Cross-Agency Priority Goal: Energy Efficiency
FY2013 Q1 Status Update

Cross-Agency Priority Goal Statement
Reduce Energy Intensity (energy demand/$ real GDP) 50% by 2035 (2010 as base year).

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About this document

The Cross-Agency Priority (CAP) Goals were a key innovation introduced in the FY2013 Federal Budget. These goals focus on 14 major issues that run across several Federal agencies. Each of these historic goals has a Goal Leader who is a senior level White House official and is fully accountable for the success and outcomes of the goal.

Historically, areas of shared responsibility for multiple government agencies have been resistant to real progress. Success in these areas requires a new kind of management approach – one that brings people together from across and outside the Federal Government to coordinate their work and combine their skills, insights, and resources. The CAP Goals represent Presidential priorities for which this approach is likeliest to bear fruit.

This report discusses one of these CAP Goals, the Energy Efficiency Goal, in detail, describing the plan for achieving the goal and the current status of progress. To see the full list of CAP Goals and to find out more about them, we encourage you to visit performance.gov.

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Overview

Increasing energy efficiency is one of the least expensive and most cost-effective ways to enhance the nation's energy security, save money for American households, reduce our dependence on oil, and ensure a clean environment.

Initiatives to reduce energy intensity are often low-cost relative to the alternative of developing additional power generation, and the upfront investments in efficiency programs can pay for themselves in energy savings within a few years.

This Cross-Agency Priority Goal is an effort to gradually reduce the total energy consumed in the United States each year through 2035, from a 2010 base year of 98 Quads (quadrillion BTUs), while the economy, measured by our Gross Domestic Product (GDP), continues to grow at a healthy rate.

Thus, while the population and sectors such as housing, American manufacturing, and high-tech industrial operations continue to expand the level and quality of service provided, the country will consume less energy as a whole due to efficiency gains in our buildings, transportation, industry, and federal operations.

Strategies

While numerous energy efficiency programs can be found across the private and public sectors, this goal focuses on a select set of Federal initiatives that can have outsized impacts through standard setting, cost-sharing programs, industry partnerships, and leading by example.

This cross-agency goal focuses on four opportunity areas for energy efficiency: buildings, industry, transportation, and federal operations. While numerous agencies have energy efficiency initiatives, this goal is currently focused on the work of a few programs found in the Department of Energy (DOE), the Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Department of Transportation (DOT).

Focus Area 1: Building Efficiency - Improve the efficiency of our residential and commercial buildings.

The residential and commercial sectors use about 40 percent of the energy consumed in the United States and represent an enormous opportunity for efficiency gains. The Department of Energy Buildings Technologies program estimates that Americans spend $400 billion each year to power our homes and commercial buildings and if we cut the energy use of U.S. buildings by 20%, we could save approximately $80 billion annually on energy bills, reduce greenhouse gas emissions, and create jobs.

The keys to realizing these benefits are increased demand for energy efficient technologies along with continued progress in technology development and standard setting. The Energy Information Administration (EIA), the independent statistical agency housed within the DOE, foresees the greatest opportunities for residential buildings in improved space heating and ventilation, air conditioners, and water heating. Likewise, for commercial buildings the greatest potential lies with space heating and upgrading lighting to new technologies such as Light-Emitting Diodes (LED). Additionally, there is a growing share of household electricity consumption that is used by new electronic devices that are not currently covered by efficiency standards.

Key levers for the Federal government are to (1) develop new minimum appliance standards (such as those for lights and refrigerators) set by the DOE; (2) expand the market of products, commercial buildings, and new homes that meet the EPA ENERGY STAR® requirements for superior energy performance (including over 65 product categories from Televisions to HVAC); (3) leverage federal investments in programs to install energy-efficient retrofits in homes, particularly for low income populations; and (4) expand successful public-private partnerships models such as the President's Better Building Initiative where partners in industry, municipalities, and universities share best practices and pledge to reduce the energy intensity of their operations by 20% by 2020.

Focus Area 2: Industrial Efficiency - Make our industrial facilities and processes more energy efficient.

The industrial sector accounts for over 30 percent of the energy consumed in the United States and reducing energy costs is critical for their success and our overall competitiveness. Experts have

observed that the United States has under-invested in these areas and that there are tremendous opportunities for improving the efficiency of energy intensive processes and facilities as well as recovering waste heat for Combined Heat and Power (CHP) generation.

The DOE Advanced Manufacturing Office (AMO) has a strategic approach to increasing industrial energy efficiency by 25 percent over 10 years in targeted areas. Their approach focuses on research, development, and demonstration of new energy-efficient manufacturing processes and materials technologies to reduce the energy intensity and life-cycle energy consumption of manufactured products. The AMO program is using a cost-sharing model to make strategic R&D investments in areas where firms would not likely otherwise invest individually. It also seeks to promote continuous improvement in energy efficiency among existing facilities and manufacturers.

A second strategy is the use of voluntary partnership programs for reducing the energy intensity of industrial facilities. The EPA ENERGY STAR® Industrial Partnership program, which includes over 700 companies with thousands of facilities across 23 sectors and subsectors, encourages corporate energy management and plant-level energy efficiency improvements by addressing barriers and providing industry-specific energy management tools and resources. Additionally, the DOE Better Plants Program includes 115 companies that have pledged to reduce their energy intensity by 25% over 10 years. In 2012, DOE also created the Superior Energy Performance designation which requires continual improvement in energy usage in addition to meeting the internationally accepted ISO 50001 energy management standard.

A third strategy is to incentivize industry to invest in technologies to repurpose waste heat to generate Combined Heat and Power. Instead of burning fuel in an on-site boiler to produce thermal energy and also purchasing electricity from the grid, a manufacturing facility can use a CHP system to provide both types of energy in one energy efficient step. In August 2012, the President issued an Executive Order to accelerate investment in industrial energy efficiency, which challenged agencies to collaborate to enable 40 gigawatts of new, cost effective industrial CHP in the United States by the end of 2020.

Focus Area 3: Transportation - Improve the fuel economy of our vehicles.

Transportation accounts for about 30 percent of the energy consumed in the United States. Of this, about 80 percent of transportation energy is used by passenger vehicles and heavy duty trucks, with the rest used by planes, ships, trains, and pipeline operation. Reduced energy use in transportation also ties into the larger challenge of energy independence and oil imports. The strategies for this goal focus on decreasing the energy intensity of fuels used in our vehicles and total vehicle miles traveled.

The first strategy is to gradually increase fuel economy standards in line with historic and projected development of vehicle technologies. In August 2012 the Administration announced groundbreaking standards that will increase fuel economy to the estimated equivalent of 54.5 miles per gallon (MPG) for passenger cars and light-duty trucks by model year 2025. In total the Administration's new fuel economy standards will save consumers more than $1.7 trillion at the

gas pump, reduce U.S. oil consumption by 12 billion barrels, and reduce greenhouse gases by 6 billion metric tons over the life of the vehicles covered by the standards. EIA predicts that the future fleet of vehicles that meet this efficiency standard will still be mostly gasoline-only internal combustion engine cars, but that an increasing share of micro-hybrids, that use a combination of gasoline, electric engine, and regenerative braking, will come on the market.

Additionally, in August 2011, EPA and DOT finalized standards for trucks and buses built in 2014 through 2018 that will reduce oil consumption by a projected 530 million barrels and greenhouse gas (GHG) pollution by approximately 270 million metric tons over the lifetime of vehicles covered. This comprehensive national program applies to vehicles in three major categories: combination tractors (semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles (like transit buses and refuse trucks). The joint DOT/EPA program includes a range of targets which are specific to the diverse vehicle types and purposes, and requires approximately 10 to 20 percent reduction in fuel consumption and greenhouse gas emissions by model year 2018.

DOT and EPA play coordinated roles in implementing the DOT fuel economy standards and the EPA greenhouse gas standards. DOT and EPA conducted joint rulemaking processes for both the light-duty vehicle and heavy-duty truck greenhouse gas standards. EPA collects manufacturer certification data and conducts selective pre-production testing. This data is used by both DOT and EPA to ensure that the manufacturers meet the fuel economy and greenhouse gas standards, respectively. Overall compliance with CAFE and greenhouse gas standards is determined later, based on the manufacturer's fleetwide average. The DOE Vehicles Technologies program is working with industry on the R&D on lightweighting materials and developing the vehicle components needed for high fuel economy, and provides technical support for the CAFE process.

A second overarching strategy is the diversification of our vehicle fuel sources. This includes incentivizing the use of biofuels and the development of hybrid, electric and natural gas vehicles. The Administration has set a goal to put 1 million advanced vehicles on the road by 2015. The DOE Vehicles Technology Program has a related Priority Goal to reduce the modeled cost of energy storage for Plug-in Electric Hybrid Vehicles to $400/kWh by 2013, from over $1000/kWh just a few years ago. America has an abundance of natural gas and there are opportunities to spur the development of natural gas vehicles, particularly for long-haul trucking. Finally, Congress has mandated a Renewable Fuels Standard to blend 36 billion gallons of renewable fuel equivalent with gasoline by 2022, with an increasing share coming from advanced biofuels that result in greenhouse gas reductions.

A third overarching strategy is to reduce vehicle miles traveled by promoting alternatives to driving. To reduce traffic congestion the DOT has a comprehensive program to develop high-speed and intercity passenger rail. Through American Recovery and Reinvestment Act grants, this program aims to create seven high speed rail corridors and 36 individual high speed rail projects, with investments concentrated in the following high-congestion corridors: San Francisco-Los Angeles, Boston-New York City-Washington, D.C., Seattle-Portland-Eugene, Charlotte-Washington, D.C., Chicago-St. Louis, and Chicago-Detroit. The DOE Clean Cities program is another example of the federal government working with state and local partners to help municipalities use less

petroleum through strategies such as promoting idle reduction measures, fuel economy improvements and promoting new technologies.

Focus Area 4: Federal Operations - Lead by example improving the energy efficiency and sustainability of Federal operations.

With more than 1.8 million civilian employees, 500,000 buildings, and billions in annual purchasing power, the Federal Government has a responsibility to lead by example when it comes to its environmental, energy, and economic performance. The implementation strategy for Executive Order 13514 is covered by separate CAP Goal for Sustainability run by the White House Council on Environmental Quality and Office of Management and Budget, which can be viewed here, and includes requirements on improved efficiency and reduced petroleum use.

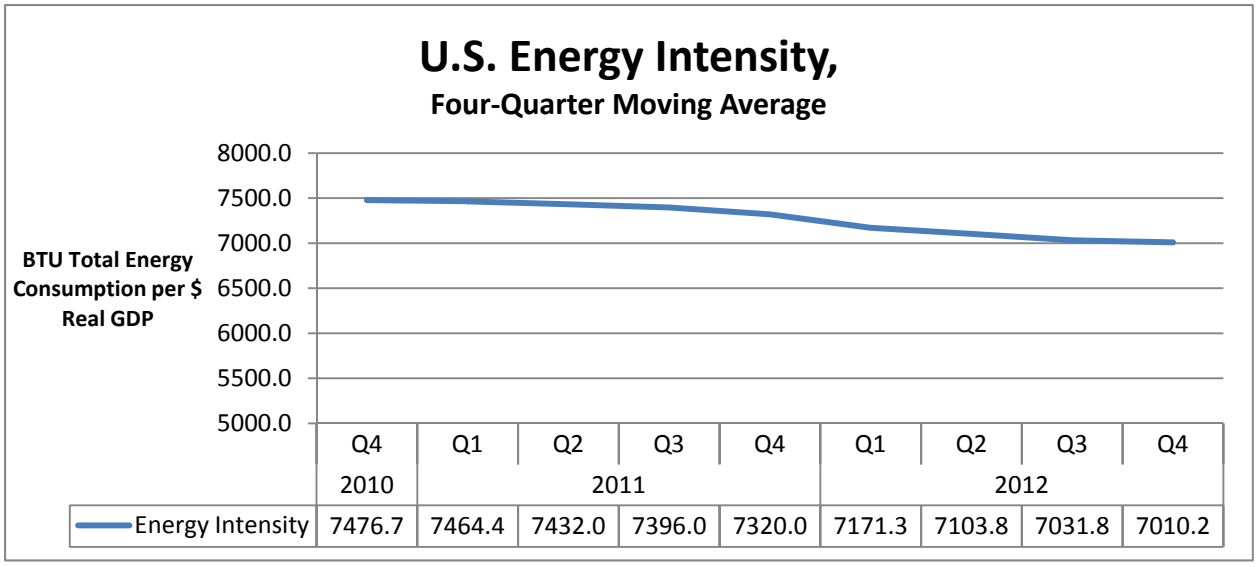
A second strategy for improving Federal efficiency is to reduce energy usage in Department of Defense facilities. DOD is the single largest consumer of energy in the nation, accounting for approximately one percent of national demand. Of this energy consumption, about 75 percent goes to predominantly petroleum-powered operational energy use, with the remaining 25 percent to power its fixed installations or "facility energy", which consists largely of traditional energy sources used to heat, cool, and provide electrical power to buildings. The DOD has a goal to reduce total facility energy intensity by 3 percent per year from more than 500 fixed installations in the United States and overseas.

Progress Update

Progress in reducing energy intensity in the U.S. economy is measured in two ways: (1) macro-economic indicators of energy intensity based on energy consumption and GDP data, and liquid fuels consumption; and (2) a set of select accomplishments or milestones from Federal Government actions. We do not attempt to model the extent to which each milestone can impact total energy intensity reductions, but as discussed in the strategies section, this plan is focused on areas where the Federal Government can maximize impact. As can be seen in the discussion of indicators and milestones below, we are on track and slightly ahead of schedule in reducing our overall energy intensity by half, a result that can be credited in part to federal programs but is also a function of public demand for cost-effective efficiency solutions.

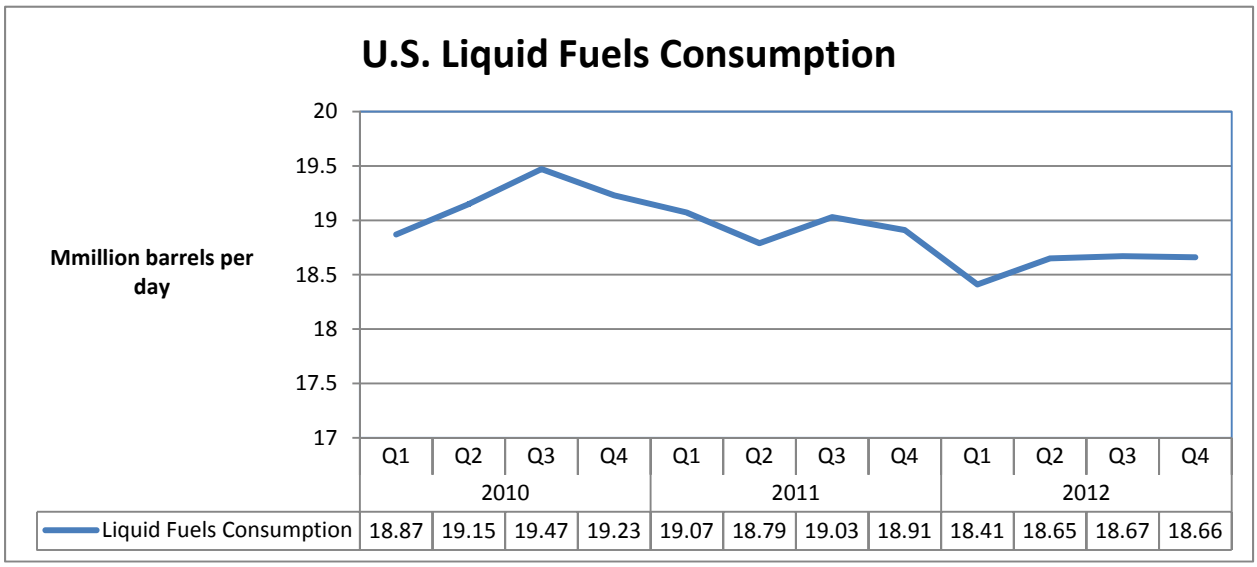
Indicators

Overall energy intensity is tracked quarterly through changes to energy consumption data and GDP (BTU Total Energy Consumption per $ Real GDP). As the long-term energy intensity goal is a 50 percent reduction by 2035, this indicator is expected to move by 2 percent on average per year. However, as can be seen in the chart below a reduction of more than 6 percent was achieved from fourth quarter of calendar year 2010 through the fourth quarter of 2012 (the latest available EIA data). In this period the total quarterly average energy consumption decreased marginally from 24.55 quadrillion BTUs to 24.55, while the quarterly average GDP has increased from $13,181 billion ($2005) to $13,506.



Source: Energy Information Administration: Short Term Energy Outlook, February 12, 2013

A second quarterly indicator is the changes in total liquid fuels consumption. Liquid fuels consist of petrochemical products, natural gas liquids, and biofuels. Gasoline for automobiles is the major driver of liquid fuel consumption, but it should be noted that about 30 percent of liquid fuels are also used for non-transportation applications such as industrial processes, and residential heating. Thus a flat line or reduction of liquid fuels in times of GDP growth (as seen in the chart below) is an indicator of a more fuel efficient overall fleet of vehicles, lower Vehicle Miles Traveled (VMT), and industrial switching from petroleum to other energy sources such as natural gas.



Source: Energy Information Administration: Short Term Energy Outlook, February 12, 2013

The cumulative vehicle miles traveled in the United States has been flat for the timeframe of the goal, a significant departure from previous continuous increase for decades. In calendar year 2010, VMT increased by 0.7 percent, then decreased by 1.2 percent in 2011, and increased through

August 2012 (latest available data) by 0.9 percent. When compared with the downward trend in liquid fuels consumption this indicates our fleet of vehicles is becoming more efficient.

Milestones Accomplished to Date

Below is a discussion of milestone-based indicators that show major accomplishments from Federal Government actions. These accomplishments are leading indicators of progress in key strategic areas and in some cases pertain to the development of policies that will yield substantial energy efficiency benefits over long timeframes.

Building Efficiency: Improve the efficiency of residential and commercial buildings.

- The DOE issued 29 new final rules for test procedures and standards in FY 2012 and 16 final rules in FY 2011. Currently, the DOE has met its Q1 FY 2013 goal of actively working on 52 products, including development of 12 test procedure proposals and final rules as well as one standards final rule. For more information see the DOE Priority Goal for appliance standards.
- The DOE weatherized more than 1 million homes from FY 2009 through FY 2012. These energy efficient retrofits have saved families an estimated 33 Million MMBTUs. A total of 1.181 million homes have been weatherized using DOE funds as of Q1 FY 2013, exceeding the original target by 18%. For more information see the DOE Priority Goal for weatherization retrofits.
- In FY 2012, HUD completed 82,343 cost effective, healthy, energy-efficient, and green retrofits or new housing builds. For more information see the HUD Priority Goal for energy efficiency.
- More than 2 Billion square feet of building space committed to the DOE Better Building Challenge to reduce energy usage 20 percent by 2020.
- ENERGY STAR Commercial Building and New Homes Programs saved over 121 billion kWh of energy in 2011. As of Q4 FY 2012, 1,392,086 new homes and 19,167 commercial buildings have been certified to earn the ENERGY STAR®.
- New homes that were built to earn the ENERGY STAR® label made up about 26% of all new homes constructed in the United States during 2011. ENERGY STAR® homes consume at least 15% less energy than those built to the 2009 International Energy Conservation Code (IECC).
- As reported in December 2012, Americans purchased about 300 million ENERGY STAR certified products in FY 2011, bringing the total to about 3.8 billion since 2000.

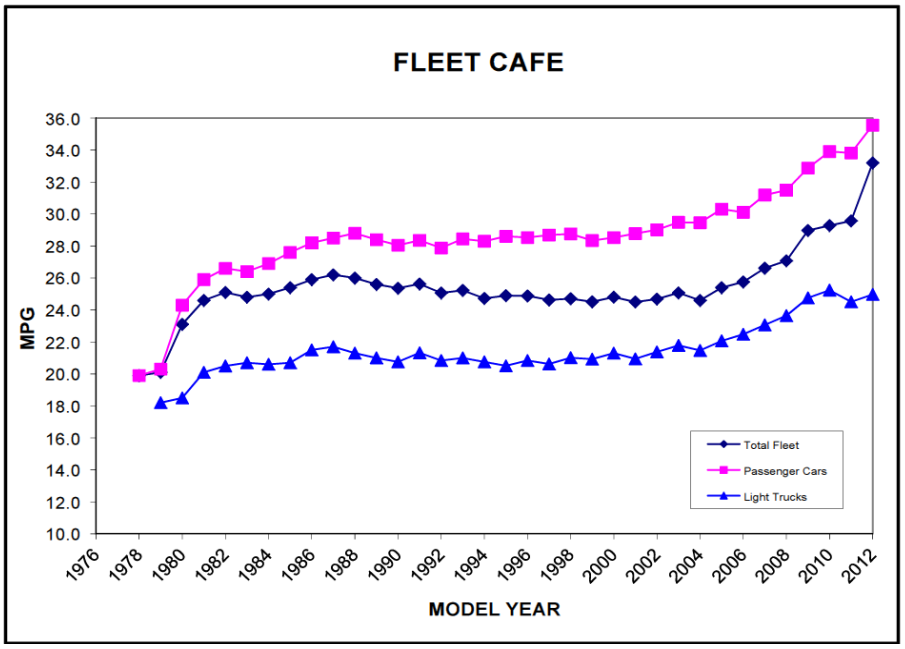
Industrial Efficiency: Make our industrial facilities and processes more energy efficient.

- In August 2012, the President issued an Executive Order for "Accelerating Investment in Industrial Energy Efficiency"
- 114 DOE Better Plants Program partners have pledged to voluntarily reduce energy intensity by 25% over 10 years.
- ENERGY STAR Industrial Partners Program saved over 19 billion kWh of energy in 2011, with a cumulative total of 110 plants earning the ENERGY STAR label.

Transportation: Improve the fuel economy of our vehicles.

- In August 2012, the Administration finalized plans for historic standards that will increase fuel economy to the estimated equivalent of 54.5 mpg.

- In August 2011, the DOT and EPA announced fuel economy standards for 10 to 20 percent reduction in fuel consumption and greenhouse gas emissions for combination tractors (semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles by model year 2018.
- In FY 2012, the average current production cost estimate from DOE/USABC battery developers for a PHEV battery is $485 per kilowatt-hour of useable energy storage capacity, compared to a 2008 base year of $1000/kWh. The DOE is also on target to meet their FY 2013 goal to develop lithium ion battery cells, through national lab and developer efforts, that demonstrate a 20-50% increase in energy density over the current baseline of 150-175 wh/kg. For more information see the DOE Priority Goal for battery performance.
- To implement the DOT fuel economy and EPA greenhouse gas standards for passenger vehicles model years 2012-2016 and heavy duty vehicles model years 2014-2018, in the first quarter of FY 2013 EPA performed pre-production confirmatory tests on 33 vehicles (light-duty plus heavy-duty) and issued 119 certificates (light-duty plus heavy-duty). For more information see the EPA Priority Goal for reducing GHG emissions from cars and trucks.
- Between Q4 FY 2011 and Q1 FY 2013, the DOT initiated construction on 5 high speed rail corridor programs and 33 individual projects. For more information see the DOT Priority Goal for developing passenger rail.
- Model year 2012 data submitted by manufacturers and compiled by DOT show that the fuel economy of passenger cars and light trucks both increased in line with the rising CAFE standards.



Source: US Department of Transportation, NHTSA. October 2012

Federal Operations: Lead by example improving the energy efficiency and sustainability of Federal operations.

- In June 2012, Federal Agencies released their annual OMB Energy and Sustainability Scorecards, which can be accessed here. The scorecards show progress on sustainability

measures, including greenhouse gas emissions, energy intensity, renewable energy use, water intensity, and fleet petroleum usage.

- Since 2003, the DOD has reduced its cumulative facility energy intensity (BTUs per square foot) by more than 13 percent. For more information see the DOD priority goal to improve energy performance.

Next Steps

Of the milestones discussed above, the following milestones can be updated on a quarterly basis:

Building Efficiency:

- New final rules issued for appliance standards
- Homes weatherized through DOE programs
- HUD cost effective, healthy, energy-efficient, and green retrofits or new housing builds
- New Better Building commitments
- Cumulative EPA ENERGY STAR® certified new homes
- Cumulative EPA ENERGY STAR® certified commercial buildings

Industrial Efficiency:

- New DOE Better Plants partners and capacity
- Cumulative EPA ENERGY STAR® certified plants

Transportation:

- DOT / EPA rules announced

Federal Operations:

- Quarterly updates on the Cross-Agency Priority Goal for Sustainability

Future Actions

In the 4th quarter of FY 2013, and on an annual basis, all of the quarterly milestones plus these annual metrics can be updated:

Building Efficiency:

- *ENERGY STAR and Other Climate Protection Partnerships Annual Report* detailing ENERGY STAR accomplishments in FY 2012
- Percent increase in lighting efficacy of "warm white light" solid-state lighting in a lab device

Industrial Efficiency:

- GW of CHP generated in industrial manufacturing sites

Transportation:

- Average fuel economy of new passenger vehicles and light trucks
- Reduction in the modeled cost of energy storage for Plug-In Hybrid Electric Vehicles ($/kilowatthour).
- Reduction in weight of passenger vehicle bodies and chassis systems without affecting price, safety or performance
- Improved fuel economy from advances in engine efficiency

Federal Operations:

- Annual Energy and Sustainability Scorecards, which are released in spring of each year covering prior fiscal year goal achievement and action item progress updates.
- Annual updates of agency energy performance data on a fiscal year basis.

Contributing Programs and Other Factors

The following agencies and programs are the main contributors to the strategies outlined in this document:

The White House

- Office of Energy and Climate: http://www.whitehouse.gov/energy
- Council on Environmental Quality: http://www.whitehouse.gov/administration/eop/ceq
    - Sustainability Scorecards: http://sustainability.performance.gov/

Department of Energy

- Energy Information Administration: http://www.eia.gov/
- Energy Efficiency and Renewable Energy (EERE), Building Technologies Program: http://www1.eere.energy.gov/buildings/
    - Better Buildings Challenge: http://www1.eere.energy.gov/buildings/betterbuildings/
- EERE Advanced Manufacturing Office: https://www1.eere.energy.gov/manufacturing/
- EERE Weatherization Assistance Program: http://www1.eere.energy.gov/wip/wap.html
- EERE Vehicle Technologies Program: http://www1.eere.energy.gov/vehiclesandfuels/about/index.html
- EERE Federal Energy Management Program: http://www1.eere.energy.gov/femp/about/emff.html

Environmental Protection Agency

- ENERGY STAR: http://www.energystar.gov/
- Office of Air and Radiation, Transportation and Air Quality: http://www.epa.gov/otaq/

Housing and Urban Development

- Office of Sustainable Housing and Communities: http://portal.hud.gov/hudportal/HUD?src=/program_offices/sustainable_housing_communities

Department of Transportation

- National Highway Traffic Safety Administration: http://www.nhtsa.gov/
- Federal Railroad Administration: http://www.fra.dot.gov/rpd/passenger/31.shtml

Department of Defense

- Facilities Energy & Privatization Directorate: http://www.acq.osd.mil/ie/energy/index.shtml