MODEL CONSERVATION STANDARDS - LESSONS LEARNED FROM THE PERSPECTIVE OF DESIGNING AND MANAGING BUILDING CODE ENFORCEMENT PROGRAMS

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ABSTRACT

In April 1983, the Northwest Power Planning Council adopted Model Conservation Standards for new electrically heated residential and commercial buildings in its long-range energy plan for the region. Shortly thereafter, Bonneville Power Administration (Bonneville) entered a field of conservation previously unfamiliar to the agency: support for the implementation of energy-efficient building codes and/or legally enforceable utility service requirements.

This paper focuses on the Northwest region's experience and progress towards implementing mandatory energy-efficiency standards, and discusses the institutional lessons that have been learned along the way. It follows, over a 3-year period, Bonneville's development and operation of building code support programs, and other technical assistance activities designed to encourage voluntary adoption and enforcement of the new Council standards.

Also included are:

- An assessment, based on practical field experience, of the program refinements necessary to overcome numerous obstacles that were encountered.
- A description of efforts to achieve integration of mandatory building energy-efficiency requirements into existing networks and the regional code enforcement infrastructure, and Bonneville's attempts to address perceptual barriers through education, technical assistance, local marketing and promotion.
- An appraisal of the need for sensitivity to involving local conditions, political circumstances, legal and liability issues, and of the importance of establishing effective methods for dealing with project-related problems as they arise; and
- A description of the progress made in the transition toward energy efficiency, upcoming challenges and new program directions.

The emphasis is on practical program application, documentation of the problems and obstacles encountered, alternative approaches pursued, and new program directions.

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INTRODUCTION

Since the passage of the Pacific Northwest Electric Power Planning and Conservation Act (Regional Act) in 1980, Public Law 96-501, the Northwest has found itself in a unique position.

Provisions of the Regional Act led to the creation of a Northwest Power Planning Council in 1981, and during the next two years to the development of Model Conservation Standards for new buildings, at levels designed to produce all energy savings that are both cost effective to the Regional power system and economically feasible for consumers.

On April 27, 1983, the Northwest Power Planning Council released the Northwest Conservation and Electric Power Plan (Power Plan). The Power Plan established stringent energy-efficiency standards for new construction (and for existing buildings being converted to electricity from other fuel sources) as a cornerstone of regional energy development efforts. In addition, the Plan prescribed a January 1, 1986, deadline for adoption and implementation of these Model Conservation Standards (MCS), either as traditional building codes or legally enforceable utility service standards. Jurisdictions that failed to adopt and implement the MCS before January 1, 1986, were potentially subject to a surcharge on wholesale power purchases from Bonneville.

There was also a carrot. To encourage regionwide MCS adoption prior to 1986, the Power Plan recommended that Bonneville fund programs to support the adoption of MCS level energy codes. This included reimbursing governmental or utility adopters for MCS-related implementation and enforcement costs, and an offer of financial incentives to builders/consumers to offset incremental construction costs.

Ultimately, Bonneville developed two programs to help local entities make the transition to enforcing the new, more stringent energy standards: (1) a demonstration program to provide enforcement support and builder incentives through December 31, 1986, and (2) a longer-term MCS enforcement support program to be operated during a transitional period beyond January 1, 1986.

BACKGROUND INFORMATION REGARDING PROGRAM DESIGN

In December 1983, Bonneville formed a task force comprised of representatives of State and local governments, the regional code enforcement community, and Northwest utilities to assist with the design of its

MCS-support activities and programs. This group played a primary role in the development of the Code Adoption Demonstration Program, as well as a variety of subsequent enforcement support activities sponsored by Bonneville. Over the months that the task force met to consider specific elements of Bonneville's support for code implementation, a consistent theme emerged, "keep it flexible, but keep it simple."

The first program to be developed, the Code Adoption Demonstration Program (CADP), was a pilot effort with a primary goal of stimulating voluntary adoption of energy-efficient building codes at the levels prescribed by the Council before the January 1986 deadline. To accomplish this goal, a two-part strategy was employed. First, the program would offer full reimbursement for the additional costs of MCS-related enforcement. Second, the program would provide builder incentive payments to offset additional construction costs associated with meeting MCS requirements. Reimbursement under the demonstration program and the method of MCS enforcement to be carried out at the local level were left, for the most part, to the discretion of individual program participants. If the adopted code met or exceeded MCS energy efficiency requirements, as determined by technical reviews performed by Bonneville staff, and the amount of funding requested appeared appropriate and reasonable for the level of MCS implementation and enforcement activity to be carried out, project funding was authorized. The level of Bonneville funding for builder incentive payments was negotiated on a case-by-case basis, and varied from jurisdiction to jurisdiction. In jurisdictions that distributed incentives on a square foot basis, payments for new single-family buildings ranged from a high of $2 per square foot plus an $800 air-to-air heat exchanger (AAHX) allowance for each unit installed, to $1.50 per square foot plus $800 AAHX allowance. Other jurisdictions provided flat-rate incentives of $2,250 per single-family building, regardless of the size. In all cases, however, builder incentive payments declined over time and were to be phased out by 1986.

A second Bonneville program, the Model Conservation Standards Implementation Program (MCSIP), was designed to provide longer-term funding support for enforcement of the MCS after the Council's January 1, 1986, deadline. This program did not include funding for builder incentive payments, based on the premise that in 1986 construction to MCS energy-efficiency levels would, at that point, be a mandatory regional requirement. Instead, MCSIP focused on transitional support for enforcement. The program provided funding to help jurisdictions gain experience in enforcing new, more stringent, energy standards. Once the MCS were fully integrated as part of established enforcement practice, it was expected that energy-related enforcement would be supported through traditional general governmental sources of revenue (permit fees and tax receipts).

Results of the Code Adoption Demonstration Program, and related research, were originally intended to provide the basis for development of enforcement support under MCSIP. However, in order to meet the Council's deadline, MCSIP had to be developed concurrently with the implementation of CADP. Working

with the previously established Code Adoption/Enforcement Task Force from late-1983 through 1985, Bonneville simultaneously funded supporting research (Keating, et al., 1986), developed policies and procedures for longer-term regional support under MCSIP, and provided funding for five pilot projects under CADP.

In November 1983, the City of Tacoma, the fourth largest city in the region with a population of approximately 160,000, adopted the MCS. Subsequently, through the authority of the municipal utility, Tacoma expanded the enforcement of the MCS to the surrounding geographic area, via the adoption and implementation of mandatory utility service requirements. Because work on the CADP had not been completed at the time of Tacoma's adoption, funding for the City's project was awarded under a separate Bonneville grant.

In June 1984, 2,600 copies of the CADP Solicitation were distributed over the four state area (Idaho, Montana, Oregon, and Washington), announcing the program and inviting local jurisdictions to apply.

Over the next year, one county and four municipalities in Washington State followed Tacoma's lead. By mid-1986, however, only this same small number of jurisdictions had adopted MCS-level codes and applied for Bonneville funding. Problems which may have contributed to lower than anticipated participation in CADP and lack of progress toward regional MCS implementation are discussed below.

LESSONS LEARNED

In supporting the adoption of energy efficiency building codes (or legally enforceable utility service requirements), Bonneville was working in a relatively new area of expertise, which fell outside the Agency's traditional responsibility for electrical power distribution. Within the Bonneville Office of Conservation, prior experience with energy-related building codes and mandatory energy-efficiency requirements was limited to several training sessions conducted in 1981 by State Energy Offices in Idaho, Montana, Oregon, and Washington under a Bonneville-funded assistance program. Although there were many small lessons learned over the three year period from 1983 through 1986, five major lessons can be identified:

1. Flexibility in program design is both desirable and necessary, but must be balanced against administrative simplicity.

2. When it comes to building codes or mandatory utility service requirements, money alone is not the answer.

3. Institutional resistance to change is strong and takes many forms. It should be expected.

4. The length of time required in order to make major changes in construction and enforcement practice was underestimated. Code change is a complex and evolutionary process that requires many years.

5. MCS-level codes and energy-efficiency requirements can be adopted and successfully enforced on a project-specific basis within relatively short timeframes, if careful attention is paid to program detail and process issues. Widespread, regional integration of mandatory standards will require a longer transition period.

Lesson 1: Program Flexibility vs. Simplicity

Maintaining flexibility without sacrificing program simplicity is not a simple task. Balancing the inevitable tradeoffs may present a significant challenge.

In designing Bonneville support for building code enforcement, program flexibility is a necessity rather than an option, since there is no way to accurately predict which of the 700-800 local governments within the region might adopt the MCS. To operate effectively, current and proposed Bonneville MCS-support programs/activities must be able to respond to the needs of small rural towns in Idaho or Montana with little or no experience in enforcing energy codes, as well as the needs of larger metropolitan areas such as Seattle or Portland, that have enforced building codes with progressive residential and commercial energy requirements for many years.

To provide the flexibility required to accommodate a wide range of local needs, Bonneville defined only basic minimum requirements for the Code Adoption Demonstration Program. Each entity decided how the MCS would be enforced within jurisdictional limits, and the level of enforcement activity to be carried out. To apply for Bonneville funding, the jurisdiction was required to submit (1) a copy of the adopted code and any technical appendices, (2) a short description of how the energy-related provisions of the code would be enforced, (3) a brief workplan, and (4) a project budget, based on estimated building activity and any additional energy-related costs that they expected to incur due to MCS adoption. If the adopted code was equivalent to the MCS, and proposed implementation costs "reasonable" for the level of enforcement activity described in the workplan, Bonneville was willing to provide financial support. All five jurisdictions funded under CADP adopted the MCS via local ordinances which referenced technical appendices to the Council Plan without significant modification, thereby simplifying the task determining whether the locally adopted code would provide energy savings equivalent to the MCS. Standardized code equivalency procedures based on the calculated thermal performance of a set of prototype buildings, modeled to incorporate local code requirements were subsequently developed for use in analyzing codes which deviate from pre-approved formats.

Enforcement costs and methods for insuring field compliance with MCS requirements were reviewed on a case-by-case basis as proposals were submitted. By allowing this discretion, Bonneville hoped to learn more about the effectiveness of various enforcement techniques through a detailed evaluation of the individual pilot projects that were funded. In turn, these evaluation results would form the basis for refining longer-term MCS code support activities.

From the standpoint of flexibility, the program was an unquestioned success. Management and administration of the program was an entirely different matter. The lack of program detail and differing, rather than standardized reimbursement levels, resulted in the submittal of incomplete project proposals, and lengthy, drawn out negotiations when there was disagreement in defining "reasonable incremental costs." Program participants also encountered numerous difficulties in complying with routine Federal reporting requirements, such as detailed tracking of project-related expenditures and performance. These matters were clearly not a high priority for local enforcement staff.

Flexibility also involves budget uncertainty. Because program participation and adoption of the MCS is based on political decisionmaking, and influenced by a myriad of evolving regional circumstances, developing annual program budgets involved more art than science. Budget uncertainty presented a major problem, which was exacerbated by allowing individual jurisdictions to negotiate project funding under CADP. Bonneville data collection efforts with regard to enforcement and construction costs, and the subsequent development of standardized reimbursement levels for MCSIP based on this research (Keating et al., 1986), offer a partial solution.

Standard reimbursement levels, along with estimates of program participation and regional housing starts, now form the basis for determining Bonneville's program budget. State and local government representatives, as well as the Bonneville staff in outlying area offices, are directly involved in developing these estimates, thereby establishing a "ceiling" for annual Bonneville expenditures, a process which provides a relative degree of budget certainty. Program applicants are awarded funding within the available budget on a first-come, first-served basis. To provide assurance to participating jurisdictions, grant funding was awarded for the entire early adopter period (from date of adoption through January 1, 1986).

Lesson 2: Monetary Incentives

Money alone is insufficient to bring about major changes in an entire industry.

The Power Plan placed a heavy reliance on financial incentives as a means of encouraging the adoption and enforcement of mandatory energy-efficiency standards. Under CADP, Bonneville offered participating jurisdictions a chance to design their own program with regard to enforcement, and to propose (within reasonable parameters) the level of builder incentive payments to be provided by Bonneville. Despite the promise of full reimbursement for MCS-related costs, only a small handful of local jurisdictions adopted the MCS.

No one, especially governmental entities, will argue that money doesn't matter, or that builder incentive payments were an unnecessary component of Bonneville's program support. Based on regional experience, however, it didn't take long to conclude that poor timing, perceptual and institutional

barriers, accompanied by a general dislike of mandatory standards and Federal requirements, outweighed money as a positive factor in stimulating MCS adoption. Local economic circumstances, shelter industry reaction within the community, and ongoing controversy regarding technical aspects of the MCS, all contributed to inaction and lack of progress toward regional adoption. In the absence of strong and stable construction industry support and direction, many jurisdictions simply took a "wait and see" attitude.

Timing and coordination with existing code change processes also played a significant role, as described later under Lesson 4.

What factors contributed to the decision to upgrade codes to MCS-levels? Examination of current CADP program participants identified these common characteristics: (1) prior experience in implementing conservation programs/activities (most, but not all, early adopters had previously received State or Federal grants related to energy management or conservation), (2) a belief that homes built to MCS requirements are better constructed than less energy-efficient homes, and (3) with the obvious exception of Tacoma, geographic proximity to another early adopting jurisdiction. If the goal is code, real world experience and the opportunity to observe other code officials effectively conducting energy-related plan reviews and inspections is critical, and no less important than conducting builder demonstration projects.

During the period from 1983 to 1986, the States of Washington and Oregon upgraded energy-efficiency requirements contained in their existing codes, but not all the way to MCS levels. (The Washington code achieves approximately 50 percent of projected MCS energy savings, the Oregon code approximately 40 percent.) It is worth noting that both States had many years prior experience in enforcing energy codes, and a strong commitment to conservation.

Lesson 3: Institutional Resistance and Technical Uncertainties

Developing a strategy for overcoming perceptual and institutional barriers is an important element in any attempt to make major changes in energy standards and construction practice. Controversy is inevitable, and should be expected.

Initial resistance to the new MCS requirements for energy efficiency went beyond a basic reluctance to change. Reaction to the Council's January 1, 1986, deadline for adoption of the MCS, and especially to the threat of a surcharge on electrical rates, was antagonistic. The comments below are a direct quote from a letter that Bonneville received when the proposed Code Adoption Demonstration Program was circulated for public review:

"It appears to me that the Bonneville Power Administration, together with the Northwest Power Council, has little regard for the general public. Bonneville assumes that they are mandated, come hell or high water, to force building standards on homes or commercial buildings regardless of what the cost will be in terms of money and health."

Many questions were raised regarding the overall cost-effectiveness of the standards as a regional energy resource. There was also a matter of timing. In a time of estimated energy surplus, was there really a need to pursue energy efficiency in new housing?

Cost to the consumer, of course, was also a big issue. Builders, realtors, and other members of the shelter industry were concerned with the effect of mandatory MCS implementation on the cost and affordability of new housing. Bonneville and the Council were accused of attempting to destroy the American dream of owning a home, due to increased costs associated with installing conservation measures required by the MCS. Further, builders were not convinced that MCS homes would sell, once built. State and local governments were concerned with increased enforcement costs, and the long-range effects on local taxpayers once Bonneville financial assistance under the program ended.

Technical aspects of the MCS also drew political fire, especially vapor barriers, infiltration control measures, and air-to-air heat exchangers. Builders, as well as a number of manufacturers and suppliers, argued that MCS construction techniques were unproven and untested. Misperceptions regarding the MCS were fueled by newspapers that carried "horror stories" of homes with dry rot due to improperly installed vapor barriers and trapped moisture buildup in ceilings and walls. Numerous local, regional, and national articles discussed health hazards associated with decreased ventilation and radon. Builders raised liability issues related to potential moisture problems, structural safety, and indoor air quality. Code officials voiced similar concerns.

Within early adopting jurisdictions there were also problems. Opponents of MCS adoption sometimes attempted to thwart local enforcement efforts long after the energy code was in place and operational. Not surprisingly, the greatest resistance came from builders who hadn't yet attempted to build an MCS home. At times, local resistance on the part of manufacturers, suppliers, and builders was influenced by forces outside the jurisdiction itself. Enforcement staff in these communities reported, however, that criticism and resistance decreased markedly over time.

Lesson 4: Program Timing and Protocol as Factors in Code Change Processes

The importance of program timing and coordination with traditional code review processes cannot be over-emphasized. Although this lesson did not entirely escape Bonneville's attention, a series of factors contributed to lower than anticipated participation in CADP, and delays in widespread regional adoption of the MCS.

The public process followed in establishing MCS requirements and in developing regional programs to encourage and support the adoption of energy-related building codes attempted to involve building officials, but inadvertently ignored traditional code change protocol. Politically

influential members of national and State-specific organizations, responsible for recommending and overseeing changes in building codes, therefore, felt no sense of ownership toward the MCS.

As a further, and perhaps unavoidable complication, the emphasis on a regionally consistent energy standard may have been perceived as an implied threat to independent State and local decisionmaking.

Timing elements were critical:

- Schedules and timelines contained in the 1983 Council Plan did not correspond, and in many cases were not sensitive to traditional State or local code review processes and schedules. Code change is a slow and evolutionary process which generally occurs over a period of several years. In the past, adoption of new codes has followed rather than led substantial changes in building practices. The Council's strategy and ambitious timelines presumed an ability to make these changes concurrently.

- Development of detailed MCS technical requirements by the Council occurred in too short a time period to allow active and widespread participation by those regional entities with a vested interest in new construction practice. As a result, the MCS requirements were viewed with distrust by both code officials and members of the building trades industry.

- The Bonneville Program Solicitation announcing CADP was released in June 1984, the middle of the Northwest building season, a time when codes are unlikely to be revised.

- Work in translating the MCS into code language and an energy code format familiar to building officials took nearly 2 years. Existing energy codes within the region were based on two distinct formats. Oregon's statewide energy code is written in Uniform Building Code (Chapter 53) format, while Washington jurisdictions enforced a Model Energy Code format developed by the Council of American Building Officials (CABO). The UBC version of the MCS was not available until February 1985. MCS Amendments to the CABO Model Energy Code were not printed and distributed until January 1986. Both codified versions of the MCS are now in the process of being revised and will be distributed in July 1986.

These factors, in combination with a temporary surplus of electrical energy in the region, raised many questions regarding the advisability of MCS adoption.

Other entities hoping to upgrade existing energy codes or promote the adoption of new energy-efficient codes or standards could potentially avoid similar problems by providing for the direct and early involvement of code officials and members of the shelter industry in a manner which acknowledges traditional code change protocol and timing. Political decisionmaking will be

delayed unless influential members of the construction industry and code enforcement community support and back the effort within their respective professional organizations.

Lesson 5: MCS Codes Can Be Adopted and Successfully Enforced

Perhaps the most important lesson learned over the last three years is that MCS-level codes or mandatory energy efficiency standards can be successfully adopted and enforced within individual jurisdictions, if careful attention is paid to program detail and process issues. The five pilot projects funded under CADP provided a valuable opportunity to field test the program design and to identify potential pitfalls before finalizing the details of subsequent Bonneville code support programs. From these projects we learned that:

- Sensitivity to evolving local needs, political circumstances, legal and liability issues is critical. Defining an acceptable balance between Bonneville programmatic responsibilities and State/local authority to enact and enforce building codes as a part of initial program design is an important first step. Code support programs must also be structured in a manner that provides an effective method of dealing with project-related problems as they arise. This is best accomplished by a program design which guarantees a sufficient level of local discretion, and through the use of contractual agreements which can be modified with relative ease if this is determined to be necessary.

- Clarity and consistency in MCS technical requirements, strong technical assistance support, and the presence of a single recognized source of interpretation to turn to as questions are raised are key to providing a stable basis for the adoption of mandatory standards. Technical and informational services should be integrated with the existing infrastructure whenever possible. Code Officials are more likely to call another code official or the International Conference of Building Officials (ICBO), rather than their local utility or Bonneville when advice is needed. Building department staff in early adopting jurisdictions indicated that a strong presence (and increased on-site assistance) was required during the first several months after implementation to insure builder conformance with MCS requirements.

- Temporary imbalances in local supply and demand may result in the need to "import" certain equipment and supplies from outside local markets. A good working relationship and close coordination with local manufacturers and suppliers can help to keep the problem from becoming an insurmountable barrier.

- Lack of information regarding the proper sizing and installation of air-to-air heat exchanger units, and air infiltration barriers was identified by builders as the single biggest impediment they encountered meeting with MCS requirements. With industry support, air-to-air heat

exchanger specifications and procedures for industry certification of installers are currently being developed. Information will also be provided for homeowner operation and maintenance of the units, once installed.

- Builder resistance can be effectively dealt with. One of the most successful ways that local project staff found to defer criticism was simply to explain the wide variety of compliance options and prescriptive paths that can be used to meet MCS requirements. Presenting a range of choices, and the offer of subsequent help in locating and installing equipment and materials helped to make the initial experience of building an MCS home less burdensome. Anecdotal reports of conversations with local builders indicated that meeting MCS requirements became much less difficult and time consuming after the first house or two, and that incremental costs generally decreased. Acceptance by homebuyers and lenders also played an important role in convincing builders that energy efficiency made sense.

- Building officials can learn to conduct energy-related plan review and inspections in a much shorter period of time than might be expected. Within early adopting jurisdictions, building enforcement management and staff were generally able to incorporate the changes needed to conduct MCS plan reviews/inspections into local enforcement procedures in a few months. Further, field compliance checks of a sample of homes constructed under CADP indicated that approximately 89 percent of potential MCS energy savings were being achieved (Keating, et al.).

Over the past one to two years, five jurisdictions in Washington State have successfully adopted and enforced the MCS as traditional building codes or as utility service standards. During that time, over 569 single-family homes and 2000 multifamily units have been built to the MCS, or are currently under construction, due to the implementation of mandatory energy-efficiency requirements. Several other local governments in Idaho and Washington are considering adoption of the MCS, and some are expected to take this action in 1986. Based on the experience gained from these demonstration projects, the region will continue to work toward an overall goal of regionwide adoption of the MCS by 1989, and the full integration of energy-efficiency into established enforcement procedures and construction practice.

NEW MCS DIRECTIONS: PUTTING LESSONS LEARNED INTO PRACTICE

A final challenge involves putting what was learned into practice through the refinement of Bonneville MCS support programs and activities.

A number of complex and interrelated market forces drive changes in building codes and construction practices. By late 1984, the Council concluded that the offer of full reimbursement of additional MCS-related enforcement costs under CADP was a start, but by itself, not enough to

stimulate the substantial changes in building practice that were required to achieve regionwide adoption. In December 1985, the 1983 Power Plan was amended to extend the deadline for mandatory adoption of the Model Conservations Standards as a regional building code. As part of this extension, the Council recommended that Bonneville continue to provide financial support for enforcement and builder incentives for an additional three years (through December 31, 1988) to jurisdictions which adopted the MCS. Beyond 1989, longer-term enforcement support is recommended, providing an ample opportunity to pursue new Bonneville program directions.

To enhance and accelerate the decisionmaking process, a combined approach has been set into motion.

- Bonneville support for the MCS implementation has been refined and streamlined. A new program, the Early Adopter Program, has been designed to replace the Code Adoption Demonstration Program. In response to the lessons learned, technical assistance components of the program have been enhanced and administrative procedures simplified. Reimbursement levels for MCS implementation and enforcement have been adjusted to reflect the results of previous research. This new program will focus on identifying and documenting reductions in incremental enforcement and construction costs over the three-year program period.

- Energy efficiency in new homes is being vigorously marketed and promoted under the Super GOOD CENTS Program, an effort designed to build public awareness and create consumer demand for MCS homes. Builder participation in this utility-operated program was strictly voluntary, inspired by the promise of a $1.5 million annual regional advertising campaign to help sell the homes once built. Builder/consumer incentive payments of $2,000 for each home certified as meeting Super GOOD CENTS technical specifications were added to the Super GOOD CENTS program in 1986, to increase market penetration.

- A wide-scale builder demonstration program, the Residential Standards Demonstration Program (RSDP), was conducted by state energy offices in each Northwest State during 1984 and 1985. Under this program, 423 single family homes were built to MCS standards. Cost and energy savings data were collected on a state-by-state basis for each home to provide regional builders with tangible evidence of building thermal performance and factual information regarding costs.

- A new demonstration and research project, the Residential Construction Demonstration Project (RCDP), is now underway and will focus on innovative ways of meeting MCS requirements while reducing builder costs. This project will collect both construction cost and energy consumption data for approximately 200 homes, building upon the knowledge and experience gained from the RSDP homes. Results of the RCDP data analyses will be used to further refine methods for meeting MCS requirements and to identify new, more effective, ways to achieve energy efficiency at a lower cost.

- Bonneville-sponsored educational and technical assistance activities were expanded and redirected. Greater emphasis was given to meeting a variety of needs identified by the code enforcement community itself, and to providing training through known and trusted sources. MCS-related training was provided as part of annual International Conference of Building Code Official short schools traditionally attended by large numbers of building officials. A toll-free hotline and technical information clearinghouse, developed and operated by ICBO with Bonneville funding, serves as a daily source of training, code interpretation, product information, testing and certification. Care was also taken to insure that all technical reference materials developed under contract to Bonneville used formats that were familiar to building officials, and that the information was organized in a manner consistent with existing energy code provisions.

CONCLUSION

In late 1983, Bonneville began with good intentions and high hopes. After nearly three years, there is a growing recognition that successful implementation of mandatory construction standards requires a significant start-up and transition period. Three to five years should be considered a minimum. Based on the region's experience thus far, as much as five to eight years may be required to achieve full regional integration of MCS technologies into established construction practice.

It would be easy to speculate, after the fact, that sacrificing some degree of stringency would have enhanced acceptance and adoption of the MCS. That conclusion however, underestimates the significant strides that have been made during the last three years toward regional integration of energy efficiency into established building techniques and enforcement practices, and the value of the lessons that were learned.

Two states, Washington and Oregon, have upgraded minimum energy efficiency requirements of their existing codes by a substantial margin. Five jurisdictions have adopted MCS-level codes, and have demonstrated that the MCS energy requirements can be successfully enforced, and that high levels of field compliance can be achieved. In these jurisdictions alone, over 569 single-family homes and 2,000 multifamily units have been built to the MCS. More MCS homes are currently under construction.

A new and streamlined Early Adopter Program, is now in place and will provide extended financial assistance support, through December 31, 1988, for the adoption of energy efficient building codes and standards. Bonneville is confident, that with the above efforts building on past program experiences, the region's progress in making the transition to energy efficiency will continue.

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