Where Have All the Data Gone?
The Crisis of Missing Energy Efficiency Data

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EXECUTIVE SUMMARY

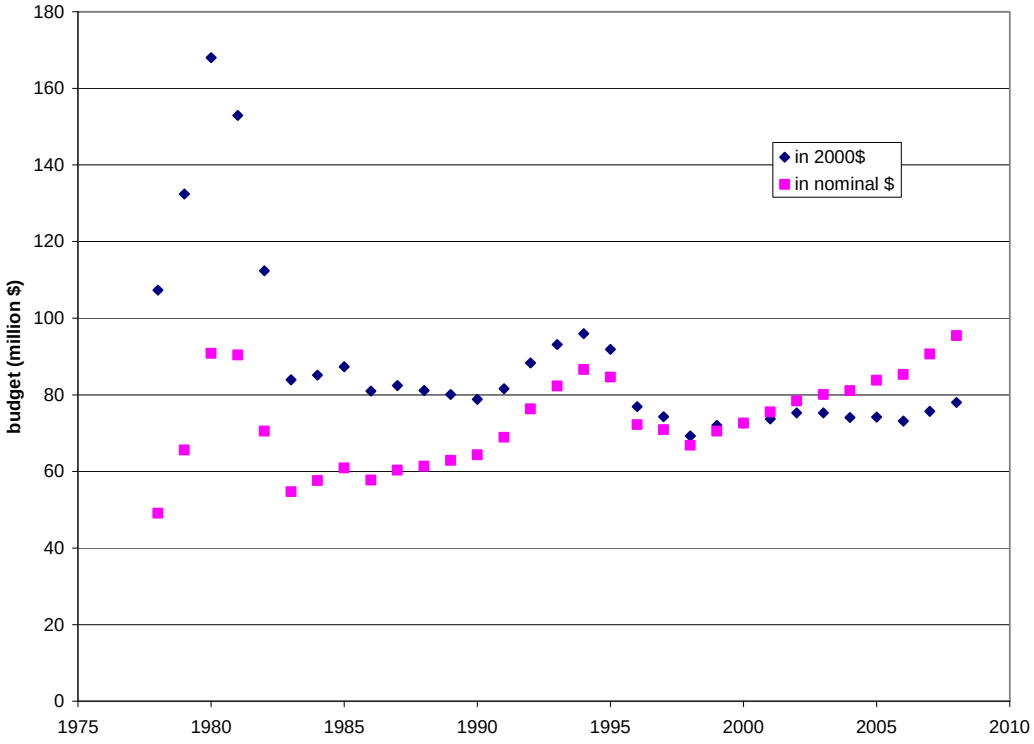
Chronic Underinvestment in Data Collection Undercuts U.S. Energy Efficiency Potential

Good data about energy efficiency in all sectors is vital to maximizing savings from the energy efficiency resource. All levels of government and a wide range of businesses rely upon accurate energy efficiency analyses in order to shape policy and outline business investment plans. Dependable analyses are grounded in good energy and market data, much of which has historically been collected by the Energy Information Administration (EIA) and other governmental data agencies such as the Census Bureau and the Federal Highway Administration.

In the past twenty years, Congress has consistently under-funded these data collection agencies, leading to spotty and uneven data quality, which results in information gaps that impede good analysis. For example, funding for EIA has been cut in half from its peak in the early 1980s (see Figure ES-1). Some critical data collection efforts, like the Census Bureau's surveys of freight vehicles (*Vehicle Inventory and Use Survey)* and some manufactured products such as electric motors, have been scrapped entirely, while others have shrunk as a result of profound budgetary stagnation or decline.

The costs of poor or missing data can be large for businesses and the U.S. economy as a whole. The U.S. energy market commanded about $1.2 trillion of our economy in 2006, vastly more than the EIA budget required to keep track of it—about $110 million. Figure ES-1 shows the EIA budget, adjusted for inflation, is down by nearly 50% relative to the average budget over the 1978–1982 period.

Figure ES-1. EIA's Appropriation History, 1978–2010



Underestimates of energy efficiency like those made in the 1980s can result in costly overinvestment in electricity generation and infrastructure for businesses and residential consumers. Reliable data and metrics are also necessary to target and measure job and energy savings investments from energy efficiency investments like the *American Recovery and Reinvestment Act of 2009* (ARRA or "stimulus").

The under-funding of federal energy data collection agencies has led to problems with the frequency, sample size, and scale of the data currently available to businesses and policymakers. In recent years, EIA reduced the frequency of key residential, manufacturing and commercial building consumption surveys, making it difficult to track the impact of building codes and other policies. In addition, funding cuts have necessitated decreases in the sample sizes of the surveys. Sample sizes drive the geographic scale at which consumption and utility survey data are meaningful, meaning that state-level data can rarely be provided and even regional data can be too broad to serve many purposes (e.g., Arizona and Montana are currently grouped in the same region). State-level data is increasingly important given the emphasis on state-level activities in recent legislation.

In addition to the insufficient quality and quantity of the data already collected, there are many fundamental gaps in the data available that have never been addressed. These include emerging end-uses, like data centers and plug loads, as well as existing end-uses that may become important in climate legislation. These existing end-use sectors include those industries that are "presumptively eligible" for inclusion in vulnerable energy-intensive industries like chemicals, paper, cement, and primary metals.

These data are used for a variety of analyses by EIA itself, including forecasting activities like the *Annual Energy Outlook* (AEO). Although these analysis reports have been criticized, it is important to note that these activities are undertaken by separate parts of EIA. Concerns about good analysis should not be justification for funding cuts to the entire agency, especially given the importance of core data collection to energy policy efforts for businesses and governments. While funding for analysis is also important, funding for data collection is crucial and should be funded at appropriate levels. If data collection frequency is reduced or data are not collected, there is no way in the future to go back and accurately fill in these missing data, but, when the data exist, one can always go back and perform another analysis if necessary to check alternative interpretations.

A Path Forward: Restoring America's Energy Efficiency Data Collection

To remedy existing data gaps, and improve data collection going forward, ACEEE recommends a series of federal actions. These begin with increased funding for the key agency tasked with energy data collection, the EIA. The President's FY 20111 budget proposed an overall increase for EIA to $128,833 million from the FY 2009 and FY 2010 appropriation level of $110,595 million (DOE 2010). This increase of approximately $18 million represents an appropriate commitment to EIA in the short term, but the agency will require additional funds in the future in order to achieve all of its Congressionally mandated goals and better serve the energy informational needs demanded by a growing U.S. economy.

In the longer term, we recommend that Congress:

1. Increase funding to the appropriate data gathering agencies responsible for data collection to insure that reliable data is publicly available; and
2. Insure that agencies responsible for data collection are directed to improve the quality and appropriateness of data collection process. These improvement would include maintaining the continuity of existing data series; expanding samples sizes of consumption surveys; considering the reallocation of samples to provide better state-level resolution; considering the reinstitution of some discontinued data series; and reexamining existing data series to insure they are still collecting meaningful data.

Good energy policy is built on good data, and a sustained commitment to collecting adequate data is critical to meeting the country's future energy needs.

INTRODUCTION

Energy efficiency is the most effective resource that can simultaneously address important issues including climate change, economic productivity, and national security. In order to maximize economic and energy savings from energy efficiency, government agencies, businesses, and analysts must be able to perform reliable analyses at all levels of the economy. The importance of energy efficiency data was underscored in the 1980s when underestimates of energy efficiency resulted in significant overinvestment in electricity generation. We face another period of planned investment in power plants and infrastructure, and, given the current economic recession, it is essential that we avoid a repeat of costly overinvestment around the country. Dependable and accurate analyses require good energy and market data, much of which has historically been collected by the Energy Information Administration (EIA) and other governmental data agencies. In the past twenty years, Congress has consistently under-funded these data collection agencies, leading to spotty and uneven data quality and resulting in information gaps that impede good analysis.

Studies by the National Academy of Sciences (AEF 2009), ACEEE (Friedrich et al. 2009), and McKinsey (2009) clearly demonstrate that energy efficiency is the cheapest, cleanest, and quickest of all energy resources. Nonetheless, significant barriers to implementing cost-effective energy efficiency remain. The opportunities for realizing energy efficiency savings are fragmented among many end-uses, from manufacturing systems to transportation choices to home appliances. Because energy efficiency potential exists in so many sectors and forms, policies that encourage realization of these different savings must be grounded in solid energy use data collected at multiple levels for each sector. This type of “good” data (that is accurate, detailed, consistent, verifiable, and accessible) is currently rarely available. In addition, given the dynamic markets and evolving policies, it is important to periodically assess whether the collected data is representative of actual national energy use and whether the data are up-to-date, and available and useful to governments, businesses, and analysts alike. In particular, are we learning from our experiences with increasing levels of energy efficiency and applying those lessons appropriately to projections of the future?

Good data are among the prerequisites for useful and pertinent energy guidelines, programs, standards, metrics, and benchmarks that break down the remaining market barriers. Federal, state, and local government policy-makers and many businesses rely on energy and economic data, and the resulting forecasts, to evaluate conditions, guide investments, and assess results. The need for good data is especially critical for having confidence in reaching "energy efficiency resource standards," which are now in place across numerous states and are being proposed at a national level. Some regions also have established target levels of energy savings, like the Regional Greenhouse Gas Initiative in the Northeast and Mid-Atlantic, the Midwestern Greenhouse Gas Reduction Accord, and the Western Climate Initiative.

Without good data, sound energy policy decisions cannot be appropriately made nor can the effectiveness of their implementation be properly measured. Inadequate, erroneous, or obsolete energy efficiency data can result in mistakes or poor choices costly to governments, businesses, utilities, and customers. When policies are designed without proper data and forecasting, energy savings opportunities can be lost, resulting in billions of dollars of lost savings to the U.S. economy. The U.S. energy market alone commanded about $1.2 trillion of our economy in 2006, a vast sum compared to the EIA budget used to keep track of it—about $110 million (EIA 2008). When poor estimates of energy efficiency are made, huge costs are incurred in unnecessary generation and infrastructure resources.

Among the main sources of energy and economic data collection are a number of federal agencies, including the Energy Information Administration, the Census Bureau (Census), the Federal Energy Regulatory Commission (FERC), USDA’s National Agricultural Statistics Service (NASS), and the Federal Highway Administration (FHWA). In recent years, many data series have been weakened because of reductions in scope, collection rate, and sample size. Several important energy data collection programs have been eliminated entirely, leaving important data gaps in many sectors.

While some of these agencies also conduct analysis and forecasting, all are important sources of public data that are used by other analysts in government and the private sector. These data are critical tools for which there rarely are accessible, affordable, and verifiable private sector substitutes.

The purpose of this document is to identify the needs and provide justification for enhanced funding of data collection related to energy efficiency. The President's FY 2011 Budget, released on February 1, 2010, calls for $128,833,000 for the Energy Information Administration, an important first step in restoring energy efficiency data quality. We call upon the Administration and Congress to adequately fund improved data collection, providing the foundation for a more robust and ongoing assessment of our nation's energy, environmental, and economic future.

WHY DATA ARE NECESSARY

To understand energy use and the opportunities for efficiency gains, it is essential to have sound data upon which to base analyses of current practices, as well as existing programs and policies. We can then build on this knowledge to achieve future efficiency gains through targeted policies, programs, and private development. These data are necessary at every level of the economy, as there are opportunities for gains in energy efficiency within every economic sector and by actors at multiple levels, from individual consumers to retail companies, contractors, manufacturers, and enforcement officials.

- At the national level, these data will allow much more robust development of the *Annual Energy Outlook* (AEO),[1] the fundamental energy use and price forecast of the federal government. They are equally essential for other energy forecasting groups in the private sector.
- At the state level, there is a need for finer-tuned data than the census-region level. This is particularly important for the Mountain West, which is all combined into one census region. EIA's *State Data Needs Assessment* (EIA 2009) identified state-level and smaller regional data as a critical area for expansion. Further, the February 2009 ARRA (stimulus) legislation directs significant resources to State Energy Offices and to states, increasing the importance of good state-level data in order to track these efforts.
- At the community level, energy use data can serve local governments—cities and counties—by allowing them to understand best energy practices for all sectors. These data also allow local governments to develop programs and policies that are specific to their needs, which can differ from state to state and region by region. Data on the ratio of residential, commercial, industrial, and institutional uses can also help focus limited resources where they are most needed and in order to gain the greatest value on the investment.

In addition, there is a need for good data in each sector of the economy. While these data are useful at the local, state, and federal level, there are some uses, like building codes, which require, at the least, better regional data, and others, like manufacturing, which require finer-grained data. Data for specific applications are needed in a consistent format, so they can be aggregated from the individual end-use up to systems, buildings (or facilities or campuses), and jurisdictions. These are some of the most apt examples, but this is by no means an exhaustive list:

- At the equipment and vehicle level, energy use data are needed to update obsolete rating methods for standards, so that ratings will be linked to energy consumption. The rating methods determine the design goals for manufacturers, so it is important that equipment and vehicles be rated under real-world conditions, with tests that encourage rather than impede efficiency improvements.
- At the energy efficiency program level, it is important to collect model-specific (for appliances, equipment, and lighting) and building-level savings and expenditure information. These data need to extend beyond just regulated and publicly owned utilities as EIA's *Electric Annual* survey does, to also include non-utility programs. It's also critical that these data are consistently reported, following established data protocols and definitions. Energy efficiency and other demand-side program data presently suffer from inconsistent and incomplete reporting.

[1] Information about this forecast series can be found at http://www.eia.doe.gov/oiaf/aeo/index.html.

- At the building level, good field performance data will allow the development of benchmarks for building performance. In turn, these benchmarks and the understanding of key variables that they imply will allow the development of performance-based building energy codes. These will be more easily enforced and are essential for closing the gap between "as designed" and "as built" or "as operated." They will maximize the freedom of designers and industry to develop better, lower-cost ways to improve performance. Identifying the performance gaps is necessary for envisioning and justifying solutions.
- At the industry level, we need more detailed, timely, and frequent data on energy consumption (from external purchase and internal byproduct use) and price information by individual sub-industries, particularly for manufacturing and agriculture. We also need a better understanding of regional variations in industrial energy use. To prepare our industries for a more viable future, we need data on status and trends in energy management (both operational practices and controls capabilities) that go well beyond the limited and uneven information available on recent or planned energy efficiency projects. In addition, we need actual operating data on key technology areas such as motor systems, steam systems, and distributed energy to understand current practice and realize substantial near-term energy efficiencies. To help U.S. industry be more globally competitive, we need the information necessary to move beyond empirically-based policies and programs. If we expect our industries to be positive contributors to our national future, we need to understand how to best focus our limited resources toward addressing critical barriers and gaps.

DATA COLLECTION AGENCIES

The agencies that collect energy-related information span across the entire federal government, with some relative newcomers and others with legacies going back to the formation of our nation.

Energy Information Administration

The Energy Information Administration was established in 1977 to serve as the statistical agency of the U.S. Department of Energy (DOE). It primarily provides three services—data collection on energy sources and consumption; analyses of potential or passed legislation; and short term, annual, and international forecasts. EIA is the only source of unbiased federal public energy data and as such, EIA is heavily relied upon by policymakers, researchers, and energy-intensive businesses.

In particular, the sector consumption surveys, like the *Residential Energy Consumption Survey* (RECS), *Commercial Buildings Energy Consumption Survey* (CBECS), and *Manufacturing Energy Consumption Survey* (MECS), are invaluable for analysts and policymakers, and are important inputs for forecasting. It takes federal initiatives to provide data that are comparable across states, and EIA is tasked with fulfilling this role. The state-level data, like the information in the *State Energy Data System*, is also used for forecasting and for the estimation of greenhouse gas emissions.

In addition, the EIA collects important energy markets data on energy resources such as petroleum, natural gas, coal, renewables, and electric generation, as well as important information about the activities of electric and gas utilities. As part of the *Electric Power Annual* (EPA), EIA has collected information on demand-side management (DSM) activities by utilities. This DSM data has been an important indicator of utility energy efficiency activity for over two decades. Unfortunately, with the restructuring in the electric power sector that began in the 1990s and the emergence of non-utility administrators for public benefit funds (PBF) collected by utilities, the information collected by the Electric Power Survey on Form 861 no longer reliably reflects the full scope of DSM activities. DSM programs are increasingly designed and delivered by non-utility entities, especially given the Obama Administration's commitment to encouraging market-based solutions for efficiency from the broadest possible set of sources. However, available resources limit the ability of this survey to expand to collect this important information from non-utility program administrators.

U.S. Census Bureau

The Census Bureau, housed within the Department of Commerce, provides critical data for energy efficiency in the form of household data; commercial data; and information on the construction, mining, and manufacturing sectors. Census information on number and value of energy-using products sold will be much more useful when disaggregated by energy efficiency categories.

The Census Bureau also used to provide data in the Vehicle Inventory and Use Survey (VIUS), which gathered information on the physical and operational characteristics of trucks as part of the *U.S. Economic Census* conducted every five years. This was discontinued as of FY 2007.

Federal Highway Administration

The Department of Transportation collects vital information for transportation energy efficiency policies in the Federal Highway Administration (FHWA) surveys and in the National Household Travel Survey, administered by the Bureau of Transportation Statistics and FHWA.

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates electricity, natural gas, and oil transmission. It collects important information on electric utilities, electricity markets, and natural gas markets. There is a high degree of overlap with EIA information.

Other Agencies

Energy efficiency policies also depend on data collected by the Department of Labor, Department of Interior, and the Department of Agriculture. The USDA's National Agricultural Statistics Service (NASS) provides important data on economic activity and energy use in rural and agricultural markets, paralleling the data collected by Census and EIA in other market segments. The Department of Labor collects data on jobs, salaries, and income in all sectors, and these data are essential to understanding the growth of energy efficiency and "green" jobs," as well as energy workforce related issues. The Department of Labor's Consumer Expenditure Survey provides valuable information on the buying habits of American consumers. The Department of the Interior collects important data on domestic energy resources and projects the future size of these resources.

THE PROBLEM

Most analyses associated with energy efficiency depend upon examining past trends, whether they are energy intensity (miles per gallon), economic activities (vehicle miles traveled per year), markets (products available), or consumption (barrels per day). To assess changes in these parameters, consistent, continuous, and timely (as current as possible given the limitations of data collections) data series are required. If the frequency of data collection is decreased or data are not collected, there is no accurate way in the future to go back and fill in these missing data, which means that we are in the dark on what has occurred in the marketplace. The problem is worst during periods of rapid change.

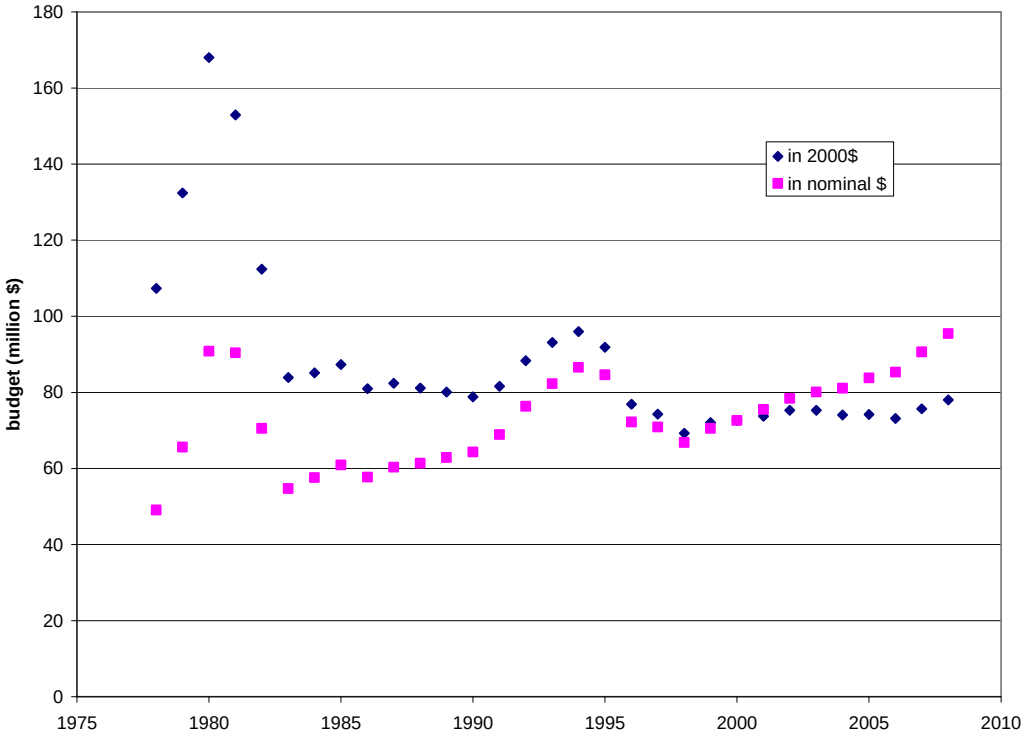
Declining Resources

Unfortunately, federal data collection has declined, despite the growth of interest in energy-related data due to cascading energy crises over the past decade and increasing concerns about climate change. In recent years, several important energy data collection programs have been eliminated entirely, and many other data series have been significantly diminished because of reduced scope and sample size.

The EIA has been steadily under-funded for years, suffering under the cumulative impact of many years of declining funding, decreasing resources, and cost inflation. When adjusted for inflation, it is clear that the amount of federal dollars appropriated has decreased sharply from its high in FY 1981 (see Figure 1).

A sharp decline in funding coincided with the beginning of the Reagan Administration, and further large cuts were experienced in 1995, which corresponded to a change in Congressional leadership. In the period from 1995 to 2002, EIA federal staff was reduced by 20 percent, from 478 full-time employees (FTEs) in 1995 to 374 FTEs in 2002. The number of FTEs at EIA has remained at or below 374 since 2002 until today. Although there has been some restoration of funding (to about 1995 levels), the agency's funding has remained relatively stagnant.

Figure 1. EIA's Appropriation History, 1978–2010



Source: EIA 2000–2009

Between FY 1995 and FY 2001, EIA was the only statistical agency that had to contend with significant budget reductions. Since then, other agencies have also experienced budget reductions, with appropriations stagnant or declining for almost all federal economic statistical agencies (Reamer 2009). According to Andrew Reamer, a fellow at Brookings Institution, "At an annual cost of less than $1.3 billion to guide the workings of a $14 trillion economy and the geographic distribution of over $500 billion in federal funds, the economic statistical system is one of the federal government's most cost-effective activities. Essentially, the cost of the system is extraordinarily low and the return on investment is almost infinite." The U.S. energy market alone commanded about $1.2 trillion of our economy in 2006, a vast sum compared to the EIA budget used to keep track of it—about $110 million (EIA 2008).

Despite the importance of accurate economic and energy data for guiding the activities of government and business, the FY 2010 appropriations process was disappointing for many of these agencies. The Energy and Water Appropriations bill (H.R. 3183) had no increase over FY 2009 funding (see Table 1) (U.S. Congress 2009b).

The President's Budget proposed an overall increase for EIA to $128,833,000 from the FY 2009 and FY 2010 appropriation level of $110,595,000 (DOE 2010). This budget recommends increases in funding to $6,645,000 from $4,867,000 in FY 2010 for the Coal, Nuclear, Electric, and Alternate Fuels group, which conducts the important DSM activity survey. Even more crucially, this budget recommends an increase

for the Energy Markets and End Use division, which conducts the energy consumption surveys, to $16,712,000 in FY 2011 from $7,489,000 in FY 2010. The request specifically calls for increasing the sample size, geographic coverage, and/or frequency of the surveys.

Similarly, the Bureau of Transportation Statistics and Federal Highway Administration's *National Household Travel Survey* (NHTS), which guides hundreds of billions in government transportation spending, was delayed for two years and no longer covers long-distance travel (Reamer 2009). This survey loses funding each cycle, which is contributing to the delays and reductions in information availability.

Table 1. EIA Funding in FY 2010 Budget

FY 2009 Enacted	FY 2008 Request	House	Senate	Conference	Conference vs. Enacted
110,595	133,058	121,858	110,595	110,595	-------

Although the United States is in the midst of a severe recession, it is important to avoid short-sighted cuts in statistical agencies that will hurt our ability to fashion smart energy efficiency policies today and in the future for navigating out of the recession.

Sample Size and Data Quality

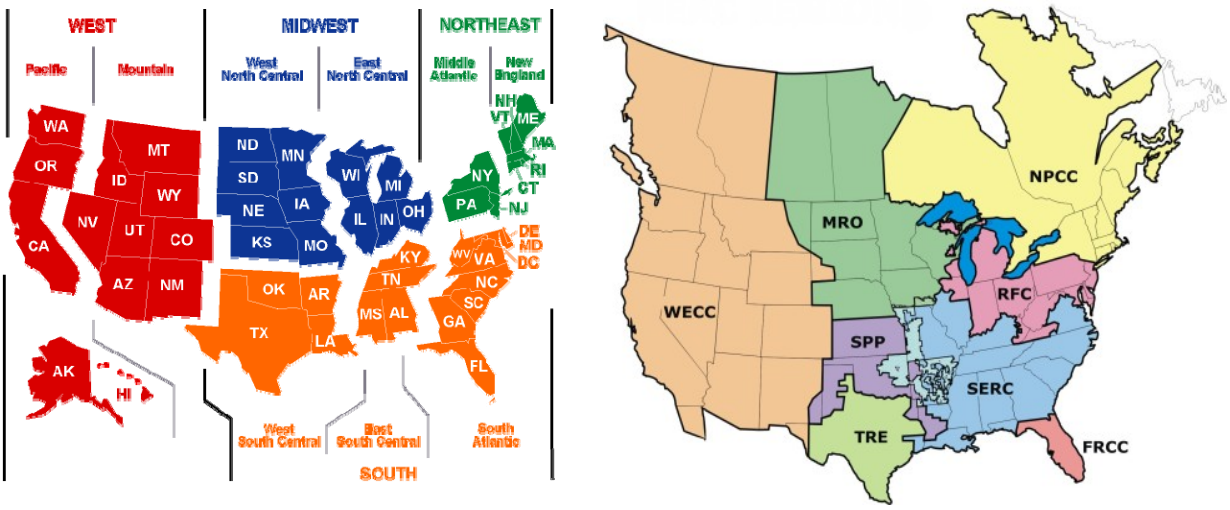
In the *Energy Independence and Security Act of 2007* (EISA), Congress recognized the need for better state-level data and commissioned EIA to complete a study of its state data resources (U.S. Congress 2007). This study found that the State Energy Programs would benefit from improvements to data collection at the state level, but would particularly benefit from investments aimed at improving the quality of estimates and the timeliness of information release. In addition, the study found that due to limited resources, the end-use consumption surveys, CBECS, RECS, and MECS, "are not currently meeting their statutory requirements for frequency and scope" (EIA 2009).[2]

Surveys like RECS, CBECS, and NHTS are particularly affected by funding cuts because the surveys are based upon sampling rather than counting of each individual (like a census). Ideally, the sample collected is representative of the population or group of products as a whole. In recent years, EIA has reduced the breadth of RECS and CBECS due to decreased funding. Smaller sample sizes impede the ability to develop state-specific analyses and to expand our understanding of specific building types (as well as tools for benchmarking the energy performance of multiple building types). As researchers and policy-makers look to EIA data as the basis for current and future policy and program decisions, it is essential that these data are robust and collected frequently.

Sample sizes also drive the geographic scale at which consumption and utility survey data are meaningful, and these are directly tied to available funds and staff resources. At present, most surveys are conducted by U.S. Census Region, and *Electric Power Annual* information is reported by NERC (North American Electric Reliability Council) region (see Figure 2).

[2] Public Law 92-275 (Federal Energy Administration Action of 1974) and Public law 95-91 (Department of Energy Organization Act)

Figure 2. U.S. Census Regions Map, PADD Map, and NERC Regions Map



Collection for these large regions, many of which do not correspond to state boundaries, can cause complications, as in the case of the consumption data organized by the Mountain Division—a large area from Montana in the north to Arizona in the south. Combining data across such diverse states and climates makes analysis difficult. Unless EIA were able to increase the overall sample size, the agency would not be able to increase the accuracy of estimates for California without reducing the sample in the Pacific Census division, thus losing accuracy in that region (EIA 2009). Larger sample sizes would improve data quality and would enable EIA to allow inferences for smaller geographic units, like climate zones, and large states. Climate zones are important for creating effective standards, and state-level data are vital in assessing programs.

As sample sizes decrease, they become too small to generate reliable state-level data in all except the largest states. In order to effectively administer these programs in states, State Energy Offices need data on residential and commercial building consumption so that they can target programs where there is the most potential for savings. In addition, many of these policies, like the $3.2 billion in funds for Energy Efficiency Conservation Block Grants and the 3.1 billion in funds to the State Energy Offices in ARRA, give states the ability to implement energy-saving measures in creative ways. Consequently, it would be helpful for policymakers to have state-level data as these programs are implemented to enable comparisons of the different programs states create. These data are also essential for determining whether the programs we are funding are the most cost-effective investments we can make, and whether they are having the intended effect (e.g., job creation).

In addition, there has been a recent emphasis on retrofitting our enormous residential building stock, more than 75% of which will still be in use in 2030 (EIA 2010). This crucial effort includes actions within the ARRA bill, in pending House and Senate energy and climate legislation, and additional program planning efforts, particularly at DOE. Enhanced and new retrofit programs will require evaluation of cost-effectiveness, energy savings, and greenhouse gas savings. These evaluations will require significant data gathering and analysis, and will be invaluable to informing continued work on energy efficiency in existing buildings. This effort should be supported by increasing sample sizes to allow for better differentiation of the data by location, climate, and building systems.

EIA's *State Data Needs Assessment* (EIA 2009), a report requested by Congress in the Energy Independence and Security Act of 2007, demonstrates that energy data needs are an increasingly important need for policymaking, and that increased investment is necessary to expand to fulfill those data needs. Nonetheless, for FY 2010, EIA was not granted the necessary funds to increase its data collection capabilities, much less the normal increases necessary for maintaining its current level of output (H.R. 3183 Conference Report).

EIA has until now been able to largely maintain the scope of the Electricity Annual Survey, which produces the *Electricity Annual* and other related reports, through increased automation and the advent of online data reporting by utilities. Unfortunately, there are indications that EIA may have run out of opportunities for maximizing productivity through gains in automation and may be poised to lose data richness due to further budget constraints. Further, it is possible that the positive effects from the use of automation and other similar techniques may have served to mask the effects of funding losses over the past 15-20 years. Budget cuts like the 2010 budget will only exacerbate this problem.

Frequency of Data

In recent years, EIA has reduced the frequency of the RECS, CBECS, and MECS due to decreased funding. Reduced frequency of the surveys makes it more difficult to track the impact of building codes and other policies on a timely basis. Policy-makers, researchers, and businesses depend upon EIA data to make policy and program decisions, and it is essential that these data are collected and released in a timely fashion.

RECS began in 1979, and were on a three-year cycle from 1984 to 1993, changing to every four years beginning in 1997. Similarly, the CBECS surveys operated on a 3-year cycle from 1986 to 1995, changing to every four years beginning in 1999. One particular consequence of this change is the disconnect between building codes revisions and the surveys. The ASHRAE 90.1 (commercial) and IECC (residential) buildings codes revisions occur on a 3-year cycle. If the RECS and CBECS frequencies can be returned to a rate of once every 3 years rather than once every 4 years, it will be much easier to document the impacts of codes improvements.

MECS was conducted on a 3-year cycle between 1985 and 1994, at which point it was reduced to a 4-year cycle. A recent interagency report on Energy-Intensive Trade-Exposed Industries (EITEs), responding to a request for information from Senators Bayh, Specter, Stabenow, McCaskill, and Brown, relied heavily on MECS data. The report attempted to understand how industry energy usage patterns would react to pending climate change legislation and found that increasing the frequency of MECS to every 2 or 3 years would further that goal substantially (EPA 2009).

Eliminated Data Series

In addition to the issues discussed above, there are a number of important surveys that, due to funding cuts, have been eliminated or significantly reduced in scope. The Census Bureau has eliminated surveys on freight vehicles and some manufacturing surveys, and the Federal Highway Administration has reduced the scope of an important personal transportation survey.

The discontinuations of some of the *Current Industrial Reports* have reduced understanding of industrial energy use. While some of these surveys were in need of methodological updates to reflect changes in their product markets, the loss of these data series poses challenges for the analytic community's ability to meet policymakers' needs. For example, the discontinuation of the Motor and Generator data series has posed problems in evaluating the impact of federal motor standards and the progress that has been made on transforming the motor marketplace to more efficient products (Elliott 2007). Further, recent requests by Senator Inhofe[3] and others for information on the detailed, localized, and sectoral impacts of climate legislation are impossible to fulfill without adequate data.

In 2006, the Census Bureau eliminated the *Vehicle Inventory and Use Survey*, the only source of national data on truck types, miles traveled, goods carried, and fuel economy for freight trucks. There is no alternate source for much of the data the VIUS provided. It was the primary source of information on the heavy-duty truck fleet, which consumes 2.3 million barrels of oil per day, or 13 percent of U.S. daily oil use. Sound policies to address energy use and environmental impacts of trucks need to reflect the distribution of trucks among weight classes, body types, and usage patterns. The loss of this data

[3] Letter to Chairman Boxer, Environment and Public Works Committee. http://www.epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=f0810d7e-641e-48fb-859a-420cd081c56a

severely limits understanding of the U.S. truck stock, to the detriment of the trucking industry and those who rely upon it. VIUS data would also be fundamental to understanding how we use and manage our highways, including issues such as highway cost allocation and roadway safety.

In addition to outright elimination of programs, some surveys have had funding reduced, and as a result, have decreased their scope. The Federal Highway Administration's National Household Travel Survey, which guides hundreds of billions in government transportation spending, was delayed for two years and no longer covers long-distance travel. Furthermore, despite the need for geographic specificity in sound transportation policy decisions, NHTS data are too sparse to be interpreted at the local level. Both fuel consumption and vehicle miles traveled, parameters essential to understanding the energy efficiency of travel, are tracked only indirectly or without sufficient geographic detail to support policy analysis.

Data That Should Have Been Collected

In addition to those surveys which have been abolished due to funding cuts, there are a number of important data sets that have never been collected, including buildings, transportation, and industrial sector information, and better emerging technologies data. In order to collect this key information, funding levels for EIA and the other data collection agencies would have to be raised further.

For the buildings sector, we have very little recent measured data on how much energy is used for space conditioning, water heating, lighting, plug loads, and other major end-uses. We do not have enough field measurements to establish good benchmarks or expectations for the energy use of schools, offices, stores, or other major categories, based on their size, construction type, location, occupancy, vintage, type of heating/air-conditioning, and so forth. EIA only collects data at the whole building level and then, for the residential sector only, statistically determines energy use by end-use. For example, while RECS does collect information on homes with more than one refrigerator, it is particularly difficult to answer key questions regarding their efficiency. Data about the age of the second refrigerator as well as its location within the home are not collected in the RECS survey. This information is critical to informing policy-makers and businesses about the best methods and policies for addressing these energy-guzzling second refrigerators.

There is a need for detailed data on passenger and freight movement at the local and neighborhood level. This is crucial for accurate modeling and for transportation planning efforts going forward, especially given increased emphasis on the potential for savings in this sector in pending climate change legislation (U.S. Congress 2009a).[4] While collection of these data might be viewed as a local responsibility, ensuring uniform and consistent collection and promulgation of these data requires federal support and guidance.

For the industrial sector, there is a serious lack of data as well as a problem with inconsistent data. This situation contrasts rather sharply with other developed countries, such as Japan, the Netherlands, and the United Kingdom. Among developing countries, Thailand has better data on their industries than we do. As an example, we are relying on 1998 data for information about motor system efficiency and data nearly that old for many industrial processes. Given the expectations for industry to be a major contributor to mitigating greenhouse gas emissions, we simply must do a better job of providing them with effective tools built on a foundation of reliable and current data. In particular, there is a need to focus on those industries that are "presumptively eligible" for inclusion in Energy-Intensive Trade-Exposed Industries, like "chemicals, paper, nonmetallic minerals, or primary metals" to better anticipate the impacts of potential climate legislation on those industries (EPA 2009).

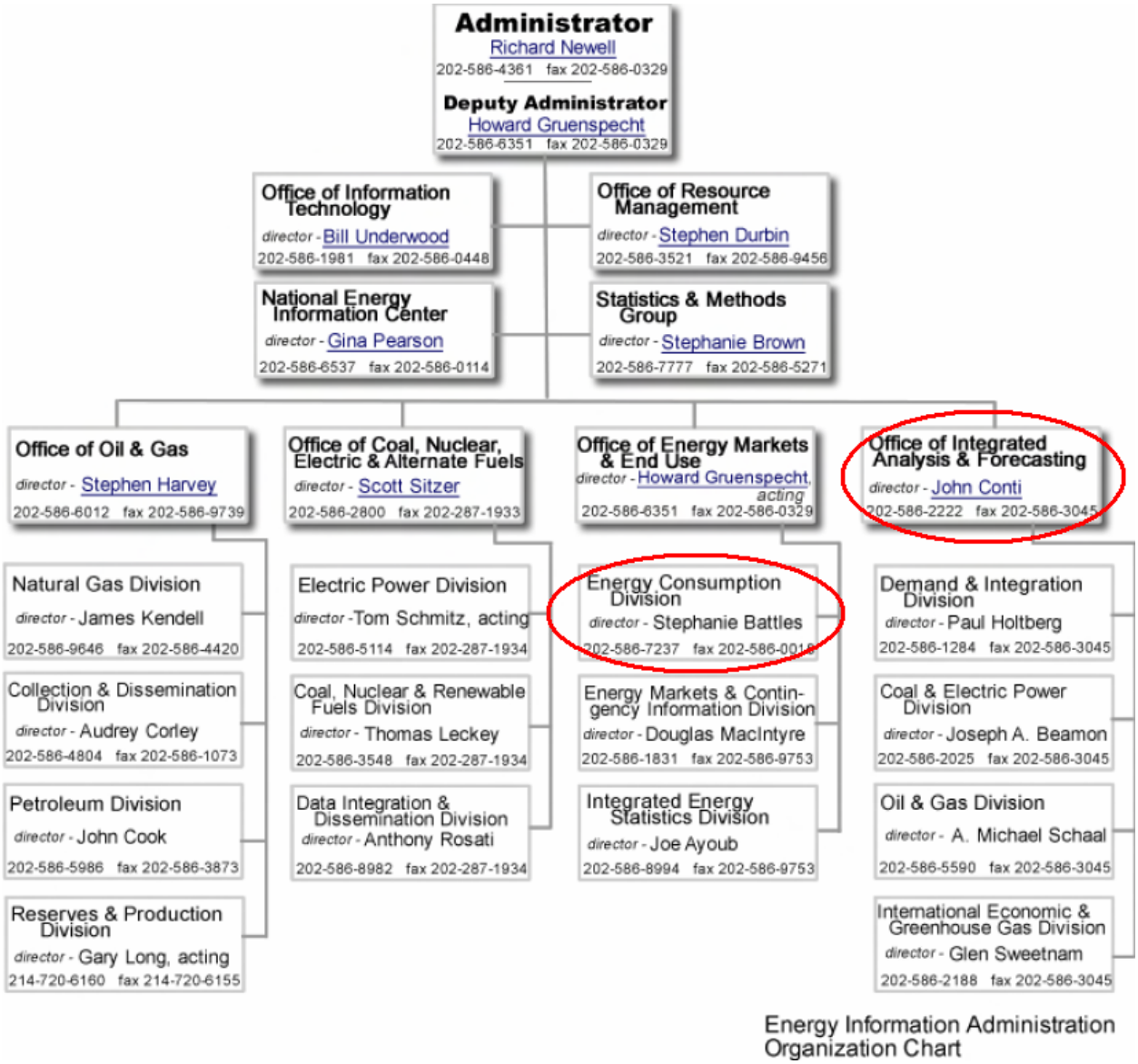
In addition to industry-specific data gaps, it is important for EIA to continually address emerging market trends, attempting to anticipate large, new end-uses. These end-uses include data centers (facilities used to house computer servers, which can use large amounts of energy) and plug loads, which include the power supplies for cell phones and computers. Creating a mechanism to continually address these energy uses is key to ensuring that all large end-uses are well-represented in the surveys.

[4] See Sec. 222 of H.R. 2454, the American Clean Energy and Security Act.

DATA COLLECTION AND FORECASTING: SEPARATE BUT INTERCONNECTED ISSUES

While energy data are critical for assessing past trends, they also provide the foundation for projections and forecasts created to help policy-makers and businesses predict future trends. Although much of the energy efficiency data used by policy-makers is collected by EIA, the forecasting activities at EIA are distinct from the data collection activities and are housed in separate offices within the agency (see Organizational Chart in Figure 3 below).

Figure 3. EIA Organizational Chart



The Energy Consumption division conducts the RECS, CBECS, and MECS surveys. The forecasting/modeling group in the Office of Integrated Analysis and Forecasting relies upon the data collected by other offices within EIA and other agencies, producing three main products whose purpose is to inform policy decisions—the *Short Term Energy Outlook*, the *Annual Energy Outlook*, and the *International Energy Outlook*. In addition, it produces various "service reports" designed to provide additional forecasts given certain pending pieces of federal legislation or areas of policy activity.

Although these forecasts, particularly the AEO have been criticized (see Senator Dorgan's recent Energy and Water Subcommittee statement[5]), it is important to note that the group responsible for these reports is separate from the data collections groups at EIA. Concerns about analysis should not be justification for funding cuts to the entire agency, especially given the importance of core data collection to energy policy efforts for businesses and governments. While funding for analysis is important, funding for data collection is crucial and should be funded at appropriate levels. If data collection frequency is reduced or data are not collected, there is no way in the future to go back and accurately fill in these missing data, but, when the data exist, one can always go back and perform another analysis if necessary to check alternative interpretations.

As of the 2009 EIA Budget request, the Coal, Nuclear, Electric and Alternate Fuels request (which includes the Electricity Annual and the 861 survey that includes DSM information) was $4.54 million and the Energy Markets and End Use request was $7.08 million. Consequently, less than 10.5% of the total EIA request of $111 million was dedicated to energy efficiency data collection, and budget cuts have severely affected this area.

CONCLUSIONS AND RECOMMENDATIONS

The energy community is faced with two related issues: the need for better (more complete, more consistent) data and analysis, and the need for more refined public economic and energy use forecasts. The forecasting depends upon the data, so it is most critical that adequate support be provided to at a minimum maintain existing data series, and to begin addressing data gaps, some of which have been mentioned previously. Moving forward, it is important that we expand our data collection in a systematic manner to better address the informational needs of expanding energy efficiency policies and programs. These goals require that the Administration and Congress commit to providing adequate funding on an ongoing basis, beginning with funding the Administration's FY 2011 budget request for EIA.

1. EIA funding should be increased above the cost of inflation. Because the Energy and Water Appropriations subcommittee maintained funding at the FY 2009 level of $110 million for FY 2010, the 2010 budget represents yet another cut in real funding. President Obama's FY 2011 budget contained $128,833,000 for EIA. We urge Congress to appropriate funds at level at least equivalent to the Administration's request,
2. Funding for EIA should be increased to support substantive improvements in the sample size of the Consumption Surveys, which are currently either underway or preparing to enter the field in coming months. Larger samples will enable more regional breakdowns and more accurate estimates.
3. According to EIA's review of state data in response to Sec. 805 of EISA, some improvements to EIA's state energy data could be carried out for relatively low costs. In particular, outreach, state data integration programs, and supplier survey data quality could be addressed at a low cost (EIA 2009). We recommend providing funding to incorporate these low-cost changes as a part of the budget request.
4. Congress should appropriate funds to restore the Vehicle Inventory and Use Survey, to be reinstated by Census Bureau or taken over by EIA and FHWA. This data series was eliminated in FY 2006, and the information it collected was vital for the trucking industry and those who rely on information about the U.S. truck stock.

Generally, we recommend the following actions be undertaken at the relevant agencies:

1. Maintain the continuity of all existing data series. Due to recent funding cuts, some series will likely be lost, and many series have been cut in recent years. Further, maintain the level of sample size and frequency of reporting for all existing data series.
2. Expand samples sizes of consumption surveys like MECS, RECS, and CBECS, and also NHTS, the household travel survey. Consider the reallocation of samples to provide state-level resolution.

[5] *Energy and Water Development Subcommittee Hearings. June 25th, 2009.* http://appropriations.senate.gov/ht-energy.cfm.

3. Restore discontinued data series, like the Vehicle Inventory and Use Survey, and discontinued census information on important product types, such as motors, lamps, and lighting fixtures.
4. Re-examine and revise the EIA 861 DSM data forms and protocols to include non-utility programs and improve data consistency, timeliness, and comparability.

Although all of the above recommendations are critical measures for improving our country's data collection abilities, we recognize the difficulty in achieving them all quickly. Much can and should be achieved through FY 2011 federal appropriations. Funding increases for both EIA and Census are imperative to maintain the most crucial energy efficiency data needs:

A commitment to robust energy data and analysis is critical for advancing energy efficiency and the clean jobs agenda. We call upon the Administration and Congress to provide for a more robust and ongoing assessment of our nation's energy, environmental, and economic future by adequately funding improved data collection.

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