regional and national groups that work on energy code issues and either help or promulgate code change proposals, including the Building Codes Assistance Project, The New Buildings Institute, and the Responsible Energy Codes Alliance
- Sister regional market transformation organizations, including the Northeast Energy Efficiency Partnerships, the Midwest Energy Efficiency Alliance, and the Southwest Energy Efficiency Project.

[33] In March 2005, the Alliance issued an RFP requesting proposals to develop a Northwest Energy "Reach" Code. The reach code is intended to establish code adoption goals significantly beyond existing codes. The work envisioned in the RFP would serve as a guideline for regional and state code adoptions for the next five to seven years, and should help address the NWPCC Fifth Power Plan recommendations on Model Conservation Standards regarding residential and nonresidential energy codes.

The NECG has reached out to some of these groups, but not in a coordinated manner. Networking with these groups should help further the likelihood that the Northwest-developed proposals are favorably considered by the IECC and IRC committees.

In order to ensure that the perspectives of local building officials from the Pacific Northwest are well represented at national code change hearings, the Alliance should consider providing funding for local building officials to attend meetings of the ICC to vote on code change proposals.

Mike Kennedy's Non-Residential Energy Savings 1996-2004 study also provided the Alliance with an assessment of specific elements of national and regional non-residential energy codes' requirements.[34] Some recommendations are relevant to energy codes only; others should be considered by the Alliance's non-energy code programs. The Alliance should review the recommendations and support action on them in the appropriate forum and program(s). The evaluation team recommends that the Alliance consider conducting a parallel effort targeted at national and regional residential energy codes.

The Alliance should conduct market research studies (e.g., baseline and efficiency measure costs and savings assessments) to ensure that the necessary independent technical data are available to inform consideration of national- and state-level energy codes. The Alliance should increase the ability of its programs to collect and analyze data in a manner that is coordinated with and proves useful to the development and consideration of national- and state-level energy codes. Alliance program managers and state energy code staff should better coordinate their efforts.

State-Level Equipment Standards

Given the likely need for funding to aide in the development, adoption and implementation of state-level equipment standards and the relatively significant opportunities, the evaluation team has multiple recommendations.

Promotion. The Alliance should explore how best to support the development of state-level standards in resulting from the work of the West Coast Governor's Global Warming Initiative (WCGGWI), including supporting the participation of representatives from Oregon and Washington.

At this time, given the effective role of the WCGGWI in promoting state-level standards in Oregon and Washington, the evaluation team believes it may be premature for the Alliance to sponsor the development of a group to foster state-level standards in the Northwest (which would include Idaho and Montana). While the WCGGWI includes only two Northwest states, the development and adoption of state standards in Oregon or Washington should provide sufficient, useful information to Idaho and Montana, should either consider developing state-standards. The Alliance should closely follow the efforts

[34] Baylon, David and Michael Kennedy, 2004. Non-Residential Energy Code Comparison, National and Regional Codes. Ecotope, Seattle, Washington. http://www.nwcouncil.org/energy/rtf/energy%20code%20comparisondb.pdf

of the WCGGWI, as there may be opportunity to leverage its activities in Idaho and Montana.

When a Northwest state is considering developing state-level equipment standards, and when standards are actually adopted, the Alliance should consider supporting efforts for which that state may not have adequate resources (e.g., the cost to implement standards, such as rulemaking and the certification and test method processes necessary to define and develop, once legislation has been adopted).

Data Collection. As the opportunity arises to inform the development of state-level standards, the Alliance should consider supporting market research studies (e.g., product market share data surveys and technical assessments of baseline and efficiency measure costs and savings) to ensure the necessary independent technical data are available to inform state-level equipment standards.

The Alliance should ensure that all of its market transformation programs have the ability to collect and analyze data in a manner that is coordinated with and proves useful to the development and consideration of state-level equipment standards. Alliance and state program staff should ensure their efforts are well coordinated.

It may also be beneficial for the Alliance to consider conducting an analysis of the equipment standards adopted by California to determine whether each item is cost effective for the Northwest states.

Outreach. To help develop support for state legislation on standards, the Alliance should consider supporting the development of educational materials for and outreach efforts to the general public and equipment providers on state-level equipment standards.

The Alliance should support the efforts of representatives from the Northwest states to participate in the state-level standards development and adoption processes (e.g., researching what other states have done, developing draft legislation, testifying at legislative committees).

National Committees

The Alliance should support opportunities to provide technical assistance to the development of improved standards (e.g., cost-effectiveness analyses) to ensure that the national standards are developed at reasonable thresholds for the Northwest market.

Alliance Coordination

Overall, the Alliance's code contractor coordination efforts have proven to be highly effective. The Code Manager has done an excellent job managing a diverse group of code contractors. Internally, there are steps that the Alliance can take to ensure that its market transformation activities are well coordinated with its energy codes and standards efforts.

Increasing Northwest Energy Code Group Meeting Effectiveness. While the meetings have proven to be an effective forum to share information and work on issues of common

interest, the Alliance should consider undertaking the following steps to increase their effectiveness:

1. Provide NECG members with a summary of the meeting, including a set of action items developed to serve as a reminder of the next steps.
2. Provide a brief written summary of the status of energy codes in each state along with work activities conducted since the last meeting.
3. Provide code contractors with a general list of items to be covered in all meetings so that the meetings' purpose and expected outcomes are clear in advance (e.g., activities conducted over the last quarter, issues and how they were addressed, examples of best practices, new information to share, etc.)
4. Encourage attendees to bring examples of work products to the meetings to share with others.

While the meetings serve the currently defined purpose well (i.e., having the Alliance code contractors share information), the Alliance should consider the following:

- Whether they ought to have a broader purpose and mission
- Whether it is time to either open up the meetings to other interested parties (e.g., building official organizations, associations of cities/local government, energy code experts) or to hold additional meetings with interested parties, as appropriate.
- Providing a summary of the meeting to interested parties and inviting them to attend, when appropriate or useful. Alternately, the Alliance could sponsor meetings with interested parties on specific topics, as necessary (e.g., the development of Northwest states IECC and IRC code change proposals).

Improving Internal Alliance Coordination Efforts. To ensure cross-program support for energy codes and standards-related activities, recommendations to the Alliance Board regarding program approval should include code- and standards-related goals in its template, where relevant.

Other Alliance program activities should include information on energy code requirements. For example, education materials on the Northwest ENERGY STAR® Homes Program should address energy code requirements being met or exceeded by installing program measures. Training would also help building officials to better understand and enforce duct requirements.

Alliance Reporting Requirements. The Alliance should review the monthly reports submitted by its code contractors and develop both a consistent level of reporting requirements and a report template.

A key feature of reporting should be information sufficient to track the clients that have received education, training, or technical support services, such as:

- The number of trainings held

- Training locations
- Attendees' professions
- Attendees' contact information

State-Specific Activities

Idaho Small-Adopters Program. The Small Adopters program was discontinued in 2004. Given the program had limited success, this was an appropriate step to take.

Idaho Site Educator Program. The information developed through the site educator program should be made available to local building officials in Montana, which, like Idaho, has adopted the 2003 IECC. The Alliance should help foster this information sharing among its code contractors in both states.

In an effort to both improve upon the program's format and technical information, the program should be discussed with Oregon and Washington, which already have similar efforts underway.

Idaho Plan Review Program. Overall, we assess that the program should not be funded further by the Alliance and should be allowed to succeed or not as a third-party program.

Appendix A. Data: Designer/Contractor by State

In What sector do you primarily work?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Residential	9 11%	16 8%9	1 50%	5 25%	23 23%	54
Non-Residential	74 89%	2 11%	1 50%	15 75%	76 77%	168
Total	*83*	*18*	*2*	*20*	*99*	*222*

How would you rate your knowledge of the building energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Very knowledgeable	18 22%	7 39%	1 50%	2 10%	3 3%	31
Somewhat knowledgeable	54 66%	9 50%	1 50%	10 50%	47 48%	121
Not very knowledgeable	10 12%	1 6%	0 0%	8 40%	36 37%	55
Not at all knowledgeable	0 0%	1 6%	0 0%	0 0%	12 12%	13
Total	*82*	*18*	*2*	*20*	*98*	*220*

Have you ever participated in your state's code adoption processes?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	9 11%	2 12%	0 0%	4 20%	10 10%	25
No	74 89%	15 88%	2 100%	16 80%	88 90%	195
Total	*83*	*17*	*2*	*20*	*98*	*220*

How easy has it been for you to comply with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Very easy	14 18%	5 36%	0 0%	4 24%	13 19%	36
Somewhat easy	51 64%	6 43%	2 100%	12 71%	50 71%	121
Somewhat difficult	13 16%	1 7%	0 0%	1 6%	5 7%	20
Very difficult	2 3%	2 14%	0 0%	0 0%	2 3%	6
Total	*80*	*14*	*2*	*17*	*70*	*183*

Was the lack of training on energy code the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	21 25%	2 11%	1 50%	6 30%	43 43%	73
No	62 75%	16 89%	1 50%	14 70%	56 57%	149
Total	*83*	*18*	*2*	*20*	*99*	*222*

Was the lack of available information on code the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	7 8%	0 0%	0 0%	6 30%	21 21%	34
No	76 92%	18 100%	2 100%	14 70%	78 79%	188
Total	*83*	*18*	*2*	*20*	*99*	*222*

Was the complexity of codes the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	21 25%	1 6%	0 0%	4 20%	13 13%	39
No	62 75%	17 94%	2 100%	16 80%	86 87%	183
Total	*83*	*18*	*2*	*20*	*99*	*222*

Was the lack of availability of qualifying products (windows, etc.) the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	8 10%	1 6%	0 0%	1 5%	7 7%	17
No	75 90%	17 94%	2 100%	19 95%	92 93%	205
Total	*83*	*18*	*2*	*20*	*99*	*222*

Was the clients' request for non-compliant products the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	24 29%	3 17%	0 0%	6 30%	30 30%	63
No	59 71%	15 83%	2 100%	14 7%	69 70%	159
Total	*83*	*18*	*2*	*20*	*99*	*222*

Was the designer not specifying to code the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	9 11%	0 0%	0 0%	3 15%	17 17%	29
No	74 89%	18 100%	2 100%	17 85%	82 83%	193
Total	*83*	*18*	*2*	*20*	*99*	*222*

Was the lack of support by state/local code officials the biggest obstacle to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	8 10%	3 17%	0 0%	1 5%	13 13%	25
No	75 90%	15 83%	2 100%	19 95%	86 87%	197
Total	*83*	*18*	*2*	*20*	*99*	*222*

Are there any other obstacles to complying with the energy code?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	12 15%	4 22%	2 100%	3 15%	13 13%	34
No	71 86%	14 78%	0 0%	17 85%	86 87%	188
Total	*83*	*18*	*2*	*20*	*99*	*222*

There are no obstacles to complying with the energy code.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
No	83 100%	18 100%	2 100%	20 100%	99 100%	222
Total	*83*	*18*	*2*	*20*	*99*	*222*

Do you find any part of the energy code unclear or confusing?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	19 24%	7 41%	1 50%	4 22%	36 39%	67
No	46 59%	8 47%	1 50%	13 72%	51 55%	119
Don't know	13 17%	2 12%	0 0%	1 6%	5 5%	21
Total	*78*	*17*	*2*	*18*	*92*	*207*

Have you attended any Non-Residential Energy Code training sessions in the past two years?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	29 41%	1 50%	0 0%	12 80%	74 96%	116
No	42 59%	1 50%	1 100%	3 20%	3 4%	50
Total	*71*	*2*	*1*	*15*	*77*	*166*

Why have you not attended a training session?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Did not know about them	26 50%	4 50%	1 100%	5 100%	2 100%	38
Not needed	6 12%	2 25%	0 0%	0 0%	0 0%	8
Not enough time	12 23%	2 25%	0 0%	0 0%	0 0%	14
Inconvenient location	2 4%	0 0%	0 0%	0 0%	0 0%	2
Other	6 12%	0 0%	0 0%	0 0%	0 0%	6
Total	*52*	*8*	*1*	*5*	*2*	*68*

What was the topic of the most recent training session you attended?

	W. Washington	E. Washington	Idaho	Montana	Total
General energy code	6 75%	1 100%	0 0%	0 0%	7
Building envelope	0 0%	0 0%	1 33%	0 0%	1
Other	2 25%	0 0%	2 67%	22 100%	26
Total	*8*	*1*	*3*	*22*	*34*

As a result of the training, how much did your knowledge of the energy code improve?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Significantly	7 21%	2 25%	0 0%	5 33%	67 71%	81
Somewhat	16 49%	3 38%	1 100%	7 47%	23 25%	50
A little	8 24%	2 25%	0 0%	3 20%	4 4%	17
Not at all	2 6%	1 13%	0 0%	0 0%	0 0%	3
Total	*33*	*8*	*1*	*15*	*94*	*151*

How knowledgeable was the training staff?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Very knowledgeable	27 84%	5 63%	1 100%	15 100%	82 86%	130
Somewhat knowledgeable	5 16%	3 38%	0 0%	0 0%	13 14%	21
Total	*32*	*8*	*1*	*15*	*95*	*151*

What was the format of the training?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Classroom	16 52%	7 88%	1 100%	15 100%	96 100%	135
On-site	8 26%	0 0%	0 0%	0 0%	0 0%	8
Other	7 23%	1 13%	0 5%	0 0%	0 0%	8
Total	*31*	*8*	*1*	*15*	*96*	*151*

How effective was the format of the presentation in conveying the information?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Very effective	12 39%	4 50%	0 0%	14 93%	71 74%	101
Somewhat effective	16 52%	4 50%	0 0%	1 7%	23 24%	44
Not very effective	3 10%	0 0%	1 100%	0 0%	2 2%	6
Total	*31*	*8*	*1*	*15*	*96*	*151*

Did the supplemental handouts, if any, provide useful additional information?

	Oregon	W. Washington	Idaho	Montana	Total
Yes, useful	23 82%	6 75%	15 100%	93 98%	137
No, not useful	2 7%	1 13%	0 0%	1 1%	4
Did not receive handouts	3 11%	1 13%	0 0%	1 1%	5
Total	*28*	*8*	*15*	*95*	*146*

Has the training resulted in any changes to your professional practices?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	8 26%	1 13%	0 0%	8 53%	82 87%	99
No	23 74%	7 88%	1 100%	7 47%	12 13%	50
Total	*31*	*8*	*1*	*15*	*94*	*149*

Have you recommended the training session to any professional colleagues?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	10 32%	2 22%	1 100%	13 87%	88 97%	114
No	21 68%	7 78%	0 0%	2 13%	3 3%	33
Total	*31*	*9*	*1*	*15*	*91*	*147*

Why have you not used the technical support services?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Not needed	16 31%	4 50%	0 0%	6 38%	11 18%	37
Not enough time	2 4%	0 0%	0 0%	1 6%	3 5%	6
Did not know existed	31 60%	2 25%	1 50%	9 56%	43 72%	86
Other	3 6%	2 25%	1 50%	0 0%	3 5%	9
Total	*52*	*8*	*2*	*16*	*60*	*138*

How often have you used technical support in the past year?

	Oregon	W. Washington	Idaho	Montana	Total
Once	8 25%	2 20%	0 0%	4 11%	14
A few times	23 72%	6 60%	3 75%	20 56%	52
More than 5 times	1 3%	2 20%	1 25%	12 33%	16
Total	*32*	*10*	*4*	*36*	*82*

Did you contact technical support for general codes information?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	16 19%	6 33%	0 0%	4 20%	29 29%	55
No	67 81%	12 67%	2 100%	16 80%	70 71%	167
Total	*83*	*18*	*2*	*20*	*99*	*222*

Did you contact technical support for process/implementation assistance?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	12 15%	1 6%	0 0%	2 10%	14 14%	29
No	71 86%	17 94%	2 100%	18 90%	85 86%	193
Total	*83*	*18*	*2*	*20*	*99*	*222*

Did you contact technical support for software information?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	9 11%	2 11%	0 0%	1 5%	5 5%	17
No	74 89%	16 89%	2 100%	19 95%	94 95%	205
Total	*83*	*18*	*2*	*20*	*99*	*222*

Did you contact technical support for website assistance?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	4 5%	1 6%	0 0%	0 0%	3 3%	8
No	79 95%	17 94%	2 100%	20 100%	96 97%	214
Total	*83*	*18*	*2*	*20*	*99*	*222*

Did you contact technical support for help with compliance forms?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	6 7%	1 6%	0 0%	0 0%	3 3%	10
No	77 93%	17 94%	2 100%	20 100%	96 97%	212
Total	*83*	*18*	*2*	*20*	*99*	*222*

Did you contact technical support for some other reason?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	5 6%	2 11%	0 0%	1 5%	1 1%	9
No	78 94%	16 89%	2 100%	19 95%	98 99%	213
Total	*83*	*18*	*2*	*20*	*99*	*222*

Rate your overall satisfaction with the technical support's response time.

	Oregon	W. Washington	Idaho	Montana	Total
Neither satisified nor dissatisfied	9 32%	1 10%	0 0%	0 0%	10
Somewhat satisfied	14 50%	4 40%	1 25%	17 50%	36
Very satisfied	5 18%	5 50%	3 75%	17 50%	30
Total	*28*	*10*	*4*	*34*	*76*

Rate your satisfaction with the technical support knowledge of staff.

	Oregon	W. Washington	Idaho	Montana	Total
Not very satisfied	1 4%	0 0%	0 0%	0 0%	1
Neither satisfied nor dissatisfied	5 18%	1 10%	0 0%	0 0%	6
Somewhat satisfied	13 46%	5 50%	1 25%	14 42%	33
Very satisfied	9 32%	4 40%	3 75%	19 58%	35
Total	*28*	*10*	*4*	*33*	*75*

Rate your satisfaction with technical support's usefulness of information.

	Oregon	W. Washington	Idaho	Montana	Total
Not very satisfied	1 4%	0 0%	0 0%	3 9%	4
Neither satisified nor dissatisfied	9 32%	1 10%	0 0%	0 0%	10
Somewhat satisfied	11 39%	6 60%	1 25%	14 42%	32
Very satisfied	7 25%	3 30%	3 75%	16 49%	29
Total	*28*	*10*	*4*	*33*	*75*

Rate your satisfaction with technical support's professionalism of staff.

	Oregon	W. Washington	Idaho	Montana	Total
Neither satisfied nor dissatisfied	2 7%	1 10%	0 0%	0 0%	3
Somewhat satisfied	15 54%	4 40%	1 25%	10 30	30
Very satisfied	11 39%	5 50%	3 75%	23 70%	42
Total	*28*	*10*	*4*	*33*	*75*

Do you plan to use technical support services in the future?

	Oregon	W. Washington	Idaho	Montana	Total
Yes	22 76%	7 70%	4 100%	35 97%	68
No	1 3%	1 10%	0 0%	0 0%	2
Don't know	6 21%	2 20%	0 0%	1 3%	9
Total	*29*	*10*	*4*	*36*	*79*

Do you have any suggestions for how these technical support services could be improved?

	Oregon	W. Washington	Idaho	Montana	Total
Yes	4 14%	1 11%	0 0%	2 6%	7
No	24 86%	8 89%	4 100%	30 94%	66
Total	*28*	*9*	*4*	*32*	*73*

Do you use the compliance forms provided by your state code office?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	60 75%	6 38%	2 100%	7 37%	9 10%	84
No	20 25%	10 63%	0 0%	12 63%	82 90%	124
Total	*80*	*16*	*2*	*19*	*91*	*208*

Clearer directions could improve compliance forms.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	18 22%	0 0%	0 0%	1 5%	0 0%	19
No	65 78%	18 100%	2 100%	19 95%	99 100%	203
Total	*83*	*18*	*2*	*20*	*99*	*222*

Compliance forms could be improved if they were easier to obtain.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	8 10%	1 6%	0 0%	1 5%	2 2%	12
No	75 90%	17 94%	2 100%	19 95%	97 98%	210
Total	*83*	*18*	*2*	*20*	*99*	*222*

Compliance forms could be improved if they were easier to turn in.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	0 0%	0 0%	0 0%	0 0%	1 1%	1
No	83 100%	18 100%	2 100%	20 100%	98 99%	221
Total	*83*	*18*	*2*	*20*	*99*	*222*

Compliance forms could be improved if there were less complicated requirements.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	11 13%	2 11%	0 0%	2 10%	0 0%	15
No	72 87%	16 89%	2 100%	18 90%	99 100%	207
Total	*83*	*18*	*2*	*20*	*99*	*222*

I can't think of a way to improve the compliance forms.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	25 30%	3 17%	1 50%	5 25%	3 3%	37
No	58 70%	15 83%	1 50%	15 75%	96 97%	185
Total	*83*	*18*	*2*	*20*	*99*	*222*

Compliance forms could be improved in some other way.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Yes	9 11%	2 11%	1 50%	0 0%	1 1%	13
No	74 89%	16 89%	1 50%	20 100%	98 99%	209
Total	*83*	*18*	*2*	*20*	*99*	*222*

Why have you not utilized the website?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Did not know existed	13 50%	7 88%	1 100%	11 85%	53 74%	85
Limited access to Internet	1 4%	0 0%	0 0%	0 0%	3 4%	4
Too confusing	1 4%	0 0%	0 0%	0 0%	0 0%	1
Quicker to phone	3 12%	1 13%	0 0%	2 15%	5 7%	11
Other	8 31%	0 0%	0 0%	0 0%	11 15%	19
Total	*26*	*8*	*1*	*13*	*72*	*120*

About how many times have you visited the website in the past year?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Once	6 11%	0 0%	0 0%	0 0%	9 36%	15
A few times	34 64%	6 60%	0 0%	5 71%	14 56%	59
More than 5 times	13 25%	4 40%	1 100%	2 29%	2 8%	22
Total	*53*	*10*	*1*	*7*	*25*	*96*

How satisfied are you with the quality of the information provided on the website?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Very satisfied	14 26%	7 70%	1 100%	3 43%	4 16%	29
Somewhat satisfied	31 59%	3 30%	0 0%	4 57%	21 84%	59
Not very satisfied	7 13%	0 0%	0 0%	0 0%	0 0%	7
Not at all satisfied	1 2%	0 0%	0 0%	0 0%	0 0%	1
Total	*53*	*10*	*1*	*7*	*25*	*96*

How satisfied are you with the ease of navigation?

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Very satisfied	11 21%	5 56%	1 100%	3 43%	5 20%	25
Somewhat satisfied	30 57%	3 33%	0 0%	4 57%	17 68%	54
Not very satisfied	8 15%	1 11%	0 0%	0 0%	3 12%	12
Not at all satisfied	4 8%	0 0%	0 0%	0 0%	0 0%	4
Total	*53*	*9*	*1*	*7*	*25*	*95*

The Residential energy code is a valuable part of state building codes.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Strongly Disagree	3 4%	0 0%	0 0%	1 5%	3 3%	7
Somewhat Disagree	3 4%	0 0%	0 0%	1 5%	2 2%	6
Neither Agree nor Disagree	29 38%	1 6%	1 50%	6 32%	23 25%	60
Somewhat Agree	24 31%	6 35%	1 50%	6 32%	39 42%	76
Strongly Agree	18 23%	10 59%	0 0%	5 26%	27 29%	60
Total	*77*	*17*	*2*	*19*	*94*	*209*

The Non-Residential energy code is a valuable part of the state building codes.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Strongly Disagree	4 5%	0 0%	0 0%	1 5%	5 5%	10
Somewhat Disagree	3 4%	1 6%	1 50%	2 10%	4 4%	11
Neither Agree nor Disagree	14 17%	3 19%	0 0%	3 15%	13 14%	33
Somewhat Agree	34 42%	5 31%	1 50%	8 40%	38 41%	86
Strongly Agree	26 32%	7 44%	0 0%	6 30%	32 35%	71
Total	*81*	*16*	*2*	*20*	*92*	*211*

Building professionals are adequately informed about energy codes.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Strongly Disagree	5 6%	0 0%	0 0%	0 0%	8 8%	13
Somewhat Disagree	23 30%	5 29%	0 0%	4 22%	31 32%	63
Neither Agree nor Disagree	31 40%	8 47%	1 100%	9 50%	39 41%	88
Somewhat Agree	16 21%	4 24%	0 0%	5 28%	14 15%	39
Strongly Agree	3 4%	0 0%	0 0%	0 0%	4 4%	7
Total	*78*	*17*	*1*	*18*	*96*	*210*

Local Code Officials are knowledgeable of the energy code.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Strongly Disagree	7 9%	1 6%	0 0%	2 10%	7 8%	17
Somewhat Disagree	16 20%	1 6%	0 0%	3 15%	26 28%	46
Neither Agree nor Disagree	36 44%	6 35%	2 100%	8 40%	41 44%	93
Somewhat Agree	18 22%	6 35%	0 0%	7 35%	16 17%	47
Strongly Agree	4 5%	3 18%	0 0%	0 0%	3 3%	10
Total	*81*	*17*	*2*	*20*	*93*	*213*

Energy codes are consistently enforced within my jurisdiction.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Strongly Disagree	7 9%	2 13%	0 0%	3 15%	22 24%	34
Somewhat Disagree	17 22%	1 6%	1 50%	4 20%	29 32%	52
Neither Agree nor Disagree	34 44%	6 38%	1 50%	7 35%	29 32%	77
Somewhat Agree	15 20%	6 38%	0 0%	5 25%	10 11%	36
Strongly Agree	4 5%	1 6%	0 0%	1 5%	2 2%	8
Total	*77*	*16*	*2*	*20*	*92*	*207*

There are advantages to working in certain parts of the state due to differing levels of energy code enforcement.

	Oregon	W. Washington	E. Washington	Idaho	Montana	Total
Strongly Disagree	2 3%	1 7%	1 50%	1 5%	7 8%	12
Somewhat Disagree	12 16%	0 0%	0 0%	2 10%	6 7%	20
Neither Agree nor Disagree	32 43%	9 60%	0 0%	5 25%	46 50%	92
Somewhat Agree	18 24%	2 13%	1 50%	8 40%	19 21%	48
Strongly Agree	11 15%	3 20%	0 0%	4 20%	14 15%	32
Total	*75*	*15*	*2*	*20*	*92*	*204*

Appendix B. Data: Official by State

Are you a building official?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	29	16	28	8	25	1	107
No	23	32	23	7	43	4	132
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Are you a Plans Reviewer?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	21	26	24	6	36	1	114
No	31	22	27	9	32	4	125
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Are you an Inspector?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	21	29	19	8	31	1	109
No	31	19	32	7	37	4	130
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Do you hold any other positions?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	3	7	10	1	7	1	29
No	49	41	41	14	61	4	210
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

How many years have you been in the building inspection services industry?

Frequency	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
One Year	3	7	4	0	5	5	24
2 to 5 Years	12	11	7	1	11	0	42
6 to 10 Years	14	11	14	1	9	0	49
11 to 20 Years	18	15	16	13	30	0	92
More than 20 Years	5	4	10	0	13	0	32
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

What is your primary sector?

	OR	W WA	E WA	ID	MT	Total
Residential	14	0	8	6	11	39
Non-Residential	4	1	11	3	7	26
Work Equally with Both	27	0	31	6	49	113
Total	*45*	*1*	*50*	*15*	*67*	*178*

How would you rate your knowledge of the Residential building energy code?

	OR	W WA	E WA	ID	MT	Total
Very knowledgeable	31	4	18	9	32	94
Somewhat knowledgeable	17	16	27	4	33	97
Not very knowledgeable	4	17	3	1	2	27
Not at all knowledgeable	0	6	0	0	0	6
Total	*52*	*43*	*48*	*14*	*67*	*224*

How would you rate your knowledge of the Nonresidential building energy code?

	OR	W WA	E WA	ID	MT	Total
Very knowledgeable	9	1	5	3	18	36
Somewhat knowledgeable	29	12	39	7	35	122
Not very knowledgeable	12	22	5	4	10	53
Not at all knowledgeable	0	8	1	0	1	10
Total	*50*	*43*	*50*	*14*	*64*	*221*

Does your department do a PLAN REVIEW for Residential Energy Code compliance through Building Envelope?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	50	30	39	14	65	0	198
No	2	18	12	1	3	5	41
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Non-Residential Energy Code compliance through Building Envelope?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	46	29	41	10	56	0	182
No	6	19	10	5	12	5	57
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Residential Energy Code compliance through a Mechanical System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	23	9	20	9	46	0	107
No	29	39	31	6	22	5	132
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Non-Residential Energy Code compliance through a Mechanical System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	29	12	39	7	56	0	143
No	23	36	12	8	12	5	96
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Residential Energy Code compliance through a Domestic Water Heating System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	15	5	14	9	44	0	87
No	37	43	37	6	24	5	152
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Non-Residential Energy Code compliance through a Domestic Water Heating System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	19	8	22	5	36	0	90
No	33	40	29	10	32	5	149
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Residential Energy Code compliance through lighting/electrical?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	8	7	12	2	11	0	40
No	44	41	39	13	57	5	199
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do a PLAN REVIEW for Non-Residential Energy Code compliance through lighting/electrical?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	32	13	34	9	42	0	130
No	20	35	17	6	26	5	109
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Residential Energy Code Compliance through Building Envelope?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	49	32	40	14	63	0	198
No	3	16	11	1	5	5	41
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Non-Residential Energy Code Compliance through Building Envelope?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	44	33	39	12	60	0	188
No	8	15	12	3	8	5	51
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Residential Energy Code Compliance through a Mechanical System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	37	17	32	12	58	0	156
No	15	31	19	3	10	5	83
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Non-Residential Energy Code Compliance through a Mechanical System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	30	15	37	10	59	0	151
No	22	33	14	5	9	5	88
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Residential Energy Code Compliance through a Domestic Water Heating System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	20	10	22	13	58	0	123
No	32	38	29	2	10	5	116
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Non-Residential Energy Code Compliance through a Domestic Water Heating System?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	21	12	26	10	54	0	123
No	31	36	25	5	14	5	116
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Residential Energy Code Compliance through lighting/electrical?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	7	10	13	2	14	0	46
No	45	38	38	13	54	5	193
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do an ON-SITE INSPECTION for Non-Residential Energy Code Compliance through lighting/electrical?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	32	15	25	5	35	0	112
No	20	33	26	10	33	5	127
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do any other ON-SITE INSPECTION for Residential Energy Code Compliance?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	4	4	0	1	3	0	12
No	48	44	51	14	65	5	227
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Does your department do any other ON-SITE INSPECTION for Non-Residential Energy Code Compliance?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	3	5	0	0	5	0	13
No	49	43	51	15	63	5	226
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Is lack of political support a primary obstacle to enforcing the **residential** energy code?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	10	20	4	1	18	0	53
No	42	28	47	14	50	5	186
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Is lack of political support a primary obstacle to enforcing the non-residential energy code?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	8	18	11	2	19	0	58
No	44	30	40	13	49	5	181
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Is lack of resources a primary obstacle to enforcing the residential energy code?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	37	33	19	6	33	0	128
No	15	15	32	9	35	5	111
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Is lack of resources a primary obstacle to enforcing the non-residential energy code?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	27	35	29	7	36	0	134
No	25	13	22	8	32	5	105
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

The residential energy code is a valuable part of state building codes.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	3	3	1	0	1	8
Somewhat Disagree	1	0	0	1	2	4
Neither Agree or Disagree	8	7	7	1	9	32
Somewhat Agree	13	22	21	6	23	85
Strongly Agree	27	13	21	7	31	99
Total	*52*	*45*	*50*	*15*	*66*	*228*

The non-residential energy code is a valuable part of state building codes.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	4	2	2	0	1	9
Somewhat Disagree	3	1	3	3	3	13
Neither Agree or Disagree	10	9	10	3	13	45
Somewhat Agree	15	20	18	4	20	77
Strongly Agree	20	11	18	5	29	83
Total	*52*	*43*	*51*	*15*	*66*	*227*

There is political support in my jurisdiction for enforcement of energy codes.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	3	2	4	0	1	10
Somewhat Disagree	6	6	9	3	17	41
Neither Agree or Disagree	19	26	14	6	17	82
Somewhat Agree	12	5	15	3	21	56
Strongly Agree	11	4	9	3	10	37
Total	*51*	*43*	*51*	*15*	*66*	*226*

Energy codes improve the quality of life for the community.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	2	1	0	1	1	5
Somewhat Disagree	3	0	3	0	1	7
Neither Agree or Disagree	8	14	12	1	9	44
Somewhat Agree	12	14	17	6	29	78
Strongly Agree	26	18	19	7	27	97
Total	*51*	*47*	*51*	*15*	*67*	*231*

Energy codes are related to my primary job function.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	1	4	4	2	1	12
Somewhat Disagree	7	8	13	2	5	35
Neither Agree or Disagree	15	14	10	4	24	67
Somewhat Agree	16	11	12	3	24	66
Strongly Agree	13	9	12	4	12	50
Total	*52*	*46*	*51*	*15*	*66*	*230*

On a day-to-day basis, energy codes are burdensome to my workload.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	7	6	8	4	18	43
Somewhat Disagree	13	12	19	4	24	72
Neither Agree or Disagree	19	16	13	2	18	68
Somewhat Agree	9	10	7	3	5	34
Strongly Agree	2	0	3	2	2	9
Total	*50*	*44*	*50*	*15*	*67*	*226*

The energy codes are no more difficult to enforce than other building codes.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	3	0	6	1	3	13
Somewhat Disagree	10	8	10	2	3	33
Neither Agree or Disagree	14	13	10	3	14	54
Somewhat Agree	10	20	17	2	22	71
Strongly Agree	14	5	8	7	24	58
Total	*51*	*46*	*51*	*15*	*66*	*229*

Builders and designers need more training on energy codes.

	OR	W WA	E WA	ID	MT	Total
Strongly Disagree	4	0	0	1	2	7
Somewhat Disagree	0	2	3	0	2	7
Neither Agree or Disagree	4	4	7	3	6	24
Somewhat Agree	17	15	20	5	22	79
Strongly Agree	26	26	21	6	35	114
Total	*51*	*47*	*51*	*15*	*67*	*231*

Would you support code requirements to verify that a building has been commissioned for lighting and mechanical systems?

	OR	W WA	E WA	ID	MT	Total
Yes	38	36	29	11	49	163
No	11	11	21	4	16	63
Total	*49*	*47*	*50*	*15*	*65*	*226*

Have you ever received training on the building energy code?

	OR	W WA	E WA	ID	MT	Total
Yes	49	47	44	13	61	214
No	2	0	7	2	6	17
Total	*51*	*47*	*51*	*15*	*67*	*231*

Please indicate the primary reason you haven't received training on the energy code.

	PR	E WA	OD	MT	Total
Did not know about them	1	2	0	4	7
Not needed	0	2	0	0	2
Not enough time	0	0	1	2	3
Inconvenient location	0	2	1	0	3
Other	2	1	2	1	6
Total	*3*	*7*	*4*	*7*	*21*

Please indicate the SECTOR and date of the most recent training you attended.

	OR	W WA	E WA	ID	MT	Total
Residential	38	4	8	7	40	97
Non-Residential	6	6	29	2	18	61
Total	*44*	*10*	*37*	*9*	*58*	*158*

What was the most recent date you attended residential **training?**

	OR	W WA	E WA	ID	MT	Total
JUN1905	9	0	5	4	18	36
DEC1992	0	0	1	0	0	1
SEP1994	0	0	0	1	0	1
JAN1995	0	0	1	0	0	1
JUL1997	0	0	1	0	0	1
AUG1999	0	0	0	0	1	1
AUG2002	0	0	0	0	1	1
NOV2003	1	0	0	0	0	1
JAN2004	1	0	0	0	0	1
FEB2004	1	0	0	0	0	1
JUN2004	0	0	1	0	0	1
AUG2004	0	0	0	1	1	2
SEP2004	0	0	0	0	1	1
DEC2004	1	1	0	0	0	2
JAN2005	2	0	0	0	0	2
FEB2005	7	0	0	0	2	9
MAR2005	0	0	1	0	0	1
APR2005	0	0	2	1	0	3
MAY2005	0	0	1	1	3	5
JUN2005	2	0	0	0	3	5
JUL2005	0	0	0	0	2	2
SEP2005	1	0	0	0	2	3
OCT2005	2	0	0	0	1	3
NOV2005	12	0	0	0	0	12
DEC2005	1	35	0	0	0	36
Total	*40*	*36*	*13*	*8*	*35*	*132*

What is the most recent date you attended non-residential **training?**

Frequency	OR	W WA	E WA	ID	MT	Total
JUN1905	2	0	6	1	9	18
JUL1997	0	0	1	0	0	1
SEP1997	0	0	1	0	0	1
SEP1998	0	0	1	0	0	1
JAN2000	0	0	0	0	1	1
JUN2000	0	0	1	0	0	1
MAR2003	0	0	1	0	0	1
AUG2003	0	0	1	0	0	1
SEP2003	0	0	1	0	0	1
JAN2004	1	0	0	0	0	1
FEB2004	1	0	0	0	0	1
APR2004	0	0	0	0	1	1
JUN2004	0	0	1	0	0	1
OCT2004	0	0	0	0	1	1
JAN2005	2	0	0	0	0	2
FEB2005	1	0	0	0	1	2
MAR2005	0	0	1	0	0	1
APR2005	0	0	3	1	0	4
MAY2005	0	0	1	0	1	2
JUN2005	0	0	1	0	5	6
AUG2005	0	0	1	0	0	1
SEP2005	0	0	1	0	0	1
OCT2005	0	0	2	1	0	3
NOV2005	6	0	1	0	0	7
DEC2005	1	41	2	1	1	46
Total	*14*	*41*	*27*	*4*	*20*	*106*

What was the topic of the most recent training session you attended?

	OR	W WA	E WA	ID	MT	Total
General energy code	14	48	20	6	44	132
Lighting/electrical	0	0	2	0	0	2
Building envelope	7	0	11	2	8	28
Mechanical	2	0	4	0	3	9
Other	26	0	4	3	6	39
Total	*49*	*48*	*41*	*11*	*61*	*210*

As a result of the training, how much did your knowledge of the energy code improve?

	OR	W WA	E WA	ID	MT	Total
Significantly	11	32	3	1	13	60
Somewhat	29	10	20	6	34	99
A little	8	1	17	4	14	44
Not at all	0	0	2	0	0	2
Total	*48*	*43*	*42*	*11*	*61*	*205*

How knowledgeable was the training staff?

	OR	W WA	E WA	ID	MT	Total
Very knowledgeable	45	46	27	10	44	172
Somewhat knowledgeable	4	1	15	1	16	37
Not very knowledgeable	0	0	0	0	1	1
Total	*49*	*47*	*42*	*11*	*61*	*210*

What was the format of the training?

	OR	W WA	E WA	ID	MT	Total
Classroom	46	47	37	10	58	198
On-site	2	0	2	0	1	5
Other	0	0	3	1	2	6
Total	*48*	*47*	*42*	*11*	*61*	*209*

How effective was the format in conveying the information?

	OR	W WA	E WA	ID	MT	Total
Very effective	24	41	9	4	27	105
Somewhat effective	24	6	26	7	31	94
Not very effective	0	0	6	0	3	9
Not at all effective	0	0	1	0	0	1
Total	*48*	*47*	*42*	*11*	*61*	*209*

Did the supplemental handouts provide useful additional information?

	OR	W WA	E WA	ID	MT	Total
Yes, useful	38	46	29	8	47	168
No, not useful	5	0	6	2	4	17
Did not receive handouts	4	0	6	1	8	19
Total	47	46	41	11	59	204

Has the training resulted in any changes to your professional practices?

	OR	W WA	E WA	ID	MT	Total
Yes	26	38	9	3	30	106
No	23	5	31	7	28	94
Total	*49*	*43*	*40*	*10*	*58*	*200*

Have you recommended the training session to any colleagues?

	OR	W WA	E WA	ID	MT	Total
Yes	33	44	9	5	35	126
No	14	1	31	6	23	75
Total	*47*	*45*	*40*	*11*	*58*	*201*

Have you ever used the technical support available from the Montana Department of Environmental Quality for energy codes?

	OR	W WA	ID	MT	Total
Yes	0	24	0	0	24
No	1	22	1	1	25
Total	*1*	*46*	*1*	*1*	*49*

Have you ever used the technical support available from the Oregon Department of Energy for energy codes?

	OR	E WA	ID	MT	Total
Yes	0	32	0	0	32
No	1	18	1	3	23
Total	*1*	*50*	*1*	*3*	*55*

Have you used the technical support available from the Oregon Department of Energy for energy codes?

	OR	ID	MT	Total
Yes	29	0	0	29
No	23	1	1	25
Total	*52*	*1*	*1*	*54*

Have you used the technical support available from Washington?

	OR	ID	MT	Total
WSU Energy Program	0	8	39	47
Washington State Building Code Council	1	5	13	19
Northwest Energy Efficiency Council	0	2	16	18
Total	*1*	*15*	*68*	*84*

Why have you not used the state for your technical support questions?

	OR	W WA	E WA	ID	MT	Total
Did not know tech support existed	9	16	11	0	4	40
Local chapter provides all our training needs	3	0	0	0	0	3
Do not know how	0	1	1	0	3	5
Other	2	1	4	1	2	10
5	6	5	4	1	4	20
Total	*20*	*23*	*20*	*2*	*13*	*78*

How often have you used technical support in the last year?

	OR	W WA	E WA	ID	MT	Total
Once	10	7	10	3	10	40
A few times	18	14	18	8	28	86
More than 5 times	2	3	6	3	11	25
Total	*30*	*24*	*34*	*14*	*49*	*151*

Was the primary reason for your technical support inquiry regarding general codes information?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	19	16	19	11	32	0	97
No	33	32	32	4	36	5	142
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Was the primary reason for your technical support inquiry regarding process/implementation assistance?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	4	4	6	1	9	0	24
No	48	44	45	14	59	5	215
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Was the primary reason for your technical support inquiry regarding software information?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	8	5	2	1	4	0	20
No	44	43	49	14	64	5	219
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Was the primary reason for your technical support inquiry regarding website assistance?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	2	0	1	1	2	0	6
No	50	48	50	14	66	5	233
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Was the primary reason for your technical support inquiry regarding help with compliance forms?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	5	4	6	5	11	0	31
No	47	44	45	10	57	5	208
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Was the primary reason for your technical support inquiry regarding code interpretation requests?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	15	10	22	8	25	0	80
No	37	38	29	7	43	5	159
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Was the primary reason for your technical support inquiry regarding administrative support?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	3	4	3	1	4	0	15
No	49	44	48	14	64	5	224
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Did you contact technical support for some other reason?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	0	2	2	1	4	0	9
No	52	46	49	14	64	5	230
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Did you contact the technical support services by phone?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	20	16	28	11	33	0	108
No	32	32	23	4	35	5	131
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Did you contact technical support services by email?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	7	7	13	6	32	0	65
No	45	41	38	9	36	5	174
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Did you contact technical support services in person?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	7	6	3	0	8	0	24
No	45	42	48	15	60	5	215
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Did you contact technical support services in any other way?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	0	1	1	1	6	0	9
No	52	47	50	14	62	5	230
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Please rate your overall satisfaction with the technical support response time.

	OR	W WA	E WA	ID	MT	Total
Not at all satisfied	1	0	1	1	1	4
Not very satisfied	0	0	0	0	1	1
Neither satisfied nor dissatisfied	4	1	9	0	7	21
Somewhat satisfied	22	23	23	12	41	121
Total	*27*	*24*	*33*	*13*	*50*	*147*

Please rate your overall satisfaction with the technical support's knowledge of staff.

	OR	W WA	E WA	ID	MT	Total
Not at all satisfied	1	0	1	1	0	3
Not very satisfied	0	0	1	0	3	4
Neither satisfied nor dissatisfied	4	0	4	0	4	12
Somewhat satisfied	20	24	27	12	42	125
Total	*25*	*24*	*33*	*13*	*49*	*144*

Please rate your overall satisfaction with the technical support's professionalism of staff.

	OR	W WA	E WA	ID	MT	Total
Not at all satisfied	1	0	1	1	0	3
Not very satisfied	0	0	0	0	1	1
Neither satisfied nor dissatisfied	4	0	4	0	4	12
Somewhat satisfied	20	24	28	11	43	126
Total	*25*	*24*	*33*	*12*	*48*	*142*

Please rate your overall satisfaction with the technical support's quality of information.

	OR	W WA	E WA	ID	MT	Total
Not at all satisfied	1	0	2	1	1	5
Not very satisfied	1	0	2	0	1	4
Neither satisified nor dissatisfied	5	1	5	1	6	18
Somewhat satisfied	20	22	24	9	40	115
Total	*27*	*23*	*33*	*11*	*48*	*142*

Do you plan to use technical support services in the future?

	OR	W WA	E WA	ID	MT	Total
Yes	23	22	26	13	43	127
No	2	1	1	1	3	8
Don't Know	4	1	6	0	5	16
Total	*29*	*24*	*33*	*14*	*51*	*151*

Do you have any suggestions for how these technical support services could be improved?

	OR	W WA	E WA	ID	MT	Total
Yes	0	2	5	3	10	20
No	28	20	25	8	33	114
Total	*28*	*22*	*30*	*11*	*43*	*134*

Do you find any part of the residential **energy code unclear or confusing?**

	OR	W WA	E WA	ID	MT	Total
Yes	10	12	5	2	16	45
No	40	27	41	12	44	164
Total	*50*	*39*	*46*	*14*	*60*	*209*

Do you find any part of the non-residential energy code unclear or confusing?

	OR	W WA	E WA	ID	MT	Total
Yes	17	13	23	10	31	94
No	30	24	21	4	25	104
Total	*47*	*37*	*44*	*14*	*56*	*198*

Would you support a supplemental, third part certification for inspectors or plan reviewers?

	OR	W WA	E WA	ID	MT	Total
Yes	19	16	22	8	45	110
No	31	15	28	7	19	100
Total	*50*	*31*	*50*	*15*	*64*	*210*

Would you support a supplemental, third party certification for residential inspectors?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	16	14	15	1	30	0	76
No	36	34	36	14	38	5	163
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Would you support a supplemental, third party certification for residential plan reviewers?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	17	14	16	2	31	0	80
No	35	34	35	13	37	5	159
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Would you support a supplemental, third party certification for non-residential inspectors?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	16	10	17	5	39	0	87
No	36	38	34	10	29	5	152
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Would you support a supplemental, third party certification for non-residential plan reviewers?

	OR	W WA	E WA	ID	MT	State Unconfirmed	Total
Yes	15	15	20	5	38	0	93
No	37	33	31	10	30	5	146
Total	*52*	*48*	*51*	*15*	*68*	*5*	*239*

Appendix C. Data: Washington State-Specific

Washington Builder State-Specific

Do you feel that there are sufficient opportunities for building professionals to attend energy code training sessions in Washington?

	Oregon	W. Washington	Total
Yes	0 0%	10 63%	10
No	1 100%	6 38%	7
Total	*1*	*16*	*17*

Washington Officials State-Specific

How would you rate your understanding of the Prescriptive Compliance Approach in the Washington State Energy Code (WSEC)?

	Oregon	Idaho	Montana	Total
Very thorough	0	4	22	26
Somewhat thorough	0	9	38	47
Somewhat vague	0	1	4	5
Very vague	0	0	3	3
Not familiar with these standards	1	0	0	1
Total	*1*	*14*	*67*	*82*

How would you rate your understanding of the Component Performance Compliance Approach in the WSEC?

	Oregon	Idaho	Montana	Total
Very thorough	0	2	10	12
Somewhat thorough	0	5	36	41
Somewhat vague	0	5	10	15
Very vague	0	2	6	8
Not familiar with these standards	1	0	4	5
Total	*1*	*14*	*66*	*81*

How would you rate your understanding of the Ventilation and Indoor Air Quality Code (VIAQ)?

	Oregon	Idaho	Montana	Total
Very thorough	0	3	17	20
Somewhat thorough	0	10	39	49
Somewhat vague	0	2	7	9
Very vague	1	0	3	4
Not familiar with these standards	0	0	1	1
Total	*1*	*15*	*67*	*83*

Have you attended formal training on the WSEC or VIAQ?

	Oregon	Idaho	Montana	Total
Yes	0	11	57	68
No	1	3	9	13
Total	*1*	*14*	*66*	*81*

Would you attend and support training for the WSEC and VIAQ?

	Oregon	Idaho	Montana	Total
Yes	0	2	10	12
No	1	0	2	3
Total	*1*	*2*	*12*	*15*

Do you use the Washington state University Energy Program website for information on the WSEC and VIAQ?

	Oregon	Idaho	Montana	Total
Yes	0	11	49	60
No	1	3	16	20
Total	*1*	*14*	*65*	*80*

Do you use the WSU Energy Program Energy Code Hotline?

	Oregon	Idaho	Montana	Total
Yes	0	7	22	29
No	1	8	44	53
Total	*1*	*15*	*66*	*82*

Do you use the Northwest Energy Efficiency Council website for information on the Non-Residential Energy Code?

	Oregon	Idaho	Montana	Total
Yes	0	7	15	22
No	1	7	52	60
Total	*1*	*14*	*67*	*82*

Would you support having technical assistance (including the hotline and website) for both the Residential and Non-Residential Energy Codes from one source?

	Oregon	Idaho	Montana	Total
Yes	1	14	64	79
No	0	1	4	5
Total	*1*	*15*	*68*	*84*

Appendix D. Data: Idaho State-Specific

Building Officials Results

Have you used the Energy Codes Toolkit put out by the Association of Idaho Cities?

	Frequency	Percent
Yes	14	26%
No	39	74%
	53	*100%*

How useful was the Toolkit?

	Frequency	Percent
Somewhat Useful	12	86%
Not Very Useful	2	14%
	14	*100%*

Have you attended any of the annual Idaho Energy Code Conferences put on by the Association of Idaho Cities?

	Frequency	Percent
Yes	35	67%
No	17	33%
	52	*100%*

How useful was the Idaho Energy Conference?

	Frequency	Percent
Very Useful	15	43%
Somewhat Useful	18	51%
Not Very Useful	2	6%
	35	*100%*

Are you aware of the GemStar rating system for residential new construction?

	Frequency	Percent
Yes	17	43%
No	23	58%
	40	*100%*

In your opinion, how has the GemStar rating system impacted energy code compliance in Idaho?

	Frequency	Percent
Increases compliance	3	17%
Has a minimal impact on compliance	10	56%
Has no impact at all on compliance	2	11%
Other	3	17%
	18	*100%*

Builder Survey Results

Have you used the Energy Code Information Network website?

	Frequency	Percent
Yes	2	9%
No	21	91%
	23	*100%*

Are you aware of GemStar?

	Frequency	Percent
Yes	4	17%
No	19	83%
	23	*100%*

Have any of your new construction projects been certified by GemStar?

	Frequency	Percent
No	8	100%
	8	*100%*

How many building projects have been certified by GemStar?

	Frequency	Percent
1-5	3	50%
Comments	3	50%
	6	*100%*

Are you familiar with RESCheck software?

	Frequency	Percent
Yes	13	62%
No	8	38%
	21	*100%*

How useful is RESCheck in helping your building projects comply with the energy code?

	Frequency	Percent
Very useful	11	85%
Somewhat useful	1	8%
Never used	1	8%
	13	*100%*

Are you familiar with COMCheck software?

	Frequency	Percent
Yes	13	68%
No	6	32%
	19	*100%*

How useful is COMCheck in helping your building projects comply with the energy code?

	Frequency	Percent
Very useful	8	57%
Somewhat useful	4	29%
Not very useful	1	7%
Never used	1	7%
	14	*100%*

Appendix E. Data: Oregon State-Specific

Do you feel that there are sufficient opportunities for building professionals to attend energy code training sessions in Oregon?

	Frequency	Percent
Yes	38	49%
No	39	51%
	77	*100%*

Are you aware of the Prescriptive Residential Duct Code Standards?

	Frequency	Percent
Yes	15	18%
No	67	82%
	82	*100%*

Have the Prescriptive Residential Duct Code Standards been adequately addressed in the training sessions you've attended?

	Frequency	Percent
Yes	2	6%
No	29	94%
	31	*100%*

Are you aware of the Demand Controlled Ventilation energy code requirement?

	Frequency	Percent
Yes	23	28%
No	58	72%
	81	*100%*

Has Demand Ventilation been adequately addressed in the training sessions you've attended?

	Frequency	Percent
Yes	6	20%
No	24	80%
	30	*100%*

Oregon Officials State-Specific

How would you rate your understanding of the Residential Duct Sealing Requirements?

	Frequency	Percent
Very knowledgeable	10	19%
Somewhat knowledgeable	28	52%
Not very knowledgeable	13	24%
Not at all knowledgeable	3	6%
	54	*100%*

How would you rate your knowledge of the recently adopted ventilation controls for high occupancy areas?

	Frequency	Percent
Very knowledgeable	6	11%
Somewhat knowledgeable	15	28%
Not very knowledgeable	24	44%
Not at all knowledgeable	9	17%
	54	*100%*

Appendix F. Data: Montana State-Specific

Montana Builder State-Specific

Do you feel that there are sufficient opportunities for building professionals to attend energy code training sessions in Montana?

	Frequency	Percent
Yes	60	61%
No	39	39%
	99	*100%*

What mechanism for learning about energy codes would be most useful to you as a building professional?

	Frequency	Percent
Brownbag lunch presentation	11	11%
Workshop	62	65%
Website	11	11%
Email listserv with frequent updates	8	8%
Other	4	4%
	96	*100%*

Do you recall receiving energy notes for residential buildings?

	Frequency	Percent
Yes	35	16%
No	187	84%
	222	*100%*

Do you recall receiving energy notes for non-residential buildings?

	Frequency	Percent
Yes	34	15%
No	188	85%
	222	*100%*

Do you recall receiving Energy code pencils?

	Frequency	Percent
Yes	8	4%
No	214	96%
	222	*100%*

Do you recall receiving $500 tax credit brochure?

	Frequency	Percent
Yes	35	16%
No	187	84%
	222	*100%*

Do you recall receiving the Montana Energy Savers Guidebook?

	Frequency	Percent
Yes	26	12%
No	196	88%
	222	*100%*

I do not recall receiving any of the Montana energy code information pieces.

	Frequency	Percent
Yes	36	16%
No	186	84%
	222	*100%*

Rate the usefulness of the Energy Notes for residential builders.

	Frequency	Percent
Neither useful nor not useful	1	3%
Somewhat useful	10	28%
Very useful	25	69%
	36	*100%*

Rate the usefulness of the Energy Notes for non-residential builders.

	Frequency	Percent
Somewhat useful	15	41%
Very useful	22	59%
	37	*100%*

Rate the usefulness of the Energy code pencils.

	Frequency	Percent
Not at all useful	1	8%
Not very useful	2	15%
Neither useful nor not useful	2	15%
Somewhat useful	2	15%
Very useful	6	46%
	13	*100%*

Rate the usefulness of the $500 tax credit brochures.

	Frequency	Percent
Not at all useful	2	6%
Not very useful	2	6%
Neither useful nor not useful	1	3%
Somewhat useful	10	28%
Very useful	21	58%
	36	*100%*

Rate the usefulness of the Montana Energy Savers Guidebook.

	Frequency	Percent
Not very useful	3	10%
Somewhat useful	11	38%
Very useful	15	52%
	29	*100%*

Which organization verifies your building plans for compliance?

	Frequency	Percent
City/county building code dept.	69	74%
MT Dept. Labor and Industry	3	3%
Lender/bank	1	1%
No checks/verification required	17	18%
Other	3	3%
	93	*100%*

Are you familiar with RESCheck software?

	Frequency	Percent
Yes	14	42%
No	19	58%
	33	*100%*

How useful is RESCheck in helping your building projects comply with the energy code?

	Frequency	Percent
Very useful	5	45%
Somewhat useful	5	45%
Not very useful	1	9%
	11	*100%*

Are you familiar with COMCheck software?

	Frequency	Percent
Yes	38	53%
No	34	47%
	72	*100%*

How useful is COMCheck in helping your building projects comply with the energy code?

	Frequency	Percent
Very useful	19	56%
Somewhat useful	11	32%
Not very useful	1	3%
Never used	3	9%
	34	*100%*

Appendix G. Survey Instruments

The following survey instruments follow this page:

- Builders Contractors
- Building Officials
- Dealer Interview
- EWA Builders
- Mystery Shopping Guide

NORTHWEST ENERGY EFFICIENCY ALLIANCE
www.nwalliance.org

Builders/Contractors and Designers

Energy Codes Survey

Thank you for taking the time to let us know your perspective on energy codes. It should take you approximately 15 minutes to complete the survey. Responses from this survey will be completely confidential, with results being reported only in aggregate.

Win a prize!

Upon completion, you will be entered into a raffle to win one of several $100 gift certificates to **Home Depot.** Chances of winning are approximately 1 in 20!

The Northwest Energy Efficiency Alliance is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace.

Background

1. In which state do you primarily work?
   - ❑ Oregon
   - ❑ Western Washington
   - ❑ Eastern Washington
   - ❑ Idaho
   - ❑ Montana

2. Which of the following best describes your professional responsibilities?
   - ❑ General contractor/construction manager
   - ❑ Architect/designer
   - ❑ Specialized/sub-contractor (specify:_____)
   - ❑ Residential Builder
   - ❑ Non-residential builder
   - ❑ Engineer
   - ❑ Other _____

3. How long have you been in the building industry?

_____ Years

4. In what sector do you primarily work?

- ❑ Residential
- ❑ Non-residential

IF PRIMARY SECTOR IS RESIDENTIAL:

5. Approximately how many projects will you complete in 2004?

- ❑ <5
- ❑ 5-10
- ❑ 10-20
- ❑ 20+

6. What part(s) of the building do you work with? [CHECK ALL THAT APPLY]

- ❑ Building envelope (e.g., insulation, windows, air sealing)
- ❑ Mechanical (e.g., furnace, heat pump)
- ❑ Piping insulation
- ❑ Other_____

IF PRIMARY SECTOR IS NON-RESIDENTIAL:

7. What part(s) of the building do you work with? [CHECK ALL THAT APPLY]

- ❑ Building envelope (e.g., insulation, windows, air sealing)
- ❑ Mechanical (e.g., furnace, heat pump)
- ❑ Service water heating (e.g., pipe insulation)
- ❑ Lighting/electrical
- ❑ Other _____

8. What type of work do you primarily do? [CHECK ONE]

- ❑ Office buildings
- ❑ Retail space
- ❑ Restaurant
- ❑ Storage/Warehouse
- ❑ Institutional
- ❑ Grocery stores
- ❑ Lodging
- ❑ Multi-family residential
- ❑ Public Assembly
- ❑ Other _____

9. What is the approximate total square footage of projects you will complete in 2004?

_____

10. How often are you personally responsible for energy code compliance?

- ❑ Always
- ❑ Frequently
- ❑ Sometimes
- ❑ Never

11. How would you rate your knowledge of the Residential/Non-residential energy code?

- ❑ Very knowledgeable
- ❑ Somewhat knowledgeable
- ❑ Not very knowledgeable
- ❑ Not at all knowledgeable

12. Have you ever participated in your state's code adoption processes?

- ❑ Yes
- ❑ No

13. How easy has it been for you comply with the energy code?

- ❑ Very easy
- ❑ Somewhat easy
- ❑ Somewhat difficult
- ❑ Very difficult
- ❑ Not applicable

14. What is the biggest obstacle(s) to implementing and complying with the energy code? [CHECK ALL THAT APPLY]

- ❑ Lack of training on code
- ❑ Lack of available information on code
- ❑ Complexity of codes
- ❑ Lack of availability of qualifying products (windows, etc.)
- ❑ Clients request non-compliant products
- ❑ Designers do not specify to code
- ❑ Lack of support by state/local code officials
- ❑ Other_____

15. Do you find any part of the energy code unclear or confusing?

- ❑ Yes (specify, which part(s)? _____)
- ❑ No

Training Satisfaction

16. Have you attended any Residential or Non-residential Energy Code training sessions in the past two years?

- ❑ Yes, most recent date: _____(mm/yy)…….Go To Q18
- ❑ No.....Go To Q17

17. Why have you not attended a training session?

- ❑ Didn't know about them
- ❑ Not needed
- ❑ Don't have enough time
- ❑ Topics are not useful to me
- ❑ Inconvenient location
- ❑ Other, specify:_____

18. What was the topic of the most recent training session you attended?

RES:

- ❑ General energy code
- ❑ Building envelope
- ❑ Mechanical
- ❑ Other, specify:_____

NONRES:

- ❑ General energy code
- ❑ Service water heating
- ❑ Lighting/electrical
- ❑ Building envelope
- ❑ Mechanical
- ❑ Other, specify:_____

19. As a result of the training, how much did your knowledge of the building energy code **improve**?

- ❑ Significantly
- ❑ Somewhat
- ❑ A little
- ❑ Not at all

20. What types of additional information would have been useful, that were not provided in the training session?

_____

21. How knowledgeable was the training staff?

- ❑ Very knowledgeable
- ❑ Somewhat knowledgeable
- ❑ Not very knowledgeable
- ❑ Not at all knowledgeable

22. What was the format of the training?

- ❑ Classroom
- ❑ On-site
- ❑ Other, specify:_____

23. How effective was format of the presentation in conveying the information?

- ❑ Very effective
- ❑ Somewhat effective
- ❑ Not very effective
- ❑ Not at all effective

24. Please provide suggestions on how the format/presentation of the material could be improved.

_____

25. Did the supplemental handouts, if any, provide useful additional information?

- ❑ Yes, they were useful
- ❑ No, they were not useful (explain: _____)
- ❑ Did not receive handouts

26. Has the training result in any changes to your professional practices?

- ❑ Yes (explain_____)
- ❑ No

27. Have you recommend this type of training to your colleagues?

- ❑ Yes
- ❑ No

Technical Support

28.

IDAHO - Have you used the technical support available through the Idaho Department of Building Safety?

- ❑ Yes .....GO TO Q30
- ❑ No.....GO TO Q29

MONTANA - Have you used the technical support available through one of the following agencies? [If multiple, choose the most often-used source]

- ❑ Montana Environmental Information Center… GO TO Q30
- ❑ Montana Department of Environmental Quality… GO TO Q30
- ❑ Montana Department of Labor and Industry …. GO TO Q30
- ❑ No, have not used technical support .....GO TO Q29

OREGON - Have you used the technical support available through the Oregon Department of Energy?

- ❑ Yes .....GO TO Q30
- ❑ No

WASHINGTON - Have you used the technical support available through one of the following agencies? [If multiple, choose the most often-used source]

- ❑ Washington State University Energy Program… GO TO Q30
- ❑ Washington State Building Council.....GO TO Q30
- ❑ Northwest Energy Efficiency Council.....GO TO Q30
- ❑ No, have not used technical support .....GO TO Q29

29. Why have you not used the technical support services?

- ❑ Not needed .....GO TO Q36
- ❑ Don't have enough time.....GO TO Q36
- ❑ Didn't know it existed .....GO TO Q36
- ❑ Topics are not useful to me (explain: _____) GO TO Q36
- ❑ Other (specify: _____) GO TO Q36

30. How often have you used technical support in the past year?

- ❑ Once
- ❑ A few times
- ❑ More than 5 times

31. What are the primary reasons for your technical support inquiries? [CHECK ALL THAT APPLY]

- ❑ General codes information
- ❑ Process/implementation assistance
- ❑ Software information
- ❑ Website assistance
- ❑ Help with compliance forms
- ❑ Other _____

32. How did you contact the technical support services? [CHECK ALL THAT APPLY]

- ❑ Phone
- ❑ Email
- ❑ In-person
- ❑ Other_____

33. Please rate your overall satisfaction with the following aspects of the technical support you received. [Place "**X**" in box] (SUE – CAN YOU MAKE THIS A 1-5 SCALE WITH "NOT AT ALL" ON LEFT AS 1, AND "VERY" AT RIGHT AS 5)

	Very satisfied	Somewhat satisfied	Not very satisfied	Not at all satisfied
Response Time				
Knowledge of staff				
Quality of information				
Professionalism of staff				

34. Do you plan to use technical support services in the future?

- ❑ Yes
- ❑ No
- ❑ Don't know

35. Do you have any suggestions for how these technical support services could be improved?

- ❑ Yes (Explain: _____)
- ❑ No

Compliance Forms

36. In percent of projects**,** how often do you use the following paths for energy code compliance?

- ❑ Prescriptive Path (prescribed building component efficiency levels) _____%
- ❑ Performance Path (Trade-off to meet a code-required UA) _____%
- ❑ Systems Analysis (Computer modeling for annual energy budget) _____%
- ❑ Don't know .....GO TO Q39
- ❑ Does not apply .....GO TO Q39

37. Do you use the compliance forms provided by your state code office?

- ❑ Yes
- ❑ No, please explain why not: _____GO TO Q39

38. In what ways, if any, could the forms be improved? [CHECK ALL THAT APPLY]

- ❑ None
- ❑ Clearer directions
- ❑ Easier to obtain
- ❑ Easier to turn in
- ❑ Less complicated requirements
- ❑ Other _____

Website Use

39.

IDAHO – Have you utilized the website for the Idaho Division on Building Safety?

- ❑ Yes .....GO TO Q41
- ❑ No.....GO TO Q40

MONTANA - Have you utilized any of the websites from the following agencies for energy code information? [If multiple, choose the most often-used site]

- ❑ Montana Environmental Information Center… GO TO Q41
- ❑ Montana DEQ (energizemontana.com)… GO TO Q41
- ❑ Montana Department of Labor and Industry …. GO TO Q41
- ❑ No, have not used websites.....GO TO Q40

OREGON - Have you utilized the website for the Oregon Department of Energy?

- ❑ Yes .....GO TO Q41
- ❑ No.....GO TO Q40

WASHINGTON - Have you utilized the website for the Washington State University Energy ?

- ❑ Yes .....GO TO Q41
- ❑ No.....GO TO Q40

40. Why have you not utilized the website?

- ❑ Didn't know it existed.....GO TO Q45
- ❑ Limited access to the Internet .....GO TO Q45
- ❑ Too confusing .....GO TO Q45
- ❑ Too complicated.....GO TO Q45
- ❑ Quicker to make phone call .....GO TO Q45
- ❑ Other _____.....GO TO Q45

41. About how many times have you visited the website in the past year?

- ❑ Once
- ❑ A few times
- ❑ More than 5 times

42. How satisfied are you with the quality of the information provided on the website?

- ❑ Very satisfied
- ❑ Somewhat satisfied
- ❑ Not very satisfied
- ❑ Not at all satisfied

43. How satisfied are you with the ease of navigation?

- ❑ Very satisfied
- ❑ Somewhat satisfied
- ❑ Not very satisfied
- ❑ Not at all satisfied

44. What additional services or information would you like to see included on the website?

_____

_____

General Perceptions of Energy Codes

Please indicate how much you agree with each of the following statements, where 1 is Strongly Disagree; 5 is Strongly Agree [Place "X" in box]

	Strongly Disagree..... Strongly Agree				
	1	2	3	4	5
45. The Residential energy code is a valuable part of state building codes.					
46. The Non-residential energy code is a valuable part of state building codes.					
47. Building professionals are adequately informed about energy codes.					
48. Local Code Officials are knowledgeable of the energy code.					
49. Energy codes are consistently enforced within my jurisdiction.					
50. There are advantages to working in certain parts of the state due to differing levels of energy code enforcement.					

State-Specific Questions

IDAHO

51. Have you used the Energy Code Information Network website?

- ❑ Yes
- ❑ No

52. Are you aware of the *GemStar* rating system for residential new construction?

- ❑ Yes
- ❑ No

53. Have any of your new construction projects been certified by *GemStar*?

- ❑ Yes
- ❑ No.....GO TO Q55

54. How many of the building projects you've worked on have been certified by *GemStar*?

- ❑ 1-5
- ❑ 6-10
- ❑ 11-20
- ❑ More than 20
- ❑ Comments_____

IF PRIMARY SECTOR IS RESIDENTIAL:

55. Are you familiar with RESCheck software?

- ❑ Yes
- ❑ No

56. How useful is RESCheck in helping your building projects comply with the energy code?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Not very useful
- ❑ Not at all useful
- ❑ Don't know, never used it

57. What changes could be made to the RESCheck software to increase its effectiveness?

_____

IF PRIMARY SECTOR IS NON-RESIDENTIAL:

58. Are you familiar with COMCheck software?

- ❑ Yes
- ❑ No

59. How useful is COMCheck in helping your building projects comply with the energy code?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Not very useful
- ❑ Not at all useful
- ❑ Don't know, never used it

60. What changes could be made to the COMCheck software to increase its effectiveness?

_____

MONTANA

61. Do you feel that there are sufficient opportunities for builders to attend energy code training sessions in Montana?

- ❑ Yes
- ❑ No

62. What mechanism for learning about energy codes would be most useful to you as a building professional?

- ❑ Brownbag lunch presentation
- ❑ Workshop
- ❑ Website
- ❑ Email listserv with frequent updates
- ❑ Other _____

63. Do you recall receiving any of the following energy code information pieces? [CHECK ALL THAT APPLY]

- ❑ Energy notes for residential buildings
- ❑ Energy notes for non-residential buildings
- ❑ Energy code pencils
- ❑ $500 tax credit brochure
- ❑ Montana Energy Savers Guidebook

64. Please rate the usefulness of the above materials [Place "X" in box]:

	Very Useful	Somewhat useful	Not very useful	Not useful at all
Energy notes for residential buildings				
Energy notes for non-residential buildings				
Energy code pencils				
$500 tax credit brochure				
Montana Energy Savers Guidebook				

65. Which of the following organizations check or verify your building plans or buildings for energy code compliance?

- ❑ City/County building code department
- ❑ Montana Department of Labor and Industry
- ❑ Lender/bank
- ❑ No checks/verification required
- ❑ Other _____

Compliance Software

If PRIMARY SECTOR IS RESIDENTIAL:

66. Are you familiar with RESCheck software?

- ❑ Yes
- ❑ No

67. How useful is RESCheck in helping your building projects comply with the energy code?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Not very useful
- ❑ Not at all useful
- ❑ Don't know, never used it

68. What changes could be made to the RESCheck software to increase its effectiveness?

_____

If PRIMARY SECTOR IS NON-RESIDENTIAL:

69. Are you familiar with COMCheck software?
    - ❑ Yes
    - ❑ No

70. How useful is COMCheck in helping your building projects comply with the energy code?
    - ❑ Very useful
    - ❑ Somewhat useful
    - ❑ Not very useful
    - ❑ Not at all useful
    - ❑ Don't know, never used it

71. What changes could be made to the COMCheck software to increase its effectiveness?

    _____

OREGON

72. Do you feel that there are sufficient opportunities for building professionals to attend energy code training sessions in Oregon?
    - ❑ Yes
    - ❑ No

73. Are you aware of the Prescriptive Residential Duct Code Standards?
    - ❑ Yes
    - ❑ No

74. Have the Prescriptive Residential Duct Code Standards been adequately addressed in the training sessions you've attended?
    - ❑ Yes
    - ❑ No

75. Are you aware of the Demand Controlled Ventilation energy code requirement?
    - ❑ Yes
    - ❑ No

76. Has Demand Controlled Ventilation been adequately addressed in the training sessions you've attended?

- ❑ Yes
- ❑ No
- ❑ Was not relevant to the training topic

WASHINGTON

77. Do you feel that there are sufficient opportunities for building professionals to attend energy code training sessions in Washington?

- ❑ Yes
- ❑ No

78. Please provide your email address or other contact information for the raffle. (Your contact information will not be used for any other purposes.)

_____

You're finished! Thank you for completing this survey.

NORTHWEST ENERGY EFFICIENCY ALLIANCE
www.nwalliance.org

Building Officials, Inspectors, and Plan Reviewers Energy Codes Survey

---

Thank you for taking the time to let us know your perspective on energy codes. It should take you approximately 15 minutes to complete the survey. Responses from this survey will be completely confidential, with results being reported only in aggregate.

Win a prize!

Upon completion, you will be entered into a raffle to win one of several $100 gift certificates to **Home Depot.**
Chances of winning are approximately 1 in 20!

The Northwest Energy Efficiency Alliance is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace.

Background

1. In which state do you primarily work?
   - ❑ Idaho
   - ❑ Montana
   - ❑ Oregon
   - ❑ Eastern Washington
   - ❑ Western Washington

2. What is your position? [CHECK ALL THAT APPLY]
   - ❑ Building Official
   - ❑ Plans Reviewer
   - ❑ Inspector
   - ❑ Other _____

3. How long have you been in the building inspection services industry?

   _____Years

4. Please indicate if you work primarily with one sector:
   - ❑ Residential
   - ❑ Non-Residential
   - ❑ Equally with Residential and Non-Residential

Energy Codes

5. For each sector, how would you rate your knowledge of the building energy code?

Residential	Non-Residential	
❑	❑	Very knowledgeable
❑	❑	Somewhat knowledgeable
❑	❑	Not very knowledgeable
❑	❑	Not at all knowledgeable

6. For which of the following building components, if any, does your department do a **Plan Review** for Energy Code compliance? [CHECK ALL THAT APPLY]

Residential	Non-Residential	
❑	❑	Building Envelope (e.g., glazing, U-factor, insulation R-value)
❑	❑	Mechanical System (e.g., furnace, heat pump)
❑	❑	Domestic Water Heating System (e.g., pipe insulation)
❑	❑	Lighting/electrical
❑	❑	Other, please specify: _____

7. For which of the following building components, if any, does your department do an **On-Site Inspection** for Energy Code compliance? [CHECK ALL THAT APPLY]

Residential	Non-Residential	
❑	❑	Building Envelope (e.g., glazing, U-factor, insulation R-value)
❑	❑	Mechanical System (e.g., furnace, heat pump)
❑	❑	Domestic Water Heating System (e.g., pipe insulation)
❑	❑	Lighting/electrical
❑	❑	Other, please specify: _____

8. What do you see as the primary obstacles to **enforcing** the energy code? [CHECK ALL THAT APPLY]

Residential	Non-Residential	
❑	❑	Lack of political support
❑	❑	Lack of resources (e.g. manpower)
❑	❑	Priority is for health and life safety; time for other codes is limited
❑	❑	Other, please specify: _____

General Attitudes toward Energy Codes

Please indicate how much you agree with each of the following statements, where 1 is Strongly Disagree; 5 is Strongly Agree

	Strongly Disagree ..... Strongly Agree				
	1	2	3	4	5
9. The Residential energy code is a valuable part of state building codes.					
10. The Non-residential energy code is a valuable part of state building codes.					
11. There is political support in my jurisdiction for enforcement of energy codes.					
12. Energy codes improve the quality of life for the community.					
13. Energy codes are related to my primary job function.					
14. On a day-to-day basis, energy codes are burdensome to my workload.					
15. The energy codes are no more difficult to enforce than other building codes.					
16. Builders and designers need more training on energy codes.					

17. Would you support code requirements to verify that a building has been commissioned for lighting and mechanical systems?
(Commissioning is a quality assurance process to ensure that a building's equipment and control systems are working as intended.)

- ❑ Yes
- ❑ No.....GO TO Q19

18. What is the best way to codify this process?

_____

Training Satisfaction

19. Have you ever received training on the energy code, either **Residential** or **Nonresidential**?

Residential	Non-Residential
❑ Yes – Most recent date: _____	❑ Yes – Most recent date: _____
❑ No	❑ No

20. [If you have never attended a training] Please indicate the primary reason you haven't received any energy code training.

- ❑ Didn't know about them .....GO TO Q31
- ❑ Not needed .....GO TO Q31
- ❑ Don't have enough time.....GO TO Q31
- ❑ Topics are not useful to me.....GO TO Q31
- ❑ Inconvenient location.....GO TO Q31
- ❑ Other (specify: _____) .....GO TO Q31

21. What was the topic of the MOST RECENT training session you attended? [Check all that apply]?

Residential	Non-Residential
❑General energy code ❑Ventilation/Indoor Air Quality code (VIAQ) ❑Building envelope ❑Other_____	❑General ½-day workshop on energy code ❑General 2-hour workshop on energy code ❑Lighting/electrical ❑Building envelope ❑Mechanical ❑Other_____

Please answer the following questions for the MOST RECENT training session you have attended.

22. As a result of the training, how much did your knowledge of the energy code improve?

- ❑ Significantly
- ❑ Somewhat
- ❑ A little
- ❑ Not at all

23. What types of additional information would have been useful, that were not provided in the training session?

_____

_____

24. How knowledgeable was the training staff?

- ❑ Very knowledgeable
- ❑ Somewhat knowledgeable
- ❑ Not very knowledgeable
- ❑ Not at all knowledgeable

25. What was the format of the training?

- ❑ Classroom
- ❑ On-site
- ❑ Other, specify:_____

26. How effective was this format in conveying the information?

- ❑ Very effective
- ❑ Somewhat effective
- ❑ Not very effective
- ❑ Not at all effective

27. Please provide suggestions on how the presentation of the material could be improved.

_____

28. Did the supplemental handouts, if any, provide useful additional information?

- ❑ Yes, useful
- ❑ No, not useful
- ❑ Did not receive handouts

29. Has the training resulted in any changes to your professional practices?

- ❑ Yes, explain:_____
- ❑ No

30. Have you recommended the training session to any colleagues?

- ❑ Yes

- ❑ No

Technical Support Satisfaction

31.

IDAHO – Have you used the technical support available from any of the **Idaho Department of Building Safety** for energy codes?

- ❑ Yes .....GO TO Q33
- ❑ No, have not used technical support .....GO TO Q32

MONTANA - Have you used the technical support available from the **Montana Department of Environmental Quality** for energy codes?

- ❑ Yes .....GO TO Q33
- ❑ No.....GO TO Q32

OREGON - Have you used the technical support available from the **Oregon Department of Energy** for energy codes?

- ❑ Yes .....GO TO Q33
- ❑ No.....GO TO Q32

WASHINGTON – Have you used the technical support available from any of the following agencies for energy codes? (If multiple, choose PRIMARY support source)

- ❑ Washington State University Energy Program .....GO TO Q33
- ❑ Washington State Building Code Council .....GO TO Q33
- ❑ Northwest Energy Efficiency Council .....GO TO Q33
- ❑ No, have not used technical support .....GO TO Q32

32. Why have you not used the state for your technical support questions?

- ❑ Didn't know technical support existed .....GO TO Q39
- ❑ Local chapter provides all our training needs .....GO TO Q39
- ❑ Don't know how .....GO TO Q39
- ❑ Don't have enough time.....GO TO Q39
- ❑ Other (specify: _____).....GO TO Q39

33. How often have you used technical support in the past year?

- ❑ Once
- ❑ A few times
- ❑ More than 5 times

34. What were the primary reasons for your technical support inquiries? [CHECK ALL THAT APPLY]

- ❑ General codes information
- ❑ Process/implementation assistance
- ❑ Software information
- ❑ Web site assistance
- ❑ Help with compliance forms
- ❑ Code interpretation request
- ❑ Administrative support
- ❑ Other (specify:_____)

35. How did you contact the technical support services? [CHECK ALL THAT APPLY]

- ❑ Phone
- ❑ Email
- ❑ In-person
- ❑ Other, specify:_____

36. Please rate your satisfaction with the following aspects of the technical support you received:

	Very satisfied	Somewhat satisfied	Not very satisfied	Not satisfied at all
Response Time				
Knowledge of staff				
Professionalism of staff				
Quality of Information				

37. Do you plan to use technical support services in the future?

- ❑ Yes
- ❑ No
- ❑ Don't know

38. Do you have any suggestions for how these technical support services could be improved?

- ❑ Yes, explain: _____
- ❑ No

39. Do you find any part of the energy code unclear or confusing?

Residential

- ❑ Yes, specify, which part(s)_____
- ❑ No

Non-Residential

- ❑ Yes, specify, which part(s)_____
- ❑ No

40. What part(s) of the energy code has been most problematic to enforce?

Residential

_____

Non-Residential

_____

41. What would be most helpful to improve **compliance** with energy codes?

Residential

_____

Non-Residential

_____

42. What would be most helpful to improve **enforcement** of energy codes?

Residential

_____

Non-Residential

_____

43. Would you support a supplemental, third-party certification for inspectors or plan reviewers for the residential or nonresidential energy code, paid for by the permit holder?

- ❑ Yes
- ❑ No.....GO TO Q45

44. Please indicate for which individuals you would support such certification. [CHECK ALL THAT APPLY]

- ❑ Residential inspector
- ❑ Residential plan reviewer
- ❑ Nonresidential inspector
- ❑ Nonresidential plan reviewer

State-Specific Questions

IDAHO

45. Have you used the Energy Codes Toolkit put out by the Association of Idaho Cities?

- ❑ Yes
- ❑ No.....GO TO Q47

46. How useful was the Toolkit?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Not very useful
- ❑ Not at all useful

47. Have you attended any of the annual Idaho Energy Code Conferences put on by the Associate of Idaho Cities?

- ❑ Yes
- ❑ No.....GO TO Q64

48. How useful was the Idaho Energy Code Conference?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Not very useful
- ❑ Not at all useful

OREGON

49. How would you rate your understanding of the Residential Duct Sealing Requirements?

- ❑ Very knowledgeable
- ❑ Somewhat knowledgeable
- ❑ Not very knowledgeable
- ❑ Not at all knowledgeable

50. How would you rate your knowledge of the recently adopted ventilation controls for high occupancy areas?

- ❑ Very knowledgeable
- ❑ Somewhat knowledgeable
- ❑ Not very knowledgeable
- ❑ Not at all knowledgeable

51. [If you have attended training sessions] Have the Residential Duct requirements been adequately addressed in the training sessions you've attended?

- ❑ Very adequately
- ❑ Somewhat adequately
- ❑ Not very adequately
- ❑ Not adequately at all
- ❑ Explain: _____

52. [If you have attended training sessions] Have the Ventilation controls for high occupancy areas been adequately addressed in the training sessions you've attended?

- ❑ Yes
- ❑ No

WASHINGTON

53. How would you rate your understanding of the Prescriptive Compliance Approach in the Washington State Energy Code (WSEC)?

- ❑ Very thorough
- ❑ Somewhat thorough
- ❑ Somewhat vague
- ❑ Very vague
- ❑ Not familiar with these standards

54. How would you rate your understanding of the Component Performance Compliance Approach in the WSEC?

- ❑ Very thorough
- ❑ Somewhat thorough
- ❑ Somewhat vague
- ❑ Very vague
- ❑ Not familiar with these standards

55. How would you rate your understanding of the Ventilation and Indoor Air Quality Code (VIAQ)?

- ❑ Very thorough
- ❑ Somewhat thorough
- ❑ Somewhat vague
- ❑ Very vague
- ❑ Not familiar with these standards

56. Have you attended formal training on the WSEC or VIAQ?

- ❑ Yes .....GO TO Q50
- ❑ No

57. Would you attend and support training for the WSEC and VIAQ?

- ❑ Yes
- ❑ No

58. Do you use the Washington State University Energy Program Web site for information on the WSEC and VIAQ?

- ❑ Yes
- ❑ No

59. Do you use the WSU Energy Program Energy Code Hotline?

- ❑ Yes
- ❑ No

60. Do you use the Northwest Energy Efficiency Council Web site for information on the Non-Residential energy code?

- ❑ Yes
- ❑ No

61. Would you support having technical assistance (including the hotline and Web site) for both the Residential and Non-Residential energy codes from one source?

- ❑ Yes
- ❑ No

EASTERN WASHINGTON

62. Based on your experience, what is your best estimate of the percentage of residential new windows that comply with the U-0.35 window requirement in Eastern Washington?

_____%

63. In your experience, what are the circumstances in which builders and designers can't comply with the U-0.35 requirement for residential windows? [CHECK ALL THAT APPLY]

- ❑ Specified window frame material not available in U-0.35
- ❑ Decorative glass is specified
- ❑ Sliding doors not available in U-0.35
- ❑ Other, specify:_____
- ❑ None
- ❑ Don't know

64. Do you use the Northwest Energy Efficiency Council Web site for information on the Non-Residential energy code?

- ❑ Yes
- ❑ No

65. Would you support having technical assistance (including the hotline and Web site) for both the Residential and Non-Residential energy codes from one source?

- ❑ Yes
- ❑ No

66. Do you have any other comments?

_____

_____

67. Please provide your email address or other contact information for the raffle. (Your contact information will not be used for any other purpose.)

_____

You're finished! Thank you for completing this survey!

Windows Dealer Name: _____

Company Address:_____

Contact Name:_____

Title: _____

Phone: ( ) _____

Interview Guide

Eastern Washington Windows Dealers/Distributors

Hello, my name is _____ and I am doing a study on behalf of the Northwest Energy Efficiency Alliance on EnergyStar windows. I'd like to ask you a few questions about your experiences with supplying EnergyStar windows to the **residential** building market. Do you have about 10 minutes?

Background

1. Do you supply EnergyStar windows (with a U-factor of U-0.35 or better)?
   - ❑ Yes
   - ❑ No.....Thank and terminate

2. Who are your primary customers? [Check all that apply]
   - ❑ Residential customers
   - ❑ Residential builders
   - ❑ Commercial builders.....If **only** commercial, thank and terminate
   - ❑ Other_____

3. Where do most of your customers live?
   - ❑ Eastern Washington
   - ❑ Idaho
   - ❑ Other_____

(Surveyor to record comments)_____
_____

Availability

4. Are there any window styles that you **cannot** get with an EnergyStar rating from your suppliers?

   - ❑ Yes,
     explain:_____
     _____
   - ❑ No

5. How has the ***supplier*** availability of EnergyStar (≤U.035) windows changed in the past 2 years?

   - ❑ Increased
   - ❑ Stayed the Same
   - ❑ Decreased
   - ❑ Don't know

6. How many window types are available as EnergyStar (≤U.035) ***at your store***?

   - ❑ All
   - ❑ Most
   - ❑ Some
   - ❑ Very few
   - ❑ None
   - ❑ Other _____

7. Has this ***in-store*** availability changed in the past 2 years?

   - ❑ Increased
   - ❑ Stayed the Same
   - ❑ Decreased
   - ❑ Don't know
   - ❑ Comments_____

8. Have you ever experienced any difficulty procuring a specific type of window in EnergyStar that a customer wanted?

   - ❑ Yes,
     explain:_____
     _____
   - ❑ No

9. [If dealer has had trouble procuring ES windows] Do you expect any changes in the availability of EnergyStar windows in the future?

   - ❑ Yes
   - ❑ No

10. For your **non-EnergyStar** window sales, what is the breakdown of Eastern Washington customers vs. Other locations?

    _____% EWA

    _____% Other, specify:_____

11. How has the proportion of **non-ES** windows sales in your store changed in the last 2 years?

Eastern Washington customers

- ❑ Increased
- ❑ Decreased
- ❑ Stayed the same
- ❑ Comments_____

Other customers (specify:_____)

- ❑ Increased
- ❑ Decreased
- ❑ Stayed the same
- ❑ Comments_____

12. [**If Q.10 > 0%**] Of those people who did not buy ES windows, do you know why?

- ❑ Used trade-off approach
- ❑ Retrofit
- ❑ Lack of availability
- ❑ Other_____

Incremental Cost

13. Are EnergyStar rated windows (U-0.35 or better) more expensive than clear glass windows? (Surveyor to probe for example pricing on a specific type if releveant)

- ❑ Yes
- ❑ No, about equal (Skip to Q0)
- ❑ No, standard are more expensive. Explain _____(Skip to Q0)
- ❑ Comments:_____
  _____

14. What is the approximate incremental cost?

- ❑ _____%

Comments:_____

15. How has the incremental cost between EnergyStar windows and clear glass windows changed in the last 2 years? *(Surveyor to push for percent)*

- ❑ Increased
- ❑ Stayed Same
- ❑ Decreased
- ❑ Don't know
- ❑ 2 years ago the incremental cost was_____%

Future Expectations

16. Do you expect the incremental cost of EnergyStar windows to change in the next few years?

- ❑ Decrease
- ❑ Stay Same
- ❑ Increase
- ❑ Don't know
- ❑ Comments _____

17. Do you plan to have more Energy Star windows in stock in the next few years?

- ❑ Yes
- ❑ No
- ❑ Don't know

18. Are you aware of new styles of windows that manufacturers will provide in U-0.35 in the future?

- ❑ Yes, please specify styles:_____
- ❑ No
- ❑ Don't know

19. Do you have any other comments about EnergyStar windows supply, demand, and cost?

_____

20. Are you familiar with the EnergyStar (U-0.35) residential energy code requirement for new windows?

- ❑ Yes
- ❑ No [Surveyor to explain requirement]

Thank you for taking the time to answer my questions.

Eastern Washington Builder/Contractor

U-0.35 Windows Requirement

Energy Codes Survey

Thank you for taking the time to let us know your perspective on energy codes. It should take you approximately 15 minutes to complete the survey. Responses from this survey will be completely confidential, with results being reported only in aggregate.

Win a prize!

Upon completion, you will be entered into a raffle to win one of several $100 gift certificates to **Home Depot.**
Chances of winning are approximately 1 in 20!

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Background

1. Which of the following best describes your professional responsibilities?
   - ❑ General contractor/construction manager
   - ❑ Architect/designer
   - ❑ Specialized/sub-contractor
   - ❑ Residential Builder
   - ❑ Engineer
   - ❑ Other (specify:_____)

2. In what sector do you primarily work?
   - ❑ Residential
   - ❑ Non-residential

3. Do you work with windows on your residential building projects?
   - ❑ Yes
   - ❑ No

4. In percent of projects**,** how often do you use the following paths for energy code compliance?

   - ❑ Prescriptive Path (prescribed building component efficiency levels) _____%
   - ❑ Performance Path (Trade-off to meet a code-required UA) _____%
   - ❑ Systems Analysis (Computer modeling for annual energy budget) _____%
   - ❑ Don't know
   - ❑ Comments_____

5. For your 2004 projects, how often did you know the energy efficiency rating (EnergyStar or U-factor) of the windows?

   - ❑ Always
   - ❑ Frequently
   - ❑ Sometimes
   - ❑ Never

6. For your projects, what percent of windows were EnergyStar rated (U-0.35 or better?)

   (*Please input a value between 0 and 100*)

   _____%

7. In the instances where windows were not EnergyStar rated (U-0.35 or better), what were the reasons? [CHECK ALL THAT APPLY]

   - ❑ Specified window frame material not available in U-0.35
   - ❑ Decorative glass is specified
   - ❑ Designed window/door not available in U-0.35
   - ❑ Incremental cost is too high
   - ❑ Complying with code through performance or computer modeling approach
   - ❑ Was not aware of the U-0.35 requirement
   - ❑ Other, specify:_____

8. Have you had any problems procuring EnergyStar rated (U-0.35 or better) windows?

   - ❑ Yes, specify:_____
   - ❑ No

9. Have you noticed a change in the availability of high-efficiency windows since the U-0.35 requirement went into effect?

   - ❑ Significantly more available now
   - ❑ Somewhat more available now
   - ❑ No change in availability
   - ❑ Less available now
   - ❑ Haven't noticed a change

- ❑ Don’t know

10. In your experience, do U-0.35 windows cost more than U-0.40 windows?
    - ❑ Yes
    - ❑ No
    - ❑ Don’t know

11. What is the incremental cost?

    _____% OR _____$/sq.ft.

12. Are there any obstacles to U-0.35 compliance in your area?
    - ❑ Yes, explain: _____
    - ❑ No
    - ❑ Don’t know

13. Where do you usually get your windows?
    - ❑ Retail outlet, please specify name:_____
    - ❑ Window specialty shop, please specify name: _____
    - ❑ Distributor/wholesaler, please specify name: _____
    - ❑ Other, please specify name: _____

14. How would you rate your knowledge of the Residential building energy code?
    - ❑ Very knowledgeable
    - ❑ Somewhat knowledgeable
    - ❑ Not very knowledgeable
    - ❑ Not at all knowledgeable

15. Have you ever attended training on the building energy code?
    - ❑ Yes
    - ❑ No

16. Please provide any additional comments here.

-

_____
_____
_____
_____

OPTIONAL: Please provide your email address so that you may be entered into the raffle.

(Your email will not be used for any other purpose.) _____

Company Name: _____

Company Address:_____

Contact Name:_____

Title: _____

Phone: ( ) _____

Eastern Washington High Efficiency Windows

Mystery Shopping Guide

Hi. My husband and I are building a new home and we are interested in buying the most energy efficient windows possible. I'm looking for some information on windows pricing and availability.

1. Do you carry both EnergyStar (U ≤0.35) and non-EnergyStar (clear glass, ≥0.35)?
   - ❑ Both
   - ❑ Only EnergyStar.....Go to Q3
   - ❑ Only Clear glass.....Go to Q3

2. What is the incremental cost of the Energy Star windows?

Window Style	Incremental Cost for ES	Delta cost for different styles, if applicable
Skylight (2'x3')	_____%	Vinyl_____% Wood_____% Aluminum_____%.
Slider (3'x3')	_____%	Vinyl_____% Wood_____% Aluminum_____%.
Picture window	_____%	

French Doors	_____%	Vinyl_____% Wood_____% Aluminum_____%.
Single-hung	_____%	Vinyl_____% Wood_____% Aluminum_____%.
Double-hung	_____%	Vinyl_____% Wood_____% Aluminum_____%.

3. Are there any window styles that must be special ordered to get in Energy Star? [Check all that apply, surveyor to prompt if necessary]

   - ❑ Skylight
   - ❑ Sliding glass doors
   - ❑ French doors
   - ❑ Decorative glass (stained glass)
   - ❑ Bay windows
   - ❑ Picture windows
   - ❑ Other_____
   - ❑ None .....Skip to Q5

4. For those styles that must be ordered, what is the incremental cost?

Window Style	Incremental Cost	Delta cost for different styles, if applicable
	_____%	Vinyl_____% Wood_____% Aluminum_____%.
	_____%	Vinyl_____% Wood_____% Aluminum_____%.
	_____%	Vinyl_____% Wood_____% Aluminum_____%.

5. What is the lowest U-factor of the windows you carry?

   U-_____

6. I'm just curious, what is the most common U-factor rating people are buying?

   U-_____

7. [Skip if only clear glass] If I wanted to order a certain window that was rated higher than 0.35, (clear glass) could I?

   - ❑ Yes (additional cost for special order = $_____)
   - ❑ No

8. Surveyor to record comments:

   _____

   _____

   _____

Appendix H. List of Acronyms

AIA	American Institute of Architect's
AIC	Association of Idaho Cities
ASHRAE	American Society of Heating, Refrigerating and Air-conditioning Engineers
Alliance	Northwest Energy Efficiency Alliance's
BCC	Montana Building Codes Council
BCD	Oregon Building Codes Division
DCV	Demand Controlled Ventilation
DLI	Montana Department of Labor and Industry
DOE	U.S. Department of Energy
ECIN	Energy Code Information Network
EPAct	Energy Policy Act of 1992
HVAC	Heating, Ventilating and Air-Conditioning
IBC	International Building Code
ICC	International Code Council
ICBO	International Conference of Building Officials
IDABO	Idaho Association of Building Officials
IECC	International Energy Conservation Code
IRC	International Residential Code
MTDEQ	Montana Department of Environmental Quality
MTLGEO	Montana Local Government Energy Office
NECC	Northwest Energy Codes Collaborative
NEEC	Northwest Energy Efficiency Council

NFPA National Fire Protection Association

NREC Non-residential Energy Code

NWEC Northwest Energy Code

OBOA Oregon Building Official's Association

ODOE Oregon Department of Energy

PNL Pacific Northwest National Laboratory

RESNET Residential Energy Services Network

SBCC Washington State Building Code Council

Structural Code Oregon Structural Specialty Code

TAG Technical Advisory Group

VIAQ Washington Ventilation Indoor Air Quality

WABO Washington Association of Building Officials

WSEC Washington State Energy Code

WSU Washington State University