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Impact of 2003 Building Technology, State and Community Programs on United States Employment and Earned Income

M.J. Scott
D.J. Hostick
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June 2002

Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RL01830

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Abstract

The Department of Energy Office of Building Technology, State and Community Programs (BTS) is interested in assessing the potential economic impacts of its portfolio of programs on national employment and income. A special purpose version of the IMPLAN input-output model called ImBuild II is used in this study of all 37 BTS programs reported in the Office of Management and Budget "Passback Budget" dated 12/21/01 and provided to BTS for inclusion in the revised budget. Energy savings, investments, and impacts on U.S. national employment and wage income are reported by program for selected years to the year 2030. Energy savings from these programs have the potential of creating a total of 270,000 jobs and about $3.41 billion in wage income (1999$) by the year 2030.

Summary

As part of measuring the impact of government programs for improving the energy efficiency of the nation's building stock, the Department of Energy Office of Building Technology, State and Community Programs (BTS) is interested in assessing the economic impacts of its portfolio of programs, specifically the potential impact on national employment and income. This assessment was done for the first time in FY 1999 as a supplement to the Government Performance and Results Act (GPRA—formerly, Quality Metrics). GPRA provides estimates of primary energy savings and environmental and direct financial benefits of the BTS programs. The current analysis performs this assessment on the FY2003 budget request from BTS.

The programmatic needs of BTS suggest that a simple, flexible, user-friendly method is needed to derive national employment and income impacts of individual BTS programs. Therefore, BTS funded Pacific Northwest National Laboratory (PNNL) to develop a special-purpose version of the IMpact Analysis for PLANning (IMPLAN) national input-output model (Minnesota IMPLAN Group, Inc. 1997) specifically to estimate the employment and income effects of building energy technologies. IMPLAN was developed originally by the U.S. Forest Service in cooperation with the Federal Emergency Management Agency and the Bureau of Land Management to assist the Forest Service in land and resource management planning. Since 1979, it has been used by a wide variety of government and private agencies to assess economic impacts. The special-purpose version of the IMPLAN model used in this study is called ImBuild II. Extensive documentation and a user's guide are provided in Scott et al. (2002). Compared with simple economic multiplier approaches, such as the published multipliers from the Department of Commerce Regional Input-Output Modeling System (RIMS II) (Bureau of Economic Analysis 1992), ImBuild allows for more complete and automated analysis of the economic impacts of energy efficiency investments in buildings. ImBuild II is also easier to use than existing macroeconomic simulation models. In this report, we use the ImBuild II model to calculate the impact of all 37 BTS programs reported based on the Office of Management and Budget "Passback Budget" dated 12/21/01 and provided to BTS for inclusion in the revised budget.

BTS programs affect the economy through three primary mechanisms. First, if the incremental capital costs of the new technology per installed unit are different from those of the conventional technology, the level of purchases will change in the sectors involved in manufacturing, distribution, and installation for both technologies, changing the level of overall economic activity. Second, the efficiency investment may crowd out other domestic saving, investments, and consumer spending, offsetting some positive impact on the economy caused by the new efficiency investment. Third, energy and non-energy expenditures are reduced. On the one hand, this saving reduces final sales in the electric and gas utility sectors, as well as in the trade and services sectors that provide related maintenance, parts, and services. But, on the other hand, it increases net disposable income of households and businesses and increases general consumer and business spending in all sectors (including some increases in expenditures for electric and gas utility services and retail trade and services).

Energy efficient technology is expected to have a measurable effect on the activity level of the U.S. economy. BTS programs are characterized by significant investment requirements and delivered energy cost savings, as shown in Figure S.1 and Table S.1.[(a)]

Figure S.1 and Table S.1 show the energy savings expected to be created by market penetration of the BTS programs have the potential of creating nearly 270,000 jobs and about $3.41 billion in wage

Table S.1. Impact of 37 BTS Programs on the U.S. Economy

	Incremental Investment Cost (million 1999 $)	**Delivered Energy Saved (10^{12} Btu)**	**Potential Jobs Created (thousand)**	**Impact on National Earnings (million 1999$)**
Impact of Energy Savings Alone				
2003	0	43	7	$81
2004	0	84	9	$115
2005	0	134	15	$180
2006	0	178	20	$238
2007	0	228	25	$300
2010	0	475	53	$630
2015	0	1,049	119	$1,417
2020	0	1,561	187	$2,280
2025	0	1,901	230	$2,839
2030	0	2,226	270	$3,358
Impact of Full Investment Scenario				
2003	$2,977	43	6	$203
2004	$3,205	84	7	$248
2005	$3,292	134	13	$316
2006	$3,485	178	18	$384
2007	$3,473	228	23	$446
2010	$3,633	475	51	$783
2015	$1,425	1,049	118	$1,473
2020	$1,411	1,561	186	$2,335
2025	$1,433	1,901	228	$2,895
2030	$1,463	2,226	269	$3,415

(a) In this analysis, we used program information from PNNL (2002) that PNNL prepared with DOE/EE program managers. Delivered energy is used to calculate potential savings resulting from reduced demand for electrical generating capacity and natural gas pipeline capacity. See Scott et al. (2002).

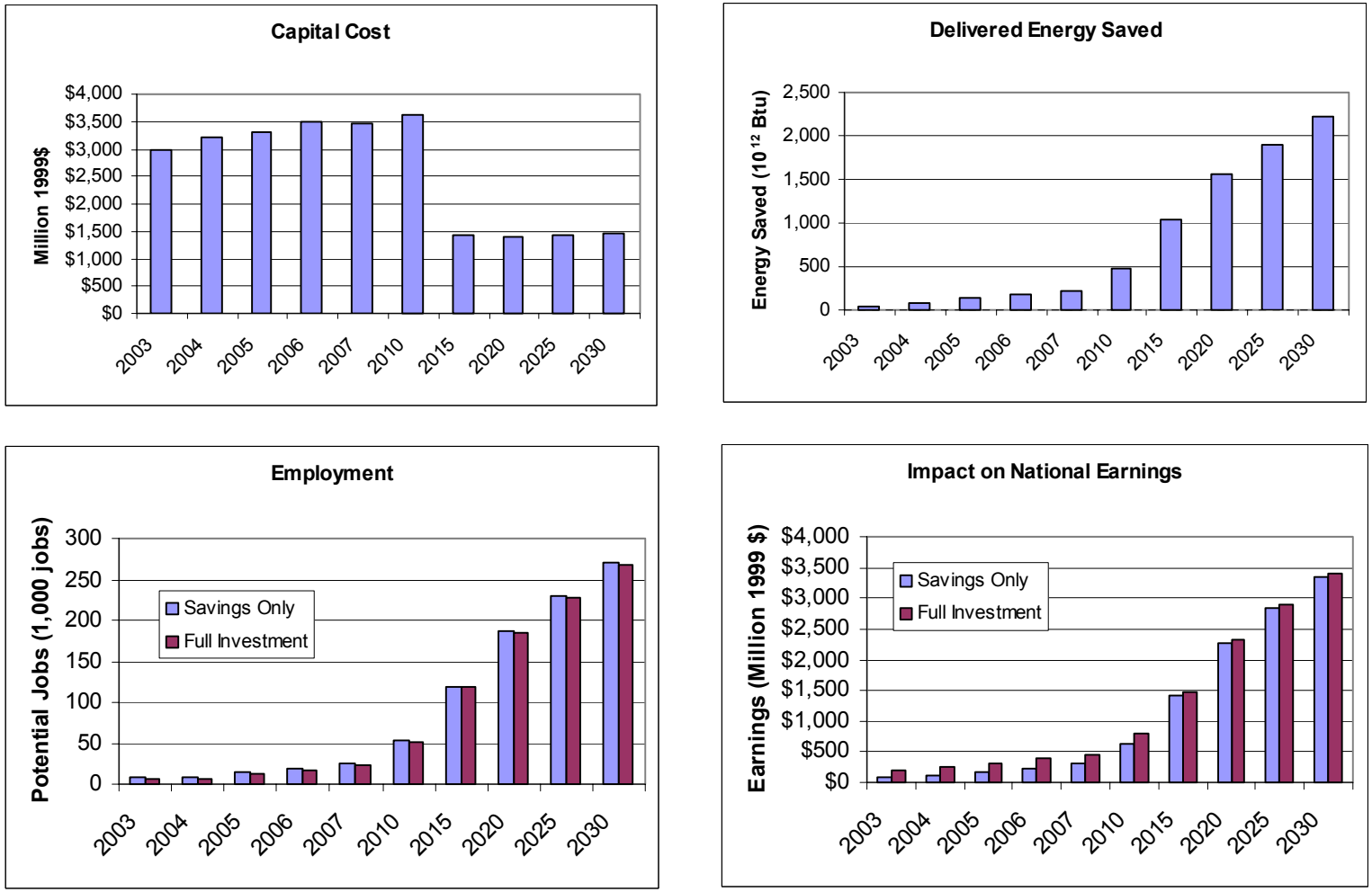

Figure S.1. Impact of 37 BTS Programs on the U.S. Economy

income (1999$) by the year 2030. However, not all of the gains would be immediately apparent because intensive investment in new energy technology and new building practices would be required during the first 30 years of the 21st century. These effects are incorporated in the full investment scenario shown in the lower half of Table S.1. Many of the capital investments required to achieve these savings begin early in the 30-year period. However, to be in concert with a recent analysis of the Department of Energy's Energy Research and Development program by the National Academy of Sciences (NAS), BTS, in many cases only takes credit for the first 5 years of market impact. The NAS used a simplifying assumption that government R&D programs do no more than accelerate the technology; bringing it to market five years before the private sector would have without government intervention. The net effect of this assumption is that incremental investments due to the BTS programs are overtaken by "normal" investments in the 2015 time frame, which results in lower program-related efficiency investments shown in the upper left-hand panel of Figure S.1, and in Table S.1. For the most part, this incremental investment in energy technology, contrary to its popular image, is likely to be more capital-intensive than the average consumption and investment in the economy. This difference is due to the fact that most of the increment to investment occurs in capital-intensive manufacturing processes. Because we assume the capital required to make the energy efficiency investments is diverted proportionately from all competing uses for money in the economy (a large proportion of which is personal and business consumption of labor-intensive goods and services such as groceries, clothing, travel services, and legal services), the investments reduce the employment level in the short run.

Only when the energy benefits of cumulative efficiency investments have grown large, relative to the costs of current investment, would the full impacts on employment and income become visible. Thus, in the full investment scenario, as the energy technologies and practices associated with the 37 BTS programs penetrate the U.S. marketplace over the next 30 years, the required capital investments are significant and increasing over most of the period, reaching about $3.6 billion *per year* in 2010. These required investments divert national spending into capital-intensive sectors and initially reduce employment below what it otherwise would have been. However, the energy savings associated with these same investments are true economic savings that provide new economic opportunities, generate ever-increasing numbers of jobs and higher income, and eventually become the dominant economic result of the BTS programs.

More than half of the jobs (59%) and net wage income benefits (63%) of the BTS programs come from only six of the programs: Training and Technical Assistance, Commercial Building Codes, Energy Star CFLs, Advanced Lighting (Two Photon Source), Building Envelope R& D on Superwindows, and EPACT Standards. These six programs are large-scale, cost-effective programs that are expected to produce large energy savings relative to the investments required. By the year 2030, each of these programs will produce net annual savings to the U.S. economy (*after* investment costs) over $1.8 billion per year (about $17.4 billion together) and 159,000 net total jobs (after investment effects). If the Energy Star Programs and Lighting and Building Equipment programs are each counted as single programs, they account for net savings impacts of $5.9 billion and $15.2 billion, respectively, and a combined positive impact of 192,000 net total jobs. The impacts of most of the other BTS programs are on a much smaller scale.

Acronyms

AC	air conditioning
BTS	Office of Building Technology, State and Community Programs (DOE)
CFL	compact fluorescent lamp
DOE-EE	Department of Energy—Office of Energy Efficiency and Renewable Energy
EIA	Energy Information Administration
FY	fiscal year
GDP	Gross Domestic Product
GPRA	Government Performance and Results Act (formerly, Quality Metrics)
HP	heat pump
HUD	Housing and Urban Development
HVAC	Heating, Ventilating and Air Conditioning
ImBuild	Specific purpose version of IMPLAN (PNNL)
IMPLAN	Impact Analysis for Planning
PNNL	Pacific Northwest National Laboratory
R&D	Research and Development
RIMS II	Regional Input-Output Modeling System
SIC	Standard Industrial Classification

Acknowledgments

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Contents

Figures

Tables

1.0 Methods

1.1 Introduction

The primary goal of the Department of Energy (DOE) Office of Building Technology, State and Community Programs (BTS) is to save energy. However, BTS programs also have economic impacts as energy investments, and the resultant energy savings, play out in the national economy. As part of measuring the impact of government programs on improving the energy efficiency of the nation's building stock, the Department of Energy Office of Building Technology, State and Community Programs (BTS) is interested in assessing the economic impacts of these programs, specifically the impact on national employment and wage income. As a consequence, BTS funded Pacific Northwest National Laboratory to develop a simple-to-use method that could be used in-house to estimate economic impacts of individual programs.

Three fundamental methods are available to estimate employment and wage income impacts for selected energy efficiency improvements in the U.S. economy: multipliers, input-output models, and macroeconomic simulation models. PNNL staff reviewed the BTS programmatic needs and available methods and, based on this assessment and on realistic resource constraints, designed and developed a special-purpose version of the IMPLAN national input-output model, specifically to estimate the employment and income effects of building energy technologies. This model is called Impact of Building Energy Efficiency Programs (ImBuild), the second version of which (ImBuild II) is now operational. Scott et al. (2002) discusses the methods, structure of the ImBuild model, its testing and performance. For a detailed discussion of the methodology used in this study, refer to that report.

In comparison with simple multipliers, ImBuild II allows for more complete and automated analysis of essential features of energy efficiency investments in buildings. ImBuild II is also easier to use than extant macroeconomic simulation models. It does not include the ability to model certain dynamic features of markets for labor and other factors of production featured in these more complex models, but for most purposes these excluded features are not critical. Such impacts can be handled well by an input-output model and the analysis should be credible, as long as the assumption can be made that relative prices in the economy would not be substantially affected by energy efficiency investments. The expected scale of these investments is small enough in most cases that neither labor markets nor production cost relationships will seriously affect national prices as the investments are made. The exact timing of impacts on gross product, employment, and national wage income from energy efficiency investments is not well enough understood that much special insight can be gained from the additional dynamic sophistication of a macroeconomic simulation model. Thus, ImBuild II is a cost-effective compromise.

1.2 Calculation of Impact Using ImBuild

As cost-effective, energy-efficient technologies penetrate the marketplace, BTS programs will affect national employment and wage income. To analyze these effects, the ImBuild II model requires certain information on BTS programs: the size of the incremental investment in the technology over time, compared with the conventional technology it replaces; corresponding energy savings by fuel in physical and monetary terms (which may include additional use of some fuels when one type of fuel replaces another); and non-energy operations savings (if any) in comparison with the current technology (Figure 1.1).

ImBuild II calculates changes in the use of energy, labor, and materials due to incremental investments and economic savings associated with BTS-supported technologies and practices, as shown in Figure 1.1. As the figure illustrates, new investments in these technologies affect the level of employment and wage income in the economy by multiple pathways. First, the procurement of equipment and installation services creates jobs and income in some industries, while diverting funds that otherwise would have been spent for other goods and services by businesses and consumers. At the same time, the investment in energy-efficient technologies or practices may make other investments in energy supply technologies (for example, power plants) unnecessary, directly and indirectly affecting jobs and income.

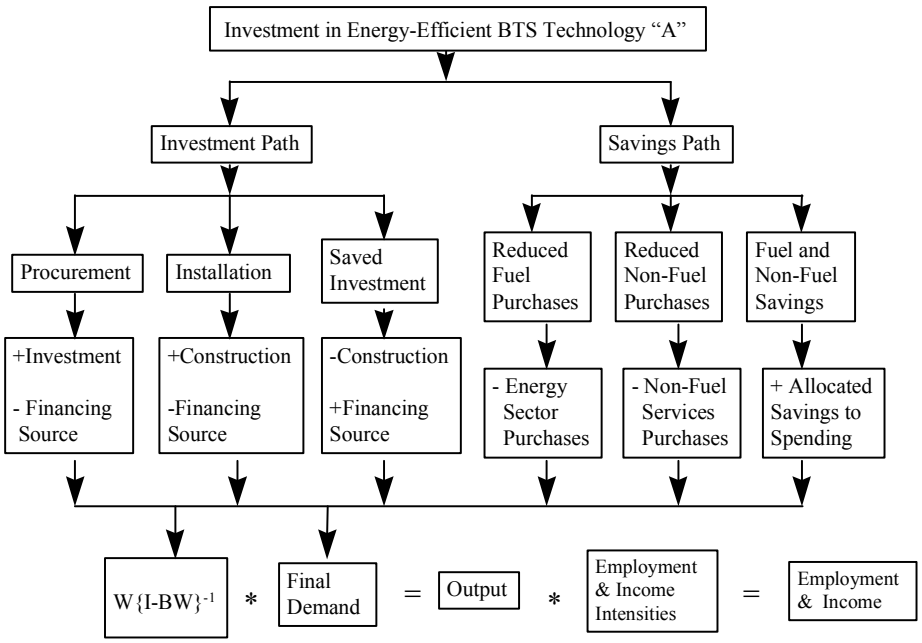

Figure 1.1. Detailed Calculations of the ImBuild II Model

The issue is discussed in more detail in Scott et al. (2002).[a] For this report, we assumed that financing for the energy-efficient investments is drawn proportionately from the rest of the U.S. economy.[b] Figure 1.1 also shows that an investment in energy-efficient technology reduces the amount of energy needed. Reducing energy consumption reduces energy purchases (which in turn reduces employment and income in the energy-supplying sectors) and produces dollar savings that can be spent on any good or service, including energy (which creates employment and income). In addition, some energy efficiency investments may save the purchaser other costs such as maintenance services, and these savings also have impacts.

All of these pathways in Figure 1.1 either affect the interindustry intermediate procurement (the matrix $W\{I-BW\}^{-1}$ in Figure 1.1) or the final demand (the set of goods and services in the economy purchased for final consumption or new investment, as distinguished from those purchased merely as intermediate inputs to current production). In residential applications, the necessary model calculations are relatively straightforward, because residential savings are assumed to be entirely recycled into personal consumption and investment (that is, final demand). For commercial building applications, the process is more complicated because the interindustry relationships between specific sectors are affected, not just final demand. For savings in the commercial sector, the interindustry portion of the input-output table is automatically recomputed; then the model is run with the recomputed table. Because the energy and maintenance intensity of the commercial sector changes, the coefficients of the input-output structure are automatically recalculated at each time step. The financial impacts of energy and non-energy cost savings (for example, savings in building maintenance) are computed by the model. These savings are treated like "free" income, available to be saved or invested by the sector collecting the income.

A brief hypothetical example from Scott et al. (2002) illustrates the concepts and functioning of the ImBuild II model. It is assumed that consumers spend a premium of $100 million on more-efficient residential heating and air-conditioning equipment in the year 2000, which each year thereafter saves them $15 million in electricity, $30 million in natural gas, and $5 million in building maintenance expenditures, for annual savings of $50 million. This $50 million annual savings yields a simple payback period of 2 years. The first two cases in Figure 1.2 show the employment effects of the $50 million savings alone. In the first case, the savings are confined to the residential sector. The second case shows how the impacts would change if these energy savings had instead been experienced in the commercial sector, where the savings are initially experienced as an increase in the profitability of those businesses saving the energy.

(a) For this report, we estimated electric power plant construction savings at about $590/kW of delivered electric energy, based on data in EIA (1997). The equivalent value for natural gas, about $1.20/cubic foot/day capacity, based on EIA (1996), was not used because much pipeline capacity is being resold or turned back. Much of the new capacity is oriented toward new sources of supply, not delivery problems. See Tobin (1997) and EIA (1996).

(b) It is assumed that personal (household) consumption represents 70% of spending; gross private fixed investment, 10%; federal defense spending 2%; federal non-defense spending, 6%; and state and local government spending, about 12%. These percentages are close to the actual distribution of final demand among these sectors in the U.S. economy.

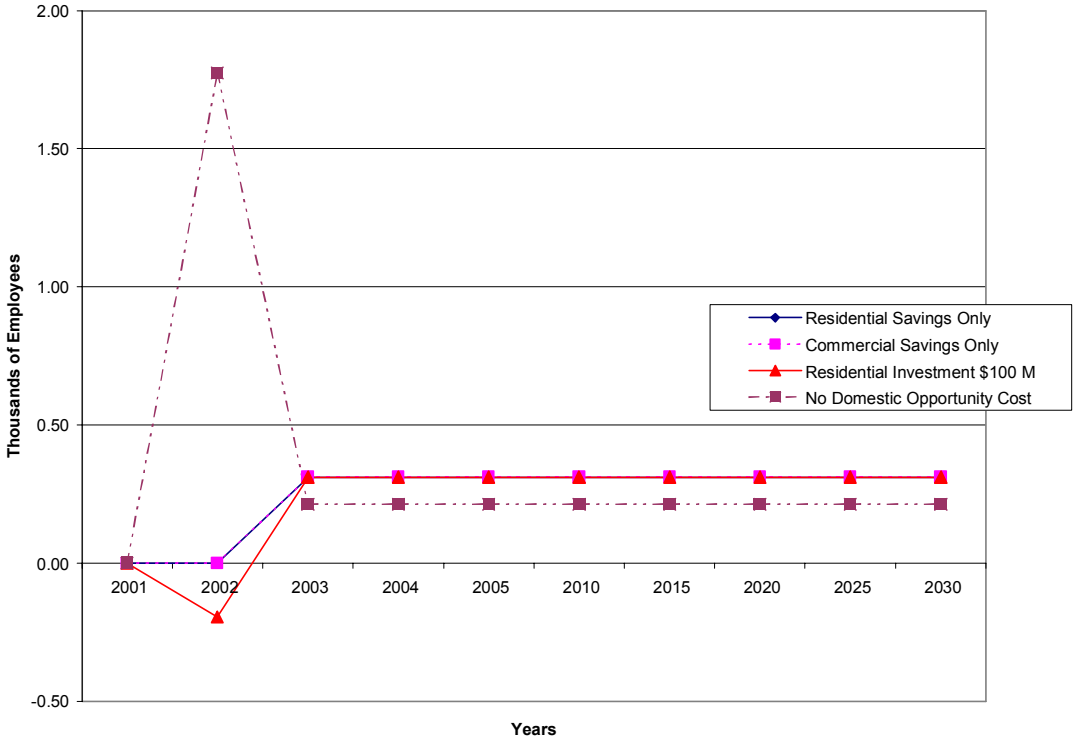

Figure 1.2. Impact on National Employment of a Hypothetical Once-Only $100 Million Investment in Appliance Efficiency

These profits are assumed to be *recycled* in the economy as spending by workers, spending by the firms themselves, and by governments experiencing increases in tax collections. In the first case, the energy savings in the residential sector of $50 million have a net impact on the U.S. economy of about 310 jobs, or about 0.6 additional jobs per $100 thousand dollars of direct energy savings. The impact is virtually identical if the energy savings occur in the commercial sector, because the employment intensity of the spending mix of businesses, their workers, and government associated with commercial savings is only slightly different from the spending intensity of the household sector alone, which is associated with residential saving. Next, Figure 1.2 adds a third and fourth case to show the employment impacts of the $100 million investment itself. The third case shows the impact of the investment premium. In this case, even though investment in the technology itself generates employment, the short run net employment impact is negative (*minus* 200 jobs) because the opportunity cost of the investment premium is the dollar amount the investment would have produced elsewhere in the U.S. economy, which on average is more labor-intensive than the manufacturing sector that makes the new technology.[(a)] Typically, efficiency programs are considered relatively labor-intensive, but this is not always the case. Heating and air conditioning manufacture, for example, is quite capital-intensive. The strength and direction of the

(a) Strictly speaking, the labor intensity that counts is the employment, direct *and indirect*, that is created by each dollar of spending. Thus, it is theoretically possible for a capital-intensive industry to buy lots of labor-intensive inputs from other industries and the total effect to be labor intensive as a result.

investment effect depends on the size of the investment premium and its combined domestic U.S. direct and indirect labor intensity, relative to that of other domestic spending (the opportunity cost of the investment). For the employment impact of the investment to be positive, the sectors supplying the new technology must on average create more domestic jobs per dollar of spending than does other domestic spending. An extreme form of this positive investment effect would occur, if the investment were financed internationally (that is, no domestic opportunity cost is included). This is the fourth case in Figure 1.2, which shows a short-run jobs impact of more than 1770 and a long-run jobs impact of 210. The fourth case also corresponds to many regional analyses that have been made of energy conservation impacts, where the investment funds are assumed to come from *somewhere else* and have no opportunity cost in the region.

The energy and non-energy savings from installation of efficient technology do not affect employment in the national economy until reinvested or spent. For purposes of the analysis conducted for this report, we assume that any increments to the economic value-added in each sector as a result of the investment (that is, the energy and non-energy savings) are allocated to compensation of labor, capital, and business taxes in the same proportions as all other value-added[(a)] in that sector. The income of each sector then is assumed to be spent on investment and consumption of goods and services (final demand) in the same proportions as existing compensation of labor, capital, and government. That is, if a given sector captures 1% of all personal consumption expenditures in the economy and a 0.7% share of all business fixed investment, it will receive these same percentage shares of the efficiency-related increase in spending. Similarly, if labor compensation represents 70% of the baseline total value added in an industry, it will receive 70% of any energy savings in that industry. Finally, labor compensation, business profits and taxes are allocated to consumption, investment, and government spending, according to current proportions.

ImBuild accumulates the energy and non-energy savings in the residential buildings sector and the changes in economic value-added associated with energy and non-energy savings within the commercial buildings sector. The program then calculates spending impacts associated with these savings by proportionately increasing final demand across all sectors as noted previously, while at the same time reducing final demand in the sectors supplying the resources that are saved. This step accounts for the spending associated with the monetary savings and improvements in technological efficiency and for the associated shift from energy to non-energy spending. It also accounts for changes in the patterns of activity in the economy due to technological change caused by the BTS programs (that is, less electricity is used per dollar of output in retailing because of more efficient lighting).[(b)]

(a) Economic value-added is the value of output of the sector, less the cost of purchased materials and services. The sum of value-added in all sectors is Gross Domestic Product (GDP).

(b) ImBuild does not account for all of the long-term run impacts of the technological change. The change in energy-using capital in the commercial sector would alter the marginal value of all of the factors of production (including both labor and capital) and would induce a rearrangement of capital and labor that would ultimately result in an increase in output and in final demand. We show part of this effect, that of the initial spending associated with the savings, but not the effect of increased capital stock that would be created by the investment portion of the spending. Most economic models, including many dynamic simulation models, do not completely reflect the effect of capital accumulation and growth in capacity on final output and employment.

ImBuild collects the estimates of the initial investments, energy and non-energy savings, and economic activity associated with spending of the savings (increases in final demand in personal consumption, business investment, and government spending), and provides overall estimates of the increase in national output for each economic sector using the adjusted input-output matrix. Finally, the model applies estimates of employment and wage income per dollar of economic output for each sector and calculates impacts on national employment and wage income.

2.0 Analysis

2.1 BTS Programs

This analysis encompasses the BTS programs that were evaluated for Fiscal Year 2003 in response to the Government Performance and Results Act (GPRA). Table 2.1 shows the level of incremental investments and net energy savings in the years 2003, 2005, 2010, 2020, and 2030 for the BTS programs that were evaluated as a supplement to the Fiscal Year 2003. Each BTS program is designated with a numerical project code or Projcode to ensure ease in numerical modeling and for tracing a given program as it undergoes periodic name changes. It is important to note that the values in Table 2.1 represent levels of *current* investment and energy and non-energy savings in the year shown, because it is *current* investment and *current* energy and non-energy savings that determine the impact on employment and wage income. Reported in this way, the values in Table 2.1 cannot be used to determine a rate of return on any particular investment because an investment in a given year provides a stream of savings over several years, and the energy savings experienced in any particular year are a function of the cumulative previous investment in energy efficiency. The investment and energy savings levels in a given year affect the level of GDP in that year, in turn affecting the level of employment and personal income. Although the BTS programs differ from each other in size and timing, for the most part the annual investment exceeds the annual savings early in the period, and savings tend to dominate later on.

The differences in investment reflect differences identified by the GPRA Program as the size of the potential market opportunity or market niche for each program, differences in the expected rate of market penetration into each niche, and differences concerning the incremental cost of the new technologies and practices penetrating the market, compared to the more conventional technologies or practices that they replace. By 2030, about 58% of the total energy savings occur in programs like Commercial Building Codes or EPACT Standards that are not projected to require any incremental investment over and above standard construction practice. Current savings do not necessarily correlate well with current investments. Some technologies and practices are expected to be extremely cost-effective and require relatively little incremental investment; others require relatively more incremental investment or may be less cost-effective. Savings are also sensitive to timing. For example, some programs like Energy Star Clothes Washers or Weatherization Assistance are expected to be still in the midst of their intensive investment phase in the year 2030, while others like Energy Star Dishwashers or Heat Pump Water Heaters are completed earlier and are enjoying all of their savings by that date. For BTS program details, refer to PNNL (2002).

Most of the BTS programs have increasing market penetration and investment levels through the year 2030. Thus, the energy savings levels for many of the programs are expected to increase far beyond 2030. By the end of the period shown in Table 2.1, total annual savings have substantially exceeded total annual investments, and are continuing to accelerate. Investments as a group have begun to flatten out by 2010. Incremental adoption of the technologies and the energy investments due to the programs mostly accelerate an adoption process that would have occurred later, anyway. Incremental investments due to the early large BTS programs are overtaken by “normal” investments in the 2015 time frame.

Table 2.1. Levels of Investment Cost and Savings from BTS Programs in Years 2003, 2005, 2010, 2020, and 2030

Category, Projcode, and Program	Fiscal Year				
	2003	2005	2010	2020	2030
1. State Energy Program					
903 State Formula Grants					
Investment	$161.0	$161.0	$161.0	$161.0	$161.0
Savings	$24.1	$70.1	$176.8	$345.0	$359.4
2. Weatherization Assistance Program					
901 Weatherization Assistance					
Investment	$506.2	$531.6	$569.5	$577.6	$577.6
Savings	$59.0	$174.6	$468.9	$916.7	$943.7
3. Community Energy Program					
1332 Rebuild America					
Investment	$81.7	$237.0	$374.6	$10.8	$11.4
Savings	$4.5	$33.9	$147.9	$193.0	$206.6
1336 Information Outreach					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$161.1	$463.5	$437.0	$450.6	$464.4
1338 Training and Technical Assistance					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$115.6	$259.0	$759.0	$2,079.2	$3,100.2
4. Energy Star Program					
422 Energy Star (Details in 4221-4228)					
4221 Energy Star: Clothes Washers					
Investment	$392.5	$463.4	$483.5	$610.6	$673.0
Savings	$74.9	$124.1	$284.9	$518.5	$774.4
4222 Energy Star: Dishwashers					
Investment	$167.4	$175.1	$183.6	$0.0	$0.0
Savings	$0.5	$2.6	$11.6	$33.7	$63.4
4223 Energy Star: Refrigerators					
Investment	$536.2	$553.4	$578.7	$0.0	$0.0
Savings	$1.6	$6.8	$48.1	$124.8	$209.2
4224 Energy Star: Room Air Conditioners					
Investment	$501.0	$508.6	$577.6	$0.0	$0.0
Savings	$1.1	$3.9	$12.3	$30.2	$51.7
4225 Energy Star: Gas Water Heaters					
Investment	$70.1	$71.2	$147.9	$0.0	$0.0
Savings	$0.0	$0.5	$9.7	$68.5	$162.3
4226 Energy Star: Electric Water Heaters					
Investment	$227.6	$233.1	$207.8	$0.0	$0.0
Savings	$0.0	$3.5	$107.0	$531.4	$1,119.2
4228 Energy Star: CFLs					
Investment	$1.4	$2.8	$7.9	$18.1	$13.3
Savings	$29.1	$146.8	$901.8	$4,066.3	$4,197.7

Table 2.1. (contd)

Category, Projcode, and Program	Fiscal Year				
	2003	2005	2010	2020	2030
5. Residential Buildings Integration					
115 Residential Technology Research & Development					
Investment	$18.2	$37.7	$124.0	$33.2	$27.2
Savings	$1.2	$6.3	$63.9	$169.0	$206.6
506 Residential Building Codes					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$0.0	$25.6	$406.4	$935.5
6. Commercial Buildings Integration					
124 Commercial Technology Development					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$6.4	$25.2	$215.3	$1,035.3	$1,572.6
507 Commercial Building Codes					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$0.0	$59.9	$785.2	$1,790.6
7. Building Equipment					
430 Lighting R&D (Details in 4302-4304)					
4302 Lighting R&D: Two-Photon Phosphors					
Investment	$0.0	$0.0	$0.0	$0.0	-$0.1
Savings	$0.0	$0.0	$22.2	$1,037.9	$2,611.1
4303 Lighting R&D: Solid State Lighting					
Investment	$0.0	$0.0	$0.0	-$0.1	-$0.3
Savings	$0.0	$0.0	$1.8	$380.2	$1,055.9
4304 Lighting R&D: Controls					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$3.5	$15.7	$98.1	$311.8	$482.9
380 Refrigeration and Thermal Distribution R&D (Details in 3801-3804)					
3801 Refrigeration & Thermal Distribution R&D: Residential HVAC Distribution System					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$10.9	$48.0	$349.1	$793.5	$284.3
3802 Refrigeration & Thermal Distribution R&D: Advanced Electric HPWH					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$0.9	$29.1	$450.4	$335.6
3803 Refrigeration & Thermal Distribution R&D: Commercial Refrigeration					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$9.0	$32.7	$127.9	$171.0	$25.6
3804 Refrigeration & Thermal Distribution R&D: Refrigerant Meter					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$1.8	$76.7	$1,075.9	$717.7
381 Emerging Technologies R&D (Details in 3811-3817)					
3811 Emerging Technologies R&D: Heat Pump Water Heater					
Investment	$190.7	$195.2	$126.6	$0.0	$0.0
Savings	$0.0	$23.9	$203.5	$625.6	$919.0

Table 2.1. (contd)

Category, Projcode, and Program	Fiscal Year				
	2003	2005	2010	2020	2030
3813 Emerging Technologies R&D: Roof Top Air Conditioners					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$4.1	$15.5	$26.5	$36.7
3815 Emerging Technologies R&D: Gas Condensing Water Heater					
Investment	$30.9	$30.4	-$2.0	$0.0	$0.0
Savings	$0.0	$1.5	$45.9	$166.0	$231.3
3816 Emerging Technologies R&D: Recessed Can Lights					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.4	$1.9	$12.9	$37.7	$38.2
3817 Emerging Technologies R&D: R-Lamp					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$13.9	$70.0	$260.5	$0.0	$0.0
2111 Building Envelope. R&D: Windows (Details in 2114-2115)					
2114 Envelope R&D: Electrochromic Windows					
Investment	$0.0	$0.0	-$0.1	-$0.3	-$0.4
Savings	$26.2	$55.6	$162.2	$448.3	$833.4
2115 Envelope R&D: Superwindows					
Investment	-$10.4	-$19.0	-$41.3	$0.0	$0.0
Savings	$16.4	$66.0	$339.2	$1,491.7	$2,833.3
2112 Building Envelope R&D: Roofs and Insulation (Details in 2116-2118)					
2116 Envelope R&D: Quick Fill Walls					
Investment	$0.0	$0.0	-$0.1	$0.0	$0.0
Savings	$0.0	$0.6	$3.8	$36.4	$85.3
2117 Envelope R&D: R30 Insulation/30 Year Life Roofs					
Investment	$0.0	$0.0	$0.0	$0.0	-$0.1
Savings	$0.0	$0.0	$1.8	$85.2	$217.3
2118 Envelope R&D: Moisture/Wet Insulation					
Investment	$65.6	$66.7	$124.2	$0.0	$0.0
Savings	$0.0	$5.5	$54.8	$297.8	$646.1
145 Design Strategies and Assistance					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$4.1	$18.2	$103.2	$387.4	$707.8
603 Standards (Details in 6039-6044)					
6039 Standards: Distribution Transformers					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$0.0	$121.7	$540.0	$554.9
6043 Standards: Residential Gas Furnaces/Boilers					
Investment	$37.3	$43.5	$9.8	$0.0	$0.0
Savings	$0.0	$0.0	$30.7	$201.8	$407.4
6044 Standards: EPACT Standards					
Investment	$0.0	$0.0	$0.0	$0.0	$0.0
Savings	$0.0	$49.0	$551.9	$2,226.9	$2,879.9
Totals					
Investment	$2,977.3	$3,291.7	$3,633.2	$1,410.8	$1,462.7
Savings	$563.4	$1,715.9	$6,341.9	$22,545.4	$32,061.0

2.2 Results

The investments and energy savings attributable to the penetration of BTS programs in the market-place will result in substantial macroeconomic effects. The following tables summarize these effects. Table 2.2 shows the impact of the energy savings alone on potential national employment on a year-by-year and program-by program basis. The employment effects are called potential here because this estimate is really of the change in demand for workers. Actual employment effects could include changes in wage rates and also would be affected by changes in labor supply conditions. Table 2.3 shows the comparable effects on national wage income. Before accounting for investment costs, the effects of savings alone in the year 2030 are an increase of about 270,000 potential jobs and about $3.36 billion in national wage income.

As was previously discussed, obtaining these energy savings benefits requires a substantial national investment in energy efficient technologies and practices. For the most part, this incremental national investment will be made in manufacturing sectors that are relatively capital intensive to produce new or better equipment. We assume the source of the investment capital will be the U.S. economy as a whole, which is less capital intensive on average than is manufacturing. Just as in the example in Figure 1.2, most of the energy efficiency investments will tend to reduce national employment while they are occurring, because they divert investment into capital-intensive sectors. Therefore, Table 2.4, which combines the employment effects of the required energy efficiency investments and the employment effects of the required savings, shows lower employment impacts than does Table 2.2, which includes only the effects of the energy and non-energy savings and ignores the investment effects. By 2030, Table 2.4 shows potential net employment increases of 269,000 jobs, over 99% of level in Table 2.2. Comparing the effects on national wage income in Tables 2.3 and 2.5 presents a similar, but slightly more mixed picture. The net effect on earned income of the required investment, combined with the effect of resulting energy and non-energy savings, is a mixed effect because many of the jobs created in the capital-intensive manufacturing sectors as a result of energy-efficiency investments are also high-wage jobs. This tends to compensate to some degree for the reduction in overall employment levels associated with the diversion of national spending into capital-intensive manufacturing activity. For a few programs, the mix of high-paid and low-paid jobs that are directly and indirectly affected is such that the impact on national wage income is slightly negative, even though the effect on employment is uniformly positive. By 2030, Table 2.5 shows a potential net positive impact on national earned income of about $3.41 billion, about 102% of the level in Table 2.3.

The individual BTS programs differ significantly from each other in scale, timing, and impact. Taking investment effects into account, more than half of the positive job and wage impacts come from only six programs: Training and Technical Assistance, Commercial Building Codes, Energy Star CFLs, Advanced Lighting (Two Photon Source), Building Envelope R& D on Superwindows, and EPACT Standards. Together they account for 54% of the annual savings in 2030, 56% of the net savings, 59% of the jobs, and 63% of the net earned income effects. These programs are large-scale, cost-effective programs that are expected to produce large energy savings relative to the investments required. By the year 2030, each of these programs will be producing net annual economic savings to the U.S. economy of over $1.8 billion per year (almost $17 billion together), even after investment costs in 2030 are subtracted. The savings alone from these programs generate an estimated 159,000 potential jobs (still

159,000 after investment effects). If the Energy Star Programs and Lighting and Building Equipment programs are each counted as single programs, they account for net savings impacts of $5.8 billion and $15.2 billion respectively. They have a combined positive net impact of 193,000 jobs (192,000 after investment effects). The impacts of most of the other BTS programs are on a much smaller scale.

The initial effect of the required investment is a short-run reduction in jobs and income in the economy, but the net effect is small. By the year 2003, the effects of energy savings already more than compensate for the effects of investment. Many of the BTS programs will have achieved only part of their ultimate market penetration at the end of the period. However, the overall positive net impact on positive employment (269,000 jobs) and earned income ($3.41 billion) in the year 2030 still is a significant boost to the economy, an effect that would continue to grow after 2030 as savings increase and investments are completed.

Table 2.2. Effect of Energy Savings from BTS Programs on Potential National Employment

Projcode	Descriptor	Effect on Total National Employment (thousands of jobs)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
1. State Energy Program											
903	State Formula Grants	0.3	0.4	0.6	0.8	1.0	1.5	2.6	3.0	3.1	3.1
2. Weatherization Assistance Program											
901	Weatherization Assistance	0.6	0.8	1.1	1.5	1.9	3.0	5.0	6.0	6.1	6.1
3. Community Energy Program											
1332	Rebuild America	0.1	0.1	0.3	0.4	0.6	1.1	1.4	1.4	1.5	1.5
1336	Information Outreach	2.1	2.6	3.8	3.8	3.7	3.5	3.6	3.7	3.7	3.8
1338	Training and Technical Assistance	1.8	1.8	2.5	3.2	4.0	7.1	13.7	19.1	23.9	28.4
4. Energy Star Program											
422	Energy Star	Details in 4221-4228									
4221	Energy Star: Clothes Washers	0.9	0.7	1.0	1.2	1.4	2.2	3.1	3.9	4.9	5.9
4222	Energy Star: Dishwashers	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6
4223	Energy Star: Refrigerators	0.0	0.0	0.1	0.1	0.2	0.5	0.9	1.2	1.6	2.0
4224	Energy Star: Room Air Cond	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5
4225	Energy Star: Gas Water Heaters	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.7
4226	Energy Star: Electric Water Heaters	0.0	0.0	0.0	0.1	0.2	1.0	2.9	5.1	7.7	10.8
4228	Energy Star: CFLs	0.4	0.8	1.4	2.4	3.7	8.8	23.9	39.7	42.1	41.0
5. Residential Buildings Integration											
115	Res. Technology Research & Development	0.0	0.0	0.0	0.1	0.2	0.5	0.9	1.2	1.4	1.5
506	Residential Building Codes	0.0	0.0	0.0	0.0	0.0	0.2	1.2	2.8	4.6	6.5
6. Commercial Buildings Integration											
124	Com. Technology Development	0.1	0.1	0.1	0.2	0.4	1.2	4.0	5.8	7.5	9.1
507	Commercial Building Codes	0.0	0.0	0.0	0.0	0.0	0.6	3.6	7.6	12.2	17.3
7. Building Equipment											
430	Lighting R&D	Details in 4302-4304									
4302	Lighting R&D: Two-Photon Phosphors	0.0	0.0	0.0	0.0	0.0	0.2	3.4	10.1	17.3	25.3
4303	Lighting R&D: Solid State Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.7	6.8	10.2
4304	Lighting R&D: Controls	0.1	0.1	0.2	0.2	0.4	1.0	2.2	3.0	3.9	4.7
380	Refrigeration and Thermal Distribution R&D	Details in 3801-3804									

Table 2.2. (contd)

Projcode	Descriptor	Effect on Total National Employment (thousands of jobs)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
3801	Refrig. & Thermal Dist. R&D: Res. HVAC Dist. System	0.1	0.2	0.3	0.6	0.9	2.4	5.9	5.6	2.9	2.1
3802	Refrig. & Thermal Dist. R&D: Adv. Elec HPWH	0.0	0.0	0.0	0.0	0.1	0.3	1.7	4.3	5.3	3.2
3803	Refrig. & Thermal Dist. R&D: Commercial Refrigeration	0.1	0.2	0.3	0.5	0.6	1.2	2.0	1.6	0.7	0.2
3804	Refrig. & Thermal Dist. R&D: Refrigerant Meter	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.9	2.1	1.2
381	Emerging Technologies R&D	Details in 3811-3817									
3811	Emerging Tech R&D: HPWH	0.0	0.1	0.2	0.4	0.6	2.0	4.9	6.0	7.4	8.9
3813	Emerging Tech R&D: Roof Top AC	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4
3815	Emerging Tech R&D: Gas Condensing WH	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.7	0.9	1.0
3816	Emerging Tech R&D: Recessed Can Lights	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4
3817	Emerging Tech R&D: R-Lamp	0.2	0.4	0.7	1.1	1.5	2.5	0.4	0.0	0.0	0.0
2111	Bldg. Env. R&D: Windows	Details in 2114-2115									
2114	Envelope R&D: Electrochromic Windows	0.4	0.4	0.6	0.8	0.9	1.6	2.9	4.4	6.2	8.2
2115	Envelope R&D: Superwindows	0.2	0.3	0.4	0.7	1.0	2.3	6.2	10.2	14.7	19.7
2112	Bldg. Env. R&D: Roofs and Insulation	Details in 2116-2118									
2116	Envelope R&D: Quick Fill Walls	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5
2117	Envelope R&D: R30 Insulation/30 Year Life Roofs	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	1.2
2118	Envelope R&D: Moisture/Wet Insulation	0.0	0.0	0.0	0.1	0.1	0.3	0.8	1.6	2.6	3.7
145	Design Strategies and Assistance	0.1	0.1	0.2	0.3	0.4	0.9	2.2	3.4	4.7	6.1
603	Standards	Details in 6039-6044									
6039	Standards: Dist. Transformers	0.0	0.0	0.0	0.0	0.0	1.2	3.2	5.2	5.3	5.4
6043	Standards: Res Gas Furnaces/Boilers	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.9	1.3	1.8
6044	Standards: EPACT Standards	0.0	0.0	0.5	0.9	1.4	5.3	13.0	21.2	24.2	27.2
Totals		7.5	9.1	14.5	19.6	25.3	53.5	119.3	186.8	229.5	270.3

Table 2.3. Effect of Energy Savings from BTS Programs on Potential National Wage Income

Projcode	Descriptor	Effect on Total National Earned Income (million 1999$)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
1. State Energy Program											
903	State Formula Grants	4.0	6.4	9.3	12.1	14.8	23.0	37.9	44.7	45.5	46.4
2. Weatherization Assistance Program											
901	Weatherization Assistance	6.2	5.9	6.3	7.1	7.8	10.3	14.8	16.5	17.1	17.6
3. Community Energy Program											
1332	Rebuild America	0.4	1.2	2.1	3.5	4.5	8.6	11.3	11.6	12.3	12.7
1336	Information Outreach	24.6	37.4	54.0	52.7	50.9	49.0	49.3	50.4	51.1	51.8
1338	Training and Technical Assistance	21.9	27.8	38.8	51.0	63.1	110.3	206.6	286.2	355.6	422.9
4. Energy Star Program											
422	Energy Star	Details in 4221-4228									
4221	Energy Star: Clothes Washers	6.0	4.9	6.3	7.9	9.4	14.1	19.8	24.4	29.7	35.6
4222	Energy Star: Dishwashers	0.1	0.1	0.3	0.5	0.7	1.3	2.4	3.7	5.2	6.9
4223	Energy Star: Refrigerators	0.2	0.3	0.7	1.5	2.4	5.3	10.0	13.7	18.0	22.9
4224	Energy Star: Room Air Cond	0.2	0.2	0.4	0.7	0.8	1.3	2.3	3.3	4.4	5.7
4225	Energy Star: Gas Water Heaters	0.0	0.0	0.0	-0.1	-0.1	-0.5	-1.4	-3.5	-5.7	-8.2
4226	Energy Star: Electric Water Heaters	0.0	0.1	0.4	0.9	1.9	11.7	32.7	58.2	88.1	122.7
4228	Energy Star: CFLs	4.4	8.8	16.7	27.9	42.6	102.6	278.2	462.4	489.9	477.2
5. Residential Buildings Integration											
115	Res. Technology Research & Development	0.1	0.1	0.2	0.4	0.6	2.0	4.6	6.3	7.0	7.7
506	Residential Building Codes	0.0	0.0	0.0	0.0	0.0	0.7	4.9	10.6	17.0	23.8
6. Commercial Buildings Integration											
124	Com. Technology Development	0.8	1.1	2.1	3.6	5.3	17.4	58.1	86.1	111.9	137.5
507	Commercial Building Codes	0.0	0.0	0.0	0.3	0.6	9.8	60.2	128.7	206.9	293.4
7. Building Equipment											
430	Lighting R&D	Details in 4302-4304									
4302	Lighting R&D: Two-Photon Phosphors	0.0	0.0	0.0	0.0	0.0	3.6	57.2	170.2	293.2	428.1
4303	Lighting R&D: Solid State Lighting	0.0	0.0	0.0	0.0	0.0	0.3	14.7	62.4	114.8	173.2
4304	Lighting R&D: Controls	0.7	1.4	2.6	4.2	6.3	16.1	37.0	51.1	65.6	79.2

Table 2.3. (contd)

Projcode	Descriptor	Effect on Total National Earned Income (million 1999$)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
380	Refrigeration and Thermal Distribution R&D	Details in 3801-3804									
3801	Refrig. & Thermal Dist. R&D: Res. HVAC Dist. System	0.6	0.7	1.3	2.2	3.3	9.6	24.0	23.7	13.9	12.1
3802	Refrig. & Thermal Dist. R&D: Adv. Elec HPWH	0.0	0.0	0.1	0.3	0.6	3.3	20.2	50.8	61.8	37.8
3803	Refrig. & Thermal Dist. R&D: Commercial Refrigeration	1.8	3.1	5.1	7.4	10.0	19.8	32.5	26.5	12.2	4.0
3804	Refrig. & Thermal Dist. R&D: Refrigerant Meter	0.0	0.0	0.1	0.2	0.5	2.5	13.9	31.4	35.1	19.6
381	Emerging Technologies R&D	Details in 3811-3817									
3811	Emerging Tech R&D: HPWH	0.0	1.6	2.6	4.3	6.7	22.3	55.3	68.6	83.6	100.7
3813	Emerging Tech R&D: Roof Top AC	0.0	0.0	0.7	1.2	1.6	2.5	3.6	4.3	5.2	6.0
3815	Emerging Tech R&D: Gas Condensing WH	0.0	0.0	-0.1	-0.2	-0.4	-2.3	-6.8	-8.4	-10.0	-11.7
3816	Emerging Tech R&D: Recessed Can Lights	0.1	0.1	0.2	0.4	0.5	1.5	3.4	4.3	4.3	4.3
3817	Emerging Tech R&D: R-Lamp	2.1	4.2	8.0	13.3	17.5	29.6	4.4	0.0	0.0	0.0
2111	Bldg. Env. R&D: Windows	Details in 2114-2115									
2114	Envelope R&D: Electrochromic Windows	6.1	7.4	10.3	13.6	16.9	29.0	49.7	76.5	106.0	139.6
2115	Envelope R&D: Superwindows	0.6	0.7	1.3	2.0	2.9	7.4	21.5	36.2	54.4	76.2
2112	Bldg. Env. R&D: Roofs and Insulation	Details in 2116-2118									
2116	Envelope R&D: Quick Fill Walls	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.5
2117	Envelope R&D: R30 Insulation/30 Year Life Roofs	0.0	0.0	0.0	0.0	0.0	0.1	1.1	2.9	5.0	7.4
2118	Envelope R&D: Moisture/Wet Insulation	0.0	-0.1	-0.2	-0.5	-0.8	-2.0	-3.8	-5.8	-7.5	-9.3
145	Design Strategies and Assistance	0.7	1.4	2.5	3.9	5.7	13.6	33.0	51.2	72.1	93.4
603	Standards	Details in 6039-6044									
6039	Standards: Dist. Transformers	0.0	0.0	0.0	0.0	0.0	20.0	53.5	88.6	89.7	91.0
6043	Standards: Res Gas Furnaces/Boilers	0.0	0.0	0.0	0.0	0.0	-1.6	-5.8	-10.4	-15.4	-21.0
6044	Standards: EPACT Standards	0.0	0.0	8.0	15.6	23.8	88.0	217.0	353.3	401.7	451.7
Totals		81.4	115.0	179.9	238.1	300.4	630.0	1,417.1	2,280.5	2,839.1	3,358.5

Table 2.4. Effect of the Full Investment Scenario on Potential National Employment

Projcode	Descriptor	Effect on Total National Employment (thousands of jobs)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
1. State Energy Program											
903	State Formula Grants	0.2	0.3	0.5	0.7	0.9	1.4	2.4	2.9	2.9	3.0
2. Weatherization Assistance Program											
901	Weatherization Assistance	0.5	0.7	1.1	1.5	1.8	3.0	5.0	5.9	6.0	6.1
3. Community Energy Program											
1332	Rebuild America	0.0	0.1	0.2	0.4	0.5	1.0	1.4	1.4	1.5	1.5
1336	Information Outreach	2.1	2.6	3.8	3.8	3.7	3.5	3.6	3.7	3.7	3.8
1338	Training and Technical Assistance	1.8	1.8	2.5	3.2	4.0	7.1	13.7	19.1	23.9	28.4
4. Energy Star Program											
422	Energy Star	Details in 4221-4228									
4221	Energy Star: Clothes Washers	0.3	0.1	0.2	0.5	0.7	1.4	2.2	3.0	3.9	4.8
4222	Energy Star: Dishwashers	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.6
4223	Energy Star: Refrigerators	-0.4	-0.4	-0.4	-0.3	-0.2	0.0	0.9	1.2	1.6	2.0
4224	Energy Star: Room Air Cond	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.3	0.4	0.5
4225	Energy Star: Gas Water Heaters	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.7
4226	Energy Star: Electric Water Heaters	-0.1	-0.1	0.0	0.0	0.1	1.0	2.9	5.1	7.7	10.8
4228	Energy Star: CFLs	0.4	0.8	1.4	2.4	3.7	8.8	23.9	39.7	42.1	41.0
5. Residential Buildings Integration											
115	Res. Technology Research & Development	0.0	0.0	0.0	0.0	0.1	0.4	0.9	1.2	1.4	1.5
506	Residential Building Codes	0.0	0.0	0.0	0.0	0.0	0.2	1.2	2.8	4.6	6.5
6. Commercial Buildings Integration											
124	Com. Technology Development	0.1	0.1	0.1	0.2	0.4	1.2	4.0	5.8	7.5	9.1
507	Commercial Building Codes	0.0	0.0	0.0	0.0	0.0	0.6	3.6	7.6	12.2	17.3
7. Building Equipment											
430	Lighting R&D	Details in 4302-4304									
4302	Lighting R&D: Two-Photon Phosphors	0.0	0.0	0.0	0.0	0.0	0.2	3.4	10.1	17.3	25.3
4303	Lighting R&D: Solid State Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.7	6.8	10.2
4304	Lighting R&D: Controls	0.1	0.1	0.2	0.2	0.4	1.0	2.2	3.0	3.9	4.7
380	Refrigeration and Thermal Distribution R&D	Details in 3801-3804									

Table 2.4. (contd)

Projcode	Descriptor	Effect on Total National Employment (thousands of jobs)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
3801	Refrig. & Thermal Dist. R&D: Res. HVAC Dist. System	0.1	0.2	0.3	0.6	0.9	2.4	5.9	5.6	2.9	2.1
3802	Refrig. & Thermal Dist. R&D: Adv. Elec HPWH	0.0	0.0	0.0	0.0	0.1	0.3	1.7	4.3	5.3	3.2
3803	Refrig. & Thermal Dist. R&D: Commercial Refrigeration	0.1	0.2	0.3	0.5	0.6	1.2	2.0	1.6	0.7	0.2
3804	Refrig. & Thermal Dist. R&D: Refrigerant Meter	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.9	2.1	1.2
381	Emerging Technologies R&D	Details in 3811-3817									
3811	Emerging Tech R&D: HPWH	-0.1	0.1	0.2	0.3	0.6	1.9	4.9	6.0	7.4	8.9
3813	Emerging Tech R&D: Roof Top AC	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4
3815	Emerging Tech R&D: Gas Condensing WH	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.7	0.9	1.0
3816	Emerging Tech R&D: Recessed Can Lights	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4
3817	Emerging Tech R&D: R-Lamp	0.2	0.4	0.7	1.1	1.5	2.5	0.4	0.0	0.0	0.0
2111	Bldg. Env. R&D: Windows	Details in 2114-2115									
2114	Envelope R&D: Electrochromic Windows	0.4	0.4	0.6	0.8	0.9	1.6	2.9	4.4	6.2	8.2
2115	Envelope R&D: Superwindows	0.2	0.3	0.5	0.7	1.0	2.3	6.2	10.2	14.7	19.7
2112	Bldg. Env. R&D: Roofs and Insulation	Details in 2116-2118									
2116	Envelope R&D: Quick Fill Walls	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5
2117	Envelope R&D: R30 Insulation/30 Year Life Roofs	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	1.2
2118	Envelope R&D: Moisture/Wet Insulation	-0.1	-0.1	-0.1	0.0	-0.1	0.1	0.8	1.6	2.6	3.7
145	Design Strategies and Assistance	0.1	0.1	0.2	0.3	0.4	0.9	2.2	3.4	4.7	6.1
603	Standards	Details in 6039-6044									
6039	Standards: Dist. Transformers	0.0	0.0	0.0	0.0	0.0	1.2	3.2	5.2	5.3	5.4
6043	Standards: Res Gas Furnaces/Boilers	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.5	0.9	1.3	1.8
6044	Standards: EPACT Standards	0.0	0.0	0.5	0.9	1.4	5.3	13.0	21.2	24.2	27.2
Totals		5.7	7.3	12.6	17.7	23.3	51.4	118.2	185.6	228.3	269.0

Table 2.5. Effect of the Full Investment Scenario for BTS Programs on Potential National Wage Income

Projcode	Descriptor	Effect on Total National Earned Income (million 1999$)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
1. State Energy Program											
903	State Formula Grants	7.9	10.4	13.2	16.1	18.7	26.9	41.8	48.6	49.4	50.3
2. Weatherization Assistance Program											
901	Weatherization Assistance	31.0	32.1	32.3	33.5	34.6	38.2	43.1	44.8	45.4	45.9
3. Community Energy Program											
1332	Rebuild America	4.8	14.2	14.8	24.4	20.8	28.7	12.1	12.2	12.9	13.3
1336	Information Outreach	24.6	37.4	54.0	52.7	50.9	49.0	49.3	50.4	51.1	51.8
1338	Training and Technical Assistance	21.9	27.8	38.8	51.0	63.1	110.3	206.6	286.2	355.6	422.9
4. Energy Star Program											
422	Energy Star	Details in 4221-4228									
4221	Energy Star: Clothes Washers	19.0	18.1	21.6	23.4	25.1	30.1	39.1	44.6	50.9	57.8
4222	Energy Star: Dishwashers	6.7	7.0	7.3	7.6	7.7	8.6	2.4	3.7	5.2	6.9
4223	Energy Star: Refrigerators	24.7	25.2	26.0	27.0	28.2	31.7	10.0	13.7	18.0	22.9
4224	Energy Star: Room Air Cond	20.1	20.4	20.7	20.4	24.0	24.4	2.3	3.3	4.4	5.7
4225	Energy Star: Gas Water Heaters	2.8	2.8	2.8	2.8	5.5	5.4	-1.4	-3.5	-5.7	-8.2
4226	Energy Star: Electric Water Heaters	9.1	9.3	9.7	10.3	10.1	20.0	32.7	58.2	88.1	122.7
4228	Energy Star: CFLs	4.5	8.9	16.8	28.1	42.8	102.9	278.8	463.1	490.5	477.7
5. Residential Buildings Integration											
115	Res. Technology Research & Development	0.8	1.0	1.6	2.9	4.0	6.8	7.6	7.6	8.1	8.8
506	Residential Building Codes	0.0	0.0	0.0	0.0	0.0	0.7	4.9	10.6	17.0	23.8
6. Commercial Buildings Integration											
124	Com. Technology Development	0.8	1.1	2.1	3.6	5.3	17.4	58.1	86.1	111.9	137.5
507	Commercial Building Codes	0.0	0.0	0.0	0.3	0.6	9.8	60.2	128.7	206.9	293.4
7. Building Equipment											
430	Lighting R&D	Details in 4302-4304									
4302	Lighting R&D: Two-Photon Phosphors	0.0	0.0	0.0	0.0	0.0	3.6	57.2	170.2	293.2	428.1
4303	Lighting R&D: Solid State Lighting	0.0	0.0	0.0	0.0	0.0	0.3	14.7	62.4	114.8	173.2
4304	Lighting R&D: Controls	0.7	1.4	2.6	4.2	6.3	16.1	37.0	51.1	65.6	79.2

Table 2.5. (contd)

Projcode	Descriptor	Effect on Total National Earned Income (million 1999$)									
		2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
380	Refrigeration and Thermal Distribution R&D	Details in 3801-3804									
3801	Refrig. & Thermal Dist. R&D: Res. HVAC Dist. System	0.6	0.7	1.3	2.2	3.3	9.6	24.0	23.7	13.9	12.1
3802	Refrig. & Thermal Dist. R&D: Adv. Elec HPWH	0.0	0.0	0.1	0.3	0.6	3.3	20.2	50.8	61.8	37.8
3803	Refrig. & Thermal Dist. R&D: Commercial Refrigeration	1.8	3.1	5.1	7.4	10.0	19.8	32.5	26.5	12.2	4.0
3804	Refrig. & Thermal Dist. R&D: Refrigerant Meter	0.0	0.0	0.1	0.2	0.5	2.5	13.9	31.4	35.1	19.6
381	Emerging Technologies R&D	Details in 3811-3817									
3811	Emerging Tech R&D: HPWH	7.6	9.3	10.4	12.2	11.7	27.3	55.3	68.6	83.6	100.7
3813	Emerging Tech R&D: Roof Top AC	0.0	0.0	0.7	1.2	1.6	2.5	3.6	4.3	5.2	6.0
3815	Emerging Tech R&D: Gas Condensing WH	1.2	1.2	1.1	1.0	-0.5	-2.4	-6.8	-8.4	-10.0	-11.7
3816	Emerging Tech R&D: Recessed Can Lights	0.1	0.1	0.2	0.4	0.5	1.5	3.4	4.3	4.3	4.3
3817	Emerging Tech R&D: R-Lamp	2.1	4.2	8.0	13.3	17.5	29.6	4.4	0.0	0.0	0.0
2111	Bldg. Env. R&D: Windows	Details in 2114-2115									
2114	Envelope R&D: Electrochromic Windows	6.1	7.4	10.3	13.6	16.9	29.0	49.7	76.4	106.0	139.6
2115	Envelope R&D: Superwindows	0.1	0.1	0.5	1.0	1.7	5.7	21.5	36.2	54.4	76.2
2112	Bldg. Env. R&D: Roofs and Insulation	Details in 2116-2118									
2116	Envelope R&D: Quick Fill Walls	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.5
2117	Envelope R&D: R30 Insulation/30 Year Life Roofs	0.0	0.0	0.0	0.0	0.0	0.1	1.1	2.9	5.0	7.4
2118	Envelope R&D: Moisture/Wet Insulation	3.0	2.9	2.8	2.6	4.7	3.6	-3.8	-5.8	-7.5	-9.3
145	Design Strategies and Assistance	0.7	1.4	2.5	3.9	5.7	13.6	33.0	51.2	72.1	93.4
603	Standards	Details in 6039-6044									
6039	Standards: Dist. Transformers	0.0	0.0	0.0	0.0	0.0	20.0	53.5	88.6	89.7	91.0
6043	Standards: Res Gas Furnaces/Boilers	0.6	0.7	0.7	0.8	0.2	-1.4	-5.8	-10.4	-15.4	-21.0
6044	Standards: EPACT Standards	0.0	0.0	8.0	15.6	23.8	88.0	217.0	353.3	401.7	451.7
Totals		203.2	248.3	316.1	384.0	445.8	783.0	1,472.9	2,335.5	2,894.8	3,415.1

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Appendix

Detailed Calculations on BTS Programs

Appendix

Detailed Calculations on BTS Programs

A.1 Table Notes

A.1.1 Table A.1

This table shows the effects of individual BTS programs (identified by their 2003 GPRA project codes and titles) on national incremental investment in energy-efficient technology or practices in individual years. Current investment spending is reported each year because current investment spending affects current employment and wage income. Also shown for each year and program are the effects of the accumulated investments on current expenditures for oil, natural gas, and electricity. (Impacts on non-energy expenditures for items such as maintenance services are not shown.) Current spending affects current employment and wage income. In some cases (such as the 115-Residential Buildings Research and Development), the program is not expected to require any investment over and above current conventional practice, so the net effect on investment spending (and employment and income) is shown as zero. In most cases, the investment is expected to reduce net fuel expenditure, but sometimes consumption of one fuel will be altered by the change in consumption of another, resulting in an increased expenditure for that fuel. Thus, for example, for Project Code 4228, Energy Star Compact Fluorescent Lights (CFL) Program, Table A.1 shows the nation investing $4.6 million more for residential lights in the year 2030 than it otherwise would have, because it is adopting more costly CFLs in place of conventional technology. The stock of CFLs in 2030 (the 2030 investment, plus all previous investments) saves $4.3 billion in electricity. However, because CFLs run cooler than conventional technology, more fuel oil and natural gas is required for heating (an additional $102.8 million worth of natural gas and $4.6 million in fuel oil), resulting in a net savings in energy expenditures of almost $4.2 billion in 2030.

A.1.2 Table A.2

This table shows how the incremental investment associated with each BTS program is assumed distributed among industrial sectors. The assumed allocation in each case was made in consultation with the GPRA researchers, based on program information provided by DOE program managers, as well as the characteristics of the technologies that are expected to be adopted as a result of the program. For example, the Weatherization Assistance Program is expected to result in incremental investments, divided one-half for incremental residential construction equipment costs, and one-half for a variety of sectors that produce the building materials that would be used in weatherization. The latter are allocated 8.3% for each sector. A different kind of example is Energy Star Clothes Washers, where the entire incremental investment is allocated to Household Laundry Equipment (the industrial sector that builds clothes washing machines). Because no incremental installation cost or retail markup is expected on these units, the entire premium results from the fact that these units are expected to be more expensive to manufacture than with the conventional technology.

Table A.1. BTS Project Investment Costs and Energy Savings, by Year (Million $1999)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
1. State Energy Program										
903 State Formula Grants										
Investment	$161.0	$161.0	$161.0	$161.0	$161.0	$161.0	$161.0	$161.0	$161.0	$161.0
Expenditures on Oil, Residential	-$0.8	-$1.6	-$2.4	-$3.2	-$4.1	-$6.6	-$11.2	-$13.2	-$13.6	-$14.0
Expenditures on Oil, Commercial	-$4.4	-$9.0	-$13.4	-$17.6	-$22.5	-$36.9	-$63.0	-$75.3	-$78.6	-$82.1
Expenditures on Natural Gas, Residential	-$0.2	-$0.3	-$0.5	-$0.7	-$0.9	-$1.4	-$2.3	-$2.7	-$2.7	-$2.7
Expenditures on Natural Gas, Commercial	-$1.2	-$2.3	-$3.5	-$4.7	-$5.9	-$9.6	-$15.6	-$18.7	-$19.1	-$19.4
Expenditures on Electricity, Residential	-$2.0	-$4.2	-$6.1	-$8.4	-$10.3	-$16.4	-$27.1	-$31.3	-$31.5	-$31.7
Expenditures on Electricity, Commercial	-$15.5	-$30.6	-$44.1	-$57.2	-$69.0	-$105.8	-$172.8	-$203.9	-$206.6	-$209.5
Change in Energy Expenditures	-$24.1	-$48.0	-$70.1	-$91.8	-$112.6	-$176.8	-$291.9	-$345.0	-$352.0	-$359.4
2. Weatherization Assistance Program										
901 Weatherization Assistance										
Investment	$506.2	$535.7	$531.6	$538.8	$546.2	$569.5	$577.6	$577.6	$577.6	$577.6
Expenditures on Oil, Residential	-$13.5	-$27.8	-$41.3	-$54.5	-$69.3	-$114.0	-$194.6	-$232.1	-$241.2	-$248.8
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	-$30.4	-$60.1	-$89.4	-$118.7	-$148.4	-$236.8	-$383.9	-$455.2	-$459.6	-$460.3
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$15.1	-$30.2	-$43.8	-$59.2	-$73.4	-$118.2	-$195.5	-$229.5	-$233.0	-$234.6
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$59.0	-$118.1	-$174.6	-$232.4	-$291.1	-$468.9	-$774.0	-$916.7	-$933.8	-$943.7
3. Community Energy Program										
1332 Rebuild America										
Investment	$81.7	$241.6	$237.0	$389.8	$304.5	$374.6	$13.9	$10.8	$11.8	$11.4
Expenditures on Oil, Residential	-$0.1	-$0.4	-$0.7	-$1.0	-$1.3	-$2.6	-$3.5	-$3.7	-$4.0	-$4.2
Expenditures on Oil, Commercial	-$0.1	-$0.4	-$0.6	-$1.0	-$1.3	-$2.4	-$2.9	-$2.6	-$2.5	-$2.3
Expenditures on Natural Gas, Residential	-$1.2	-$5.5	-$9.7	-$17.0	-$22.3	-$44.4	-$56.2	-$57.8	-$60.2	-$61.2
Expenditures on Natural Gas, Commercial	-$0.7	-$2.6	-$4.5	-$7.6	-$10.2	-$19.7	-$24.1	-$23.0	-$23.1	-$22.9
Expenditures on Electricity, Residential	-$1.2	-$5.7	-$10.0	-$17.4	-$22.7	-$45.4	-$59.2	-$61.6	-$65.6	-$68.0
Expenditures on Electricity, Commercial	-$1.3	-$5.0	-$8.4	-$14.0	-$18.0	-$33.3	-$43.7	-$44.5	-$46.4	-$48.0

Table A.1 (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
Change in Energy Expenditures	-$4.5	-$19.5	-$33.9	-$57.9	-$75.7	-$147.9	-$189.6	-$193.0	-$201.7	-$206.6
1336 Information Outreach										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	-$0.3	-$0.5	-$0.8	-$0.8	-$0.8	-$0.8	-$0.9	-$0.9	-$0.9	-$0.9
Expenditures on Oil, Commercial	-$3.3	-$6.8	-$10.1	-$10.0	-$10.2	-$10.5	-$11.0	-$11.4	-$11.9	-$12.4
Expenditures on Natural Gas, Residential	-$2.7	-$5.3	-$8.0	-$7.9	-$7.9	-$7.8	-$7.7	-$7.9	-$7.9	-$7.9
Expenditures on Natural Gas, Commercial	-$39.0	-$76.5	-$115.6	-$116.5	-$117.6	-$119.7	-$119.7	-$124.3	-$126.5	-$128.9
Expenditures on Electricity, Residential	-$6.5	-$13.0	-$19.1	-$19.2	-$19.1	-$19.0	-$19.2	-$19.3	-$19.4	-$19.6
Expenditures on Electricity, Commercial	-$109.2	-$215.0	-$310.0	-$301.9	-$291.3	-$279.1	-$280.5	-$286.8	-$290.6	-$294.8
Change in Energy Expenditures	-$161.1	-$317.0	-$463.5	-$456.3	-$446.8	-$437.0	-$439.0	-$450.6	-$457.2	-$464.4
1338 Training and Technical Assistance										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	-$1.4	-$1.5	-$2.2	-$3.6	-$4.4	-$9.8	-$25.7	-$39.1	-$51.0	-$62.8
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	-$3.4	-$4.7	-$6.6	-$9.9	-$13.9	-$36.6	-$106.9	-$171.6	-$226.3	-$275.3
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.5	$0.5	$0.5	$1.1	$1.1	$1.1	$1.2	$1.2
Expenditures on Electricity, Residential	-$13.5	-$26.8	-$37.2	-$46.4	-$56.9	-$98.5	-$182.7	-$246.1	-$299.1	-$348.3
Expenditures on Electricity, Commercial	-$97.2	-$152.9	-$213.4	-$282.2	-$349.6	-$615.3	-$1,164.2	-$1,623.6	-$2,025.1	-$2,415.0
Change in Energy Expenditures	-$115.6	-$185.8	-$259.0	-$341.6	-$424.3	-$759.0	-$1,478.4	-$2,079.2	-$2,600.4	-$3,100.2
4. Energy Star Program										
422 Energy Star Details in 4221-4228										
4221Energy Star: Clothes Washers										
Investment	$392.5	$400.1	$463.4	$469.7	$475.2	$483.5	$581.6	$610.6	$641.1	$673.0
Expenditures on Oil, Residential	-$4.6	-$5.7	-$7.7	-$9.6	-$11.7	-$17.5	-$24.3	-$30.2	-$36.1	-$42.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	-$25.2	-$31.4	-$42.6	-$53.9	-$65.4	-$99.8	-$142.4	-$189.8	-$238.3	-$290.2
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$45.2	-$56.9	-$73.8	-$92.9	-$111.0	-$167.6	-$237.3	-$298.6	-$366.5	-$442.2
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
Change in Energy Expenditures	-$74.9	-$94.1	-$124.1	-$156.4	-$188.1	-$284.9	-$404.0	-$518.5	-$640.9	-$774.4
4222 Energy Star: Dishwashers										
Investment	$167.4	$172.1	$175.1	$178.1	$177.0	$183.6	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$0.5	-$1.3	-$2.6	-$4.9	-$6.1	-$11.6	-$21.8	-$33.7	-$47.8	-$63.4
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$0.5	-$1.3	-$2.6	-$4.9	-$6.1	-$11.6	-$21.8	-$33.7	-$47.8	-$63.4
4223 Energy Star: Refrigerators										
Investment	$536.2	$546.1	$553.4	$559.8	$563.6	$578.7	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$1.6	-$2.7	-$6.8	-$13.5	-$22.1	-$48.1	-$90.9	-$124.8	-$163.8	-$209.2
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$1.6	-$2.7	-$6.8	-$13.5	-$22.1	-$48.1	-$90.9	-$124.8	-$163.8	-$209.2
4224 Energy Star: Room Air Conditioners										
Investment	$501.0	$505.6	$508.6	$494.5	$583.5	$577.6	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$1.1	-$2.2	-$3.9	-$6.0	-$7.2	-$12.3	-$21.4	-$30.2	-$40.0	-$51.7
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
Change in Energy Expenditures	-$1.1	-$2.2	-$3.9	-$6.0	-$7.2	-$12.3	-$21.4	-$30.2	-$40.0	-$51.7
4225 Energy Star: Gas Water Heaters										
Investment	$70.1	$70.7	$71.2	$71.3	$142.1	$147.9	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	-$0.5	-$1.5	-$2.8	-$9.7	-$27.5	-$68.5	-$113.3	-$162.3
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	$0.0	-$0.5	-$1.5	-$2.8	-$9.7	-$27.5	-$68.5	-$113.3	-$162.3
4226 Energy Star: Electric Water Heaters										
Investment	$227.6	$230.7	$233.1	$236.8	$204.7	$207.8	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	-$0.7	-$3.5	-$8.2	-$17.3	-$107.0	-$298.7	-$531.4	-$804.2	-$1,119.2
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	-$0.7	-$3.5	-$8.2	-$17.3	-$107.0	-$298.7	-$531.4	-$804.2	-$1,119.2
4228 Energy Star: CFLs										
Investment	$1.4	$2.1	$2.8	$3.5	$4.4	$7.9	$14.9	$18.1	$15.0	$13.3
Expenditures on Oil, Residential	$0.0	$0.1	$0.1	$0.2	$0.4	$0.9	$2.5	$4.2	$4.6	$4.6
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.8	$2.0	$3.8	$6.3	$9.6	$22.9	$60.4	$100.7	$106.1	$102.8
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$29.9	-$79.3	-$150.8	-$252.0	-$384.5	-$925.6	-$2,510.6	-$4,171.2	-$4,419.0	-$4,305.1
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$29.1	-$77.2	-$146.8	-$245.5	-$374.6	-$901.8	-$2,447.7	-$4,066.3	-$4,308.3	-$4,197.7

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
5. Residential Buildings Integration										
115 Res. Technology Research & Development										
Investment	$18.2	$22.7	$37.7	$65.5	$86.4	$124.0	$76.6	$33.2	$27.2	$27.2
Expenditures on Oil, Residential	$0.0	-$0.1	-$0.2	-$0.4	-$0.6	-$1.8	-$3.8	-$4.9	-$5.5	-$6.3
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	-$0.6	-$1.5	-$3.2	-$6.3	-$10.6	-$30.7	-$59.7	-$74.6	-$82.6	-$90.6
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$0.6	-$1.5	-$2.9	-$6.1	-$10.5	-$31.4	-$67.6	-$89.6	-$99.7	-$109.8
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$1.2	-$3.0	-$6.3	-$12.7	-$21.6	-$63.9	-$131.0	-$169.0	-$187.8	-$206.6
506 Residential Building Codes										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	-$2.3	-$19.5	-$44.7	-$74.1	-$106.1
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	-$0.7	-$0.7	-$12.4	-$81.8	-$193.2	-$316.9	-$447.4
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	-$10.9	-$74.8	-$168.5	-$272.3	-$382.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	$0.0	$0.0	-$0.7	-$0.7	-$25.6	-$176.1	-$406.4	-$663.2	-$935.5
6. Commercial Buildings Integration										
124 Com. Technology Development										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	-$0.1	-$0.1	-$0.2	-$0.3	-$1.2	-$4.0	-$5.8	-$7.2	-$8.5
Expenditures on Oil, Commercial	-$0.2	-$0.4	-$0.7	-$1.2	-$1.9	-$6.3	-$19.4	-$24.6	-$27.0	-$29.2
Expenditures on Natural Gas, Residential	-$0.8	-$1.5	-$3.0	-$5.1	-$7.7	-$25.8	-$81.9	-$114.6	-$135.9	-$153.7
Expenditures on Natural Gas, Commercial	-$1.1	-$2.2	-$4.3	-$7.4	-$11.2	-$38.0	-$119.2	-$163.5	-$195.0	-$225.8
Expenditures on Electricity, Residential	-$1.2	-$2.5	-$4.8	-$8.4	-$12.6	-$42.8	-$146.8	-$220.5	-$282.5	-$339.6
Expenditures on Electricity, Commercial	-$3.1	-$6.4	-$12.3	-$21.0	-$30.7	-$101.3	-$339.9	-$506.3	-$661.3	-$815.8
Change in Energy Expenditures	-$6.4	-$12.9	-$25.2	-$43.3	-$64.4	-$215.3	-$711.1	-$1,035.3	-$1,308.9	-$1,572.6

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
507 Commercial Building Codes										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.6	-$0.6	-$1.2
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	-$1.9	-$3.7	-$59.9	-$366.8	-$784.6	-$1,261.3	-$1,789.4
Change in Energy Expenditures	$0.0	$0.0	$0.0	-$1.9	-$3.7	-$59.9	-$366.8	-$785.2	-$1,261.9	-$1,790.6
7. Building Equipment										
430 Lighting R&D Details in 4302-4304										
4302 Lighting R&D: Two-Photon Phosphors										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.1	-$0.1
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$22.2	-$348.7	-$1,037.9	-$1,787.9	-$2,611.1
Change in Energy Expenditures	$0.0	$0.0	$0.0	$0.0	$0.0	-$22.2	-$348.7	-$1,037.9	-$1,787.9	-$2,611.1
4303 Lighting R&D: Solid State Lighting										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.1	-$0.2	-$0.3
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$1.8	-$89.5	-$380.2	-$700.1	-$1,055.9
Change in Energy Expenditures	$0.0	$0.0	$0.0	$0.0	$0.0	-$1.8	-$89.5	-$380.2	-$700.1	-$1,055.9

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
4304 Lighting R&D: Controls										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	-$3.5	-$8.7	-$15.7	-$25.6	-$38.1	-$98.1	-$225.4	-$311.8	-$399.9	-$482.9
Change in Energy Expenditures	-$3.5	-$8.7	-$15.7	-$25.6	-$38.1	-$98.1	-$225.4	-$311.8	-$399.9	-$482.9
380 Refrigeration and Thermal Distribution R&D Details in 3801-3804										
3801 Refrig. & Thermal Dist. R&D: Res. HVAC Dist. System										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	-$0.2	-$0.6	-$1.1	-$1.7	-$2.7	-$7.9	-$19.6	-$18.9	-$9.5	-$6.9
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	-$5.6	-$13.2	-$24.4	-$40.0	-$61.8	-$175.6	-$412.0	-$387.2	-$179.4	-$115.9
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$5.1	-$12.4	-$22.5	-$37.7	-$57.8	-$165.6	-$401.4	-$387.4	-$205.8	-$161.6
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$10.9	-$26.2	-$48.0	-$79.5	-$122.3	-$349.1	-$832.9	-$793.5	-$394.7	-$284.3
3802 Refrig. & Thermal Dist. R&D: Adv. Elec. HPWH										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	-$0.8	-$2.4	-$5.4	-$27.5	-$169.4	-$424.1	-$516.7	-$316.9
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	-$0.1	-$0.3	-$1.5	-$10.0	-$26.3	-$31.7	-$18.7
Change in Energy Expenditures	$0.0	$0.0	-$0.9	-$2.5	-$5.7	-$29.1	-$179.3	-$450.4	-$548.4	-$335.6

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
3803 Refrig. & Thermal Dist. R&D: Commercial Refrigeration										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	-$0.4	-$0.9	-$1.6	-$2.4	-$3.4	-$7.2	-$11.7	-$9.7	-$4.5	-$1.5
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	-$8.6	-$19.1	-$31.1	-$45.3	-$60.9	-$120.8	-$198.1	-$161.3	-$74.5	-$24.1
Change in Energy Expenditures	-$9.0	-$20.0	-$32.7	-$47.7	-$64.3	-$127.9	-$209.9	-$171.0	-$79.0	-$25.6
3804 Refrig. & Thermal Dist. R&D: Refrigerant Meter										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	-$1.5	-$5.0	-$11.4	-$61.8	-$369.9	-$884.3	-$1,034.0	-$598.2
Expenditures on Electricity, Commercial	$0.0	$0.0	-$0.4	-$1.3	-$2.9	-$14.9	-$84.4	-$191.6	-$213.9	-$119.5
Change in Energy Expenditures	$0.0	$0.0	-$1.8	-$6.3	-$14.2	-$76.7	-$454.4	-$1,075.9	-$1,247.9	-$717.7
381 Emerging Technologies R&D Details in 3811-3817										
3811 Emerging Tech R&D: HPWH										
Investment	$190.7	$193.3	$195.2	$198.2	$123.2	$126.6	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	-$15.0	-$23.9	-$39.3	-$61.5	-$203.5	-$504.7	-$625.6	-$762.9	-$919.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	-$15.0	-$23.9	-$39.3	-$61.5	-$203.5	-$504.7	-$625.6	-$762.9	-$919.0

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
3813 Emerging Tech R&D: Roof Top AC										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	-$4.1	-$7.4	-$9.9	-$15.5	-$22.0	-$26.5	-$31.4	-$36.7
Change in Energy Expenditures	$0.0	$0.0	-$4.1	-$7.4	-$9.9	-$15.5	-$22.0	-$26.5	-$31.4	-$36.7
3815 Emerging Tech R&D: Gas Condensing WH										
Investment	$30.9	$30.6	$30.4	$30.0	-$2.0	-$2.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	-$1.5	-$3.9	-$7.7	-$45.9	-$135.0	-$166.0	-$197.3	-$231.3
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	$0.0	-$1.5	-$3.9	-$7.7	-$45.9	-$135.0	-$166.0	-$197.3	-$231.3
3816 Emerging Tech R&D: Recessed Can Lights										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.1	$0.1	$0.1	$0.3	$0.6	$0.8	$0.8	$0.8
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$0.4	-$1.1	-$2.0	-$3.2	-$4.9	-$13.2	-$30.9	-$38.5	-$38.7	-$39.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$0.4	-$1.0	-$1.9	-$3.2	-$4.8	-$12.9	-$30.2	-$37.7	-$37.9	-$38.2

Table A.1. (contd)

3817 Emerging Tech R&D: R-Lamp										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.1	$0.1	$0.2	$0.3	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.4	$0.9	$1.8	$3.0	$4.0	$6.6	$1.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$14.2	-$37.8	-$71.9	-$120.4	-$157.9	-$267.4	-$39.3	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$13.9	-$36.8	-$70.0	-$117.3	-$153.8	-$260.5	-$38.3	$0.0	$0.0	$0.0
2111 Bldg. Envelope R&D: Windows Details in 2114-2115										
2114 Envelope R&D: Electrochromic Windows										
Investment	$0.0	-$0.1	$0.0	-$0.1	-$0.1	-$0.1	-$0.2	-$0.3	-$0.3	-$0.4
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.1	$0.2	$0.1	$0.2	$0.4	$0.6	$0.9	$1.6	$2.3	$3.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$3.7	$5.3	$7.1	$8.7	$10.6	$14.6	$17.6	$17.6	$17.3	$16.8
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	-$30.0	-$45.5	-$62.9	-$83.5	-$103.2	-$177.4	-$304.1	-$467.5	-$648.3	-$853.2
Change in Energy Expenditures	-$26.2	-$40.0	-$55.6	-$74.6	-$92.3	-$162.2	-$285.5	-$448.3	-$628.8	-$833.4
2115Envelope R&D: Superwindows										
Investment	-$10.4	-$14.2	-$19.0	-$24.3	-$28.0	-$41.3	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	-$3.5	-$7.9	-$13.5	-$19.8	-$27.8	-$61.4	-$149.5	-$212.0	-$275.4	-$338.8
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	-$8.2	-$18.4	-$31.7	-$47.5	-$68.1	-$160.1	-$426.0	-$706.6	-$1,002.4	-$1,322.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	-$4.7	-$11.8	-$20.8	-$32.7	-$47.1	-$117.7	-$334.3	-$573.1	-$850.8	-$1,172.5
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	-$16.4	-$38.1	-$66.0	-$99.9	-$142.9	-$339.2	-$909.9	-$1,491.7	-$2,128.7	-$2,833.3
2112 Bldg. Env. R&D: Roofs and Insulation Details in 2116-2118										

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
2116 Envelope R&D: Quick Fill Walls										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.1	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	-$0.1	-$0.2	-$0.8	-$1.8	-$2.8	-$3.7
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	-$0.1	-$0.3	-$0.5	-$0.8	-$2.7	-$11.1	-$25.7	-$41.9	-$59.7
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	-$0.2	-$0.2	-$0.2	-$0.9	-$4.0	-$8.9	-$15.0	-$21.8
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	-$0.1	-$0.6	-$0.7	-$1.1	-$3.8	-$15.8	-$36.4	-$59.7	-$85.3
2117 Envelope R&D: R30 Insulation/30 Year Life Roofs										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.1	-$0.1
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.1	-$2.1	-$6.5	-$10.9	-$15.5
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$1.3	-$18.8	-$66.4	-$116.6	-$170.2
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$0.4	-$4.8	-$12.3	-$21.1	-$31.7
Change in Energy Expenditures	$0.0	$0.0	$0.0	$0.0	$0.0	-$1.8	-$25.6	-$85.2	-$148.6	-$217.3
2118 Envelope R&D: Moisture/Wet Insulation										
Investment	$65.6	$66.3	$66.7	$66.7	$119.8	$124.2	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	-$0.1	-$0.1	-$0.2	-$0.8	-$3.4	-$8.4	-$14.0	-$20.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	-$1.5	-$5.0	-$10.2	-$17.3	-$49.8	-$124.9	-$236.4	-$357.9	-$492.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	-$0.4	-$0.4	-$0.9	-$4.2	-$21.4	-$53.0	-$90.8	-$134.2
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	-$1.5	-$5.5	-$10.7	-$18.4	-$54.8	-$149.6	-$297.8	-$462.7	-$646.1

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
145 Design Strategies and Assistance										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	-$0.1	-$0.2	-$0.3	-$0.5	-$0.7	-$1.8	-$4.6	-$7.2	-$10.4	-$13.8
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	-$0.7	-$1.7	-$3.2	-$5.2	-$7.8	-$19.8	-$48.0	-$73.9	-$104.4	-$135.7
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	-$3.4	-$8.2	-$14.8	-$23.7	-$34.0	-$81.6	-$197.5	-$306.3	-$431.2	-$558.3
Change in Energy Expenditures	-$4.1	-$10.1	-$18.2	-$29.3	-$42.5	-$103.2	-$250.1	-$387.4	-$545.9	-$707.8
603 Standards Details in 6039-6044										
6039 Standards: Dist. Transformers										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$121.7	-$326.1	-$540.0	-$547.1	-$554.9
Change in Energy Expenditures	$0.0	$0.0	$0.0	$0.0	$0.0	-$121.7	-$326.1	-$540.0	-$547.1	-$554.9
6043 Standards: Residential Gas Furnaces/Boilers										
Investment	$37.3	$41.0	$43.5	$45.4	$11.5	$9.8	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.1	$0.2
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	-$30.9	-$112.5	-$203.0	-$301.4	-$410.2
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.7	$1.1	$1.8	$2.7
Expenditures on Electricity, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Change in Energy Expenditures	$0.0	$0.0	$0.0	$0.0	$0.0	-$30.7	-$111.9	-$201.8	-$299.5	-$407.4

Table A.1. (contd)

Project and Category	Fiscal Year									
	2003	2004	2005	2006	2007	2010	2015	2020	2025	2030
6044 Standards: EPACT Standards										
Investment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Oil, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Natural Gas, Commercial	$0.0	$0.0	$0.0	$0.0	$0.0	-$16.0	-$43.5	-$74.2	-$100.5	-$127.9
Expenditures on Electricity, Residential	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Expenditures on Electricity, Commercial	$0.0	$0.0	-$49.0	-$95.4	-$145.4	-$536.0	-$1,321.9	-$2,152.7	-$2,447.4	-$2,752.0
Change in Energy Expenditures	$0.0	$0.0	-$49.0	-$95.4	-$145.4	-$551.9	-$1,365.4	-$2,226.9	-$2,547.9	-$2,879.9

Table A.2. Allocation of BTS Project Investment Costs by Sector

Projcode	Name	Maximum Incremental Investment (1999$/year)	Percent Distribution	Comments
1. State Energy Program				
903	State Formula Grants	$161.0	Complex	Same proportions as in all U.S. investment
2. Weatherization Assistance Program				
901	Weatherization Assistance	$577.6	Residential Construction 50%; 8.3% each to Millwork, Paint and Allied Products, Rubber and Plastic Products, Other Glass Products, Mineral Wool, Metal Doors	Weatherization mostly involves incremental expenditures on residential construction, plus increases in costs of window and door components and insulation.
3. Community Energy Program				
1332	Rebuild America	$389.8	Commercial Construction 32.5%; Other Non-residential Construction 11.4%;Machinery and Equipment 11.5%; Commercial Refrigeration and Heating Equipment 10%; Wholesale and Retail Trade 7.6%, "Other" Manufacturing 5.5%; Other Structural Metal Products 5.4%; Sheet Metal Work 5.1%; Computer and Office Equipment 4.4%; Communications Equipment 3%; Measuring and Control Devices 1.3%; and Less than 0.5% each on Other Service Equipment, Power Equipment, Motors and Generators, Relays and Industrial Controls, Other Electrical Equipment, Other Fabricated Metal Products, Engines and Turbines, Misc. Electric Supplies.	Approximately the same proportions as for U.S. capital investment as a whole, except that household and transportation equipment are excluded and the extra investment is put into non-residential construction.

Table A.2. (contd)

Projcode	Name	Maximum Incremental Investment (1999$/year)	Percent Distribution	Comments
1336	Information Outreach	$0.0	Residential Construction 9.4%; Commercial Construction 22.1%; all others same as for Rebuild America	Information Outreach is a residential and commercial Program. It is assumed that 2/3 of the building construction cost increment will be commercial
1338	Training and Technical Assistance	$0.0	Same as Information Outreach	Same as Information Outreach
4. Energy Star Program				
4221	Energy Star: Clothes Washers	$673.0	Household Laundry Equipment 100%	This sector is the manufacturing sector for the advanced equipment
4222	Energy Star: Dishwashers	$183.6	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment
4223	Energy Star: Refrigerators	$578.7	Household Refrigerators and Freezers 100%	This sector is the manufacturing sector for the advanced equipment
4224	Energy Star: Room Air Cond	$583.5	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment
4225	Energy Star: Gas Water Heaters	$147.9	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment
4226	Energy Star: Electric Water Heaters	$236.8	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment
4228	Energy Star: CFLs	$18.1	Lighting Bulbs and Tubes 50%; Other Lighting and Wiring 50%	These sectors are the manufacturing sectors for the advanced equipment

Table A.2. (contd)

Projcode	Name	Maximum Incremental Investment (1999$/year)	Percent Distribution	Comments
5. Residential Buildings Integration				
115	Res. Technology Research & Development	$124.0	10% each for Heating Equipment, Lighting Bulbs and Tubes, and Electronic Components; 5% each for Residential Construction Household Cooking, Household Refrig and Freezers, Household Refrig and Freezers, Household Laundry, Electric Housewares and Fans, Household Vacuum Cleaners, Other Lighting and Wiring, Rubber and Plastic Prodts, Other Glass Products, Cement, Lime and Gypsum, and Mineral Wool.	Incremental investment as a result of the program would be expected in residential construction and in the manufacturing sectors making the equipment and materials that would achieve energy savings
506	Residential Building Codes	$0.0	Residential Construction 30%; Heating Equipment 30%; Other Glass Products (windows) 20%; Electronic Components 10%; Lighting Bulbs and Tubes 5%; Other Lighting and Wiring 5%.	Incremental investment as a result of the program would be expected in residential construction and in the manufacturing sectors making the equipment and materials that would be required by codes--mostly better windows and improved lighting and climate and lighting control.
6. Commercial Buildings Integration				
124	Com. Technology Development	$0.0	Commercial Construction 10%; Electronic Components 50%; 15% each for Commercial Refrigeration and Heating, Service Equipment; Lighting Bulbs and Tubes 5%; Other Lighting and Wiring 5%.	Incremental investment as a result of the program would be expected in commercial construction and in the manufacturing sectors making the equipment and materials that would achieve energy savings. Much of the improvement would be expected in climate control electronics.

Table A.2. (contd)

Projcode	Name	Maximum Incremental Investment (1999$/year)	Percent Distribution	Comments
507	Commercial Building Codes	$0.0	Commercial Construction 30%; 20% Other Glass Products (windows); Electronic Components 10%; 15% each for Commercial Refrigeration and Heating, Service Equipment; Lighting Bulbs and Tubes 5%; Other Lighting and Wiring 5%.	Incremental investment as a result of the program would be expected in commercial construction and in the manufacturing sectors making the equipment and materials that would be required by codes--mostly better windows and improved lighting and climate and lighting control.
7. Building Equipment and Materials				
4302	Lighting R&D: Two-Photon Phosphors	$0.0	Lighting Bulbs and Tubes 100%	This sector is the manufacturing sector for the advanced equipment
4303	Lighting R&D: Solid State Lighting	$0.0	Lighting Bulbs and Tubes 50%; Other Lighting and Wiring 50%	These sectors are the manufacturing sectors for the advanced equipment
4304	Lighting R&D: Controls	$0.0	Electronic Components 100%	This sector is the manufacturing sector for the advanced equipment
3801	Refrig. & Thermal Dist. R&D: Res. HVAC Dist. System	$0.0	Residential Construction 100%	This program is mostly focused on improvements in the construction of residential buildings, including appropriate equipment purchases by contractors
3802	Refrig. & Thermal Dist. R&D: Adv. Elec HPWH	$0.0	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment
3803	Refrig. & Thermal Dist. R&D: Commercial Refrigeration	$0.0	Commercial Refrigeration and Heating Equipment 100%	This sector is the manufacturing sector for the advanced equipment
3804	Refrig. & Thermal Dist. R&D: Refrigerant Meter	$0.0	Commercial Refrigeration and Heating Equipment 50%; Heating Equipment 50%	These sectors are the manufacturing sectors for the advanced equipment
3811	Emerging Tech R&D: HPWH	$198.2	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment

Table A.2. (contd)

Projcode	Name	Maximum Incremental Investment (1999$/year)	Percent Distribution	Comments
3813	Emerging Tech R&D: Roof Top AC	$0.0	Commercial Refrigeration and Heating Equipment 100%	This sector is the manufacturing sector for the advanced equipment
3815	Emerging Tech R&D: Gas Condensing WH	$30.9	Household Appliances, Not Elsewhere Classified 100%	This sector is the manufacturing sector for the advanced equipment
3816	Emerging Tech R&D: Recessed Can Lights	$0.0	Lighting Bulbs and Tubes 50%; Other Lighting and Wiring 50%	These sectors are the manufacturing sectors for the advanced equipment
3817	Emerging Tech R&D: R-Lamp	$0.0	Lighting Bulbs and Tubes 100%	This sector is the manufacturing sector for the advanced equipment
2114	Envelope R&D: Electrochromic Windows	$0.0	Other Glass Products 90%; Measuring and Control Devices 10%	These sectors are the manufacturing sectors for the advanced equipment. Most of the additional cost is expected in the glass and coatings.
2115	Envelope R&D: Superwindows	$0.0	Other Glass Products 80%; Other Wood Products 5%;Plastics 5%; Metal Doors, etc.5%, Other Fabricated Metal Products 5%	These sectors are the manufacturing sectors for the advanced equipment. Most of the additional cost is expected in the glass and coatings, but some additional cost is expected in the frames.
2116	Envelope R&D: Quick Fill Walls	$0.0	Residential Construction 75%; Commercial Construction 25%	The cost is expected to be the additional cost of constructing these walls. About 75% of the market is thought to be residential.
2117	Envelope R&D: R30 Insulation/30 Year Life Roofs	$0.0	Commercial Construction 75%; Synthetic Materials 25%	Commercial applications. Cost is expected to be the additional construction costs, plus some advanced materials.
2118	Envelope R&D: Moisture/Wet Insulation	$124.2	Synthetic Materials 100%	All of the cost increment is expected to be in advanced materials.

Table A.2. (contd)

Projcode	Name	Maximum Incremental Investment (1999$/year)	Percent Distribution	Comments
145	Design Strategies and Assistance	$0.0	Residential Construction 20%; Heating Equipment 30%; 10% each for Lighting Bulbs and Tubes and Other Lighting and Wiring; 5% each for Household Cooking, Household Refrig and Freezers, Household Refrig and Freezers, Household Laundry, Electric Housewares and Fans, Household Vacuum Cleaners, and Household Appliances Not Elsewhere Classified.	A broad array of sectors involved in residential construction and equipment is expected to be affected, with most of the impact on construction, heating plant, and lighting.
6039	Standards: Dist. Transformers	$0.0	Other Electrical Equipment 100%	This sector is the manufacturing sector for the advanced equipment
6043	Standards: Res Gas Furnaces/Boilers	$45.4	Heating Equipment 100%	This sector is the manufacturing sector for the advanced equipment
6044	Standards: EPACT Standards	$0.0	Commercial Refrigeration and Heating Equipment 100%	This sector is the manufacturing sector for the advanced equipment

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