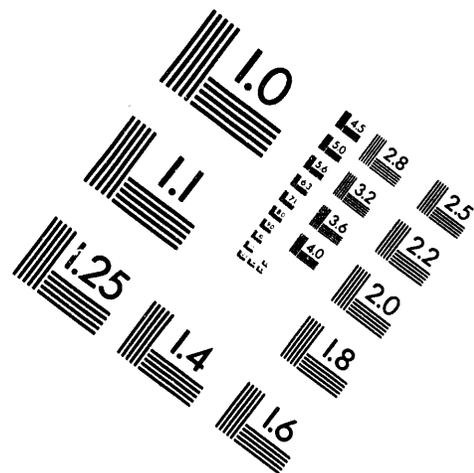
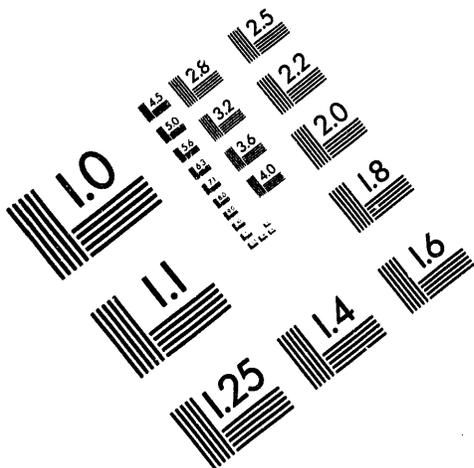




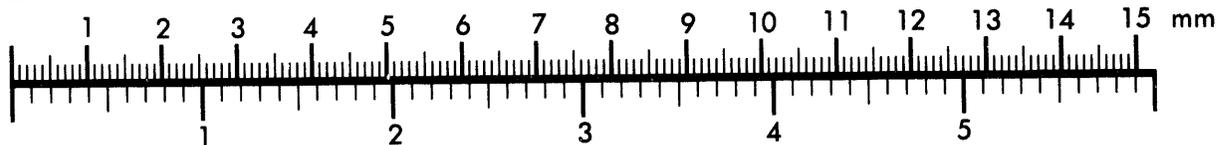
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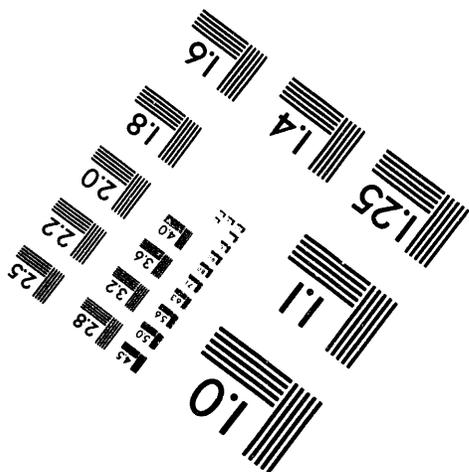
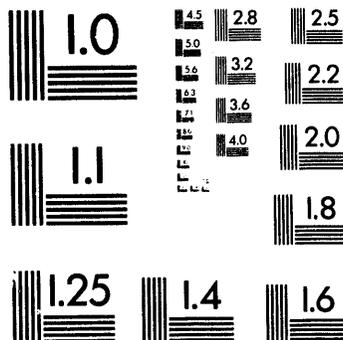
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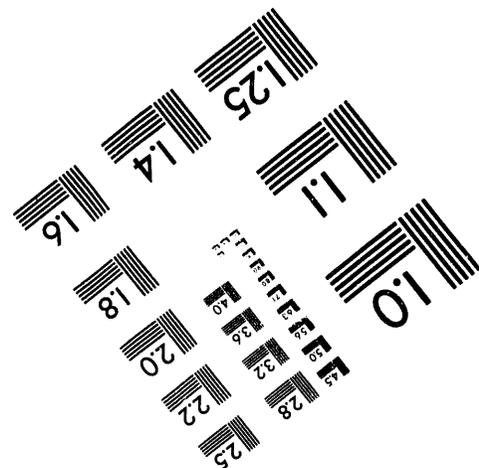
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ASSESSMENT OF STATES' NEEDS FOR BUILDING ENERGY INFORMATION TOOLS

M. P. Hatstrup
T. L. Gilbride

August 1994

Prepared for
the U.S. Department of Energy
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MASTER

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Foreword

This report is one in a series of documents describing research activities in support of the U.S. Department of Energy (DOE) Building Energy Standards Program. The Pacific Northwest Laboratory (PNL) leads the program for DOE. The goal of the program is to develop and encourage the implementation of performance standards to achieve the maximum practicable energy efficiency in the design of new buildings. Such standards are required of DOE by Title III of the Energy Conservation and Production Act (42 USC 6831 et seq.) as amended by the Energy Policy Act of 1992 (Public Law 102-486).

The program approach to meeting the goal is to initiate and manage individual research and standards and guidelines development efforts that are planned and conducted in cooperation with representatives from throughout the buildings community. Projects under way involve practicing architects and engineers, professional societies and code organizations, industry representatives, and researchers from the private sector and national laboratories. Research results and technical justifications for standards criteria are provided to standards development and model code organizations and to Federal, State, and local jurisdictions as a basis to update their codes and standards. This effort helps to ensure that building standards incorporate the latest research results to achieve maximum energy savings in new buildings, yet remain responsive to the needs of the affected professionals, organizations, and jurisdictions. Our efforts also support the implementation, deployment, and use of energy-efficient codes and standards.

This report documents findings from results of two surveys that PNL conducted of state energy office representatives to determine their need for materials and "tools" to help them implement the residential code and commercial building energy standards requirements of EPAct.

Readers with questions, comments, or suggestions about this document or the work it describes are encouraged to contact the author(s), program managers, or project managers.

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Summary

In this study for the U.S. Department of Energy (DOE) Office of Codes and Standards, Building Energy Standards Program (BESP), which is operated by the Pacific Northwest Laboratory (PNL), conducted two surveys of state agencies involved with building codes (including each state energy office) to determine what resources they would find most helpful in complying with the residential and commercial energy efficiency requirements of the Energy Policy Act of 1992.

PNL conducted a telephone survey of all 50 states and then a mail survey of each state plus Washington, D.C. and the six trust territories. Telephone survey participants were asked a number of questions including the three questions listed below (responses are also listed):

- "What technical assistance would you like from DOE to implement residential and commercial building energy codes?" 27 responded with requests ranging from how-to training videos to simplified compliance guidelines.
- "What tools would be helpful to you for standards development and compliance checking?" 14 responded with many requesting software and manuals and some requesting simplified checklists.
- "Where would you apply incentive funding from DOE to comply with the Energy Policy Act (EPAAct)?" 16 of the 19 who responded to this question indicated training needs would get the bulk of the funding.

In the mail survey we provided survey participants with a list of 27 hypothetical tool descriptions; we asked the participants to choose the tools they thought would be most useful in helping them implement building energy codes and standards in their state. Of the 27 hypothetical tools, the five that received the highest average usefulness ratings were

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers/Illuminating Engineering Society (ASHRAE/IES) Standard 90.1-89 training materials
- an ASHRAE/IES Standard 90.1-89 code manual
- software for Section 13 (energy cost budget method) of ASHRAE/IES Standard 90.1-89
- MEC training materials
- a code language version of ASHRAE/IES 90.1-89.

The respondents were also asked to characterize their state's commercial and/or residential building energy code development/implementation processes. Five states and Guam said they have no commercial process, 3 states and Guam said they have no residential process; 13 states said they do have a commercial process; 16 have a residential process; 9 are developing a commercial process; 10 are developing a residential process; 11 are modifying their commercial process because of EAct; and 10 are modifying their residential process because of EAct.

The mail survey respondents were also asked if they would be interested in serving on task forces for commercial or residential code development, implementation, enforcement or utility programs. States were most enthusiastic about participating in a task force on residential code development (14 responses) and least enthusiastic about participating in utility program task forces (four responses).

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1.0 Introduction

This report describes building energy standards research sponsored by the U.S. Department of Energy (DOE) Office of Codes and Standards and conducted by the Building Energy Standards Program (BESP) operated for DOE by the Pacific Northwest Laboratory (PNL). The primary objective of this research was to gather information that would allow DOE's BESP to prioritize its research and development activities.

To collect this information PNL conducted a telephone survey and asked state energy office representatives a series of questions including the three questions below:

- What technical assistance would you like from DOE to implement residential and commercial building energy codes?
- What program tools or materials would be helpful for developing standards and checking compliance?
- How would you use incentive funding from DOE to comply with the Energy Policy Act of 1992 (EPAAct)?

To help states determine their needs, we sent out a mail survey that included descriptions PNL prepared of 27 hypothetical "tools" and materials that could be funded to help states meet the requirements of EPAAct. These "tools" ranged from developing new Model Energy Code training materials to putting the American Society of Heating, Refrigerating, and Air-Conditioning Engineers/Illuminating Engineering Society (ASHRAE/IES) Standard 90.1-89 into code language to creating a computerized residential code compliance program. We sent the survey to state agencies involved in building codes, including all 50 state energy offices. We asked the states to rank these hypothetical tools in terms of their usefulness in helping the states adopt, implement, and enforce building energy codes that comply with EPAAct.

1.1 Background

The Energy Policy Act requires each state to review its residential code and make a determination if it meets or exceeds the Council of American Building Officials (CABO) Model Energy Code (MEC 1992). The Act does not require states to revise their residential codes; however, if a state determines not to revise its code the act requires the state to notify the Secretary of DOE in writing to explain the reasons for such a determination. The Act requires that such written statements be made public.

States must review and update their commercial building energy efficiency codes to meet or exceed the provisions of ASHRAE/IES Standard 90.1-1989. Each state must certify to the Secretary that it has reviewed and updated the provisions of its commercial building code and must include a demonstration that the code meets or exceeds the provisions of ASHRAE/IES Standard 90.1-1989. The states have 2 years from the Act's enactment, until October 24, 1994, to certify to the Secretary that they have completed these processes.

1.2 Outline of This Report

Chapter 2 provides conclusions and recommendations. The methodology and results of the telephone and mail survey are described in Chapter 3. Appendix A contains descriptions of the hypothetical tools and ranking scores given to each by the states. Appendix B contains verbatim comments from the states regarding the tools.

2.0 Conclusions and Recommendations

Based on our mail survey it appears that most of the tools or materials that were viewed as most useful and that would be needed in the near future, are being or recently have been developed by DOE's BESP. Table 2.1 contains the 10 most useful tools according to the survey participants, along with their development status and an approximate expected completion date.

Table 2.1. Ten Most Useful Tools, Development Status, Timeline

Tool or Material:	Development Status	Estimated Start Date	Estimated Completion Date
ASHRAE/IES Standard 90.1-89 Training Materials	In Progress	6/94	12/94
ASHRAE/IES Standard 90.1-89 Code Manual	In Progress	6/94	10/94
Software for Section 13 (energy cost budget method) of ASHRAE/IES Standard 90.1-89	In Progress	1/94	11/95
MEC Training Materials - Workbook	In Progress	7/94	10/94
A Code Language Version of ASHRAE/IES 90.1-89	Completed	4/93	1/94
An MEC Users Manual (including a prescription compliance method)	In Progress	1/94	10/94
Computerized Residential Code Compliance Program	In Progress	1/94	10/94
Building Prototype Design and Construction Technique Guides for Code Compliance	Possible Future Research	Unknown	Unknown
A Computerized Commercial Code Compliance Calculation Program	Possible Future Research	Unknown	Unknown
Specifier Guides for Residential and Commercial Lighting Fixtures	Possible Future Research	Unknown	Unknown

While most of the tool and material descriptions were thought to be at least somewhat useful, the three tools with the lowest average usefulness ratings were

- the construction technology instruction media (CTIM) access software
- a DOE energy code certification program for architecture instructors, practicing architects, and energy engineers
- a building energy efficiency bulletin board system.

These may not warrant future development unless they can be modified so that they are more useful than they appeared to the states based on their description in the survey.

3.0 Data Collection

To conduct this needs assessment, PNL used a two-step approach: a telephone survey and a mail survey.

3.1 Telephone Survey Results

In the telephone survey, all 50 states were contacted. The states were asked a series of open-ended questions which included those shown in Table 3.1.

Table 3.1. Questions Regarding Technical Assistance, Tool Needs and Uses for EPart Incentive Funding

Question	Number of States Responding
What technical assistance would you like from DOE to implement residential and commercial building energy codes?	27
What tools would be helpful to you for standards development and compliance checking?	14
Where would you apply incentive funding from DOE to comply with the Energy Policy Act (EPart)?	19

3.1.1 Technical Assistance Needs

Twenty-seven states responded to the telephone survey question about what technical assistance they would like from DOE. Their responses, which are summarized below, include a variety of training needs and other requests.

Alaska said that videos would be very helpful. **Connecticut** indicated they would like help with "how-to" procedures for code enforcement, e.g., procedures for plans review that involve simple math. One format option for the procedures they mentioned involved a computer program that uses input from the builder to determine compliance with the codes. Connecticut is currently developing such a program. They also indicated a desire for training videos for single-family construction showing correct and incorrect application of techniques. The videos should include "how-to" and "why-you-are-doing-it" explanations. **Delaware** responded that they have just begun to discuss their needs. **Iowa** said their building officials find it difficult to perform the calculations because they are not engineers; the calculations associated with building codes are often viewed as being too complex

for the average inspector. Iowa also would like to see some explanation or justification of why they should adopt the codes associated with EAct.

Kentucky indicated they wanted simpler codes, codes that could be understood by building owners. They felt the codes should be more specification-oriented, i.e., identify the amount of insulation or the thermal envelop width, etc., rather than relying on or requiring calculations. Louisiana would like information on the negative consequences if compliance with EAct is not met. They want to use the information to convince the state legislature to adopt new codes and comply with EAct. Maine indicated they wanted educational materials in camera-ready form that could be reproduced as needed and at cost. Michigan also indicated that educational materials were desired, specifically handouts for building officials. Minnesota said the lighting requirements associated with EAct are a "pain." Mississippi indicated they would like an educational package and help in communicating code information. Missouri would like an informal assistance guide.

Montana would like more training regarding EAct. Nebraska wants some form of computer modeling and cost estimates. Nebraska would also like a one-page compliance check sheet. Nevada said their entire state government is being reorganized and their two-person office could use any assistance available. New Jersey would like a report of DOE activities related to EAct direct from DOE that contains information on what other states are doing to comply with EAct. New York simply stated that anything available would be helpful. North Dakota indicated a need for anything that would make the code easier to interpret and use, especially the commercial code. Oregon indicated they would like to see a 12- to 18-month phase-in period for the EAct codes because the building officials will have a big learning curve. Pennsylvania would like to see a huge education effort aimed at the building industry and they would like ASHRAE to write its standards in code form. South Carolina would like training seminars for building officials and money for inspectors training. They would like to see mandatory requirements for building inspector licensing and training.

South Dakota wants to know what kind of guidance BESP could give them. Tennessee needs training programs that can teach their staff about the code in layman's terms. Vermont would like to know what other states are doing. Virginia feels that a "package" that explains the high points of EAct would be very helpful. West Virginia would like help in providing technical information on the actual ramifications associated with the new 1993 code. Wisconsin would like to see DOE play a bigger information dissemination role. Wyoming would like information to give to the state legislature to entice them into updating the code from 75 to 90.1. It will be 2 years before the legislature will meet and a bill updating 90.1 can be introduced.

3.1.2 Tool Needs

Only 14 states responded to the open-ended question about tool needs. Their responses are shown in Table 3.2 and summarized in Figure 3.1.

Table 3.2. Tool Needs Expressed by States

State	Tool Need
Illinois	Software that gives modifiable design options that comply with the energy code
Iowa	Software used to train code officials on energy savings calculations
Louisiana	Anything that is available would be helpful
Minnesota	Checklist forms similar to California's (but simpler); a practical lighting compliance program
Nevada	Anything that is available would be helpful
New Hampshire	Tools for educating design & enforcement professionals that would make training cheaper
New Jersey	A "layman's guide" for energy standard development and compliance checking
New York	Software/manuals that are specific to NY's conditions (e.g., economics, climate, etc.)
N. Carolina	Modeling software that would allow experiments with different materials to meet 90.1
North Dakota	Software/manuals for training and educating enforcement officials
Ohio	Software/manuals for training and educating enforcement officials
Pennsylvania	Technical manual with graphical description of code complying construction methods; a collection of printouts of performance design alternatives (like Minnesota fact sheets)
Tennessee	Additional information on a "Ball State software demonstration" (probably CERES code)
Wyoming	Anything that is available would be helpful

As Figure 3.1 illustrates, most of the tools mentioned in response to the open-ended telephone question were related to software and or manuals that could be used to train code officials and that could be used by the code officials in their daily work. If the software is to be used it must be extremely user friendly and it must reduce the time and effort the code official spends in determining code compliance.

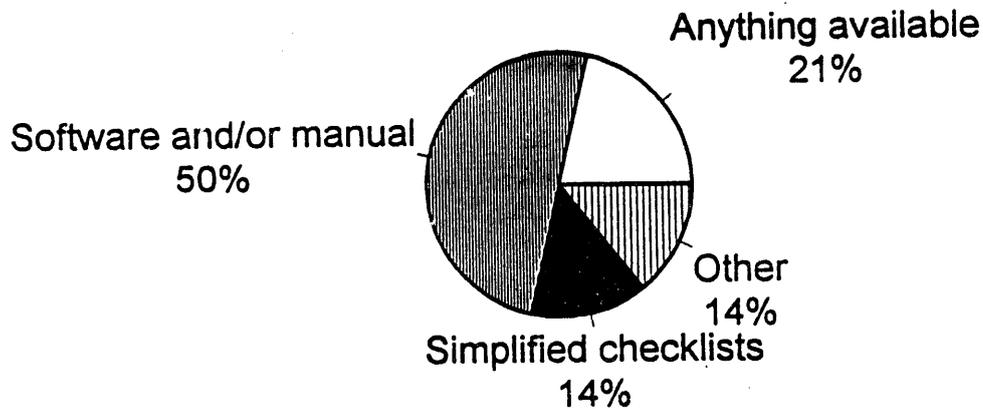


Figure 3.1. Breakdown of Tool Needs from Telephone Survey

3.1.3 Incentive Funding

Nineteen of the states responded to the question about incentive funding. Their answers are provided below and summarized in Figure 3.2.

Connecticut said they would use incentive funding for training materials because they feel their biggest enforcement problem is lack of understanding of the codes. **Idaho** indicated incentive funding would be used for training. **Kansas** indicated they would use incentive funding to implement a Home Energy Rating System (HERS). **Louisiana** stated they would use money for training. **Minnesota** said they would apply the funding toward training practitioners, targeting first building officials then lighting designers. **Mississippi** would apply the funding to code implementation.

Nebraska said incentive funding would be used for training and subsidizing costs for out-of-state inspectors (human resources). It would also go toward the production of training materials. **Nevada** stated incentive funding would be used for training. **New Hampshire** indicated that funding would be used for training design and enforcement professionals. **New York** stated it would be used for contractual activities under their control; to assess the impact of EPAAct; and to educate design and enforcement officials and, if fiscally possible, building professionals. **North Carolina** would use incentive funding to train inspectors and contractors and **North Dakota** would use it to train enforcement officials and contractors. **Ohio** indicated that incentive funding would be used to first train enforcement officials and, if enough money were available, they would train contractors. **Oregon** indicated the funds would be used for training. **Pennsylvania** would use the funds to pay for printing and distributing of camera-ready materials supplied by DOE. **Rhode Island** would use the funds in two areas: 1) to provide greater insulation values in existing buildings and 2) to buy more energy-efficient equipment such as heating and hot-water units for rental units.

Tennessee has a priority on training courses; they would also like to create a "buy-down" program with start-up monies. **Virginia** has something called the "Code Academy" that needs more

funding. Anytime there is an update to the codes, the building officials can get additional training through the Academy. Wyoming indicated that any money would be used for training designers, inspectors, and contractors.

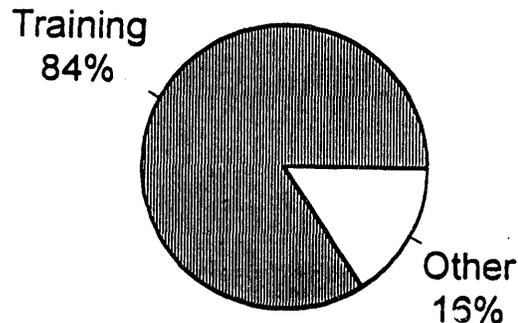


Figure 3.2. Uses for Incentive Funding from Telephone Survey

Many of the states indicated they would apply incentive funding to training activities directed at code enforcement personnel, designers, and contractors if enough money is available. Given the current environment surrounding the Federal budget, it is not likely that enough money will be available to meet all these training needs.

Washington state has developed an innovative solution that might be effective in reducing the shortfall for other states as well. The Washington State Building Code Council worked with the state's utilities and the contractors' association to create a public/private partnership that would provide training and code implementation tools for the state's general contractors. Under the agreement a non-profit corporation was established by the utilities to pay for the training provided by an association of general contractors. The agreement calls for a 3-year, \$4.3 million budget to develop materials, provide training, and get the contractors up to speed on the new code.

3.2 Mail Survey Method and Results

Because many of the states were either unable or unwilling to respond to the open-ended telephone questions regarding tool needs, we decided to send out a mail survey.

We mailed 108 surveys to state energy offices or code organizations in each of the 50 states, Washington, D.C., and six trust territories. In many instances, a survey was sent to a state's energy office as well as to another state agency identified as responsible for or involved with the state's building codes. Twenty-two states and one trust territory have sent in at least one survey response and six states have sent in two responses for a total of 35 responses received to date.

The surveys contained the 27 mock tool/material descriptions we had prepared. We hoped that, by asking the states to provide feedback on something tangible (i.e., the mock tool descriptions), the

survey would elicit a better response than was obtained by asking open-ended questions over the telephone. Results of the tool/materials ranking are discussed in Section 3.2.1. The respondents were also asked to characterize their state's commercial and/or residential building energy code development/implementation processes; these results are shown in Section 3.2.2. They were also asked if they would be interested in serving on a number of different residential and/or commercial code task forces; these results are shown in Section 3.2.3.

3.2.1 State Ranking of Hypothetical Code Implementation Tools

The respondents were asked to review and rate the 27 tools, using a 7- point scale, based on how useful they would find the tool or material in establishing or increasing compliance with building energy codes in their state. The respondents were then asked if they thought the tool would meet the needs their state will have in the next 12 months, 2 to 5 years, or 5 to 10 or more years. PNL hoped to be able to use the information on the needs time frame to prioritize future tool development efforts.

Once the respondents had reviewed the entire set of 27 tools and material descriptions they were asked to identify the five tools or materials they thought would be the most useful in establishing or enforcing building energy codes in their state (i.e., their Top Five choices).

The tools are shown in Table 3.3 in order of their "average usefulness" rating. Most of the tools or materials viewed as "most useful" are either under development or have recently been developed by DOE. Some of these tools and materials were developed by other organizations. In some cases the states indicated that DOE should support the other organizations' efforts, either by helping to publicize the work being done or by aiding states in the adoption and implementation of the tool or materials that others have developed. For example the mock tool description associated with the specifier guides for windows, skylights, doors, and other building components drew comments from a number of states. The states suggested that DOE should adopt the National Fenestration Rating Council (NFRC) Program and use the ratings established in that standard for evaluating energy savings and product costs. The respondent from Washington suggested that for other building components (not covered by NFRC) a DOE labeling program or DOE assistance to industry groups to develop a labeling program and/or specifier guide would be moderately useful.

Another tool that drew comments from a number of states was the computerized residential code compliance calculation program. Some states were aware of state-developed code compliance programs already in existence. For example a respondent from Iowa indicated that WATTSUN 5.2 is currently available from the Washington State Energy Office (WSEO). A respondent from Idaho indicated he would like to see the MEC become one of many paths that are available on the WATTSUN program as developed by WSEO. The respondent went on to state that WATTSUN is used for all energy code compliance documentation in Idaho; code officials, builders, and utility staff there have been trained on WATTSUN for the past 8 years so it doesn't make sense to bring in a totally new program. The respondent from Washington indicated that WATTSUN had become an industry standard with over 1,500 copies circulated statewide, and that the U.S. Department of

Housing and Urban Development (HUD) recently revised compliance specifications for federal funding on new residential buildings and accepts WATTSUN for MEC equivalence in Washington.

Table 3.3. Tools and Materials in Order of Estimated Usefulness

Res. or Com?	Tool/Material	Usefulness? 1=low 7=high	# of "Top 5" Votes	Meet State Needs in:		
				12 Months?	2-5 Years?	5+ Years?
C	ASHRAE/IES Standard 90.1-89 Training materials	5.8	16	14, 47%	14, 47%	2, 7%
C	ASHRAE/IES Standard 90.1-89 Code Manual	5.7	16	13, 42%	14, 45%	4, 13%
C	Software for Section 13 (energy cost budget method) of 90.1-89	5.6	10	10, 32%	18, 58%	3, 10%
R	MEC training materials	5.5	15	18, 56%	13, 41%	1, 3%
C	ASHRAE/IES 90.1-89 Code language version	5.4	10	12, 43%	13, 46%	3, 11%
R	MEC users manual	5.3	14	15, 46%	16, 49%	2, 6%
R	Computerized residential code compliance program	5.0	14	12, 41%	14, 48%	3, 10%
C	Building prototype design and construction technique guides for code complying buildings	5.0	4	5, 17%	23, 77%	2, 7%
C	Computerized commercial code compliance calculation program	5.0	9	7, 23%	20, 65%	4, 13%
B	Specifier guides for residential and commercial lighting fixtures	4.8	3	11, 39%	16, 57%	1, 4%
C	Computer automated code compliance & building permit forms	4.7	11	5, 17%	22, 76%	2, 7%
B	Ventilation compliance guides for building energy codes	4.7	6	10, 36%	13, 46%	5, 18%
C	Building component energy efficiency trade-off guide	4.7	4	8, 30%	16, 59%	3, 11%
B	Specifier guides for windows, skylights, doors & other building components	4.6	2	10, 37%	14, 52%	3, 11%

Res. or Com?	Tool/Material	Usefulness? 1=low 7=high	# of "Top 5" Votes	Meet State Needs in:		
				12 Months?	2-5 Years?	5+ Years?
B	Energy code compliance construction technique demonstration videos	4.3	2	4, 14%	22, 79%	2, 7%
R	BSRA/ASHRAE 90.2-1993 Code language version	4.3	6	6, 23%	16, 62%	4, 15%
B	Advanced energy design software	4.3	1	3, 13%	14, 61%	6, 26%
B	Energy code compliance design curriculum for residential and commercial buildings	4.3	6	5, 20%	14, 56%	6, 24%
R	Commercial construction method life-cycle cost index	4.2	3	3, 11%	20, 74%	4, 15%
R	Compendium of energy analysis software tools & training	4.2	1	6, 21%	21, 72%	2, 7%
R	EPAAct92-ASHRAE 90.1 design impacts video tape	4.0	4	8, 31%	18, 69%	0, 0%
R	Interactive computer-aided teaching for design students	4.0	1	3, 12%	13, 50%	10, 39%
R	Video tape on economic advantages of energy-efficient commercial buildings for clients	3.9	6	6, 23%	19, 73%	1, 11%
B	A building energy efficiency bulletin board system (BEEBBS)	3.8	1	3, 12%	19, 73%	4, 15%
B	DOE energy code certification program for architecture instructors, practicing architects, and energy engineers	3.8	1	7, 32%	8, 36%	7, 32%
B	Construction technology instruction media (CTIM) access software	3.7	1	3, 13%	14, 58%	7, 30%
R	State-by-state inventory of utility programs for new construction	3.4	1	7, 29%	14, 58%	3, 13%

R = residential, C = commercial, B = both

A respondent from Indiana mentioned CERECODE a computer program developed at Ball State University; the software shows compliance with the 1992 CABO MEC. The respondent indicated Ball State has had some success marketing the code in Indiana. In the initial round of telephone contacts, a respondent from Connecticut indicated that their state was currently developing a computer program that allows input from the builder and then determines compliance with the codes. Based on these comments, DOE might want to follow a strategy of supporting the revision and updating of existing software programs.^(a)

From the point of view of the states some of the tools and materials should not be recommended for development, at least not without obtaining more feedback as to how they could be made more useful. The tools that had the lowest average usefulness ratings were

- the construction technology instruction media (CTIM) access software
- a DOE energy code certification program for architecture instructors, practicing architects, and energy engineers
- a building energy efficiency bulletin board system.

The first two tools are directed at architects and the design community; it is not surprising the states gave them low ratings since they are not likely to be used directly by the states. The bulletin board system is currently funded as an FY94 BESP activity. It might be appropriate to re-evaluate the decision to fund this activity or perhaps it should be modified so that what is developed will be of use to the state code organizations.

3.2.2 State Code Process Characterization

The respondents were asked to characterize their state's commercial and/or residential building energy code development/implementation processes by indicating whether or not they agreed with each of the statements in Table 3.4. Based on the responses it appears that many states are modifying their commercial and residential codes as a result of EAct. One respondent stated that EAct has been a big help in getting the leverage the energy office needs to promote legislation for an upgraded energy code. Table 3.4 contains a summary of the responses from the states.

(a) Appendix A contains a more extensive set of verbatim state comments associated with each of the tool/material descriptions. Anyone responsible for developing these tools or materials may want to examine the feedback from a group of potential users.

Table 3.4. Characterization of the State's Commercial and Residential Building Energy Code Development and Implementation Processes

Statement	States
State does not have a commercial process	AK, ID, KS, LA, MO, GUAM
State does not have a residential process	KS, LA, MO, GUAM
State is currently developing a commercial process	AL, AR, CO, LA, MO, MT, NE, NV, SD
State is currently developing a residential process	AL, AR, CO, ID, LA, MO, MT, NE, NV, SD
State has an established commercial process	GA, IA, IN, MA, MD, MN, NH, NY, NC, OR, SC, VA, WA
State has an established residential process	AK, GA, IA, IN, MA, MD, MN, MT, NC, NH NY, OR, SC, VA, WA, WI
Commercial process is being modified because of EAct	AR, GA, IN, MA, MT, NC, NE, NH, NV, SC, WI
Residential process is being modified because of EAct	AR, GA, HI, MA, MT, NC, NE, NH, NV, SC

3.2.3 Task Force Participation

The respondents were also asked if they would be interested in serving on a number of different task forces if DOE's BESP were to establish them. The task forces covered the following areas: residential or commercial code development, code implementation, code enforcement, and residential or commercial utility programs. Table 3.5 contains a summary of the responses from the states.

States were most enthusiastic about participating in a task force on residential code development and least enthusiastic about participating in code enforcement or utility programs task forces.

Table 3.5. States Willing to Participate in Possible Task Forces

Task Force Focus	States Willing to Serve on Task Force
Commercial Code Development Residential Code Development	ID, KS, LA, MA, NC, NY, OR, SC, VA, WA AK, CO, GA, ID, KS, LA, MA, MN, NC, NE, NY, SC, VA, WA
Commercial Code Implementation Residential Code Implementation	ID, KS, LA, MA, NC, NY, OR, SC, SD, WA AK, AR, CO, ID, KS, MA, NC, NE, NY, SC, SD, WA
Commercial Code Enforcement Residential Code Enforcement	CO, ID, IN, LA, MA, OR, NC, SC AR, IN, MA, NC, NE, SC
Commercial Utility Programs Residential Utility Programs	KS, MA, NC, SC KS, MA, NC, SC

APPENDIX A

**COMPLETE TOOL AND MATERIAL DESCRIPTIONS
AND STATE EVALUATION RESULTS**

INSTRUCTIONS: Please read each of the following descriptions of tools or materials and respond to the questions that follow each of the descriptions. After you have read all the descriptions you will be asked to identify the 5 tools or materials that you feel would be the most useful (the 5 can be a mixture from the 3 tool sets). **PLEASE RESPOND BY FEBRUARY 28, 1994**

Tool Set 1: Residential Implementation Tools & Materials

1.1 Title: BSR/ASHRAE Standards 90.2-1993 Code Language Version

Description: A codified version of Standard 90.2 will be developed to assist states in adopting the standard. This document will use a building codes format to present the requirements contained in Standard 90.2. Only requirements that are required in the code will be included in the codified document. Recommendations while in the Standard, will not be included in the codified document.

Number of Times Selected as Most Useful: 6

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		4	5	2	4	4	7		5		3
		11.8%	14.7%	5.9%	11.8%	11.8%	20.6%		14.7%		8.8%
											missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 26	<u>6</u> 12 months	<u>16</u> 2 to 5 years	<u>4</u> 5 to 10+ years	missing = 9
	23.1%	61.5%	15.4%	

1.2 Title: Model Energy Code (MEC) Users Manual

Description: A users' manual will be developed for the Model Energy Code. This document will contain sections targeted to designers, contractors, plans examiners and field inspectors. It will be developed to facilitate the adoption, enforcement and implementation of the essential requirements of the MEC. The manual will be developed by DOE as a critical implementation tool for the states as well as to assist in training and to assist the code enforcement efforts by states and local agencies.

Number of Times Selected as Most Useful: 14

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 35		2	0	4	4	6	6		13		0
		5.7%	0.0%	11.4%	11.4%	17.1%	17.1%		37.1%		0.0%

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 33	<u>15</u> 12 months	<u>16</u> 2 to 5 years	<u>2</u> 5 to 10+ years	missing = 2
	45.5%	48.5%	6.1%	

1.3 Title: MEC Training Materials

Description: Training and other support materials will be developed to help implement the MEC. This activity will translate the technical materials from the users manual into a training seminar, workbook, and other training aids. This will enable code enforcement agencies to provide information on how to comply with and enforce the MEC.

Number of Times Selected as Most Useful: 15

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 35		3	0	1	3	9	3		16		0
		8.6%	0.0%	2.9%	8.6%	25.7%	8.6%		45.7%		0

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

	<u>18</u> 12 months	<u>13</u> 2 to 5 years	<u>1</u> 5 to 10+ years	missing = 3
	56.2%	40.6%	3.1%	

A.1

Tool Set 1 - Residential Implementation Tools & Materials

1.4 Title: Computerized Residential Code Compliance Calculation Program

Description: DOE could develop a simple, user-friendly computer program that will calculate code compliance through a comparison against an MEC code-equivalent structure (for compliance demonstration). This program could have the capacity to calculate projected energy consumption, and to identify energy use/loss for each component of the building envelope. It could also have the potential to compare various advanced construction strategies with each other, for the purpose of comparing estimated energy consumption differences. This would allow users to explore impacts of changes in envelop performance, air infiltration rates, orientation and equipment efficiency. Designers, code officials and builder would be able to analyze projected energy consumption by component. It could help them decide which features of the building envelope can be cost-effectively upgraded to improve the efficiency of the house.

Number of Times Selected as Most Useful: 14

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X
<i>N</i> = 35	3 8.6%	2 5.7%	2 5.7%	7 20.0%	4 11.4%	4 11.4%	13 37.1%	0 0.0%

Do you think this tool or material will meet the needs your state will have in the next....
(Please check only one)

<i>N</i> = 29	<u>12</u> 12 months 41.4%	<u>14</u> 2 to 5 years 48.3%	<u>3</u> 5 to 10+ years 10.3%	missing = 6
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Tool Set 2 - Commercial Implementation Tools & Materials

2.1 Title: ASHRAE/IES Standards 90.1-1989 Code Language Version

Description: A codified version of Standard 90.1 will be developed to assist states in adopting the standard. This document will use a building codes format to present the requirements contained in Standard 90.1. Only requirements that are required in the code will be included in the codified document. Recommendations while in the Standard, will not be included in the codified document.

Number of Times Selected as Most Useful: 10

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		2	2	3	0	5	8	13		1	
		5.9%	5.9%	8.8%	0.0%	14.7%	23.5%	38.2%		2.9%	

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.....
(Please check only one)

N = 28	<u>12</u> 12 months	<u>13</u> 2 to 5 years	<u>3</u> 5 to 10+ years	missing = 7
	42.9%	46.4%	10.7%	

2.2 Title: ASHRAE/IES Standard 90.1-89 Code Manual

Description: Following the publication of the codified document of the ASHRAE/IES Standard 90.1-89 in October 1993, a users' manual will be developed. This document will contain sections targeted to architects, engineers, lighting designers, contractors, plans examiners and field inspectors. It will be developed to facilitate the adoption, enforcement and implementation of the essential requirements of the Standard 90.1. The manual will be developed by DOE as a critical implementation tool for the states as well as to assist in training and to assist the code enforcement efforts by states and local agencies.

Number of Times Selected as Most Useful: 16

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		0	1	3	3	6	4	16		1	
		0.0%	2.9%	8.8%	8.8%	17.6%	11.8%	47.1%		2.9%	

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.....
(Please check only one)

	<u>13</u> 12 months	<u>14</u> 2 to 5 years	<u>4</u> 5 to 10+ years	missing = 4
	41.9%	45.2%	12.9%	

2.3 Title: ASHRAE/IES Standard 90.1-89 Training Materials

Description: Training and other support materials will be developed to help implement the ASHRAE/IES Standard 90.1-89. As a continuation of the task that helped develop the code document for the 90.1 Standard, this activity will translate the technical materials from the users manual into a training seminar, workbook, and other training aids. This will enable code enforcement agencies to provide information on how to comply with and enforce Standard 90.1.

Number of Times Selected as Most Useful: 16

How useful would you find this tool or material in establishing or increasing compliance with building energy codes your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		2	1	1	2	4	6	17		1	
		5.9%	2.9%	2.9%	5.9%	11.8%	17.6%	50.0%		2.9%	

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.....
(Please check only one)

N = 30	<u>14</u> 12 months	<u>14</u> 2 to 5 years	<u>2</u> 5 to 10+ years	missing = 5
	46.7%	46.7%	6.7%	

Tool Set 2 - Commercial Implementation Tools & Materials

2.4 Title: Development of Software for Section 13 (Energy Cost Budget Method) of ASHRAE/IES Standard 90.1-89

Description: This task will produce new compliance software and supporting documentation for use with Standard 90.1. The software will integrate envelope, mechanical, and electrical requirements within a single shell, thereby providing a consistent user interface. It will automatically produce a reference building and corresponding energy cost budget based on the users input of their proposed design. Compliance forms will also be printed automatically by the program.

Number of Times Selected as Most Useful: 10

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

N = 34	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
	0	2	1	2	9	8	12	2
	0.0%	5.9%	2.9%	5.9%	26.5%	17.6%	35.3%	5.9%

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 31	<u>10</u> 12 months	<u>18</u> 2 to 5 years	<u>3</u> 5 to 10+ years	missing = 4
	32.3%	58.1%	9.7%	

2.5 Title: Video Tape on Economic Advantages of Energy Efficient Commercial Buildings For Clients

Description: DOE could create a video tape presenting the life-cycle cost savings and occupancy satisfaction levels associated with building designs complying with ASHRAE 90.1. The tape would present arguments for accepting the increased initial costs and the long term pay-back associated with constructing a building that meets ASHRAE 90.1. The tape would also present information on resale value enhancement, and occupant satisfaction as it relates to occupancy turnover. The video would be an "unbiased" sales tool prepared by the U.S. DOE that should lower the client's resistance to constructing a building with a higher first cost (that will give the design team a larger fee) but will also have lower operating costs. Designers could provide the video to potential clients to illustrate the advantages of building to meet ASHRAE 90.1. The video will focus on mitigating the clients reluctance to building a structure with a higher first cost.

Number of Times Selected as Most Useful: 6

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

N = 34	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
	6	6	2	5	6	1	7	1
	17.6%	17.6%	5.9%	14.7%	17.6%	2.9%	20.6%	2.9%

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 26	<u>6</u> 12 months	<u>19</u> 2 to 5 years	<u>1</u> 5 to 10+ years	missing = 9
	23.1%	73.1%	3.8%	

2.6 Title: Building Component Energy Efficiency Trade-Off Guide

Description: DOE could develop an energy efficiency per dollar rating for different models of windows, doors, skylights, insulation, HVAC equipment and lighting fixtures that could be used in efficiency trade-off calculations to demonstrate compliance with ASHRAE 90.1. The guide would also contain examples of typical trade offs between HVAC efficiencies, thermal envelope efficiencies, and lighting efficiencies. [Extensive tables containing efficiency/dollar ratings of different building components. The trade-off examples would be in story problem/solution format.] The component efficiency trade-off guide would help architects and engineers design buildings that meet ASHRAE 90.1 by using examples of previously illustrated acceptable efficiency trade-offs.

Number of Times Selected as Most Useful: 4

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

N = 34	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
	3	3	3	4	5	8	6	2
	8.8%	8.8%	8.8%	11.8%	14.7%	23.5%	17.6%	5.9%

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 27	<u>8</u> 12 months	<u>16</u> 2 to 5 years	<u>3</u> 5 to 10+ years	missing = 8
	29.6%	59.3%	11.1%	

Tool Set 2 - Commercial Implementation Tools & Materials

2.7 Title: EPACT92-ASHRAE 90.1 Design Impacts Video Tape

Description: DOE could develop a video tape explaining the impacts practicing architects will face as the result of EPACT92. The video tape would explain the "design implications" that the ASHRAE 90.1 standard would have on commercial designs and construction practices. Designers could view the tape and use the information to help themselves prepare to create commercial building designs that comply with ASHRAE 90.1.

Number of Times Selected as Most Useful: 4

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		5	4	4	4	6	5	4	2		
		14.7%	11.8%	11.8%	11.8%	17.6%	14.7%	11.8%	5.9%		

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 26	<u>8</u> 12 months	<u>18</u> 2 to 5 years	<u>0</u> 5 to 10+ years	missing = 9
	30.8%	69.2%		

2.8 Title: Building Prototype Design and Construction Technique Guides For Code Complying Buildings

Description: DOE could develop a design and construction technique handbook for different building prototypes (e.g., hospital, warehouse, school, library, office building, banks, doctors office, dentist office, etc.). Each guidebook would contain information on energy code compliance strategies used for different types of buildings and each would contain a components list of energy efficient equipment and building materials appropriate for the building's expected use. The guides could provide builders and designers with a code complying model or prototype for different types of buildings. They could use the information in the guide books as an example for methods and materials that result in a building that meets ASHRAE 90.1.

Number of Times Selected as Most Useful: 4

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		1	2	3	5	8	9	6	0		
		2.9%	5.9%	8.8%	14.7%	23.5%	26.5%	17.6%			

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 30	<u>5</u> 12 months	<u>23</u> 2 to 5 years	<u>2</u> 5 to 10+ years	missing = 5
	16.7%	76.7%	6.7%	

2.9 Title: Compendium of Energy Analysis Software Tools and Training

Description: DOE could compile a list of computer programs useful in analyzing energy usage in new buildings built to comply with ASHRAE 90.1 and evaluate energy conservation options in terms of savings and payback. DOE could also develop video based training tapes for each of the tools identified. Designers, and code officials could review the information presented on the selected computer program(s) they prefer and then go out and obtain them. They could also then request a copy of the relevant video based training from DOE.

Number of Times Selected as Most Useful: 1

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		2	2	6	9	8	4	2	1		
		5.9%	5.9%	17.6%	26.5%	23.5%	11.8%	5.9%	2.9%		

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 29	<u>6</u> 12 months	<u>21</u> 2 to 5 years	<u>2</u> 5 to 10+ years	missing = 6
	20.7%	72.4%	6.9%	

Tool Set 2 - Commercial Implementation Tools & Materials

2.10 Title: Commercial Construction Method Life-Cycle Cost Index

Description: DOE could develop life-cycle cost figures for different building/construction methods and operating costs for buildings meeting the ASHRAE standard 90.1 - "Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings". Different commonly used commercial construction methods would be analyzed to develop life-cycle cost index figures for the energy used by the construction method and the resulting energy use of the building while it is occupied. (This analysis may also look at the energy used to manufacture the building materials being used in the construction - lumber, steel, cement etc.). This information would be summarized from a series of case studies on buildings constructed using the different methods and would result in a single cost rating for each construction method. Designers could use the information when presenting their recommendations to clients regarding the overall cost effectiveness or their designs for buildings that comply with ASHRAE 90.1.

Number of Times Selected as Most Useful: 2

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
N = 34	2	6	5	3	6	9	2	1
	5.9%	17.6%	14.7%	8.8%	17.6%	26.5%	5.9%	2.9%

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 27	<u>3</u> 12 months	<u>20</u> 2 to 5 years	<u>4</u> 5 to 10+ years	missing = 8
	11.1%	74.1%	14.8%	

2.11 Title: Computer Automated Code Compliance/Building Permit Forms

Description: DOE could develop a software package that would automate preparation of designs and typical paperwork requirements associated with the design compliance/building permitting process. DOE could develop a package that is relevant to commercial buildings and compliance with ASHRAE 90.1 and compliance with MEC for residential building. The forms could also be used by Building Code Officials when they do on site inspections. Designers could use the software to automate their design compliance/building permitting paperwork process. The software could save them significant amounts of time in preparing forms and doing calculations. The Building Code Officials could use the forms in the field during on-site inspections.

Number of Times Selected as Most Useful: 12

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
N = 34	2	5	3	3	6	3	10	2
	5.9%	14.7%	8.8%	8.8%	17.6%	8.8%	29.4%	5.9%

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 29	<u>5</u> 12 months	<u>22</u> 2 to 5 years	<u>2</u> 5 to 10+ years	missing = 5
	17.2%	75.9%	6.9%	

2.12 Title: Computerized Commercial Code Compliance Calculation Program

Description: DOE could develop a simple, user-friendly computer program that will calculate code compliance through a comparison against an ASHRAE 90.1 code-equivalent structure (for compliance demonstration). This program could have the capacity to calculate projected energy consumption, and to identify energy use/loss for each component of the building envelope. It could also have the potential to compare various advanced construction strategies with each other, for the purpose of comparing estimated energy consumption differences. This would allow users to explore impacts of changes in envelop performance, air infiltration rates, orientation and equipment efficiency. Designers, code officials and builder would be able to analyze projected energy consumption by component. It could help them decide which features of the building envelope can be cost-effectively upgraded to improve the efficiency of the building.

Number of Times Selected as Most Useful: 9

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
	0	2	6	3	8	8	6	1
	0.0%	5.9%	17.6%	8.8%	23.5%	23.5%	17.6%	2.9%

missing = 1

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 31	<u>7</u> 12 months	<u>20</u> 2 to 5 years	<u>4</u> 5 to 10+ years	missing = 4
	22.6%	64.5%	12.9%	

Tool Set 2 - Commercial Implementation Tools & Materials

2.13 Title: State by State Inventory of Utility Programs For New Construction

Description: The U.S. Department of Energy (DOE) could accumulate and summarize information on utility sponsored new construction demand side management (DSM) programs that would help a new building comply with ASHRAE 90.1. The information would be compiled on a state by state basis. The information would explain the types of equipment, or practices that are being advocated by the utility program and would include contact names and phone numbers. It would also include information on rebate/incentive amounts, qualification criteria and program eligibility. The information could identify the goal of each program (e.g., conservation/energy use reduction, or peak load shifting).

Designers, builders, and code officials could provide the information about the utility's programs to their clients (e.g., commercial building owner, or developer) in an effort to promote the construction of buildings that comply with ASHRAE 90.1.

Number of Times Selected as Most Useful: 1

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X
N = 35	5 14.3%	10 28.6%	4 11.4%	5 14.3%	4 11.4%	4 11.4%	2 5.7%	1 2.9%

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 24	<u>7</u> 12 months 29.2%	<u>14</u> 2 to 5 years 58.3%	<u>3</u> 5 to 10+ years 12.5%	missing = 11
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2.14 Title: Interactive Computer Aided Teaching For Design Students

Description: DOE could develop an interactive computer teaching package that moves through the design process posing more complex problems related to the ASHRAE 90.1 code for architecture students to solve as their experience increases. Over a 4 or 5 year program graduates should be able to become very sophisticated in decision making related to code complying designs. The program could present typical objections from clients regarding code complying design options and provide the students with response strategies. Students could participate in a simulation of the design process with a hypothetical client. The simulation will pose relatively simple design requirements for a low cost building to 1st, or 2nd year students. The simulations would become more complex for advanced students with higher more extensive design requirements for a higher cost building.

Number of Times Selected as Most Useful: 1

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X
N = 35	5 14.3%	5 14.3%	3 8.6%	6 17.1%	5 14.3%	4 11.4%	5 14.3%	2 5.7%

Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)

N = 26	<u>3</u> 12 months 11.5%	<u>13</u> 2 to 5 years 50.0%	<u>10</u> 5 to 10+ years 38.5%	missing = 9
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Tool Set 3 - Commercial or Residential Implementation Tools & Materials																																															
<p>3.1 Title: Ventilation Compliance Guides For Building/Energy Codes</p> <p>Description: DOE could develop recommendations for meeting ventilation rates for different building codes that also meet with provisions in energy codes for ventilation. Designers could use the guides to design buildings to meet the ventilation rate requirements under building codes and energy codes.</p> <p><i>Number of Times Selected as Most Useful: 6</i></p>	<p>How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">Not at all useful</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Extremely useful</td> <td style="text-align: center;">Don't Know</td> </tr> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">X</td> </tr> <tr> <td><i>N = 35</i></td> <td style="text-align: center;">1</td> <td style="text-align: center;">5</td> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">8</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">0</td> </tr> <tr> <td></td> <td style="text-align: center;">2.9%</td> <td style="text-align: center;">14.3%</td> <td style="text-align: center;">8.6%</td> <td style="text-align: center;">14.3%</td> <td style="text-align: center;">22.9%</td> <td style="text-align: center;">17.1%</td> <td style="text-align: center;">20.0%</td> <td></td> </tr> </table> <p>Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td><i>N = 28</i></td> <td style="text-align: center;"><u>10</u> 12 months</td> <td style="text-align: center;"><u>13</u> 2 to 5 years</td> <td style="text-align: center;"><u>5</u> 5 to 10+ years</td> <td style="text-align: center;"><i>missing = 7</i></td> </tr> <tr> <td></td> <td style="text-align: center;">35.7%</td> <td style="text-align: center;">46.4%</td> <td style="text-align: center;">17.9%</td> <td></td> </tr> </table>		Not at all useful						Extremely useful	Don't Know		1	2	3	4	5	6	7	X	<i>N = 35</i>	1	5	3	5	8	6	7	0		2.9%	14.3%	8.6%	14.3%	22.9%	17.1%	20.0%		<i>N = 28</i>	<u>10</u> 12 months	<u>13</u> 2 to 5 years	<u>5</u> 5 to 10+ years	<i>missing = 7</i>		35.7%	46.4%	17.9%	
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<p>3.2 Title: DOE Energy Code Certification Program For Architecture Instructors, Practicing Architects, and Energy Engineers</p> <p>Description: DOE could develop a set of video courses on the use of energy design tools used to help building designs comply with building energy codes and on energy code compliance tactics. The video courses would be targeted at faculty of the nations' schools of Architecture, practicing architects, and energy engineers. Architecture faculty or practicing designers could request a set of video tapes and evaluation forms from DOE's Building Energy Standards Program. Faculty or practicing designers would view the video and complete the evaluation forms and send the completed forms to DOE. DOE would issue the relevant certificate. The code compliance design tool certification could become something practicing designers could use to market themselves when competing with other designers in the marketplace.</p> <p><i>Number of Times Selected as Most Useful: 1</i></p>	<p>How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">Not at all useful</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Extremely useful</td> <td style="text-align: center;">Don't Know</td> </tr> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">X</td> </tr> <tr> <td><i>N = 34</i></td> <td style="text-align: center;">7</td> <td style="text-align: center;">4</td> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">2</td> <td style="text-align: center;">5</td> <td style="text-align: center;">2</td> </tr> <tr> <td></td> <td style="text-align: center;">20.6%</td> <td style="text-align: center;">11.8%</td> <td style="text-align: center;">8.8%</td> <td style="text-align: center;">14.7%</td> <td style="text-align: center;">17.6%</td> <td style="text-align: center;">5.9%</td> <td style="text-align: center;">14.7%</td> <td style="text-align: center;">5.9%</td> </tr> </table> <p style="text-align: right;"><i>missing = 1</i></p> <p>Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td><i>N = 22</i></td> <td style="text-align: center;"><u>7</u> 12 months</td> <td style="text-align: center;"><u>8</u> 2 to 5 years</td> <td style="text-align: center;"><u>7</u> 5 to 10+ years</td> <td style="text-align: center;"><i>missing = 13</i></td> </tr> <tr> <td></td> <td style="text-align: center;">31.8%</td> <td style="text-align: center;">36.4%</td> <td style="text-align: center;">31.8%</td> <td></td> </tr> </table>		Not at all useful						Extremely useful	Don't Know		1	2	3	4	5	6	7	X	<i>N = 34</i>	7	4	3	5	6	2	5	2		20.6%	11.8%	8.8%	14.7%	17.6%	5.9%	14.7%	5.9%	<i>N = 22</i>	<u>7</u> 12 months	<u>8</u> 2 to 5 years	<u>7</u> 5 to 10+ years	<i>missing = 13</i>		31.8%	36.4%	31.8%	
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Tool Set 3 - Commercial or Residential Implementation Tools & Materials
3.3 Title: Specifier Guides For Windows, Skylights, Doors Other Building Components

Description: DOE could develop a database containing evaluations of the energy performance of different building components and provide an index measure of the windows' or doors' cost to energy performance ratio. DOE would produce a handbook or computer database containing all the Windows, Skylights, Doors, etc. that meet the MEC or ASHRAE 90.1 energy codes. DOE could develop easily understandable labels similar to the energy guide labels used on appliances. Use of the labels would be voluntary by industry. The information in the guides could help users select and identify energy efficient windows and doors to be used in new construction.

Number of Times Selected as Most Useful: 2

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 34		5	0	3	8	5	6	7	7	0	
		14.7%	0.0%	8.8%	23.5%	14.7%	17.6%	20.6%			

missing = 1

Do you think this tool or material will meet the needs your state will have in the next....
(Please check only one)

N = 27	<u>10</u> 12 months	<u>14</u> 2 to 5 years	<u>3</u> 5 to 10+ years	missing = 8
	37.0%	51.9%	11.1%	

3.4 Title: Specifier Guides For Residential and Commercial Lighting Fixtures

Description: DOE could develop a database containing evaluations of the energy performance of different lighting fixtures and systems and provide an index measure of their cost to energy performance ratio. DOE would produce a handbook or computer database containing all the lighting fixtures that are best to use to meet the MEC or ASHRAE 90.1 energy codes. The information in the guides could help users select and identify energy efficient lighting fixtures to be used in new construction.

Number of Times Selected as Most Useful: 3

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful	1	2	3	4	5	6	Extremely useful	7	Don't Know	X
N = 35		2	2	2	9	5	9	5	5	1	
		5.7%	5.7%	5.7%	25.7%	14.3%	25.7%	14.3%		2.9%	

Do you think this tool or material will meet the needs your state will have in the next....
(Please check only one)

N = 28	<u>11</u> 12 months	<u>16</u> 2 to 5 years	<u>1</u> 5 to 10+ years	missing = 7
	39.3%	57.1%	3.6%	

Tool Set 3 - Commercial or Residential Implementation Tools & Materials
3.5 Title: A Building Energy Efficiency Bulletin Board System (BEEBBS)

Description: DOE could create a computer bulletin board containing information on energy efficient building design case studies, equipment and building material evaluations, an expertise index listing experts in different topics, permitted building variances under different building codes, and news on new methods and techniques for compliance with MEC and ASHRAE 90.1. The access to the bulletin board would be free to anyone who can dial in via modem. The bulletin would allow two way communication so users could find other users with similar interests or problems share how they handled a code related problems. Users would dial in and be able to work through a series of menus to search databases containing case studies, articles, code compliance information, etc. The users would also be able to interact with each other and form special discussion groups for particular topics that are of common concern.

Number of Times Selected as Most Useful: 2

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
N = 35	2	7	7	6	6	4	2	1
	5.7%	20.0%	20.0%	17.1%	17.1%	11.4%	5.7%	2.9%

Do you think this tool or material will meet the needs your state will have in the next....
(Please check only one)

N = 26	<u>3</u> 12 months	<u>19</u> 2 to 5 years	<u>4</u> 5 to 10+ years	missing = 9
	11.5%	73.1%	15.4%	

3.6 Title: Construction Technology Instruction Media (CTIM) Access Software

Description: DOE could develop a software package that enables all architecture and design schools to have access to the American Institute of Architects' Construction Technology Instruction Media (CTIM) databases without having to purchase proprietary software. Schools could obtain the software from DOE and install it on appropriate computer systems to form a link/network with the CTIM databases being developed.

Number of Times Selected as Most Useful: 12

How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)

	Not at all useful						Extremely useful	Don't Know
	1	2	3	4	5	6	7	X
N = 35	3	7	4	6	6	1	3	5
	8.6%	20.0%	11.4%	17.1%	17.1%	2.9%	8.6%	14.3%

Do you think this tool or material will meet the needs your state will have in the next....
(Please check only one)

N = 24	<u>3</u> 12 months	<u>14</u> 2 to 5 years	<u>7</u> 5 to 10+ years	missing = 11
	12.5%	58.3%	29.2%	

Tool Set 3 - Commercial or Residential Implementation Tools & Materials																			
<p>3.7 Title: Energy Code Compliance Construction Technique Demonstration Videos</p> <p>Description: DOE could develop video based training and demonstration of construction techniques and methods that produce residential and commercial structures that comply with the relevant building energy codes. These video tapes would be added to the CTIM databases, and would be appropriate for student as well as practicing architects. The videos could illustrate various construction techniques and methods that produce energy efficient buildings. This information could allow designer to know what the state of the art construction techniques can produce and provide them with some leverage when dealing with a builder/contractor.</p> <p><i>Number of Times Selected as Most Useful: 2</i></p>	<p>How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)</p> <table border="1"> <thead> <tr> <th></th> <th>Not at all useful 1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>Extremely useful 7</th> <th>Don't Know X</th> </tr> </thead> <tbody> <tr> <td>N = 34</td> <td>3 8.8%</td> <td>4 11.8%</td> <td>3 8.8%</td> <td>7 20.6%</td> <td>8 23.5%</td> <td>5 14.7%</td> <td>4 11.8%</td> <td>0 0.0%</td> </tr> </tbody> </table> <p>missing = 1</p> <p>Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)</p> <p>N = 28 <u>4</u> 12 months <u>22</u> 2 to 5 years <u>2</u> 5 to 10+ years 14.3% 78.6% 7.1% missing = 7</p>		Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X	N = 34	3 8.8%	4 11.8%	3 8.8%	7 20.6%	8 23.5%	5 14.7%	4 11.8%	0 0.0%
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N = 34	3 8.8%	4 11.8%	3 8.8%	7 20.6%	8 23.5%	5 14.7%	4 11.8%	0 0.0%											
<p>3.8 Title: Advanced Energy Design Software</p> <p>Description: DOE could develop a series of computer program modules that incorporate the vast body of knowledge about energy-efficient performance of buildings. Each module will have a different function, some will be automated assistants that provide advice to architects during the early phases of design when decisions have major energy performance impacts. Design professionals will have access to up-to-date economical computer-based assistance for designing and operating energy-efficient buildings.</p> <p><i>Number of Times Selected as Most Useful: 1</i></p>	<p>How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)</p> <table border="1"> <thead> <tr> <th></th> <th>Not at all useful 1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>Extremely useful 7</th> <th>Don't Know X</th> </tr> </thead> <tbody> <tr> <td>N = 34</td> <td>2 5.9%</td> <td>4 11.8%</td> <td>4 11.8%</td> <td>5 14.7%</td> <td>8 23.5%</td> <td>5 14.7%</td> <td>3 8.8%</td> <td>3 8.8%</td> </tr> </tbody> </table> <p>missing = 1</p> <p>Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)</p> <p>N = 23 <u>3</u> 12 months <u>14</u> 2 to 5 years <u>6</u> 5 to 10+ years 13.0% 60.9% 26.1% missing = 12</p>		Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X	N = 34	2 5.9%	4 11.8%	4 11.8%	5 14.7%	8 23.5%	5 14.7%	3 8.8%	3 8.8%
	Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X											
N = 34	2 5.9%	4 11.8%	4 11.8%	5 14.7%	8 23.5%	5 14.7%	3 8.8%	3 8.8%											

A.12

Tool Set 3 - Commercial or Residential Implementation Tools & Materials											
3.9 Title: Energy Code Compliance Design Curriculum For Residential and Commercial Buildings				How useful would you find this tool or material in establishing or increasing compliance with building energy codes in your state? (Please circle only one)							
Description: DOE could develop energy efficient design curriculum for schools of Architecture, either an entire course or a two or three week module that could be plugged into a design class. Several modules could be developed that would each be appropriate for first, second, third, and fourth year students. Architecture schools could obtain the course materials from DOE and use them to create an independent energy code compliance design class or simply use the two-three week modules. The course material could cover the use of energy code compliance design tools, efficiency trade-off strategies and tactics, economic advantages to clients stemming from code complying designs.				Not at all useful 1	2	3	4	5	6	Extremely useful 7	Don't Know X
				N = 35 5 14.3%	4 11.4%	3 8.6%	4 11.4%	9 25.7%	3 8.6%	7 20.0%	0 0.0%
Number of Times Selected as Most Useful: 6				Do you think this tool or material will meet the needs your state will have in the next.... (Please check only one)							
				N = 25 5 20.0%	12 months		14 56.0%	2 to 5 years		6 24.0%	5 to 10+ years

Which of the tools or materials described in the previous pages which do you think would be the most useful in establishing or enforcing building energy codes in your state? Please list the numbers (e.g. 1.1, 2.1, 3.1 etc..) of the 5 most useful tools or materials in the spaces below:

Tool or Material numbers: # _____ # _____ # _____ # _____ # _____

How would you characterize the commercial and/or residential building energy code development/implementation processes in your state? Would you say (Please check all that apply.)

	COMMERCIAL	RESIDENTIAL
Our state does not have a process	<input type="checkbox"/> 7	<input type="checkbox"/> 4
Our state is currently developing a process	<input type="checkbox"/> 11	<input type="checkbox"/> 12
Our state has an established process	<input type="checkbox"/> 16	<input type="checkbox"/> 20
Our state process is being modified as a result of EPACT	<input type="checkbox"/> 11	<input type="checkbox"/> 9
Other, Please Explain: _____		

Would you be interested in serving on a task force if the Program were to establish one?

	YES	NO	.
Residential Code Development	<input type="checkbox"/> 15	<input type="checkbox"/> 10	10
Residential Code Implementation	<input type="checkbox"/> 13	<input type="checkbox"/> 10	12
Residential Code Enforcement	<input type="checkbox"/> 7	<input type="checkbox"/> 15	13
Residential Utility Program	<input type="checkbox"/> 4	<input type="checkbox"/> 15	16
Commercial Code Development	<input type="checkbox"/> 11	<input type="checkbox"/> 11	13
Commercial Code Implementation	<input type="checkbox"/> 10	<input type="checkbox"/> 11	14
Commercial Code Enforcement	<input type="checkbox"/> 9	<input type="checkbox"/> 13	13
Commercial Utility Program	<input type="checkbox"/> 4	<input type="checkbox"/> 15	16

If you would like to be added to the Building Energy Standards Program's mailing list and receive the Program's quarterly newsletter please provide your name and address below:

APPENDIX B

VERBATIM COMMENTS FROM THE STATE MAIL SURVEY

APPENDIX B

VERBATIM COMMENTS FROM THE STATE MAIL SURVEY

1.1 BSR/ASHRAE STANDARDS 90.2-1993 CODE LANGUAGE VERSION

- NEVADA Depending on its difference to 90-1980 and difficulty of builder acceptance.
- HAWAII Most Hawaii homes neither heated nor cooled.
- NEBRASKA2 Climate-targeted materials are necessary for small home builders - I don't think these paper tools will be very useful without that feature.
- MINNESOTA As I understand the basis of 90.2, it will be an "optimization" standard, not very appropriate for adoption by a state as a minimum code.

1.2 MODEL ENERGY CODE (MEC) USERS MANUAL

- NEBRASKA Most users in this state would be contractors and targeting this sector would be helpful.
- IOWA ARES 1.2 User's guide is available and DOE is working on a 1992 MEC user's guide.
- INDIANA Anthony S. Dzwonar, program manager, Energy Policy Division, Indiana Department of Commerce, responded to the survey mailed to Amy Stewart and included two items he thought we might find useful: (1) a simplified code compliance guide for residential buildings. The guide was created for use with the 1992 CABO MEC with Indiana amendments; (2) a copy of the Indiana amendments. Mr. Dzwonar encouraged BESP to borrow from the guide if it could be useful for other states; he thought it might be similar to tool 1.2, the MEC users manual that BESP is either developing or planning to develop.
- HAWAII Charles Eley has created a manual for the Hawaii MEC.
- NEBRASKA2 Climate-targeted materials are necessary for small homebuilders - I don't think these paper tools will be very useful w/o that feature.
- COLORADO Tomorrow.

1.3 MEC TRAINING MATERIALS

- NEVADA** Code officials not comfortable yet with providing training on their own - PNL may need to provide this service initially.
- HAWAII** Would have to be Hawaii-specific.
- NEBRASKA2** Climate-targeted materials are necessary for small homebuilders - I don't think these paper tools will be very useful w/o that feature.
- COLORADO** Tomorrow.

1.4 COMPUTERIZED RESIDENTIAL CODE COMPLIANCE CALCULATION PROGRAM

- NEBRASKA** The current HUD program can be confusing and still requires a lengthy delay to receive. A more "user friendly" program would be helpful.
- NEW YORK** Good info, not sure if it increases compliance.
- IOWA** WATTSUN 5.2 is available in Washington so this may be redundant. Tool 2.11 Computer automated code compliance/building permit forms includes compliance with MEC for residential buildings Tool 1.4 May be redundant to Tool 2.11.
- INDIANA** He also suggested that, during our review of the software, if we find it meets our requirements, BESP could utilize the computer software program developed by CERES at Ball State University that shows compliance with the 1992 CABO MEC. He thought this might represent Tool 1.4, the computerized residential code compliance calculation program. He indicated CERES has had some success marketing the program in Indiana.
- WASHINGTON** The WATTSUN software developed by WSEO for residential code compliance has become a standard in the industry with over 1,500 copies circulated statewide. HUD recently revised compliance specifications for federal funding on new residential buildings and accepts WATTSUN for MEC equivalence in Washington. The program has evolved over time and could accommodate a national standards compliance calculation.
- HAWAII** Homes are neither heated or cooled.
- NEBRASKA2** We have used the HUD MECCP software. It is okay as far as it goes, but not really sophisticated enough to explore alternate designs etc. If you decide to do this one, I'd be glad to help suggest some design parameters if you like - Kirk Conger, NE Energy Office (402)471-2867.
- COLORADO** Next week (e.g., ASAP)

IDAHO We would like to see the MEC become one of many paths which are available on the WATTSUN computer program as developed by the Washington State Energy Office. We use WATTSUN for all energy code compliance documentation in Idaho. We have trained planners code officials, builders, and utility staff on WATTSUN for the past 8 years. I can't see bringing in a totally new program.

2.1 ASHRAE/IES STANDARDS 90.1-1989 CODE LANGUAGE VERSION

WASHINGTON This will be extremely useful on a national level. Washington developed the 1994 Non-Residential Energy Code over a period of two years based on 90.1, With numerous technical committee meetings and implementation committee review sessions. A national standard will provide other states with a less time-consuming alternative for code adoption and will prevent the same process from being repeated in every state.

NEVADA It is my understanding that ASHRAE has already done this?...

HAWAII Charles Eley has developed an MEC for Hawaii. The city of Honolulu codified it.

NEBRASKA2 I've been promised this from several different offices. They keep talking like its almost done but nothing has ever been sent.

COLORADO I've already received a copy.

2.2 ASHRAE/IES STANDARD 90.1-89 CODE MANUAL

WASHINGTON These will be extremely useful on a national level. A manual based on the Washington non-residential energy code is under development. Training curriculum and materials are currently offered to code officials and the design community. A special inspector program is underway. Compliance forms will be available on the implementation date of April 1, 1994. These tools and materials are the cornerstone for the implementation of the code in Washington.

NEVADA It is my understanding that ASHRAE has already done this?...

HAWAII If the document goes beyond Eley's manual as a training tool, it'd be very useful.

2.3 ASHRAE/IES STANDARD 90.1-89 TRAINING MATERIALS

WASHINGTON These will be extremely useful on a national level. A manual based on the Washington non-residential energy code is under development. Training curriculum and materials are currently offered to code officials and the design community. A special inspector program is underway. Compliance forms will be available on the implementation date of April 1, 1994. These tools and materials are the cornerstone for the implementation of the code in Washington.

NEVADA Code officials not comfortable yet with providing training on their own - PNL may need to provide this service initially.

HAWAII If the document goes beyond Eley's manual as a training tool, it'd be very useful.

2.4 DEVELOPMENT OF SOFTWARE FOR SECTION 13 (ENERGY COST BUDGET METHOD) OF ASHRAE/IES STANDARD 90.1-89.

NEVADA It is my understanding that ASHRAE has already done this?....

2.5 VIDEO TAPE ON ECONOMIC ADVANTAGES OF ENERGY EFFICIENT COMMERCIAL BUILDINGS FOR CLIENTS

NEW YORK These don't work.

COLORADO Not necessary once code is adopted and enforced.

2.6 BUILDING COMPONENT ENERGY EFFICIENCY TRADE-OFF GUIDE

NEW YORK Building professionals know how to do this.

2.8 BUILDING PROTOTYPE DESIGN AND CONSTRUCTION TECHNIQUE GUIDES FOR CODE COMPLYING BUILDINGS

IOWA If Tools 2.4 & 2.6 are developed then Tool 2.8 may not be needed.

2.9 COMPENDIUM OF ENERGY ANALYSIS SOFTWARE TOOLS AND TRAINING

NEVADA Sounds like it could be very useful, but don't know for sure.

2.11 COMPUTER AUTOMATED CODE COMPLIANCE/BUILDING PERMIT FORMS

WASHINGTON These will be extremely useful on a national level. A manual based on the Washington non-residential energy code is under development. Training curriculum and materials are currently offered to code officials and the design community. A special inspector program is underway. Compliance forms will be available on the implementation date of April 1, 1994. These tools and materials are the cornerstone for the implementation of the code in Washington.

OREGON Good idea, but we already have our own.

2.12 COMPUTERIZED COMMERCIAL CODE COMPLIANCE CALCULATION PROGRAM

NEVADA I don't understand how this would be different from 2.4 (I am not all that familiar with 90.1)

2.13 STATE-BY-STATE INVENTORY OF UTILITY PROGRAMS FOR NEW CONSTRUCTION

NEW YORK Changes too often.

2.14 INTERACTIVE COMPUTER AIDED TEACHING FOR DESIGN STUDENTS

NEVADA I imagine it would help in the long run.

3.1 VENTILATION COMPLIANCE GUIDES FOR BUILDING/ENERGY CODES

NEW YORK Link with ASHRAE.

NEVADA This should also include recommendation for determining (testing) compliance with required ventilation rate (such as use of blower door, etc.)

COLORADO Let ASHRAE do this work.

3.2 DOE ENERGY CODE CERTIFICATION PROGRAM FOR ARCHITECTURE INSTRUCTORS, PRACTICING ARCHITECTS, AND ENERGY ENGINEERS.

INDIANA Mr. Dzwonar went on to mention that ICBO has a nationwide certification program for building inspectors, architects, engineers, and others on a number of code-related topics. ICBO's program has been utilized and is respected by Indiana's Dept. of Fire and Building Services. He went on to suggest that PNL may want to consider using the expertise of ICBO in this area in relation to Tool 3.2, DOE energy code certification program for architecture instructors, practicing architects, and energy engineers.

3.3 SPECIFIER GUIDES FOR WINDOWS, SKYLIGHTS, DOORS OTHER BUILDING COMPONENTS

WASHINGTON The Washington legislature has adopted the NFRC standard and product certification program for rating windows, doors, and skylights in both residential and non-residential buildings. The program includes listing and labeling, applies to manufacturers nationwide, and includes industry involvement in setting and enforcing the standard. The Department of Energy should simply adopt the NFRC program and use the ratings established in that standard for evaluating energy savings and product costs. For other building components, a DOE labeling program, or DOE assistance to industry groups to develop a labeling program and/or specifier guide, may be moderately useful. Numerous versions of "product directories" have been developed and published in the northwest. The most important element for code compliance is a rating and labeling system or program. A standard system for rating, listing, and labeling would also be moderately useful for building assemblies; for example, optimum value engineered wood framework, steel framework, or insulated masonry block standardized allowable r-values and u-factors for those elements.

NEW YORK NFRC?

IOWA If Tools 2.6 and 2.12 are developed then Tool 3.3 may not be needed. Developing Tools 2.6 and 2.12 are more important than developing Tool 3.3.

NEVADA Not needed due to existence of NFRC.

ALASKA What about NFRC?

COLORADO Why duplicate what NFRC is doing?

3.4 SPECIFIER GUIDES FOR RESIDENTIAL AND COMMERCIAL LIGHTING FIXTURES

NEW YORK NYS Energy Office can do this.

IOWA The Lighting Research Center is developing lighting specifications and guides so DOE doesn't need to duplicate this.

ALASKA Specifier reports already exist.

COLORADO Let IES do this work.

3.7 ENERGY CODE COMPLIANCE CONSTRUCTION TECHNIQUE DEMONSTRATION VIDEOS

COLORADO Would not be useful after code is adopted.

3.8 ADVANCED ENERGY DESIGN SOFTWARE

COLORADO Expert system? Knowledge based?

GENERAL COMMENTS:

NEBRASKA The respondent changed one of the response options on the last page from "our state process is being modified as a result of EPAct" to....

INDIANA Finally, he stated that Indiana is in the process of updating its energy code to meet the requirements of EPAct. The 1993 version of CABO MEC is being considered for adoption, as this code incorporates ASHRAE Standard 90.1-1989 as the sole criteria for commercial buildings. This task is expected to be complete by the October 1994 date set by EPAct. Any questions should be directed to Mark Jansen at 317/232-8948.

WASHINGTON Tim Nogler, energy code specialist, Washington State Energy Office, enclosed a letter with the survey (completed by Julie Palakovich, WSEC program manager, Olympia, Washington). The letter explained that many of the tools described in the survey have already been developed and have been implemented in Washington; thus, they would not be of great use. This, however, does not "diminish the importance of some of these materials in establishing or increasing compliance in many other states." WSEO believes that they have advanced beyond other states and, although Washington doesn't need some of the tools, other states do need them. WSEO completed the survey based on how important the tools and materials would be for Washington.

NEW HAMPSHIRE Our state has already adopted 90.1 as a result of EAct and will begin the process of revising its residential code in 1994-1995.

NEVADA The Nevada Energy Office (NEO) has recently reorganized with associated personnel turn over. I was recently hired to support the NEO's energy efficient construction promotion and energy code adoption efforts. My lack of experience is reflected in some of my answers to your survey. I would be very appreciative of whatever PNL could offer me and the NEO regarding energy code adoption/implementation assistance.

Our state is currently developing a process as the result of EAct, EAct has been a big help in getting the leverage this office needs to promote legislation for an upgraded energy code.

We are a two-person office and would not have the time to serve on a task force.

WEST VIRGINIA The West Virginia Energy Efficiency Program would be very interested in any training and support materials that could be provided to local building code officials to assist them in implementing the current energy efficiency standards.

COLORADO The questions that were answered as extremely useful, the tools or materials would be useful as soon as possible. We at OEC would suggest that pnl place a high priority on the questions that were answered as extremely useful. In particular the questions that relate to tools that help train designers and code officials and tools that can be used to verify energy code compliance.

MASSACHUSETTS I find it difficult to cut tools to only five - there are so many good tools.

VIRGINIA James A. Smith, Virginia Department of Mines, Minerals, and Energy, sent a letter following a phone conversation confirming that the survey was forwarded to the Virginia Department of Housing and Community Development (VDHCD) for their response. The VDHCD is the Virginia agency responsible for codes and standards development. Mr. Smith indicated a personal interest in the area of building energy standards during the conversation and indicated in the letter that he would appreciate receiving a copy of the survey results (he had called earlier to remove his name from the mailing list because he was not the official contact for codes).

LOUISIANA

Jerry W. Jones, chief architect, Office of the Louisiana State Fire Marshall, responded to the survey, indicating that Louisiana currently does not have a commercial and/or residential building energy code development/implementation process; they are, however, currently developing a process. Mr. Jones also indicated an interest in serving on potential task forces on residential code development, commercial code development, commercial code implementation, and enforcement. He also indicated that several of the tools/materials listed would be extremely useful in meeting needs during the next 12 months (e.G., MEC users manual, MEC training materials, computerized residential code compliance calculation program, ASHRAE/IES 90.1-89 Code Manual, 90.1-89 training materials etc.).

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