

Appendix E-1

Estimates of Administrative Costs for Energy Efficiency Policies and Programs¹

This appendix provides summary descriptions of the administrative costs associated with twelve energy policies and programs, as well as descriptions of several additional policies and programs for which those calculations could not be made. The summaries included in this appendix are under review, and additional information is being collected to include in the final document.

Ultimately, we sought to learn how much money is invested in the administration of these policies and programs for each MBtu of energy saved, a figure we call the administrative cost ratio. This figure then is added to the incremental technology costs required to generate one delivered MBtu of energy savings. Specifically, the administrative cost per MBtu is multiplied by the primary energy savings in 2010 or 2020 to get the total annualized program costs in that year. This figure then is added to the annualized incremental investment costs in that year to calculate total annualized costs for the scenario.

Information used to calculate administrative cost ratios was collected from telephone or face-to-face interviews with persons knowledgeable about the policies or programs at issue as well as documentary evidence. These approaches are intended to improve the estimates used in the *Five-Lab Study*.

For the purposes of this effort, *administrative costs* include the following:

- program planning, design, analysis, and evaluation;
- activities designed to reach customers, bring them into the program, and deliver services such as marketing, audits, application processing, and bid reviews;
- inspections and quality control;
- staff recruitment, placement, compensation, development, training, and transportation;
- data collection, reporting, record-keeping, and accounting; and
- overhead costs such as office space and equipment, vehicles, and legal fees.

This definition is encompassing, and often is broader than definitions used within the programs themselves. For some programs, such as information-dissemination programs, all costs were considered to be administrative. This approach provides conservative values to use in the Clean Energy Future Study.

Because of the small sample size of programs and policies, it is not possible to explain the differences across programs. However, it is likely the administrative costs will be greater in the early years of a program and that they might be less for regulatory policies such as codes and standards than for programs that provide a great deal of technical assistance and information outreach.

The average administrative cost for these 12 policies and programs is \$0.53 per MBtu of primary energy saved. To be conservative, this cost was rounded to \$0.6/MBtu. A conservative figure is used for two main reasons. First, it is used to account for the likelihood that new programs and policies with relatively high initial administrative cost ratios will begin in the coming years. In contrast, many of the 12 policies and programs examined in this appendix are mature; their administrative cost ratios are stable and relatively lower than would be anticipated for new programs and policies. Primarily because of the paucity of energy savings data for relatively new programs, it was difficult to use them as examples in this appendix. Second, and related to the first reason, a conservative administrative cost ratio was used to account for the possibility of a shift in the nature of energy saving programs and policies in coming decades. For example, regulatory policies like codes and standards or emissions trading programs, once adopted, appear to have relatively low administrative cost ratios. However, at least in the case of standards, until they are established, all costs are

administrative with no immediate energy savings. As another, similar, example, there appears to be a trend toward developing programs and policies intended to shift the market for energy-efficient products or energy sources. One can anticipate a time lag between when such policies or programs are implemented and when they effectively achieve their goals. Experience is too limited to know how long this time lag may be for different kinds of programs and policies. However, during this start-up phase, administrative costs may be high relative to the energy savings achieved. This conservative approach, and the \$0.6/MBtu value itself, are being reviewed and may be revised as the result of an ongoing analysis of policy and program implementation costs.

The \$0.6/MBtu figure is used as the cost of policy implementation and administration within this CEF study. For end-use sector fuel savings, it is added directly to the incremental technology costs. For electricity savings in the end-use sectors, it is first multiplied by 2.9 to account for the difference between primary energy and delivered electricity.

Based on the total administrative costs and annualized incremental technology investment costs presented in this appendix, these estimates of administrative costs are quite consistent with the findings of Berry (1991 and 1989). Berry reviewed the expenses incurred by utilities to administer demand-side management programs in the 1980s. Her work appears to provide the only published overview of administrative costs relevant to energy efficiency programs. She estimated that administrative costs are approximately 20% of the incremental technology costs per MBtu of energy saved. Similar proportions result when the administrative cost estimate of \$0.53 per MBtu of primary energy saved is used in the Clean Energy Future Study both in 2010 and 2020, and for both the Moderate and Advanced Scenarios.

The results are summarized in the following table.

Table E.1 A Review of Administrative Costs for Energy-Efficiency Programs

Policy/Program	Type of Policy/Program	Administrative Cost per MBtu of Primary Energy Saved	Buildings	Industry	Transportation
Residential Appliance and Commercial Equipment Program	Regulatory policies—Codes and Standards	\$0.095	√		
Building Standards and Guidelines Program	Regulatory policies—Codes and Standards	\$0.052	√		
Demand-Side Management Programs of the Bonneville Power Administration: Residential	Financing and investment enabling	\$0.543	√		
Demand-Side Management Programs of the Bonneville Power Administration: Commercial	Financing and investment enabling	\$0.323	√		
Weatherization Assistance Program	Financing and investment enabling	\$0.899	√		
Market Transformation Programs of the Southern California Edison: Residential	Financing and investment enabling	\$2.486	√		
Energy Star Programs	Voluntary, information and technical assistance	\$0.092	√	√	
Market Transformation Programs of the Southern California Edison: Non-Residential	Financing and investment enabling	\$0.515	√	√	
Industrial Assessment Centers	Voluntary, information and technical assistance	\$0.386		√	
Demand-Side Management Programs of the Bonneville Power Administration: Industrial	Financing and investment enabling	\$0.115		√	
Energy-Related Inventions Program	Public-private RD&D partnerships	\$0.697	√	√	√
Fuel Economy Guide	Voluntary, information and technical assistance	\$0.131			√

Residential Appliances/Commercial Equipment Program

Program Summary

Program/Policy Type

Regulatory Policies Codes and Standards

Sectors

Residential and Commercial Appliances

Goal

The program seeks to develop and implement energy conservation standards that are technologically feasible and economically justified.

Lifespan

The program began in 1978, but the first standards were enacted in 1987.

Program structure

Minimum efficiency standards have been implemented through updates to the National Appliance Energy Conservation Act of 1987 (NAECA) and through the Energy Policy Act of 1992. DOE and the national laboratories it contracts develop testing procedures, provide labeling information to a separate program, and do the research and analyses necessary to develop and implement energy conservation standards. Part of this effort involves considerable communication efforts with the public and other stakeholders, including manufacturers. Evaluations have been conducted of minimum efficiency standards for central and room heaters, air conditioners, water heaters, refrigerators, freezers, ranges and ovens, dryers, dishwashers, clothes washers, and pool heaters. With regard to estimating energy savings, DOE and its contractors must distinguish program effects in terms of both the energy efficiency of appliances on the market and consumers' choices from what the situation might have been in the absence of the program.

Administrative Costs

Overview of Program Costs

\$200 million total federal government expenditures to implement appliance efficiency standards from 1978–1996 (1995\$, calculated at a 7% discount rate; includes program costs and salaries of DOE, contractor, and other staff). All costs are administrative, according to our definition.

Energy Savings

In energy

2.1 Quads primary energy savings (through 1997)

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)
\$0.0952/MBtu (\$200 million/2.1 Quads)

Sources

Koomey, J. G., S. A. Mahler, C. A. Webber, and J. E. McMahon 1998 (February). *Projected Regional Impacts of Appliance Efficiency Standards for the U.S. Residential Sector*. LBNL-39511; UC-1600. Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley, CA.

McMahon, James E., Lawrence Berkeley National Laboratory, personal communication.

Building Standards and Guidelines Program

Program Summary

Program/Policy Type

Regulatory Policies Codes and Standards

Sectors

Buildings

Goal

To improve the design and implementation of state energy codes for buildings, to assure at least a minimum level of energy efficiency that is cost-effective, technically feasible, and environmentally sound.

Lifespan

Initiated in 1980.

Program structure

DOE works in partnership with other federal agencies, state and local governments, the building industry (including the financial side), utilities, public interest groups, and building owners and users. The agency provides technical support and assistance to states and building industry organizations to develop and implement voluntary or legislatively mandated energy-efficient building codes and standards, provides State Energy Program Grants, promulgates federal building energy efficiency standards, and conducts a variety of outreach services such as a hotline, web site, newsletter, and annual conference. In addition, the Department develops training, software, and other materials that can assist in supporting and accelerating the implementation of energy-efficient, fiscally sound building codes and standards.

Administrative Costs

Overview of Program Costs

\$8 million appropriations in *1998* (crude estimate of total appropriations from 1980—1998 @ \$8 million/year = \$144 million). Assume all costs are administrative, according to our definition.

Energy Savings

In dollars

\$1.12 billion (in *1998*, but 1994 dollars)

In energy

154 trillion Btus primary annual energy savings (in *1998*)

Administrative Cost Ratios

Total administrative costs:total energy savings (\$)
\$0.007/dollar energy savings (\$8 million/\$1.12 billion)

Total administrative costs:total energy savings (MBtu)
\$0.0519/MBtu (\$8 million/154 tBtu)

Sources

EERE Success Stories, Draft, 5/18/99.

Energy Efficiency and Renewable Energy Web Site, <http://www.eren.doe.gov>.

Shankle, Diana L., Pacific Northwest National Laboratory, Richland, WA, personal communication.
U.S. DOE Energy Efficiency and Renewable Energy Network, Office of Codes and Standards, web site, <http://www.eren.doe.gov/buildings/codes_standards/>.

Demand-Side Management Programs
Example: Bonneville Power Administration—Residential Sector

Program Summary

Program/Policy Type

Financing

Sector

Residential

Goal

To encourage the adoption of energy-conserving design, materials, and equipment.

Lifespan

Bonneville has engaged in DSM programs for over 20 years. However, since 1993, BPA has been engaged in a transition to much lower program expenditures from approximately \$172 million in 1993 to \$37 million in the year 2000.

Program structure

BPA partners with public utilities, state and local governments, and private firms in promoting energy efficiency programs and measures. As a member of the Northwest Energy Efficiency Alliance, Bonneville increasingly is making the transition to market transformation approaches to energy conservation. BPA also is involved in a Market Development program, which promotes energy efficiency among external customers and internal clients. Bonneville offers a suite of programs in residential, commercial, industrial, and agricultural sectors. Residential programs include weatherization, low-income weatherization, Super Good Cents for new home construction, and code savings through its early adopter program.

Administrative Costs

Overview of Program Costs FY1993

\$151.9 million total program costs, all sectors

\$108.75 million residential total program costs

\$80.2 million direct program expenditures for residential programs

\$13.95 million administrative costs associated with overall program (since 71.6% of total acquisition costs are for the residential sector, this figure is that same percentage of the overall program's administrative costs for all sectors, \$19.5 million)

\$14.6 million administrative costs associated with direct program expenditures (71.6% of the costs for the entire program for all sectors, \$20.4 million)

\$28.55 million total administrative costs, residential

Energy Savings—FY1993

In energy

33.4 aMW or 292,584 MWh. This figure is equivalent to **2.63 million MBtu** (assuming 9000 Btu per MWh for combined gas cycle turbine, the likely marginal resource in this hydro-based system), in *FY1993*.

Assuming these savings persist for *20 years*, the energy savings is estimated to be **52.6 million MBtu** (20×2.63).

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)

\$10.86/MBtu (28.55 million/2.63 tBtu; *FY 1993*)

\$0.543/MBtu (28.55 million/52.6 tBtu, over *20 years*)

Source

Bonneville Power Administration web site, www.bpa.gov.

Keating, Ken, Bonneville Power Administration, personal communication.

Demand-Side Management Programs
Example: Bonneville Power Administration—Commercial Sector

Program Summary

Program/Policy Type

Financing

Sector

Commercial

Goal

To encourage the adoption of energy-conserving design, materials, and equipment

Lifespan

Bonneville has engaged in DSM programs for over 20 years. However, since 1993, BPA has been engaged in a transition to much lower program expenditures from approximately \$172 million in 1993 to \$37 million in the year 2000.

Program structure

BPA partners with public utilities, state and local governments, and private firms in promoting energy efficiency programs and measures. As a member of the Northwest Energy Efficiency Alliance, Bonneville increasingly is making the transition to market transformation approaches to energy conservation. BPA also is involved in a Market Development program, which promotes energy efficiency among external customers and internal clients. Bonneville offers a suite of programs in residential, commercial, industrial, and agricultural sectors. Commercial programs include its Energy Smart Design Assistance Program and code savings. Thousands of commercial establishments have benefited from BPA efforts since FY 1982.

Administrative Costs

Overview of Program Costs FY1993

\$151.9 million total program costs

\$29.92 million commercial total program costs

\$22.1 million direct program expenditures for commercial programs

\$3.8 million administrative costs associated with overall program (since 19.7% of total acquisition costs are for the commercial sector, this figure is that same percentage of the overall program s administrative costs for all sectors, \$19.5 million)

\$4.02 million administrative costs associated with direct program expenditures (19.7% of the costs for the entire program for all sectors, \$20.4 million)

\$7.82 million total administrative costs

Energy Savings—FY 1993

In energy

15.4 aMW or 134,904 MWh. This figure is equivalent to **1.21 million MBtu** (assuming 9000 Btu per MWh for combined gas cycle turbine, the likely marginal resource in this hydro-based system), in *FY 1993*.

Assuming these savings persist for *20 years*, the energy savings is estimated to be **24.2 million MBtu** (20 x 1.21).

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)

\$6.46/MBtu (7.82 million/1.21 tBtu; *FY 1993*)

\$0.323/MBtu (7.82 million/24.2 tBtu, *over 20 years*)

Source

Bonneville Power Administration web site, www.bpa.gov.

Keating, Ken, Bonneville Power Administration, personal communication.

Weatherization Assistance Program

Program Summary
Program/Policy Type Government procurement
Sector Buildings
Goal To improve the energy efficiency of low-income residences.
Lifespan Initiated in 1976 under the Energy Conservation and Production Act; the program's peak funding was in the early 1980s.
Program structure The Weatherization Assistance Program delivers energy conservation services to low-income Americans. DOE's Office of State and Community Programs provides grants to states, which have some discretion in how they implement the program. In 1989, an average of \$1600 was spent per residence; in 1998 that average increased to \$2000 per residence. During the course of the program's life, there has been a shift from a fairly basic, low-cost and low-technology approach to one based on more sophisticated diagnostics (e.g., blower doors), which requires more training and expertise to implement. DOE's expenditures for the Weatherization Program constituted about 45% of the total spent on low-income weatherization from 1978—1996; the remainder was expended by states, utilities, and the Department of Health and Human Services Low-Income Home Energy Assistance Program. However, most non-DOE weatherization funds were channeled through DOE's program and, therefore, used to weatherize residences according to DOE standard practice.

Administrative Costs

Overview of Program Costs

\$125 million (DOE) + \$198 million (non-DOE) = \$323 million appropriations (in 1998)

\$96.9 million administrative costs (30%, all costs other than labor and materials administration, training, technical assistance, evaluation, program support, *with the exception of* DOE and state staffing)

\$225K DOE office staffing (3 FTE @ \$75K/person, fully loaded)

Note: our definition of administrative costs differs from that used by the program. The program definition includes training and technical assistance, but does not include program implementation. Therefore, the administrative costs and administrative cost ratios reported here do not mesh with the figures used by the program.

Costs

Total Program Costs = **\$125.23 million** (program appropriations + DOE staffing, in 1998)

Total Administrative Costs = **\$97.1 million** (technical evaluation + program office + DOE staffing)

Energy Savings

In dollars

\$35 million (in 1998; \$209/home x 167,400 homes)

\$550 million (of 1998 investments, over 20-year life of measures)

In energy

5.4 tBtu (in 1998; 32.2MBtu/home x 167,400 homes)

108 tBtu (of 1998 investments, over 20-year life of measures)

Administrative Cost Ratios

Total administrative costs:total energy savings (\$)

\$2.77/dollar saved (1998)

\$0.177/dollar saved (20 years)

Total administrative costs:total energy savings (MBtu)

\$17.98/MBtu (1998)

\$0.899/MBtu (20 years)

Sources

Berry, Linda, Oak Ridge National Laboratory, personal communication.

Berry, L. G., M. A. Brown, and L. F. Kinney, 1997 (September). *Progress Report of the National Weatherization Assistance Program*. ORNL/CON-450. Oak Ridge National Laboratory, Oak Ridge, TN.

Brown, M. A., L. G. Berry, R. A. Balzer, and E. Faby, 1993 (May). *National Impacts of the Weatherization Assistance Program in Single-Family and Small Multifamily Dwellings*. Oak Ridge National Laboratory, Oak Ridge, TN.

BTS Success Stories, Draft, 3/23/99, with *BTS Success Stories Draft Documentation*, 4/13/99.

Eisenberg, Joel, Oak Ridge National Laboratory, personal communication.

Demand-Side Management/Market Transformation— Southern California Edison, Residential Programs

Program Summary

Program/Policy Type

Demand-side Management/Market Transformation

Sector

Residential

Goal

To promote market transformation for energy efficiency goods and services.

Lifespan

Following about two decades of developing and implementing demand-side management programs, in 1997 Southern California Edison (SCE) shifted to a market transformation framework. Some of the programs implemented are the same as, or nearly identical to, earlier demand-side management programs; but new efforts have been initiated, the largest being performance contracting. These new efforts represent a fundamental change in approach to energy conservation.

Program structure

SCE offers a \$90 million suite of residential, commercial, and industrial programs, which have varied program structures. While some of these programs have been carried over into the market transformation era from the demand-side management era, others have only recently been initiated and still others are planned, but not yet under way. Residential programs, like small-customer-oriented non-residential programs, tend to be more costly to serve and operate than large-customer-oriented programs. An exception here may be upstream programs that offer incentives at the manufacturers level. The structure of residential programs offered by SCE varies some involve rebates/incentives; others, such as audits or information-provision programs, are entirely administrative. Because programs are authorized annually, they may be implemented in a start-and-stop fashion. This pattern may result in spikes of relatively high administrative costs throughout the program's life, rather than just during the program's start-up phase.

Administrative Costs

Overview of Program Costs (1998)

\$19.3 million total program costs (excludes shareholder incentives)

\$14.7 million recorded and committed program incentives paid to customers

\$4.6 million recorded and committed administrative costs (\$0.6 million SCE labor; \$3.7 million non-labor; \$0.3 million in ESCO commitments)

Energy Savings

In energy

57,033 MWh net annualized *first-year* savings (assuming 9000 Btu/MWh for combined gas cycle turbine, 0.51 million MBtu)

205,209 MWh net savings over *20-year estimated lifetime of measures* (assuming 9000 Btu/MWh, 1.85 million MBtu)

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)

\$9.02/MBtu in the *first year* (\$4.6 million admin. costs/0.51 tBtu)

\$2.49/MBtu *cumulatively* (\$4.6 million admin. costs/1.85 tBtu)

Sources

Brown, Marian, Southern California Edison, personal communication.

Southern California Edison, 1999 (May). *1999 Energy Efficiency Annual Report*.

Energy Star

Program Summary

Program/Policy Type

Voluntary Agreement; Market Transformation

Sectors

Residential, Commercial, Industrial, Agricultural

Goal

To develop public-private partnerships that promote cost-effective energy efficiency and reductions in greenhouse gas emissions, thereby resulting in market transformation

Lifespan

Initiated in 1991 with the Energy Star Computers and GreenLights programs; the program expanded in 1993, for example, to deal with whole buildings, and not just lighting. The array of Energy Star programs now include partnership programs for commercial, industrial, and residential buildings including a product labeling program, as well as for methane and environmental stewardship.

Program structure

The Energy Star Program is operated by the U.S. Environmental Protection Agency's Climate Protection Division and the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. The program consists of five major program elements: Energy Star Buildings and Green Lights, oriented towards commercial and industrial buildings; Energy Star Homes; Energy Star-Labeled Products, equipment and appliances for offices and homes; Environmental Stewardship Programs, focusing on industrial processes; and Methane Partnerships to reduce methane and other greenhouse gas emissions from industrial, agricultural, and state and local government operations. The various program elements operate differently. For instance, in the commercial sector, private partners are asked to make commitments but for the residential sector, the program partners with builders to encourage energy-efficient construction without seeking formalized commitments.

Administrative Costs

Overview of Program Costs*

Climate Protection Division Program Expenditures, 1991—1998 \$242.3 million (constant dollars)

Climate Protection Division Program Expenditures, 1998 \$47.8 million (current-year dollars)

* Notes: Figures for EPA's program costs are provided here. All program expenditures are treated as administrative.

Energy Savings (in 1998 dollars)

In energy

2,627 trillion Btus (converted from 42.3 MMTCE, cumulative, with a conversion factor of 16.1 MtC per quad of primary energy equivalent)

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)

\$0.092/MBtu (\$242.3 million total administrative costs 1991—1998/2,627 tBtu energy savings)

Sources

Laitner, John, U.S. Environmental Protection Agency, personal communication.

Lee, Virginia, U.S. Environmental Protection Agency, personal communication.

U.S. Environmental Protection Agency, Climate Protection Division, 1999 (June). *Driving Investment in Energy Efficiency: Energy Star and Other Voluntary Programs*. DRAFT 1998 Annual Report.

Demand-Side Management/Market Transformation Southern California Edison, Non-Residential Programs

Program Summary

Program/Policy Type

Demand-side Management/Market Transformation

Sectors

Commercial, Industrial, Agricultural

Goal

To assist non-residential customers and promote market transformation for energy efficiency goods and services, eliminating market barriers and encouraging privatization.

Lifespan

In 1997 Southern California Edison (SCE) shifted to a market transformation framework. Some of the programs implemented are the same as, or nearly identical to, earlier demand-side management programs; but new efforts have been initiated, the largest being performance contracting.

Program structure

SCE offers a \$90 million suite of residential, commercial, and industrial programs, which have varied program structures. SCE has information provision programs, programs to promote energy management services, energy efficiency incentive programs, and upstream programs. While some of these programs have been carried over into the market transformation era from the demand-side management era, others have only recently been initiated and still others are planned, but not yet under way. Small-customer-oriented non-residential programs, like residential programs, tend to be more costly to serve and operate than large-customer-oriented programs. An exception here may be upstream programs that offer incentives at the manufacturers level. Annual authorizations may lead to a pattern of stop-and-start program implementation, possibly resulting in spikes of relatively high administrative costs throughout the program's life, rather than just during the program's start-up phase.

Administrative Costs

Overview of Program Costs 1998

\$36.6 million total program costs (excludes shareholder incentives)

\$24.0 million recorded and committed program incentives paid to customers

\$12.6 million recorded administrative costs (\$8.6 million SCE labor; \$3.5 million non-labor; \$0.5 million in ESCO commitments)

Energy Savings

In energy

182,410 MWh net *annualized first-year savings* (assuming 9000 Btu/MWh for combined gas cycle turbine, **1.64 million MBtu**)

2,716,677 MWh net savings over *20-year estimated lifetime of measures* (assuming 9000 Btu/MWh, **24.45 million MBtu**)

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)

\$7.683/MBtu in the *first year* (\$12.6 million admin. costs/1.64 tBtu)

\$0.515/MBtu *cumulatively* (\$12.6 million admin. costs/24.45 tBtu)

Sources

Brown, Marian, Southern California Edison, personal communication.

Southern California Edison, 1999 (May). *1999 Energy Efficiency Annual Report*.

U.S. DOE's Office of Industrial Technologies: Industrial Assessment Centers (IACs)

Program Summary

Program/Policy Type

Technical assistance

Sector

Industrial

Goal

To conduct assessments of small- to medium-sized manufacturing facilities to reduce energy-consumption and energy costs, minimize manufacturing waste and waste costs, and to enhance productivity and reduce production costs.

Lifespan

Formerly known as the Energy Analysis and Diagnostic Center program, which began performing energy audits in 1976, and renamed the IAC program in FY 1994. The program has expanded considerably, growing from 4 to 30 centers. In 1994, assessments began to address waste reduction/pollution prevention as well as energy conservation. In 1996, the assessments also began to address productivity savings.

Program structure

Housed in U.S. DOE's Office of Industrial Technologies, the IAC program uses 30 university-based centers to deliver assessment services. Two field management offices, Rutgers University and the University City Science Center, oversee assessment activities in the eastern and western divisions, respectively. Further, the Rutgers office maintains a database of results from over 8,000 assessments for the entire program. Annually, each Center conducts 25 comprehensive assessments, for a program total of 750 assessments. Each assessment includes the following activities and products: pre-visit client interview and data analysis, one-day site visit, engineering feasibility study, assessment report, and a follow-up phone call (within 6 to 9 months) to verify implementation status of assessment recommendations.

Administrative Costs

Overview of Program Costs (1989—1998)

\$55.138 million appropriations from 1989 through 1998, including all staffing

Note: by our definition, all program costs are administrative. However, an argument can be made that the costs associated with the assessments themselves are non-administrative. A budget breakdown for 1999, with a total program budget of \$8,248,329, is provided to illustrate the proportion of funds associated with the assessments.

- Assessment-related costs (750 assessments @ \$5950 each + center director travel to key meetings/expos + equipment maintenance + special projects) \$5,055,000
- OIT (DOE-HQ-related) costs \$932,000
- Field management costs \$1,895,329

- Technology transfer \$366,000

Energy Savings (1989–1998)

In dollars

\$1,420 million (includes waste- and productivity-savings in latter years)

In energy

142.56 trillion Btus (includes persistent savings plus spillover effects such as the replication of assessments in other areas of the plant or in other plants and professional impacts of program alumni)

Administrative Cost Ratios

Total administrative costs: total energy savings (\$)

\$0.038/client dollar savings

Total administrative costs: total energy savings (MBtu)

\$0.386/MBtu

Sources

Martin, Michaela, Oak Ridge National Laboratory, personal communication.

Muller, Michael R. and Merritt Kirk, 1999 (March). *Savings Generated by the Industrial Assessment Center Program: Fiscal Year 1997*. Prepared by Rutgers University and University City Science Center for the Office of Industrial Technologies, U.S. Department of Energy.

Demand-Side Management Programs
Example: Bonneville Power Administration—Industrial Sector

Program Summary

Program/Policy Type

Financing

Sector

Industrial

Goal

To encourage the adoption of energy-conserving design, materials, and equipment.

Lifespan

Bonneville has engaged in DSM programs for over 20 years. However, since 1993, BPA has been engaged in a transition to much lower program expenditures from approximately \$172 million in 1993 to \$37 million in the year 2000.

Program structure

BPA partners with public utilities, state and local governments, and private firms in promoting energy efficiency programs and measures. As a member of the Northwest Energy Efficiency Alliance, Bonneville increasingly is making the transition to market transformation approaches to energy conservation. BPA also is involved in a Market Development program, which promotes energy efficiency among external customers and internal clients. Bonneville offers a suite of programs in residential, commercial, industrial, and agricultural sectors. Among BPA's significant recent industrial sector efforts has been its Conservation/Modernization program, an effort to upgrade aluminum smelters. The energy savings for this program are tracked separately from other industrial sector programs. In general, industrial customers approach BPA with ideas, and ask for co-funding based on projected energy savings. It can take several years for a new program to ramp up to achieve anticipated savings.

Administrative Costs

Overview of Program Costs FY1993

\$151.9 million total program costs

\$10.04 industrial total program costs

\$7.4 million direct program expenditures for industrial programs

\$1.29 million administrative costs associated with overall program (since 6.6% of total acquisition costs are for the industrial sector, this figure is that same percentage of the overall program's administrative costs for all sectors, \$19.5 million)

\$1.35 million administrative costs associated with direct program expenditures (6.6% of the costs for the entire program for all sectors, \$20.4 million)

\$2.64 million total administrative costs

Energy Savings—FY1993

In energy

14.6 aMW or 127,896 MWh. This figure is equivalent to **1.15 million MBtu** (assuming 9000 Btu per MWh for combined gas cycle turbine, the likely marginal resource in this hydro-based system), in FY 1993.

Assuming these savings persist for 20 years, the energy savings is estimated to be **23.0 million MBtu** (20 x 1.15).

Administrative Cost Ratios

Total administrative costs:total energy savings (MBtu)

\$2.30/MBtu (2.64 million/1.15 tBtu; FY 1993)

\$0.115/MBtu (2.64 million/23.0 tBtu, over 20 years)

Source

Bonneville Power Administration web site, www.bpa.gov.

Keating, Ken, Bonneville Power Administration, personal communication.

Energy-Related Inventions Program

Program Summary

Program/Policy Type

Research and Development

Sectors

All

Goal

To support the development of innovative, non-nuclear energy-reducing technologies.

Lifespan

Initiated in 1974; first budget appropriations in 1976; in 1998 the program was re-engineered and now is administered differently, from a different DOE office

Program structure

Several steps are involved in the ERIP process. First, inventors submit applications to DOE-EE. DOE provides an average of \$78K to each grantee and, through NIST, provides technical evaluations of ideas. Since 1974, NIST has evaluated over 32,000 inventions. Of these inventions, DOE has provided commercialization and financial assistance for nearly 750 and grants to support about 500. DOE evaluates the program every 2 years.

Administrative Costs

Overview of Program Costs

\$84.1 million appropriations through 1995 (cumulative over life of program, 1995\$)

\$34.5 million grants, cumulative through 1995 (1995\$)

\$5.1 million DOE staffing over program life (1 FT director @ GS 13, 4 FT invention coordinators @ GS 11, 1 FT secretary @ GS 7) with multiplier (1.5) for benefits package and office space, for 15 years (1980—1995) (1999 GS levels, grade 1, for Washington, D.C. area)

Costs

Total Program Costs=\$89.2 million (program appropriations + DOE staffing with multiplier)

Total Administrative Costs=\$54.7 million (tech. evaluation + program office + DOE staffing with multiplier)

Note: we do not consider any within-grant administrative costs.

Energy Savings

In dollars

\$186 million (in 1995 dollars; cumulative for all inventions on market in that year)

In energy

78.5 trillion Btus (in 1995, cumulative for all inventions on market in that year)

Administrative Cost Ratios

Total administrative costs:total energy savings (\$)

\$0.294/dollar energy savings

Total administrative costs:total energy savings (MBtu)

\$0.697/MBtu

Sources

Braid, R. B., Jr., M. A. Brown, C. R. Wilson, C. A. Franchuk, and C. G. Rizy 1996 (October). *The Energy-Related Inventions Program: Continuing Benefits to the Inventor Community*. ORNL/CON-429. Oak Ridge National Laboratory, Oak Ridge, TN.

Brown, M. A., C. R. Wilson, C. A. Franchuk, S. M. Cohn, and D. Jones 1994 (July). *The Economic, Energy, and Environmental Impacts of the Energy-Related Inventions Program*. ORNL/CON-381. Oak Ridge National Laboratory, Oak Ridge, TN.

Perlack, Robert and Marilyn Brown, Oak Ridge National Laboratory, personal communication.

Fuel Economy Guide

Program Summary

Program/Policy Type

Voluntary

Sectors

Transportation

Goal

To provide consumers considering the purchase of automobiles and light trucks with information about fuel mileage; new car and light truck dealers are required to display copies of the guide prominently in their showrooms and to have copies of the guide.

Lifespan

The program started in 1975 and the first fuel economy guide was published in 1976. Over time, the number of hard-copy guides printed and distributed has decreased; recently, the guide has been available on the internet.

Program structure

The U.S. EPA compiles the raw data that are used in the Guide as a by-product of its emissions testing program. EPA tests a sample of vehicle makes and models and confirms information submitted by manufacturers. The U.S. Department of Energy's Office of Transportation Technologies re-formats the EPA data, categorizing it by manufacturer as well as by class of vehicle. Fuel economy information is provided for city and highway driving. DOE puts the information in book and internet form. DOE prints the hard copies of the Guide and mails it.

Administrative Costs

Overview of Program Costs

\$13.2 million appropriations averaging \$500K per year, plus \$100K per year for DOE and EPA staff time (funded out of a separate budget), cumulative from 1976—1997

According to our definition of administrative costs, all costs are administrative.

Energy Savings

In dollars

\$880 million (cumulative from 1976—1997)

In energy

101 trillion Btus (cumulative from 1976—1997, based on an estimated 806 million gallons of motor fuel saved)

Administrative Cost Ratios

Total administrative costs:total energy savings (\$)

\$0.015/dollar energy savings (\$13.2 million/\$880 million)

Total administrative costs:total energy savings (MBtu)

\$0.131/MBtu (\$13.2 million/101 tBtu)

Source

Patterson, Phil, U.S. Department of Energy, personal communication.

Emissions Trading

The U.S. Environmental Protection Agency recently completed an analysis of emissions reductions options for the electric power industry. While this report acknowledges that utilities, state and local regulators, and EPA will incur administrative costs, those costs were not analyzed. Nevertheless, the kinds of administrative costs incurred by these organizations include the following: For some electric generation units,...monitoring emissions, certifying compliance, modifying permits, and trading allowances. For States and local governments and EPA, there will be program development and implementation costs. Experience under Title IV SO₂ Allowance Trading program suggests that the cap-and-trade programs considered in this study will not have large administrative costs....

Source

U.S. Environmental Protection Agency, Office of Air and Radiation, 1999 (March). *Analysis of Emissions Reduction Options for the Electric Power Industry*, p. 2—13.

FEMP Procurement

The Federal Energy Management Program's (FEMP) Federal Procurement Challenge Program primarily disseminates information about energy-efficient products that meet a directive in a presidential executive order for federal agencies to buy products in the top 25% of energy efficiency. Energy managers and procurement officers at the different federal agencies then may incorporate specifications for these energy-efficient, cost-effective products into their purchasing efforts. FEMP Energy Management Awards recognize agency efforts to incorporate FEMP-recommended energy-efficient products into their specifications. We were unable to estimate the administrative cost ratio of FEMP procurement because, while there is information about administrative costs, there are no data about actual or estimated energy savings.

Source

Coleman, Phil, Lawrence Berkeley National Laboratory, personal communication.

Fiscal Policies

There is a series of federal-level efforts to use fiscal policies, like tax credits, to achieve energy- and carbon-conservation goals. Among these efforts is the Clinton administration's Climate Change Tax Credit program. In programs like these, the Internal Revenue Service is responsible for developing the regulations and associated forms and instructions. After tax returns are filed, the IRS must process the additional information. In addition, the IRS has both auditing and collection functions. We could not estimate the administrative cost ratio for these kinds of programs because administrative cost figures are not maintained by the Department of Treasury. Tax credit and other fiscal policies are administered as some among the multiple activities overseen by various Department and Internal Revenue Service offices; program-specific allocations are not made.

Sources

Auten, Gerald, U.S. Department of Treasury, personal communication

Gerardi, Geraldine, U.S. Department of Treasury, personal communication.

ENDNOTES

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