APPENDIX I – FEDERAL ENERGY MANAGEMENT PROGRAM (FEMP) INPUTS FOR FY 2008 BENEFITS ESTIMATES

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Program Summary

The Federal Energy Management Program (FEMP) strives to enhance energy security, environmental stewardship, and cost reduction within the Federal Government by advancing energy efficiency and water conservation; promoting the use of renewable energy, alternative fuels in Federal vehicle fleets, sustainable building design, and distributed energy resources; and improving utility management decisions at Federal facilities.

FEMP supports the mission of the Office of Energy Efficiency and Renewable Energy (EERE) by improving the energy efficiency and productivity of Federal Government buildings and by bringing clean, innovative, energy-efficient, and renewable technologies to Federal facilities. FEMP supports DOE's goal of improving energy security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy to Federal facilities. These activities fulfill several national energy and environmental priorities as outlined in the President's National Energy Policy (NEP) as well as the statutory requirements of the National Energy Conservation Policy Act (NECPA); Energy Policy Act of 1992 (EPACT 1992); Energy Policy Act of 2005 (EPAct 2005); and provisions of Executive Order 13123 (Efficient Energy Management) and Executive 13149 (Federal Fleet). These policy measures call upon Federal agencies to reduce the energy intensity of their operations, accelerate the protection and improvement of the environment, and increase our Nation's energy security.

Program Approach

FEMP assists Federal agencies in increasing their use of energy efficiency and renewable energy through alternative financing contract support and technical assistance and reporting and evaluating agency progress each year. Success occurs when FEMP and its agency and private-sector partners enable Federal energy managers to make better energy management choices that result in a more efficient, effective, and energy-secure government.

Program Strategic Goal

FEMP's goal is to provide assistance with project financing and technical assistance to Federal agencies to further the use of cost-effective energy efficiency and renewable energy. FEMP's activities enhance energy security, environmental stewardship, and cost reduction within the Federal Government.

These energy savings will help agencies reach the goals set by executive orders and legislation. In addition to these FEMP-assisted efforts, agencies make additional energy-savings investments without direct FEMP assistance and are expected to continue to do so. Federal agencies will need to make significant investments beyond the projects assisted by FEMP to meet the goals set forth by Executive Order 13123 and EPAct 2005 as summarized below:

- Executive Order 13123 establishes that the goal for all Federal agencies is to reduce energy intensity in Federal buildings by 35% by 2010 (relative to the 1985 baseline level of 139,480 Btu per gross square foot).
- EPAct 2005 sets forth the following goals for Federal agencies (including DOE):
    - Reduce energy consumption per square foot by 20% by 2015, compared to the baseline year of FY 2003, at a rate of 2% per year.

- Ensure that at least 3% of Federal electricity consumption be generated by renewables in the years FY 2007 through FY 2009; 5% in the years FY 2010 through FY 2012; and 7.5% in FY 2013 and each fiscal year thereafter.

DOE has already achieved the Executive Order 13123 goal for 2010 to reduce the energy intensity in its standard[1] buildings. The baseline (1985) energy intensity in standard buildings was 473,126 Btu per square foot, whereas the energy intensity in 2005 was 224,043 Btu per square foot, showing a 53% reduction in energy intensity in that time period. Contributing factors to this reduction in intensity include actions that were related to FEMP program activities such as retrofit projects receiving technical assistance from FEMP or projects financed through Energy Savings Performance Contracts. Other factors independent of FEMP that have contributed to this reduction include decommissioning of old buildings, changes in mission at facilities, and construction of new facilities (which are generally more energy efficient than older building stock).

In FY 2005, renewable energy accounted for 4.7% of Federal facility electricity consumption, thereby exceeding the Executive Order 13123 requirement to use renewable energy for 2.5% of electricity consumption in FY 2005.

Significant Changes from Previous Analysis

In previous years, FEMP utilized a "top-down" modeling approach, in that it first estimated the total energy intensity reduction expected in the Federal sector, and then estimated the share of those savings that would be due to FEMP activities. For FY08, FEMP employed a "bottom-up" approach, in that energy savings from specific historic FEMP activities are estimated and then total future FEMP benefits are estimated from aggregating across all FEMP activities. This new modeling approach is used to better align FEMP's program activities and outputs with its estimated benefits. Also, because funding for the Departmental Energy Management Program is discontinued in FY 2008, it is no longer modeled.

The Baseline ("without DOE RD3" case)

FEMP assumed that the *Annual Energy Outlook (AEO) 2006* Reference Case adequately captured the technological improvements that would occur in the absence of the program. In the *AEO2006* Commercial Reference Case, shell improvements for new buildings can range up to 22% more efficient than the 1999 building stock; and through 2030, new building shells are assumed to improve by 8%, while existing building stock efficiency is assumed to improve 6% over the 1999 stock efficiency (EIA 2006).

Target Market Description.

The target market is the Federal sector, the Nation's 3.0 billion square feet of standard Federal buildings (e.g., military bases, post offices, hospitals, courthouses) and the Nation's 300 million square feet of Federal energy-intensive operations (e.g., laboratories, check-processing facilities, and linear accelerators). The Federal Government's actions – via leadership, awards, influence,

[1] The Federal sector's buildings are grouped into two general categories: standard buildings and energy-intensive operations buildings. Standard buildings include military bases, post offices, and hospitals; and energy-intensive operations buildings include laboratories, check-processing facilities, and linear accelerators.

and raw purchasing power – may well influence private-sector and state and local government decisions with respect to energy-related decisions, but any such "spillover" impact is not estimated in this GPRA process. Therefore, FEMP's impact on future energy savings may be understated.

Baseline Adjustments to the *AEO2006* Reference Case

FEMP is not modeled endogenously within NEMS-GPRA08; however, the base energy use in the commercial module is modified to reflect the impact of the FEMP programs before the other DOE programs are modeled. The baseline for the energy efficiency goal for Federal facilities of EPAct 2005 is the FY 2003 energy intensity of standard and energy-intensive Federal buildings – approximately 115,000 Btu per square foot (this baseline will be updated in FY 2006 when revised FY 2003 data are available). The baseline for Executive Order 13123 for standard buildings is the 1985 energy intensity of 139,480 Btu/square foot.

Representation of Program-Relevant Technologies in the AEO Reference Case

As Federal floor space is neither specifically tracked nor projected within the AEO, and as FEMP is a deployment program for currently available technologies, FEMP assumed that the AEO Reference Case adequately represents a "no DOE RD3" baseline.[2] The *AEO2006* Commercial Reference Case includes impacts of energy efficiency programs through behavior rules. Additionally, the commercial module assumes that the shell efficiency of new and existing buildings will increase by 8% and 6% over their respective 1999 baselines (EIA 2006). The commercial module also includes the minimum efficiency standards that were passed as part of EPAct 2005; however, there is no indication in the EIA NEMS documentation that the EPAct provisions for Federal agencies were specifically included in the reference case; as Federal buildings are not specifically broken out, it is unlikely that the AEO Reference Case reflects these projections because they are specific to Federal buildings.

Removing Effects of Program Activities

As discussed in the previous paragraph, FEMP assumed that no program-related impacts are included in the *AEO2006* Reference Case; therefore, nothing was removed from the Reference Case to establish the "non-program" baseline.

Other Program-Relevant Adjustments to AEO Reference Case

No other corrections or adjustments were made to the *AEO2006* Reference Case.

Program Outputs

FEMP assists Federal agencies in providing benefits to the Nation by increasing their use of energy efficiency and renewable energy through alternative financing contract support, technical assistance, guidance on Federal fleet activities, and reporting and evaluating agency progress each year. The program facilitates the award of alternative financing contracts between agencies and the private sector to fund energy efficiency improvements through the use of savings to the Treasury on Federal energy bills. While alternative financing activities do not save energy per se, as savings come from project selection and execution, alternative financing activities do allow cost-effective projects to be implemented when funding is not otherwise available through the

[2] A "no DOE RD3" baseline reflects the expectations of a future without FEMP.

appropriations process. FEMP provides technical assistance to Federal energy managers so they can identify, design, and implement energy efficient and renewable energy technologies and practices. In addition, FEMP reports to Congress on Federal energy efficiency, renewable electric power, and agency compliance with executive order requirements to reduce dependence on foreign sources of oil.

Assumed Budget Projections

FEMP assumed level funding of $16,791,000 throughout the analysis period (2008 through 2030).

Description of Key Activities

FEMP developed its alternative financing effort to help Federal agencies access private-sector financing to fund needed energy improvements. It provides guidance, documentation, and individual project assistance to agencies that utilize Energy Savings Performance Contracts (ESPCs), public benefit funds, and Utility Energy Service Contracts (UESCs) to finance energy saving improvements. This financing pays for energy improvements at Federal facilities that are in need of significant energy system retrofits. Projects include energy improvements of all types, such as lighting upgrades, new heating and ventilation systems, and improved control systems. EPAct 2005 extended the authority for implementing ESPCs through 2016.

Technical Guidance and Assistance helps agencies take advantage of innovative technologies, tools, and best practices. FEMP assists Federal energy managers in their efforts to identify, design, and implement new construction and facility improvement projects. FEMP provides unbiased, expert technical assistance in areas such as audits for buildings and new technology deployment, including combined heat and power and distributed energy technologies. FEMP also provides analytic software tools to help agencies choose the most effective energy and water project investments. In addition, FEMP helps agencies acquire the most energy-efficient and water-conserving products by continuing to update its specifications for highly energy efficient products and providing them to the General Services Administration (GSA) and Defense Logistics Agency (DLA) as required by the "federal purchase requirement" set forth in EPAct 2005.

Milestones

Each year, FEMP will complete ESPC and UESC contract awards and provide technical assistance that will result in 15-year life-cycle energy savings of 20.2 trillion Btu.

Program Outputs

FEMP pursues its mission through integrated activities to improve the energy efficiency of, and renewable energy use by, the Federal Government. We expect these improvements to reduce the energy intensity at Federal facilities, lower their energy bills, and provide environmental benefits. Additionally, energy efficiency technologies for buildings provide less easily quantifiable benefits, such as improved lighting quality and building-occupant productivity. The benefits estimates reported exclude any expected acceleration in the deployment of the technologies that may result from "spillover" to state or local office buildings.

In addition to the benefits quantified, improved energy management increases the ability of the Federal Government to manage its energy loads during emergencies, and facilitates coordination of energy use with local authorities in the event of local energy supply constraints or emergencies.

Table I-1. Program Outputs, Activities and Milestones

Outputs	Associated Activities	Associated Milestones
Project Financing Activities (Annual)	Key activities 1. Energy Savings Performance Contracts (ESPC) 2. Utility Energy Savings Contracts (UESC) 3. Energy Markets/Shared Energy Savings Support	Complete project financing activities that will result in lifecycle Btu savings of 14.9 trillion annually.
Technical Assistance Activities (Annual)	Key activities 1. Technical Assistance Projects (TA) 2. Renewable Energy Purchases	Complete technical assistance activities that will result in lifecycle Btu savings of 4.7 trillion and support renewable energy purchases of 0.6 trillion Btu annually.

Translating Program Outputs to Market Outcomes

As of 2005 (the year with the latest available data), FEMP has assisted agencies in reducing energy intensity in Federal buildings by 29.6%, using 1985 as a baseline. While there is a trend in reducing energy intensity over time, many factors combine to affect Federal energy consumption in any one year. Throughout its history, FEMP has had a significant effect on reducing Federal energy intensity. Other factors such as new Federal building construction, military base closures and greater use of the existing building stock have contributed to this reduction as well.

Table I-2. Linkage of Outputs with Outcomes

Outputs	Associated Immediate Outcomes	Associated Interim Outcomes	Associated Ultimate Outcomes
Project Financing Activities	• Energy Savings Performance Contracts • Utility Energy Savings Contracts • Energy Markets/Shared Energy Savings Support	Complete project financing activities	Lifecycle Btu savings of 14.9 trillion annually.
Technical Assistance Activities	• Technical Assistance Projects • Renewable Energy Purchases	Complete technical assistance activities	Lifecycle Btu savings of 4.7 trillion and renewable energy purchases of 0.6 trillion Btu annually.

Key Factors in Shaping Market Adoption of EERE technologies

The following factors were considered in developing benefits estimates for the impact of FEMP:

- Price: FEMP is a deployment program that provides energy-related project financing and technical assistance support to Federal agencies. The technologies and practices promoted by FEMP are commercially available. As such, FEMP does not have a direct impact on the price of these technologies.
- Non-price factors
  - Policy factors: FEMP's mission is to assist the 32 Federal agencies in attaining the energy goals set by executive order and other legislation for the Federal Government. Strictly speaking, these are not goals for FEMP but goals for each individual agency, and their involvement is essential. Executive Order 13123 establishes that the goal for all Federal agencies is to reduce energy intensity in "standard" Federal buildings by 35% by 2010 (relative to the 1985 statutory baseline level of 139,480 Btu per gross square foot). Additionally, Executive Order 13123 contains a goal for energy-intensive operations, which is to reduce energy per square foot by 25% in 2010 relative to a 1990 baseline.

    EPAct 2005 establishes the following goals: to reduce energy consumption per square foot by 20% by 2015 compared to the baseline year of FY 2004 at a rate of 2% per year; and to ensure that at least 3% of Federal electricity consumption is generated by renewables in the years FY 2007 through FY 2009, by 5% in the years FY 2010 through FY 2012, and by 7.5% in FY 2013 and each fiscal year thereafter.

Immediate Outcomes

The immediate outcomes of FEMP's activities include: established Energy Savings Performance Contracts and Utility Energy Savings Contracts, Energy Markets/Shared Energy Savings Support, technical assistance activities, and renewable energy purchases.

Interim Outcomes

Interim outcomes include completed project financing activities and technical assistance projects.

Final Outcomes (Benefits)

FEMP maintains a database with information on all of the projects it assists – through both its technical assistance and project financing efforts. The database includes information regarding engineering estimates of energy and cost savings for individual projects. FEMP relied on this database, as well as written contracts, to develop annual energy savings estimates for projects it assisted in FY 2001, FY 2002, FY 2003, FY 2004, and FY 2005. These engineering estimates were used to develop a savings projection for FY 2008–FY 2030.

Annual energy savings projections attributable to quantifiable FEMP activities were calculated for five FEMP subprograms using the following sources and assumptions. Life-cycle energy savings were estimated by multiplying the annual savings by 15 years, the average life span of installed energy efficient equipment.

The five FEMP subprograms are categorized into two groups: Project Financing activities and Technical Assistance activities. The next section of this appendix will discuss how benefits estimates for these activities are developed.

Project Financing (PF) Activities:

(1) Energy Savings Performance Contracts (ESPC)
An ESPC is a contracting vehicle that allows agencies to accomplish energy projects for their facilities without upfront capital costs and without special Congressional appropriations to pay for the improvements. An ESPC project is a partnership between the customer and an energy services company (ESCO). The ESCO conducts a comprehensive energy audit and identifies improvements that will save energy at the facility. In consultation with the agency customer, the ESCO designs and constructs a project that meets the agency's needs and arranges financing to pay for it. The ESCO guarantees that the improvements will generate savings sufficient to pay for the project over the term of the contract. After the contract ends, all additional cost savings accrue to the agency. Contract terms up to 25 years are allowed. Estimates of annual savings from these contracts were obtained directly from Super ESPC[3] Delivery Order schedules. Savings are assumed to begin accruing in the year of the delivery order award. In instances where annual savings data were not available for a particular delivery order, the average savings per dollar of project investment (9,000 Btu/dollar) was used to estimate annual savings. Savings in this category only apply to ESPCs in which agencies receive assistance from FEMP in developing and negotiating the award.

(2) Utility Energy Savings Contracts (UESC)
With a UESC, the utility typically arranges financing to cover the capital costs of the project. Then the utility is repaid over the contract term from the cost savings generated by the energy efficiency measures. With this arrangement, agencies can implement energy improvements with no initial capital investment; the net cost to the Federal agency is minimal, and the agency saves time and resources by using the one-stop shopping provided by the utility. Savings in this category apply only to UESCs awarded with direct assistance from FEMP.

(3) Energy Markets/Shared Energy Savings Support
These estimates apply to projects in which FEMP directly assisted agencies in successfully applying for public benefit funds or other energy efficiency funds.

Technical Assistance (TA) Activities:

(4) Technical Assistance Projects
These estimates reflect the savings potential from projects for which FEMP provided technical assistance, including both energy efficiency and renewable energy support. In the case of renewable energy projects, nonrenewable energy savings are presumed to equal the amount of energy generated from the on-site renewable project and used by the Federal facility.

(5) Renewable Energy Purchases
Renewable energy purchases were credited as one-year, nonrecurring savings when measuring progress toward the Federal reduction goals. “Savings” in this category apply to

[3] Super ESPCs are indefinite-delivery, indefinite-quantity (IDIQ) contracts that are competitively awarded to energy service companies (ESCOs), with several ESCOs representing each region. A Super ESPC covers all facilities in a geographic region, allowing agencies to skip time-consuming competitive awards of contract and go directly to developing a project and delivery order.

renewable energy purchase contracts that were entered into with FEMP's assistance using contract arrangements and negotiations.

FEMP Project Financing – Estimated Savings. Project financing benefits estimates were derived from the average annual energy savings (in billion Btu) for projects signed in fiscal years 2002 through 2005. **Table I-3** details the annual FEMP-facilitated savings for the three project financing programs – Super ESPCs, UESCs, and Energy Markets – including support for the Postal Service's shared energy-savings projects.

Table I-3. Annual Savings for Project Financing Programs (Billion Btu)

	2002	2003	2004	2005	Average 2002-2005
Super ESPC	517	2,634	215	559	981
UESC	204	163	140	140*	162
Energy Markets	0	66	142	142*	88
Project Financing Total	720	2,863	498	841	1,231

* 2005 data were not available; therefore 2004 data were used as a proxy.

Some further explanation of the ESPC numbers for 2003 and 2004 is warranted. Authorization for ESPC contracts, established as part of the National Energy Conservation Policy Act of 1978, included a sunset requirement of October 1, 2003. Because of this sunset requirement, a number of agencies signed ESPCs during 2003 in anticipation of the sunset clause. During FY 2004, there was a lapse in authority for ESPC contracts, so no new contracts were signed; however, modifications to existing contracts were allowed and the 2004 numbers presented in Table I-3 reflect energy savings from those contract modifications. The National Defense Authorization Act reauthorized the ESPC program and extended the ESPC sunset date to October 1, 2006; and then EPAct 2005 further extended ESPC authorization to 2016. FEMP used a simple average of 2002 through 2005 because FEMP assumed that many ESPC contracts signed in 2003 would otherwise have been signed in 2004 if the sunset clause had not been in effect, causing the 2003 and 2004 numbers to "average out."

FEMP divided the average annual energy savings by the total project financing annual budgets (**Table I-4**) for the four years to determine "Annual Energy Savings per FEMP Dollar of Funding" shown in **Table I-5**.

Table I-4. Project Financing Dollars (Thousand $)

2002	2003	2004	2005	2002-2005
$8,700	$7,839	$7,830	$7,133	$31,502

Table I-5. Annual Energy Savings per FEMP Dollar of PF Funding (Site-Delivered Btu/$)

2002	2003	2004	2005	Average 2002-2005
82,813	365,224	63,550	117,951	156,257

The "Annual Energy Savings per FEMP Dollar of Funding" for 2002-2005 (156.3 kBtu) was multiplied by the draft project financing budget request for FY 2008 to estimate annual savings from the project financing activity for that year, yielding an estimate of 1,240 billion Btu.

FEMP's benefits estimate for project financing in 2008 is 80% of the annual estimate for FY 2008 (or 992 billion Btu) based on the average performance of the fiscal years 2002 through 2005. FEMP used the 80% multiplier to ensure that the projected savings estimates are conservative and attainable.

FEMP calculated life-cycle energy savings by taking the estimated annual savings and multiplying by 15 to reflect an average project life of 15 years, for a total life-cycle energy savings of 14,880 billion site-delivered Btu.

FEMP Technical Assistance – Estimated Savings. Program benefits estimates for these activities were derived first from the estimated recommended annual energy savings from all TA projects facilitated by FEMP (**Table I-6**), whether or not those projects are ultimately implemented by the agency. Data for FY 2001 – FY 2004 were used, as FY 2005 data were not available at the time of the analysis.

Table I-6. Estimates of Recommended Annual Energy Savings for Technical Assistance Programs (Billion Btu)

	2001	2002	2003	2004	Average 2001-2004
Energy Efficiency	720.2	817.4	3,673.1	762.2	1,493.2
Renewable Energy	103.8	48.2	22.8	14.4	47.3
TOTAL	824.0	865.6	3,695.9	776.7	1,540.5

The estimated annual energy savings for fiscal years 2001 through 2004 were divided by the total TA budget for those years (**Table I-7**) to arrive at "Recommended Annual Energy Savings per FEMP TA Dollar of Funding" (**Table I-8**).

Table I-7. Technical Assistance Dollars (Thousand $)

2001	2002	2003	2004	2001-2004
$7,896	$7,000	$7,825	$8,140	$30,861

Table I-8. Recommended Annual Energy Savings per FEMP Dollar of TA Funding (Site-Delivered Btu/$)

2001	2002	2003	2004	Average 2001-2004
104,359	123,656	472,315	95,414	199,674

FEMP multiplied the average annual energy savings per dollar (199.7 thousand Btu from Table I-8) by the draft budget request for FY 2008 to estimate potential annual savings identified by all TA projects for FY 2008. FEMP estimated that 30% of the potential savings (1,301.7 billion Btus) would be implemented, yielding a realized annual savings of 391 billion Btu. FEMP used the 30% multiplier to reflect that not all projects for which FEMP provides technical assistance are actually implemented. Based on the estimated savings from recommendations vs. estimated savings for implemented projects for 2001-2004, FEMP determined the 30% figure to be a reasonable estimate of how many projects would be implemented in the future.

FEMP calculated the 2008 TA benefits estimates by taking 80% of estimated implemented savings from TA facilitated projects, yielding 312 billion Btu. FEMP used the 80% multiplier to ensure that the projected savings estimates were conservative and attainable.

FEMP calculated life-cycle energy savings by taking the estimated annual savings and multiplying by 15 to reflect an average project life of 15 years, for a total life-cycle energy savings of 4,680 billion site-delivered Btus.

Renewable purchases are also covered under the TA budget. For the analysis period, FEMP assumed that renewable purchases would be essentially level with FY 2004, the last year for which data was available (see **Table I-9**).

Table I-9. Renewable Purchase Energy Savings (Billion Btu)

	2001	2002	2003	2004	Annual Projected Purchases 2008-2030
Renewable Purchases	491	181	590	808	800

FEMP calculated the 2008 Renewable Purchase benefits estimates by taking 80% of the projected renewable purchases, yielding 640 billion Btu. FEMP used the 80% multiplier to ensure that the projected savings estimates were conservative and attainable.

Forecast of Benefits for the Analysis Period. The annual benefits estimated using the procedures described in the preceding sections were assumed to represent the realized savings that would be associated with each year's funding. With the exception of renewable purchases, which will be discussed shortly, FEMP assumed that the savings associated with each year's funding would be in effect through the life cycle of the equipment (e.g., a project implemented in 2008 will continue to save energy for the life cycle of the equipment, or 15 years, so it is assumed to realize the savings level in each year).

Table I-10 illustrates this by presenting the "in-year" savings, which are the savings associated with the PF and TA activities; and the "annual savings," which are the savings that are accruing to the program due to program activities that began in FY 2008. As can be seen in the annual savings column, the savings level off after 15 years, when projects implemented in the early years are no longer assumed to save energy because the life of the project has been exhausted.

With respect to renewable purchases, the above discussion does not apply. Renewable purchases displace fossil energy with renewable energy that is used in that year; renewable energy purchases do not have savings that can be carried over from year to year and therefore count for only one year of savings. Therefore, the annual savings for 2010 are equal to the PF and nonrenewable purchase TA activities that were implemented in 2008, 2009, and 2010, plus the renewable purchases that occurred within 2010.

Table I-10. Calculation of Annual Site Savings (Billion Btu)

Year	In-Year PF Site Savings	In-Year TA Site Savings	Total In-Year Site Savings	In-Year Renewable Purchases	Annual Site Savings
2008	992	312	1,304	640	1,944
2009	992	312	1,304	640	3,249
2010	992	312	1,304	640	4,553
2011	992	312	1,304	640	5,857
2012	992	312	1,304	640	7,162
2013	992	312	1,304	640	8,466
2014	992	312	1,304	640	9,770
2015	992	312	1,304	640	11,075
2016	992	312	1,304	640	12,379
2017	992	312	1,304	640	13,683
2018	992	312	1,304	640	14,988
2019	992	312	1,304	640	16,292
2020	992	312	1,304	640	17,596
2021	992	312	1,304	640	18,901
2022	992	312	1,304	640	20,205
2023	992	312	1,304	640	20,205
2024	992	312	1,304	640	20,205
2025	992	312	1,304	640	20,205
2026	992	312	1,304	640	20,205
2027	992	312	1,304	640	20,205
2028	992	312	1,304	640	20,205
2029	992	312	1,304	640	20,205
2030	992	312	1,304	640	20,205

FEMP allocated the energy savings into savings by fuel type using historical fuel-mix data from the Federal sector (*Annual Reports*, see **Figure I-1**). FEMP assumed that the FY 2004 Federal fuel mix would apply throughout the analysis period (i.e., year 2030).

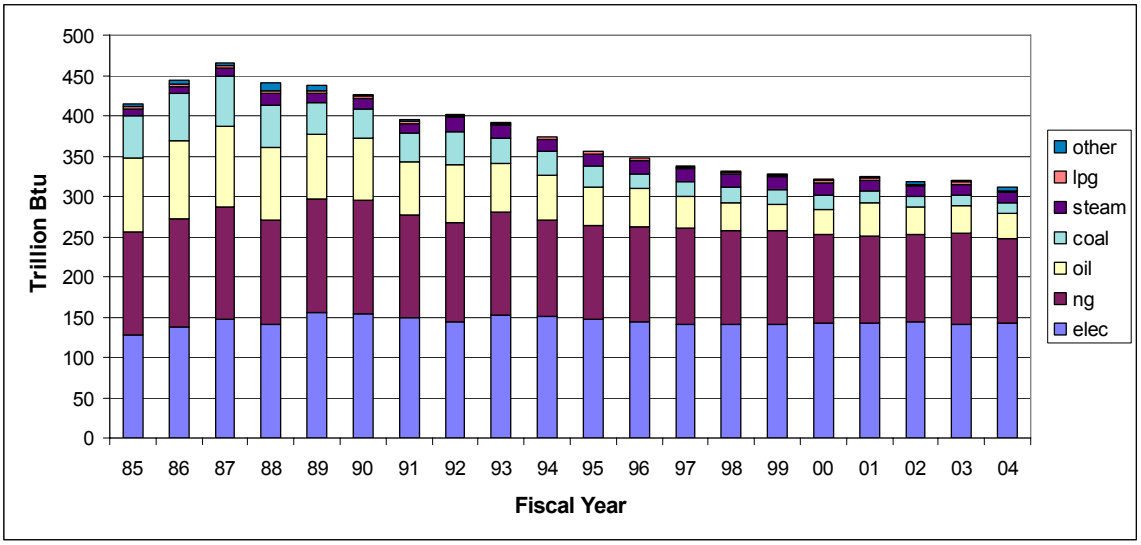

Figure I-1. Historical Energy Use in Standard Federal Buildings

Summary of Inputs

FEMP provided the calculated benefits, shown in **Table I-11**, for inclusion in the integrated modeling effort.

Table I-11. Summary of Benefits Inputs to Models (Billion Btu)

Year	In-Year Site Savings	In-Year Renewable Purchases	Annual Site Savings	Annual Site Electricity Savings	Annual Site Natural Gas Savings	Annual Site Fuel Oil Savings	Annual Site Coal Savings	Annual Site Purchased Steam Savings	Annual Site LPG Savings	Annual Site Other Savings
2008	1,304	640	1,944	1,235	442	131	54	56	11	16
2009	1,304	640	3,249	1,830	884	261	107	111	23	32
2010	1,304	640	4,553	2,424	1,326	392	161	167	34	48
2011	1,304	640	5,857	3,019	1,768	523	214	223	46	64
2012	1,304	640	7,162	3,614	2,210	653	268	279	57	80
2013	1,304	640	8,466	4,209	2,652	784	322	334	69	96
2014	1,304	640	9,770	4,804	3,094	915	375	390	80	112
2015	1,304	640	11,075	5,399	3,536	1,046	429	446	92	128
2016	1,304	640	12,379	5,993	3,978	1,176	482	502	103	144
2017	1,304	640	13,683	6,588	4,420	1,307	536	557	115	160
2018	1,304	640	14,988	7,183	4,862	1,438	590	613	126	176
2019	1,304	640	16,292	7,778	5,304	1,568	643	669	138	193
2020	1,304	640	17,596	8,373	5,746	1,699	697	725	149	209
2021	1,304	640	18,901	8,967	6,188	1,830	750	780	161	225
2022	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2023	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2024	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2025	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2026	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2027	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2028	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2029	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241
2030	1,304	640	20,205	9,562	6,629	1,960	804	836	172	241

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