

Policy Perspective: Meeting the Challenge of Sustainability – 14603

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ABSTRACT

DOE's Sustainability Performance Office is working to meet sustainability goals at DOE by implementing Executive Orders, Departmental policy, the DOE Strategic Sustainability Performance Plan (SSPP) and legislation related to sustainability.

INTRODUCTION

The Federal government occupies nearly 500,000 buildings, operates more than 600,000 vehicles, employs more than 1.8 million civilians, and purchases more than \$500 billion per year in goods and services.

DOE is the third-largest user of facility energy in the Federal Government. In FY 2012, DOE used, occupied and emitted approximately:

- 31.7 trillion Btus energy; 3% of Government total
- 5.1 million MWH electricity; 9% of Government total
- 7.4 billion gallons of potable water; 5% of Government total
- 122 million square feet; 4% of Government total
- 4.0 million MTCO_{2e} Scope 1 & 2 GHG; 8% of Government total

DOE Sustainability Performance Office (SPO)¹ operates within the strategic context of:

- Energy Policy Acts (EPA) 1992 and 2005
- Energy Independence and Security Act (EISA) 2007
- Executive Order (EO) 13423
 - "Strengthening Federal Environmental, Energy, and Transportation Management"
- EO 13514
 - "Federal Leadership in Environmental, Energy and Economic Performance"
- DOE 2013 Strategic Plan
- DOE Strategic Sustainability Performance Plan²
- DOE Order 436.1, "*Departmental Sustainability*"

DISCUSSION

DOE Order 436.1

This Departmental policy establishes responsibilities and requirements for managing sustainability within DOE to ensure goals (described in Figure 1) and milestones in the annual Strategic Sustainability Performance Plan (SSPP) are met. It provides an overarching sustainability policy for DOE to ensure compliance with sustainability requirements and statutes, consolidates DOE Orders *Departmental Energy, Renewable Energy, and Transportation* (430.2B) and *Environmental Protection Program* (450.1A), and establishes DOE Sustainability Performance Office (SPO) as the Office of Primary Interest (OPI).

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The order requires implementation of the SSPP, Site Sustainability Plans (SSPs), and Environmental Management Systems (EMSs). It streamlines the Department's approach to implementing EO 13514, EO 13423, EPLA 1992 and 2005, EISA 2007, and relevant Contractor Requirements Document (CRD) that incorporates this policy into performance requirements for DOE's National Laboratories and sites.

Strategic Sustainability Performance Plan (SSPP)

The SSPP is an annual sustainability plan required by EO 13514³. Agency SSPPs⁴ focus on 9 goals that integrate previous EOs, statutes, and requirements into a single framework:

1. Greenhouse Gas (GHG) Reduction
2. Sustainable Buildings
3. Fleet Management
4. Water Use Efficiency & Management
5. Pollution Prevention & Waste Reduction
6. Sustainable Acquisition
7. Electronic Stewardship & Data Centers
8. Renewable Energy
9. Climate Change Resilience

DOE's sustainability goals are represented in TABLE I below:

Sustainability Goals	Requirement
Greenhouse Gas Emission Scopes 1 and 2 Reduction	28% (2020)
Greenhouse Gas Emission Scope 3 Reduction	13% (2020)
Energy Intensity Reduction (Btu/ft ²)	30% (2003-2015)
Renewable Electricity Consumption Increase	20% (2020 forward)
Fleet Petroleum Reduction	30% (2005-2020)
Fleet Alternative Fuel Increase	10% (2005-2015)
Fleet Inventory Reduction	35% (2005-2014)
Potable Water Intensity Reduction (gal/ft ²)	26% (2007-2020)
Industrial/Other Water Consumption Reduction	20% (2010-2020)
Recycling & Waste Diversion	50% (by 2015)
Procurements Meet Sustainability Requirements	95% (each year)
Buildings Meet Guiding Principles	15% (by 2015)
Net-Zero Energy in New Facilities	100% (by 2030)

TABLE I - DOE Requirement Targets

Each goal has specific strategies that the agency will implement to achieve its sustainability goals. Accompanying each strategy is a descriptive narrative as well as a specific target/metric to measure success. Figure I below is an excerpt from the FY 2013 SSPP showing examples of strategies for Goal 1 Greenhouse Gas (GHG) Reduction goal.

(A) Will the agency implement the following strategies to achieve this goal?	(B) Top Five? Yes/No/NA	(C) Strategy Narrative (100 word limit)	(D) Specific targets/metrics to measure strategy success including milestones to be achieved in next 12 months
Reduce on-site fossil-fuel consumption by installing more efficient boilers, generators, furnaces, etc. and/or use renewable fuels.	Yes	Building upon recent successes, including the installation of biomass boilers at two DOE sites, DOE will continue to focus on reducing on-site fossil-fuel consumption by implementing lifecycle cost-effective ECMs and accelerating deployment of on-site renewable generation including photovoltaic, biomass, landfill gas, combined heat and power and wind.	(1) Update and implement cost-effective ECMs across DOE sites including steam system decentralization, lighting upgrades, building management system improvements, and mechanical equipment upgrades. (2) Complete feasibility evaluation for on-site landfill gas generation at one DOE site.
Reduce grid-supplied electricity consumption by improving/upgrading motors, boilers, HVAC, chillers, compressors, lighting, etc.	Yes	DOE will improve the efficiency of existing buildings through EISA energy and water audits.	(1) Continue implementation of lifecycle cost-effective ECMs, when appropriate and cost effective. (2) Issue a case study on best practices of building management.
Employ operations and management best practices for energy consuming and emission generating equipment.	Yes	DOE will continue educational campaigns to change employee behavior when operating DOE facilities, including promoting the use of specialized equipment for inventory control, detecting emission leaks, and performing preventative maintenance.	(1) Deploy Peer-to-Peer network to partner high performing sites with low performing sites to share operational and management best practices. (2) Issue case study on best practices of operations and management of high energy consuming

Figure 1 – DOE FY 2013 SSPP Goal 1: GHG Reduction Strategies

**Office of Management and Budget (OMB)/Council on Environmental Quality (CEQ)
Sustainability Scorecard**

DOE is regularly evaluated on its progress toward meeting sustainability goals. Since Fiscal Year 2010, DOE and agencies across the Federal government publicly posted their OMB/CEQ scorecards detailing sustainability and energy performance annually. DOE's FY 2012 scorecard (Figure 2 below) serves as an important benchmark to see where the Department has been successful in achieving its sustainability goals, reducing pollution, cutting costs, and identifying where there is still more work to do.

President Obama made clear that Federal agencies must lead by example in clean energy and directed each agency to set aggressive targets for saving energy and water, limiting pollution, and reducing waste. Based on benchmarks identified in these annual scorecards, DOE updates its SSPP annually to continue building on accomplishments and find better ways to meet and exceed sustainability goals.

Over the last year, DOE achieved a number of important successes in its efforts to promote clean energy, reduce energy waste, and lead by example across the Federal government. These successes include:

- Savannah River Site replaced its 1950's era coal-fired boilers with a new steam plant using an Energy Savings Performance Contract (ESPC). The new plant will produce up to 20 megawatts of clean energy, avoid 100,000 tons of GHG emissions each year, and save \$35 million in energy and operations and maintenance costs annually.
- DOE added 30 buildings to its green building portfolio, nearly doubling its overall High Performance Sustainable Buildings (HPSB) total from FY 2011. Many of the Department's new facilities are being designed to take into account the important lessons learned from successes, such as the National Renewable Energy Laboratory's (NREL) Research Support Facility, a LEED-Platinum facility.
- DOE awarded an ESPC to construct the Federal government's largest wind farm at the Pantex Plant. As DOE's first award in support of the President's Performance Contracting Challenge, the project is expected to save on average \$2.6 million annually over 18 years and supply 60 percent of the site's electricity annually.
- Numerous DOE sites have installed solar-assisted plug-in electric vehicle charging stations. For example, the National Renewable Energy Laboratory (NREL) installed 36 electric vehicle charging stations to advance research of plug-in electric vehicle technology. The stations, available for use by NREL fleet, government, and employee vehicles, are linked to the Energy Systems Integration Facility (ESIF) to provide information on user charging habits and hardware performance.
- The Portsmouth Site (PORTS) decreased water consumption dramatically by 906 million gallons, a 12 percent decrease from 2011. This was achieved by replacing the old one-through cooling system at the Dry Air Plant (DAP) with a new recirculating cooling water system and the old coal-fired steam plant with a new gas-fired boiler plant.

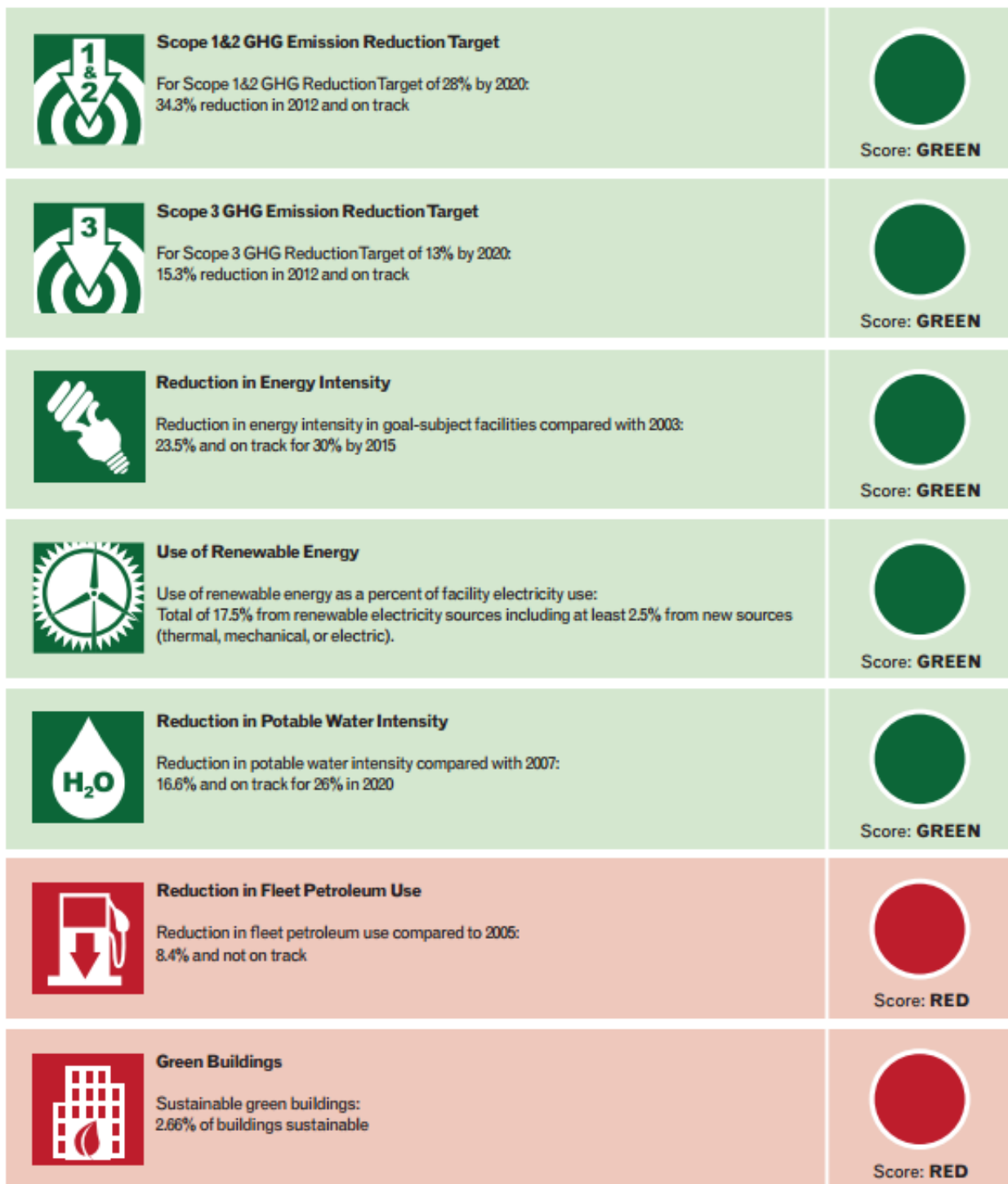


Figure 2 – DOE FY 2012 OMB/CEQ Sustainability Scorecard

Standards for Success- Red Performance Indicators

DOE had two red performances indicators on its 2012 OMB/CEQ Scorecard for the Fleet Petroleum Use and Green Buildings goals.

DOE has faced challenges to reduce fleet petroleum use due to mission specific activities. Notably, the American Recovery and Reinvestment Act (Recovery Act) accelerated DOE's cleanup of cold war legacy sites. These activities subsequently increased DOE's overall fleet petroleum use as they require heavy duty, petroleum intensive vehicles which are not readily available in alternative fuel platforms. As these activities are completed over the next few years, the Department should see a marked reduction in petroleum use. Many DOE sites are also located in remote locations inaccessible to alternative fueling stations. To address this issue, the Department will utilize available alternative fueling locator tools and, where applicable, evaluate the installation of on-site alternative fueling infrastructure to serve these locations. In the past year, DOE greatly improved its petroleum reduction performance. Through FY 2013, DOE reduced fleet petroleum use by 16 percent relative to the FY 2005 baseline. This signals an 8 percent improvement over FY 2012 and nearly places the Department on-track to meet the FY 2015 20 percent goal.

Meeting the Guiding Principles for High Performance Sustainable Buildings is a challenge for a variety of reasons; foremost among them is the requirement for building-level metering. Installation of a meter requires the building to shut down for a period of time, which can interfere with DOE's scientific and national security operations. In addition, attainment requires meeting all five Guiding Principles. If a single aspect of the goal is not cost effective or applicable to a building, compliance cannot be achieved. For example, requirements under the Guiding Principle for Indoor Air Quality are geared toward typical office environments and are not a good fit for buildings that do not house staff. DOE's large, enduring sites are increasing their number of compliant buildings each year and frequently collaborate to share tools and lessons learned. Environmental cleanup sites find that meeting the Guiding Principles is not cost-effective given planned closures.

DOE Internal Scorecards

In addition to the OMB/CEQ sustainability scorecards, DOE also developed an internal Sustainability Scorecard, which measures progress toward agency sustainability goals based on the line management accountability structure of meeting the Department's sustainability goals. These scorecards are provided to each of the Under Secretaries and major landlords such as the Office of Management which oversees DOE Headquarters in Washington, D.C. and Germantown, MD. The scorecards provide updates on offices, sites, and lab progress on meeting the Department's reporting requirements and sustainability goals (Figure 3).

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DOE Sustainability Scorecard Under Secretary of Energy							
		FY 2012 Results	FY 2013				FY 2014 Q1
			Q1	Q2	Q3	Q4	
1 Submit Complete and Timely Planning Documents (Program)							
	1a. Composite U/S Sustainability Plan (Apr 15, 2013)				✓		
	1b. Annual Budget Planning		✓	✓	✓		
	1c. Undertake Innovative Measures to Meet Sustainability Goals and Transform U.S. Energy Economy		✓	✓	✓		
2 Submit Complete and Timely Data and Planning Documents (Sites)							
	2a. Site Sustainability Plans (Dec 7, 2012 ; Dec 2013)		✓				
	2b. Budget Data (e.g., OMB Sustainability Budget Data Request)		✓	✓	✓		
	2c. EISA 432 Facility Footprint (March 30, 2013)			✓			
	2d. EISA 432 CTS Update: Progress, ECMs, M&V (June 28, 2013)				✓		
	2e. Facility and HPSB data (Sept 28, 2012 ; Sep 2013)						
	2f. Building energy, water, and GHG data (Dec 7, 2012 ; Dec 2013)		✓				
	2g. Fleet data (Nov 21, 2012 ; Nov 2013)		✓				
	2h. Pollution prevention and waste elimination (Nov 30, 2012 ; Nov 2013)		✓				
3 Key FY 2013 Performance Milestones							
	3a. Reduce Scope 1 and 2 emissions by 17% from FY 2008 (28% by FY 2020)	-32.1%					
	3b. Reduce Scope 3 emissions by 4% from FY 2008 (12% by FY 2020)	-17.8%					
	3c. Reduce energy intensity by 24% from FY 2003 (30% by FY 2015)	-13.8%					
	3d. Meter 90% of the site's total electricity *	TBD					
	3e. Meter 50% of the site's total natural gas (90% by FY 2015) *	TBD					
	3f. Maintain 7.5% renewable energy as percent of facility energy use (50% from post-1999 sources)	18.9%					
	3g. Reduce water intensity by 12% from FY 2007 (26% by FY 2020)	-17.8%					
	3h. Reduce petroleum use by 16% from FY 2005 (30% by FY 2020)	-18.9%					
	3i. Increase Alternative Fuel Use by 114% from FY 2005 (159% by FY 2015)	117.2%					
	3j. Reduce fleet by 35% from FY 2005 (by 2013) **	TBD					
	3k. 11% of building stock meets Federal Guiding Principles for HPSB (15% by FY 2015)	3.3%					
4 Alternative Financing and Performance Based Contracting							
	4a. Meet monthly reporting deadlines for Presidential Performance Based Contracting Initiative (the 10th of each month)		✓	✓	✓		
	4b. Consider alternative investment opportunities and sustainability reinvestment policies		✓	✓	✓		

Figure 3 - Internal DOE Sustainability Scorecard

Each site is also provided an annual scorecard to record actual and project future progress. An example DOE Site Scorecard is provided in Figure 4. All performance analyses are based on data provided by DOE sites. Projections are based on data provided by DOE sites and a few assumptions including energy use and future decommissioning and demolition of assets.

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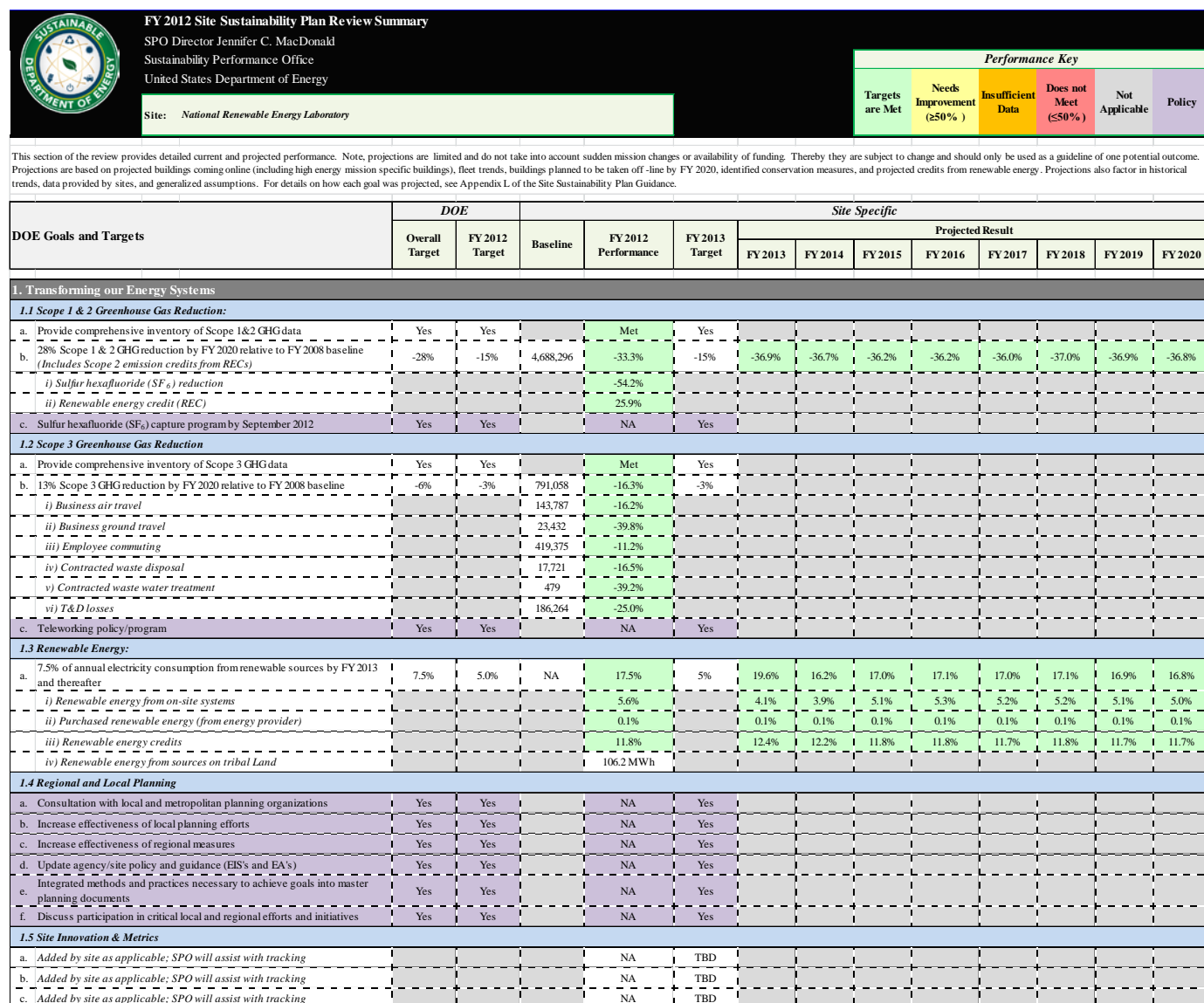


Figure 4 - DOE Example Site Scorecard

DOE Site Sustainability Plans (SSPs)

These plans are comprised of annual data and narratives. The site narratives provide information on:

- Major initiatives or changes to mission/facilities that contribute to goal performance (positively or adversely)
- Expectations of future performance (major initiatives or obstacles)
- Best practices, lessons learned, and success stories
- Renewable energy systems and/or efficiency measures
- Local and regional planning activities
- Policies to reduce waste and pollution
- Measurable actions and site innovations deployed to support sustainability goals

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- Climate change adaptation

SSPs are utilized to develop internal scorecards, inform DOE's OMB/CEQ scorecard and populate the annual SSPP.

DOE Greenhouse Gas (GHG) Inventory

A Comprehensive Site GHG Inventory and a Comprehensive DOE GHG Inventory are required for annual submission to CEQ. The Department tracks and reports its emissions in several categories:

- Scope 1 emissions including fleet fuel consumption and facility energy consumption (on-site)
- Scope 2 emissions including facility energy consumption (from purchased energy) and renewable energy/purchases.
- Scope 3 emissions including employee commute, business ground/air travel, contracted (off-site) waste water treatment, contracted (off-site) municipal waste disposal, and transmission and distribution (T&D) losses.

This inventory is verified by an internal, independent DOE team to ensure that all data reported are correct and transparent. In addition to the inventory, DOE also compiles annual reports with numerous sustainability data points including energy use, metering, fleet petroleum, alternative fuel vehicles and fuel use, renewable energy use and success stories to Congress and the Federal Energy Management Program (FEMP). Figure 5 contains the Scope 1 & 2 GHG emissions trend and Figure 6 contains Scope 3 emissions trend from the 2008 baseline. In FY 2012, DOE exceeded all GHG emission reduction targets.

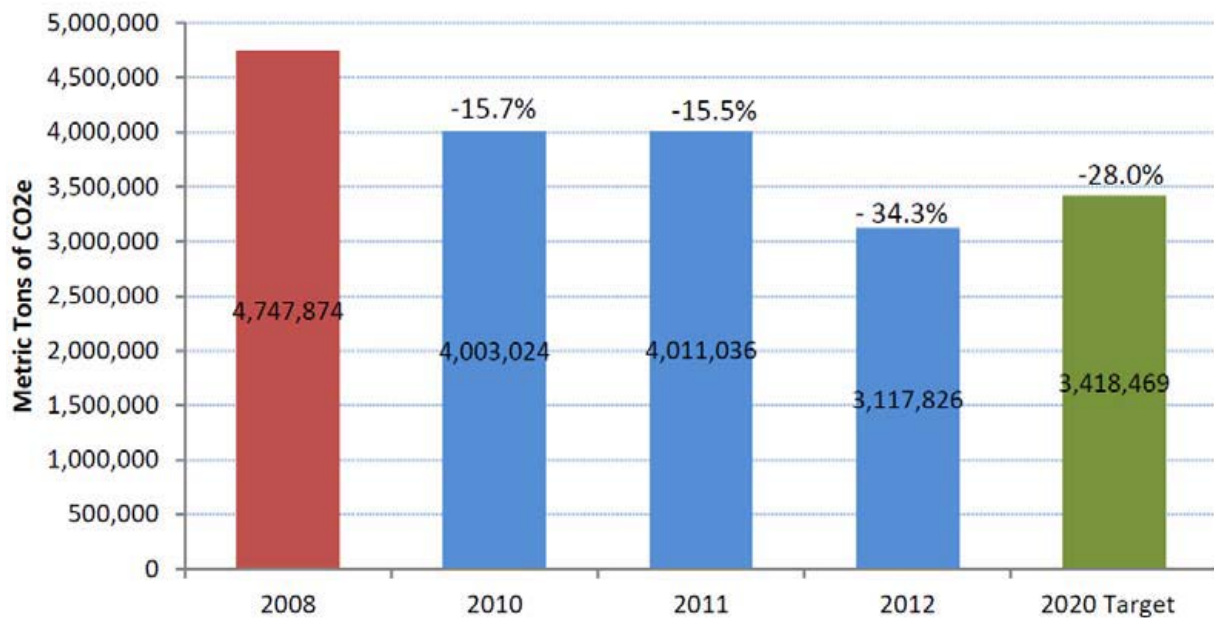


Figure 5 – Scope 1 & 2 GHG Emissions

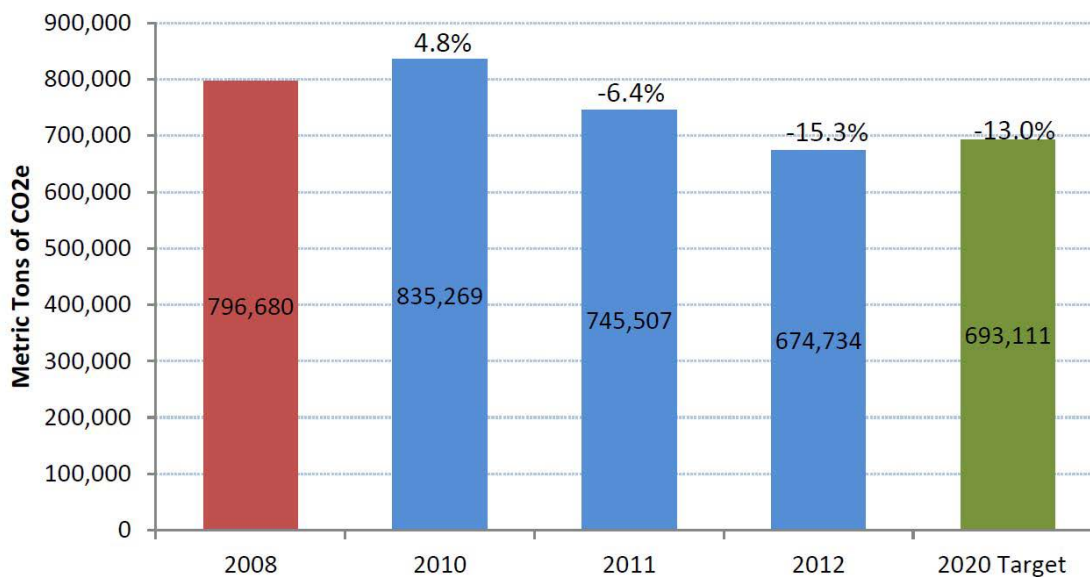


Figure 6 – Scope 3 GHG Emissions

CONCLUSION

Through implementation of Executive Orders, Departmental policy, the SSPP, statutory requirements and regular reporting, analysis and communication, DOE's SPO is working to maintain and expand DOE's leadership in sustainability.

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