Assistant Secretary of the Army for Civil Works

US Army Corps of Engineers®

Sustainability Plan
FY 2011 – FY 2020

3 June 2011

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I. Agency Policy Statement

As a prominent Federal entity, a key participant in the use and management of many of the Nation's water resources, a critical team member in the design, construction, and management of military and civil infrastructure, and as responsible members of the Nation's citizenry, the U.S. Army Corps of Engineers (USACE) strives to protect, sustain, and improve the natural and manmade environment of our Nation, and is committed to compliance with applicable environmental and energy statutes, regulations, and Executive Orders. Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, states that sustainability "means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations." The EO emphasizes that sustainability should not only be a natural part of all USACE decision processes, but should also be part of our organizational culture. The USACE is a steward for some of the Nation's most valuable natural resources, and we must ensure our customers receive products and services that provide for sustainable solutions that address short and long-term environmental, social, and economic considerations.

USACE sustainability performance will be evaluated against EO 13514, EO 13423 (*Strengthening Federal Environmental, Energy, and Transportation Management*), the Energy Independence and Security Act (EISA) of 2007, the Energy Policy Act (EPAct) of 2005, the 10 USACE Strategic Sustainability Performance Plan (SSPP) goals, and other relevant executive and congressional directives. These goals are to be integrated into our organizational strategic guidance, which includes the USACE Civil Works (CW) Strategic Plan, the Military Programs (MP) Strategic Plan, and the USACE Campaign Plan. To achieve sustainability, I ask that a systems approach be employed and programmatic solutions sought for each area of concern and within each level of command. While systems analysis and programmatic solutions are important, our key to success will be the assignment and acceptance of personal responsibility for achieving a sustainable future by leaders throughout USACE. This SSPP applies to all aspects of USACE activities to include contracted work; however, the sustainability outcomes supported by USACE on behalf of Federal customers will be accounted for in the customers' SSPPs.

The priority areas for sustainability in Fiscal Years 2011 and 2012 (FY11 and FY12) include:

- Establish or validate facility, vehicle, and vessel baselines for consumption of energy, water and petroleum, and for the production of solid waste, while developing effective data collection systems for each.
- Establish or update USACE and subordinate organization policies, standards, and procedures to address sustainability.
- Define USACE covered facilities, and initiate energy and water audits at a minimum of 25% of covered facilities.

- Identify and implement energy, fuel, and water efficiency programs and technologies that will place the USACE on target to meet its statutory requirements.
- Identify, develop, and submit proposals to achieve hydropower modernization and other renewable energy generation and consumption.
- Identify, plan for and begin programming non-tactical vehicle (NTV) right-sizing and right-positioning actions at all organizational levels to meet long-term NTV goals for reducing petroleum use and increasing consumption of alternative fuels.
- Identify, plan for and begin programming vessel fleet fuel efficiency initiatives, and evaluate technologies and options for accelerating and expanding USACE fleet enhancements.
- Identify USACE renovation projects for compliance with the Five Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (the Guiding Principles)
- Conduct climate change adaptation pilots and transfer "lessons learned" to the USACE and Major Subordinate Command (MSC) Headquarters for policy development and Districts for implementation.

Compliance with sustainability requirements will be a challenge, especially in the initial stages. However, it is just one of the challenges that the USACE faces regularly and is one where I am confident that we can not only meet the goals, but set standards for others to emulate. I believe that excelling in sustainability is not only good for the Nation and our posterity, but a sound business practice that will ease some of our future operations and maintenance expenses. I have every confidence that we will be successful.

Essayons!

Jo-Ellen Darcy
Assistant Secretary of the Army (Civil Works)
Senior Sustainability Officer for USACE

June 2, 2010
Date

II. Sustainability and the Agency Mission

The mission of USACE is to provide vital public engineering services in peace and war to strengthen our Nation's security, energize the economy, and reduce risks from disasters. In achieving this mission, USACE must contribute to the national welfare and serve the public by providing quality and responsive services to the Nation, the Army, and other customers in a manner that is environmentally, economically, and socially sustainable, and that focuses on public safety and collaborative partnerships.

Key mission activities include:

- Development and management of the Nation's water resources
- Protection and management of the natural environment
- Restoration of aquatic ecosystems
- Flood risk and emergency management
- Military and civil engineering, and technical services.

To be successful, USACE must serve not only as a competent public engineering organization, but also as a steward of the Nation's natural resources. Many lands managed by USACE have the dual purpose of recreation and habitat/wildlife mitigation. These lands provide a great opportunity for making a difference in sustainability. This is especially true concerning water resources. EO 13514 makes clear that USACE, as a Federal agency, should strive to be an example of sustainable behavior in the conduct of its daily operations and execution of projects and programs. USACE is not only committed to complying with environmental and energy statutes, regulations, and Executive Orders, but for over 230 years, USACE has been an innovative leader in science, engineering, and construction. USACE must continue this leadership through sustainable activities that conserve natural resources, reduce greenhouse gas (GHG) emissions, and preserve the natural environment, while continuing to provide for the health, safety, welfare, and economic development of the Nation. To become a GREAT organization, it is essential that USACE include "sustainability" throughout the "lifecycle" of all its activities. This will require not only adherence to minimum requirements, but also a change in polices and organizational culture. To be GREAT means the members of USACE accept their personal responsibility to help create a more efficient, more effective, and more sustainable future.

Table 1-1 USACE Size and Scope of Operations

Data as of 30 Sep 2010 unless otherwise noted

Total # Employees	35,438
Total Acres Land Managed	11,700,000[1]
Total # Facilities Owned	746[2]
Total # Facilities Leased (GSA lease)	46
Total # Facilities Leased (Non-GSA)	96
Total Facility Gross Square Feet (GSF)	17,613,000
Operates in # of Locations throughout U.S.	689[3]
Operates in # of Locations outside of U.S.	n/a[4]
Total # Fleet Vehicles Owned	722[5]
Total # Fleet Vehicles Leased	7,795[6]
Total # Exempted-Fleet Vehicles (Tactical, Emergency, etc.)	50
Total Operating Budget FY 2010 ($MIL)	$6.652
Total # Contracts Awarded FY 2010	97,465
Total Amount Contracts Awarded FY 2010 ($MIL)	$28,747
Total Amount Spent on Energy Consumption FY 2010 ($MIL)	$54.4
Total MBTU Consumed per GSF	0.077
Total Gallons of Water Consumed per GSF	44.8
Total Scope 1&2 GHG Emissions (Comprehensive) FY 2008 Baseline MMTCO2e	338,989
Total Scope 1&2 GHG Emissions (Subject to Agency Scope 1&2 Reduction Target) FY 2008 Baseline MMTCO2e	338,788
Total Scope 3 GHG Emissions (Comprehensive) FY 2008 Baseline MMTCO2e	162,274
Total Scope 3 GHG Emissions (Subject to Agency Scope 3 Reduction Target) FY 2008 Baseline MMTCO2e	162,274

IIa. Environmental Operating Principles

In 2002, USACE promulgated a set of Environmental Operating Principles that included "Environmental Sustainability" (Figure 1-1) and established a strategic environmental direction for all of USACE's programs and activities. The direction provided by these principles has served as an indispensible guide as USACE continually evaluates the short and long-term environmental, social, and economic impacts of its projects and operations.

[1] Source: Civil Works Program Statistics, 8 Dec 2010

[2] The number of facilities that reported energy and water consumption in FY10

[3] Source: FRPP

[4] USACE has made a Corporate decision to focus on stateside operations at this point in time

[5] Source: USACE-owned vehicles data from FY10 SF82

[6] Source: GSA Federal Fleet Report for FY10

USACE Environmental Operating Principles, 2002

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
- Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

Figure 1-1 USACE Environmental Operating Principles

IIb. Campaign Plan

In 2007, USACE introduced its Campaign Plan to provide strategic direction, transform USACE business approaches, and assess progress. The Campaign Plan consists of the following goals.

Goal 1: Deliver USACE support to combat, stability, and disaster operations through forward deployed and reach back capabilities.

Goal 2: Deliver *enduring* and essential water resource solutions through collaboration with partners and stakeholders.

Goal 3: Deliver innovative, resilient, *sustainable* solutions to the Armed Forces and the Nation.

Goal 4: Build and cultivate a competent, disciplined, and resilient team equipped to deliver high quality solutions.

USACE believes that sustainable solutions can simultaneously protect the environment and natural resources while effectively achieving project and program outcomes. Sustainability is an important component in each of the USACE Campaign Goals.

USACE is both an owner/operator of facilities and a provider of services to a wide-range of customers. While the majority of facilities owned and operated by USACE are funded through energy and water appropriations; engineering, real estate, and scientific services are funded

through an array of sources, with a large proportion from defense appropriations. Consequently, the largest number of USACE owned facilities, non-tactical vehicles, and operations are part of the Civil Works Program. However, portions of Goal 8 (Agency Innovation & Government-wide Support) also describe the sustainability services that USACE provides to external customers. Examples of such innovation include reductions in energy and water consumption associated with Leadership in Energy and Environmental Design (LEED) construction and similar sustainability practices and innovations.

Global changes such as demographic shifts, changing land use and cover, and climate change increasingly challenge public health, the heath of the natural environment, and the performance of the existing water resources infrastructure. As a result, new water resources strategies are needed to assure continued public health, safety, welfare, and economic development. At the same time, USACE must operate and sustain existing water infrastructure to meet current and evolving water resources needs. The extent of these challenges is well expressed by the report on events associated with Hurricane Katrina prepared by the Interagency Performance Evaluation Task Force (IPET) in 2009:

> *Man-made structures alone cannot sufficiently reduce risk for vulnerable areas. Nonstructural solutions such as zoning restrictions, floodproofing, and limited development; and natural processes such as marshes, mangroves, and barrier islands need to be integrated into a systems strategy for risk reduction. In combination with aggressive emergency management planning and execution, an enhanced natural environment would be a major component of a sustainable and effective long-term strategy to deal with the dynamics of climate, demographics, and social and economic well-being*.

Specific to the subject of sustainability, the future challenges in water resources include applications of new methods in social and physical science analyses (e.g., climate change and demographic variations), a better appreciation of the interrelationships between natural and manmade systems, adoption of approaches that require fewer short and long term resources to create and sustain water resources, and better collaboration among the various stakeholders involved with water resources issues. In recognition of these needs, a key initiative undertaken by USACE is the adoption of Integrated Water Resources Management (IWRM) as an overarching strategy to facilitate collaboration between stakeholders and coordinate efforts associated with the natural and built environments. When combined with the six cross-cutting strategies that include applying a systems approach, collaboration, and partnering, use of risk informed decision making, applying innovative financing, use of adaptive management, and application of state-of-the art technology, the Civil Works program is engaging in approaches that facilitate the adoption of sustainable concepts, designs, and operations.

The USACE water resources management mission requires a continuing operation of more than 2500 projects throughout the Nation, many of which have profound life-safety consequences. In addition, USACE must continually plan for the maintenance and rehabilitation of existing projects and construction of new projects to support environmental and economic development needs. Planning, design, and construction of facilities and projects that incorporate best sustainability technology and practice must consider the full life-cycle of the project. This is a fundamental shift in civil and mechanical engineering design and construction that has traditionally focused on function, safety, and cost. Identifying best practices and new innovations for large and unique projects such as locks, dams, levees, and aquatic ecosystem restoration will require innovation and study. Similarly, practices concerning operations and maintenance of Civil Works facilities will require review and evaluation to determine the best practices to optimize sustainability principles and outcomes.

Each phase of a project's life-cycle will require examination to improve conservation and reduce GHG emissions. This planning should consider alternative GHG reduction strategies, such as construction activities that include incentives for contractor reduction of GHG emissions and development of operational procedures that include GHG emission analyses. Not only will reductions in GHG emissions reduce carbon loading in the atmosphere, but reduce the energy costs that produce them.

IIc. Civil Works

The goals of the Civil Works program are to provide quality, responsive service to the Nation through the following:

- Enable and Assist in the Development of Safe and Resilient Communities and Infrastructure.
- Promote Sustainable Water Resources, Marine Transportation Systems, and Healthy Aquatic Ecosystems.
- Implement Effective, Reliable, and Adaptive Life-Cycle Project Performance.
- Build and Sustain a Competent Team.

Actions to achieve these goals are implemented through eight business areas representing the diversity of the Nation's water resources requirements: (1) Navigation, (2) Flood and Coastal Storm Damage Reduction, (3) Environment, (4) Hydropower, (5) Regulatory, (6) Recreation, (7) Emergency Management, and (8) Storage for Water Supply. While these business areas provide a framework for conducting the Civil Works program, the activities transcend individual programs and often interact to produce multiple water resources benefits. Consequently, close coordination between business programs is required to deliver quality, timely, and sustainable products and services.

Over the past several years, a number of external factors have emerged as significant impacts to Civil Works activities. Of particular importance are climate change and demographic shifts, which affect water availability and water demand. While water demand is primarily a local issue, USACE is a key participant in meeting that demand with water supply storage that provides for general consumption needs, irrigation, hydropower, and cooling water for fossil fuel and nuclear electrical energy production. Similarly, maintaining inland and coastal navigation remains critical to national and regional economic vitality. In both water supply and navigation, USACE is a key partner at the macro scale of water and energy sustainability. As emphasized by EO 13514, the leadership set by Federal agencies such as USACE in reducing their own energy and water consumption, will serve as both an example for others to emulate and a catalyst for innovations that others might adopt. At the macro scale, the reduction in GHG emissions by USACE activities will not only create potential reductions in energy consumption, but will also produce significant reductions in carbon emissions and the future climate change impacts that might be associated with those emissions.

IId. Military Programs

The USACE Military Programs provides premier engineering, construction, real estate, stability operations, and environmental management products and services for the Army, Air Force, other U.S. Government agencies and foreign governments. To accomplish this mission, the Military Programs Directorate has established four core mission areas:

- Strategic Integration (Base Realignment and Closure, BRAC)
- Gulf Region Integration & Security Assistance
- Military Construction
- Stability and Reconstruction Operations

Major mission activities include construction supporting Army, Air Force and other DoD Agencies; Environment (Formerly Used Defense Sites Program, munitions response, cleanup, and environmental quality support); Real Estate (Army staff mission, Department of Defense Executive Agent, and provision of world-wide real estate services); International and Interagency Services (supporting the Environmental Protection Agency, Department of Homeland Security, Department of State, active in more than 90 Countries); Contingency Support (active in the Global War on Terrorism and reconstruction infrastructure work); and Installation Support (181 Army installations and 71 Air Force installations).

To maintain its leadership and technical relevance in the provision of the above services, USACE must embrace sustainability principles and concepts and proactively integrate them into the organization's value proposition. USACE is committed to assisting customers to meet their

sustainability targets, which may be different from USACE's internal sustainability targets described within this SP.

III. Greenhouse Gas Reduction Goals

In FY10, as required by EO 13514 Section 2(a), the Strategic Sustainability Officer (SSO) for USACE established an agency-wide greenhouse gas (GHG) Scopes 1 and 2 reduction target of 23% by FY20 relative to the FY08 USACE baseline. This target was developed using the Development of Agency Reduction Target (DART) tool for GHG Scopes 1 and 2 emissions provided by the White House Council on Environmental Quality (CEQ) to maintain consistency with other reporting agencies. However, the DART target calculation only included GHG emissions from facility energy consumption and non-tactical vehicle fleet petroleum consumption. As a land and water management agency, USACE also owns and operates a vessel fleet ("floating plant"). Therefore, the standard DART calculation was amended to include GHG emissions associated with floating plant petroleum consumption and establish a floating plant petroleum use reduction target of 7.7% by FY20 from a FY08 baseline. Additionally, USACE extended the Federal energy intensity reduction target of 30% by FY15 to 30.5% by FY20 as a component of the strategic strategy to meet the 23% GHG reduction target. The Federal GHG Scopes 1 and 2 reduction target of 28% is an aggregate target based on individual Federal Agency targets (including USACE's) ranging from 12.3% to 47.4%.

In FY10, as required by EO 13514 Section 2(b), the USACE SSO established an agency-wide GHG Scope 3 reduction target of 5% by FY20 against a FY08 baseline using the Scope 3 Target Tool provided by CEQ. The Scope 3 Target Tool calculation accounted for the GHG emissions associated with the transmission and distribution (T&D) losses from purchased electricity, contracted solid waste disposal, contracted wastewater treatment, business air travel, business ground travel, and employee commuting. Because USACE had not yet established baselines for these Scope 3 categories, rough estimates of relative magnitude were developed. This analysis indicated that employee commuting and business travel represented the largest opportunities for GHG reductions, while contracted wastewater treatment and solid waste disposal provides comparatively small reduction opportunities. The sub-targets in Section 2, Goal 2 reflect this analysis.

Because USACE has limited direct operational control over visitor activities in our campgrounds, day use facilities, and lands and waters, visitor activities will be excluded from each of the GHG emission targets. However, associated facility-based GHG emissions will be reported as part of the USACE Comprehensive GHG Inventory. USACE is committed to providing quality recreation facilities and services to accommodate the needs of our visitors. Accordingly, the Sustainability Plan (SP) includes initiatives to improve energy, water, and petroleum efficiency at recreation facilities and to positively influence visitors to support sustainable practices.

USACE received approximately $120M in O&M and Construction Funds through ARRA for requirements that included facility energy and water efficiency or rehabilitation of hydropower units at selected USACE facilities. As of the date of this SP, some of the construction work is still underway or it has been completed so recently that USACE does not yet have the data to estimate the energy/water efficiency impacts or increases in hydropower generation capacity.

Our strategy for reducing GHGs is founded on the execution of requirements that are defined through collaborative planning processes employing (along with other tools) GHG wedge analyses, prioritized through budgeting processes based on risk assessment and benefit-cost analyses, and guided continually at a corporate level with a focus on sustainability. We intend to achieve the reduction targets through incremental investments of appropriated funds over time, and by leveraging Energy Savings Performance Contracts, and Utility Energy Service Contracts, and similar tools available to Federal agencies. These investments will be aligned and integrated with mission-defined programs, plans, and budgets to provide life-cycle benefit on a local level while supporting corporate USACE goals and objectives under EO 13514.

In keeping with Federal Greenhouse Gas Accounting and Reporting Guidance (6 Oct 2010), and using the resulting FY10 comprehensive GHG inventory, we anticipate that near-term efforts for Scope 3 reductions will focus largely on employee commuting and TDY travel (air and ground). We will also focus on reducing contracted solid waste disposal (except for solid waste disposal associated with emergency operations), primarily to support USACE waste diversion and recycling goals, but also to provide slight reductions in Scope 3 GHG emissions.

IV. Plan Implementation

IVa. Internal Coordination and Communication

The EO 13514 Project Delivery Team (PDT), led by the USACE Environmental Community of Practice (CoP) developed this second USACE SP. The PDT was comprised of headquarters staff with representation from a wide cross-section of USACE organizations including the CW Operations Division, Engineering & Construction CoP, CW Program Integration Division, Installation Support CoP, Interagency & International Support CoP, Directorate of Logistics, National Contracting Organization, Corporate Information, Office of Counsel, Public Affairs, Strategy & Integration Office, Institute of Water Resources, and the Engineer Research and Development Center, as well as the office of the Assistant Secretary of the Army for Civil Works.

All USACE employees can find current information on USACE's efforts to implement EO 13514 on the Engineering Knowledge Online (EKO) Environmental CoP webpage through URL:

http://www.usace.army.mil/sustainability/Pages/home.aspx

IVb. Coordination and Dissemination of the Plan to the Field

The SP was coordinated with the Major Subordinate Commands (MSCs) prior to finalization and disseminated throughout headquarters and the field under an update to Operations Order (OPORD) 2010-71, dated October 25, 2010, "Strategic Sustainability Performance Plan (SSPP) Execution and Reporting". The OPORD directed sustainability requirements to be integrated into organizational implementation plans supporting the USACE Campaign Plan in accordance with the USACE Strategic Management System (SMS) described in ER 5-1-15.[7] Section 20(a) of the Executive Order provides that, "This order shall be implemented in a manner consistent with applicable law and subject to the availability of appropriations" and thus this 2011 SP should be understood in that light.

Communications and training plans continue to be developed and implemented to promote understanding of sustainability requirements in the context of USACE missions, facilities, vehicles and vessels. Existing environmental-related awards programs were updated to include sustainability criteria, and in early FY11, a new award program (i.e., the USACE Sustainability award) was developed to recognize special sustainability achievements. As its sustainability initiatives become more established in FY12, USACE plans to convert the EO 13514 PDT into a Sustainability Sub-CoP and to significantly increase MSC participation in sustainability planning, implementation, and communication.

IVc. Leadership and Accountability

The Assistant Secretary of the Army for Civil Works (ASA(CW)), as the designated USACE Strategic Sustainability Officer (SSO) and the Climate Change Adaptation Senior Agency Official, is responsible for the execution of the USACE Sustainability Program and USACE Climate Change Adaptation program, to include compliance with the requirements of EO 13514, EO 13423, EISA, EPACT and the joint CEQ /OFEE and OMB letter, dated March 4, 2011, Subject: Implementing instructions for climate change adaptation. To assist with the execution of the USACE Sustainability Program, USACE established the Strategic Sustainability Committee (SSC) chaired by the Deputy Commanding General, USACE and comprised of the Commanders of the Major Subordinate Commands, Commanders of the Huntsville Engineering and Support Center and selected senior executives. The SSC, in coordination with the ASA(CW), develops strategic guidance and provides oversight of the USACE Sustainability Program. Routine activities will be accomplished through work groups (WG), project delivery teams (PDT), communities of practice (CoP), etc. that will be called upon or formed as required by the SSC. The SSC will

[7]ER 5-1-15, *Strategy and Integration - U.S. Army Corps of Engineers Strategic Management,* 1 December 2009, http://140.194.76.129/publications/eng-regs/er5-1-15/toc.html

oversee development of reports and other information requests for submission through the SSO to OMB and CEQ.

In April 2011, the ASA/CW was designated as the US Army Corps of Engineers (USACE) senior official responsible for carrying out the climate change adaptation planning actions required by the Instructions for Implementing Climate Change Adaptation Planning in Accordance with Executive Order 13514[8].

The USACE Climate Change Adaptation Policy Statement states the purpose of the policy, including both the agency's vision for successful adaptation planning and initial adaptation goals as well as recognition that climate change adaptation is a critical complement to climate change mitigation and that both are required to address the causes and consequences of climate change. The USACE Climate Change Adaptation Policy Statement adopts the Interagency Climate Change Adaptation Task Force's guiding principles and framework for adaptation planning, describes the USACE process to ensure effective adaptation planning implementation, including how USACE will coordinate adaptation planning across programs and operations internally as well as with other agencies on climate change adaptation matters of common interest. The USACE Climate Change Adaptation Policy Statement also identifies programs and resources within the agency to support the climate change adaptation planning process.

Additional information on USACE climate change adaptation plans and progress is included in the USACE Adaptation Plan and Report submitted concurrently with this SP in accordance with the *Support Document* to the *Instructions for Implementing Climate Change Adaptation Planning in Accordance with Executive Order 13514*.

IVd. Agency Policy and Planning Integration

Table 1-2 Critical Planning Coordination lists the plans and reports in which the sustainability policy and SP goals must be integrated. As these documents are updated, the Sustainability Sub-CoP will ensure each plan and report appropriately addresses sustainability requirements to institutionalize sustainability into existing business practices. A "Yes" in the table indicates that the sustainability goal has been integrated into the document; "No" indicates that the sustainability goal has not yet been integrated into the document; and "n/a" indicates that the sustainability goal is not applicable to the document.

Table 1-2 Critical Planning Coordination

[8] Released 4 March 2011, see http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation

Originating Report / Plan	Scope 1 & 2 GHG Reduction	Scope 3 GHG Reduction	Comprehensive GHG Inventory	High Performance Sustainable Design / Green Buildings	Regional and Local Planning	Water Use Efficiency and Management	Pollution Prevention and Waste Elimination	Sustainable Acquisition	Electronic Stewardship and Data Centers	Agency Specific Innovation
CW GPRA Strategic Plan	No	No	n/a	No	Yes	No	No	No	No	Yes
USACE Capital Plan	No	No	No	No	n/a	No	No	No	Yes	n/a
OMB Circular A-11 Section 300: Planning, Budgeting, Acquisition, and Management of Capital Assets	No	n/a	n/a	No	No	No	No	No	No	No
Annual GHG Inventory and Energy Data Report	Yes	No	Yes	n/a	n/a	Yes	n/a	n/a	n/a	n/a
EISA Sec. 432 Facility Eval-uations/Project Reporting/Bench marking	No	No	n/a	No	No	No	n/a	No	No	No
Budget	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asset Management Plan / 3 year Timeline	No	No	n/a	No	No	No	No	No	Yes	n/a
Circular A-11 Exhibit 53s	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Yes	n/a
OMB Scorecards	No	No	n/a	No	n/a	No	n/a	No	n/a	n/a
DoE's Annual Federal Fleet Report to Congress and the President	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Data Center Con-solidation Plan	Yes	No	n/a	n/a	n/a	n/a	n/a	n/a	Yes	n/a

Originating Report / Plan	Scope 1 & 2 GHG Reduction	Scope 3 GHG Reduction	Comprehensive GHG Inventory	High Performance Sustainable Design / Green Buildings	Regional and Local Planning	Water Use Efficiency and Management	Pollution Prevention and Waste Elimination	Sustainable Acquisition	Electronic Stewardship and Data Centers	Agency Specific Innovation
Environmental Management System	No	No	No	No	No	No	No	No	No	No
Instructions for Implementing Climate Change Adaptation Planning	No	No	No	No	No	No	No	No	No	n/a
USACE Campaign Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MP Strategic Plan	No	No	n/a	No	No	No	No	No	No	No
Command Mgmt. Reviews	No	No	n/a	No	No	No	No	No	No	No
District Management Reviews	No	No	n/a	n/a	No	No	No	No	No	No
Economic and Environmental Principles and Guidelines for Water and Related Resource Studies	n/a	Yes	n/a	n/a	Yes	n/a	n/a	n/a	n/a	Yes
Planning Resource Notebook, ER-1105-2-100	n/a	Yes	n/a	n/a	Yes	Yes	Yes	n/a	n/a	n/a
National Economic Development Manual Series	n/a	n/a	n/a	No	No	n/a	n/a	n/a	n/a	n/a
Federal Real Property Profile (FRPP) Report	n/a	n/a	n/a	Yes	n/a	n/a	n/a	n/a	n/a	n/a

IVe. USACE Budget Integration

Since FY10, USACE has been working to integrate sustainability requirements into existing business processes for planning, programming, and budgeting. The primary impact is on the CW budget funded through energy and water appropriations. For FY12, sustainability guidance was disseminated to the field as an amendment to the Budget Engineering Circular (EC 11-2-200). In FY13, guidance on sustainability requirements was fully integrated into the Civil Works Budget Engineering Circular document. USACE conducted a series of webinars to assist the MSCs, Districts and Civil Works project facilities with integrating sustainability into budget requirements.

In addition to actions supporting the integration of sustainability requirements into the budget at the MSC, District and field levels, HQ USACE in late FY10 and early FY11 prepared budget justifications for USACE-wide initiatives under the newly established Sustainability and Energy Program. As a result, the newly established Sustainability and Energy Program is now in the FY12 President's Budget, and Sustainability and Energy requirements are being developed and submitted for the FY13 Civil Works budget as required in EC11-2-200.

IVf. Methods for Evaluation of Progress

Sustainability performance will be evaluated using Federal and USACE-defined sustainability measures incorporated in existing management review processes (e.g., the Strategic Management System; Command Management Review; and Implementation Plans (IPlans)), at all organizational levels supporting the USACE Campaign Plan. At the HQ USACE level, the SSC will provide management review and oversight of performance, as discussed in Section IV.c., above. Results of the management reviews will be communicated internally through command channels to inform and enable timely updates to policies, procedures and practices designed to enhance USACE progress toward EO 13514 goals. Feedback and information will flow both upward and downward and through communication tools such as existing mission/organization-specific knowledge management websites.

V. Evaluating Return on Investment

Va. Economic Life-Cycle Cost / Return on Investment

USACE will continue to prioritize, fund, and execute initiatives to advance EO 13514 goals and objectives that maximize net national economic, environmental, and social benefits. Prioritization of competing actions will be based on return on investment measured as net economic benefits per dollar of investment with the highest return prioritized first. Our strategy will include a mix of investment scales and each investment will be evaluated in terms of both

the rate of return and the degree of certainty of achieving the intended return. The emphasis will be on a mix of near term and medium term initiatives aligned with USACE mission-defined programs. These initiatives will be chosen in ways that enable USACE to address both its internal interests as well as the interests of its cost sharing partners while advancing USACE progress on SP goals. Within this strategy, our intent is to use EO 13514 requirements and resulting USACE-implemented actions to enhance O&M and alternatively funded investments in facilities, infrastructure, non-tactical vehicles and floating plant, emphasizing in the near-term a simplified cost-benefit analysis for those deferred investments posing the most critical risk to sustainable mission operations. Actions will be evaluated at a level of detail commensurate with the scope and potential impacts of the action in terms of their beneficial and adverse economic, environmental, and social impacts in appropriate monetary and non-monetary terms over the life of the action.

Evaluation of the return on investment will include consideration of uncertainty by balancing a portfolio of near-term initiatives that have more certain returns with those that have a higher return, but are more speculative. Our analysis of return on investment (ROI) will emphasize life-cycle economic and environmental benefits and the life-cycle economic and environmental costs of the initiatives. Over-time, the evaluation of social costs and benefits will become more robust as Federally-provided/designated tools and techniques become available.

Vb. Social Costs and Benefits

USACE incorporates a full range of economic, environmental, and social factors in evaluating and prioritizing its activities. A wide range of policy and project guidance relates to the procedures used for life cycle analysis across mission areas. There is an enduring historic base and tradition of social benefit in USACE missions. For example, a seminal directive, *The Flood Control Act of 1936* states that "… *the Federal Government should improve or participate …. for flood control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are not otherwise adversely affected*." This dual emphasis on efficiency (benefits exceeding costs) and other social effects (lives and social security of people are not otherwise adversely affected) still guides project analyses. Specific analysis procedures are detailed in the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (P&G), the Planning Guidance Notebook, ER-1105-2-100, the National Economic Development Manuals series, and other engineering regulations and circulars.

A series of publications has been produced by the Institute for Water Resources from 2004-2010: *Review of Guidance and Procedures for Regional Economic Development and Other Social Effects, Theoretical Underpinnings of the Other Social Effects Account, Handbook on Applying "Other Social Effects" Factors in Corps of Engineers Water Resources Planning, Social*

Vulnerability Index Handbook, and Regional Economic Development Handbook. These documents provide USACE staff with the tools for analysis of other social effects during project planning. Currently, a major exploration of public safety as a factor in project analysis is ongoing in response to population encroachment near water resources infrastructure and within floodplains.

Social factors are considered throughout the life cycle analysis. They are critical in defining the problem, establishing opportunities, and defining objectives. They are essential elements in engaging and collaborating with key stakeholders—such as local communities, Federal agencies, state and local governments, academia, and nongovernmental organizations—and strengthen regional partnerships to effect systems focused planning. Social factors are included in life cycle analysis both qualitatively and quantitatively depending on mission appropriateness, data availability and relevance to the decision process.

Vc. Environmental Costs and Benefits

USACE has a long history of stewardship of the natural environment on the lands associated with projects it operates. With the passage of the National Environmental Policy Act, these knowledge and skills were used to evaluate the environmental impacts of proposed projects with increasing sophistication. Ecosystem restoration became an USACE mission in 1990 with a goal to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. USACE reaffirmed its commitment to the environment by formalizing in 2002 the "Environmental Operating Principles." The EOPs are applicable to all USACE programs and decision making. These principles foster unity of purpose on environmental issues, reflect a consistent tone and direction for dialogue on environmental matters, and ensure that employees consider conservation, environmental preservation and restoration in all USACE activities.

USACE identifies and quantifies the environmental effects of proposed projects or the benefits of ecosystem restoration in measurable units. In most cases, these are non-monetary. Then systematic Cost Effectiveness and Incremental Cost Analyses are used to aid in identifying alternatives with either the least negative impact or greatest benefit relative to cost.

As part of its commitment to Integrated Water Resource Development, USACE will continue its efforts to develop the scientific, economic, and sociological measures to judge the effects of its projects on the environment and to seek better ways to achieve sustainable solutions.

Vd. Mission-Specific Costs and Benefits

The Civil Works program supports water resources development, management, and restoration through investigations and surveys, engineering, design, construction, and operations and

maintenance, as authorized and appropriated by Congress. Civil Works Mission-specific costs and benefits are discussed above.

Ve. Operations & Maintenance and Deferred Investments

USACE operates and maintains projects that provide river and harbor navigation, flood damage reduction, coastal storm damage reduction, water supply, hydroelectric power, recreation, environmental restoration, and wildlife protection. USACE protects the Nation's waterways and wetlands. It also undertakes disaster relief and recovery work as part of the Corps' Emergency Support Function's (ESF) responsibilities in support of the Federal Emergency Management Agency.

The criteria used to allocate operation and maintenance funding considers both the condition of the projects as well as the potential risks and consequences if the O&M activity is not undertaken. The criteria include, but are not limited to: cost effective measures to increase or maintain asset availability; cost effective measures to maintain or increase asset reliability; high economic return for the nation; acceptable levels of public safety and health; cost effective measures to address a significant environmental concern; and legal requirements.

Vf. Climate Change Risk and Vulnerability

Climate change is recognized as having important impacts to water resources management (Milly et al 2008[9], Brekke et al 2009[10] and others). The primary concern of US Army Corps of Engineers (USACE) with respect to these impacts is to protect the enormous Federal investment in water resources by enhancing the resilience of water infrastructure (built and natural) and by reducing potential vulnerabilities to the effects of climate change and variability. USACE must therefore understand and respond effectively to climate change and climate variability, both as currently observed and projected for the future.

USACE began addressing climate change adaptation issues as a result of internal and external analyses following Hurricane Katrina through the IPET-HPDC Lessons-Learned Implementation Team. This program supported a range of activities designed to improve our ability to incorporate information about new and changing conditions, including an update of our sea-level change policy and a collaborative effort in 2007 called the "Climate Change and Water Working Group" with the Bureau of Reclamation, the US Geological Survey, and the National

[9] Milly, P.C.D., Betancourt, J., Falkenmark, M., Hirsch, R.M., Kundzewicz, Z.W., Lettenmaier, D.P., and Stouffer, R.J., 2008, Stationarity is dead: Whither water management?: Science, v. 319, no. 5863, p. 573-574.

[10] Brekke, Levi D., J. Kiang, J. Rolf Olsen, R. S. Pulwarty, D. A. Raff, D. P. Turnipseed, R. S. Webb, and K. D. White. 2009. Climate Change and Water Resources Management: A Federal Perspective; U.S. Geological Survey, Circular 1331.

Oceanic and Atmospheric Administration. The first task of this group was to develop a comprehensive assessment of climate impacts to water resources, including potential adaptation measures. That assessment was published as USGS Circular 1331 in February 2009. In the executive summary, these four agencies noted that climate change could affect all sectors of water resources management, both coastal and inland, and then described a range of options for adapting to climate change impacts.

USACE is currently undertaking a screening analysis of its vulnerabilities to climate change across the conterminous US (CONUS). This vulnerability assessment is built on nationwide data and existing national-level tools that include indicators or processes that can be used to identify vulnerabilities at multiple scales of analysis. The screening-level vulnerability assessment is also designed to identify areas where physical, climate-related changes are occurring over time which are projected to be either rapid or associated with severe consequences, because such changes will require more detailed attention or monitoring. The team producing this assessment includes USACE, academic (three different universities) and private sector (two contractors representing four different groups) experts bringing diverse knowledge, skills, experience, and perspectives to help identify the causal relationships, cascading impacts, and possible unintended consequences, all of which will be important factors in assessing future adaptation measures.

The USACE Adaptation Policy document submitted as a comprehensive and complete supplement to this Sustainability Plan reports the details of these USACE climate change risk and vulnerability assessments which have been the basis of the agency responses to the CEQ guiding questions provided in Appendix E of the Support Document to the Federal Agency Climate Change Adaptation Planning: Implementing Instructions.

VI. Transparency

VIa. Internal USACE Communication on the Requirements of and Progress on EO 13514

Earlier in FY11, USACE began monitoring and evaluating its sustainability progress on a monthly basis at a headquarters level using the Army's Strategic Management System (SMS), an automated tool that provides a framework for leaders at all levels to manage performance. The metrics used to monitor and evaluate USACE sustainability progress via the SMS are based on measures identified the EO 13514 and on the OMB Scorecard on Sustainability and Energy. Results of management's review of USACE's sustainability progress will continue to be communicated internally through command channels (upward and downward flow of information and feedback) and through communication tools such as existing mission/organization-specific knowledge management Web sites.

USACE maintains a corporate Web site addressing business and mission for all activities, Civil Works and Military. USACE also maintains Engineering Knowledge Online (EKO) for USACE employees. Federal and USACE sustainability information is posted on the Environmental CoPs EKO web page[11] for all USACE employees and a collaborative team page is used by members of the EO 13514 PDT. Forums for discussion and information dissemination also regularly occur at the District level. Environmental staff and staff who support sustainability processes are encouraged to set up brown bag lunches, workshops, and other discussions to explain what they are doing to meet requirements of EO 13514. Senior leaders and USACE staff will participate in regular and recurring Environmental Conferences and other leadership fora, which provide significant opportunities to focus on SP goals and performance of USACE programs and initiatives.

VIb. External Communication of Progress on EO 13514

USACE will continue communicating its performance under EO 13514 to external stakeholders using Federally-developed formats and communication tools. USACE set up a Web site on the USACE homepage (http://www.usace.army.mil/sustainability/Pages/Home.aspx) that continues to expand and improve over time. On the Web site, USACE will continue to post material relevant EO13514 to include press releases, periodic updates, and information about projects and initiatives that USACE districts have undertaken to meet requirements of EO 13514. USACE will work with the current and incoming Chief of Engineers to add sustainability topics to the Chief's blog, just as the outgoing Chief did (http:// http://usace.armylive.dodlive.mil/index.php/2011/02/delivering-on-sustainability/). Articles written by staff for both *The Engineer Update* and *The USACE Environment* will continue to be posted to the external USACE Web site and sent to customers as well as members of Congress. Speaking engagements with professional societies will continue to provide opportunities for USACE to explain the goals laid out in the SP and detail the performance of initiatives developed to achieve these goals. These include the American Planning Association, American Society of Civil Engineers, the Society of American Military Engineers, and others.

Forums that Engineer Districts use to communicate to the public such as public meetings, PAO newsletters, monthly news publications, and other public outreach efforts often are used to present information to the public on various project plans. These forums allow USACE to highlight actions that benefit local and regional citizens and the country as a whole. These information forums will be used to make public the initiatives USACE is undertaking to meet SP goals.

[11] https://eko.usace.army.mil/usacecop/environmental/

Section Two: Performance Review and Annual Update

I. Summary of Accomplishments

USACE has been active over the past year on many actions, programs, and initiatives that advance sustainability throughout its business areas. The following paragraphs highlight the 2010/11 achievements with respect to goals and targets directed by law, executive orders, and agency policies. Because 2010 was the first year in which USACE was a Federal Sustainability and Energy Scorecard agency, several of the accomplishments during the past year (since submitting the initial USACE SSPP on June 2, 2010) focused on establishing key elements (e.g., policy, management review, metrics) of a management system to guide and enable continual improvement in sustainability performance throughout USACE. These accomplishments focus mainly on Civil Works mission and facilities, since our sustainability support to Federal customers is more appropriately captured in their respective organizations' SP accomplishments.

- Formed and officially chartered the USACE Strategic Sustainability Committee (SSC) to provide leadership direction and policy for SP implementation and to routinely review USACE performance against SP goals and USACE targets.
- The first SSC management review meeting was held on February 9, 2011. The SSC reviewed USACE performance on Federal sustainability and energy metrics, and initiated discussion of a HQ-proposed approach for apportioning the USACE GHG Scope 1 and 2 target across the MSCs.
- Issued an Operations Order (OPORD 2010-71) through USACE command channels to officially operationalize sustainability throughout the Corps.
- Agree to apportion the USACE Scope 1&2 GHG target among the Major Subordinate Commands based on FY10 consumption in facilities, NTV, and floating plant.
- Developed and submitted USACE comprehensive GHG inventories for FY08 (baseline) and FY10.
- Integrated Sustainability and Energy goals and metrics into the USACE Campaign Plan, which is the overarching strategic plan spanning all USACE missions and organizations.
- Incorporated Federal Sustainability and Energy metrics in the USACE Strategic Management System to provide commanders throughout USACE a dashboard tool to track their sustainability performance.
- Fully integrated Sustainability and Energy into USACE (FY13) Civil Works budget development guidance.
- Set-aside $10M for Sustainability and Energy in the Civil Works O&M portion of FY12 President's Budget.
- Established a central database of USACE facility-level energy, water, petroleum, and GHG data to support all aspects of sustainability planning, budgeting, execution, and performance evaluation.
- Defined the initial list of USACE Covered Facilities in accordance with the requirements of EISA Section 432 and FEMP guidance.

- Completed facility energy and water evaluations at 5 (out of a total of 47) USACE Covered Facilities.

Under USACE climate change adaptation initiatives, USACE has been an active participant in the CEQ Interagency Climate Change Adaptation Task Force (ITF) on climate change adaptation. This support has included: active representation on numerous ITF working groups of the Task Force; authorship of substantial sections of the ITF November 2010 Report to the President; production of background text and final language for the Implementing Instructions for Federal Agency Adaptation Planning issued on 4 March 2011; and testing the CEQ ITF flexible framework for climate change adaptation planning through adaptation pilots at the USACE project scale. Additional detailed information about USACE climate change adaptation accomplishments is included in the USACE Adaptation Plan and Report[12].

At the District level, Civil Works initiatives include, but are not limited to:

- The comprehensive sustainability efforts by the staff at the Portland District's Bonneville Lock and Dam include: a ride share program that since 2010 has reduced employee commuter fuel purchases by 19,000 gallons of gas annually, which reduces the equivalent of 169 metric tons of CO2 into the atmosphere; the operation of a yard waste compost system that handles approximately 90 cubic meters of material annually, effectively eliminating the need to dispose the yard waste in landfills, conserving funds and extending the useful life of the landfill; changing their landscaping service contract scopes of work to assure zero application of pesticides; a successful paper and mixed metals recycling program that results in an annual diversion of over 36,000 pounds of materials from landfill, an equivalent to 90 metric tons of CO2e reduction; the use of an oil water separator for recycling and reclamation of used oil, which enabled Bonneville Lock and Dam staff to collect 9,786 gallons of used oil for reuse in other markets, thus reducing disposal costs.
- Verified that an ESPC is economically feasible for selected Civil Works facilities within the geographic footprint of Pittsburgh District. (Contract process is still underway as of the date of this Sustainability Plan.)
- Completed repowering of the Corps' largest hopper dredge, the 350 foot, 10,000 ton ESSAYONS, and achieved roughly 14% improvement in fuel efficiency due to several engineering improvements.
- Completed pilot testing of biodiesel in 4 vessels of the USACE fleet.

II. Goal Performance

USACE developed and submitted its FY08 and FY10 sustainability and GHG data reports in accordance with the *Federal GHG Accounting and Reporting Guidance* (6 Oct 2010) and using the Federally-prescribed report format, *FEMP GHG Sustainability Data Report Version 1-6* (17 Dec 2010). Also in accordance with Federal requirements, USACE excluded from its reduction targets the energy and water

[12] USACE (2011) "USACE Adaptation Plan and Report" report submitted to CEQ, 3 June 2011

consumption and GHG emissions resulting from recreation visitor activities. USACE did, however, include the GHG emissions from facility-based recreation visitor activities in its Qualitative Statement Supporting Comprehensive GHG Inventory for FY10 and FY08 Baseline. USACE is committed to providing quality recreation facilities and services to accommodate the needs of our visitors. Accordingly, the Sustainability Plan (SP) includes initiatives to improve energy, water, and petroleum efficiency at recreation facilities and to positively influence visitors to support sustainable practices.

USACE established in its FY10 SP "internal USACE" glide paths for each of the SP goals. Each of the "internal USACE" glide paths lags significantly behind the analogous Federal glide path in the initial years because USACE is just getting started in the long-standing Federal Sustainability and Energy program. However, each of the USACE-established glide paths reflects USACE intent to strive to come into alignment with each of the Federal glide paths by stepping-up the rate of USACE progress toward the respective goals in FY12 and the out years. It is important to note that FY12 is the first year in which USACE had an opportunity to impact the budget with EO13514 requirements, the results of which won't be visible until data is collected and reported in January of 2013.

Consistent with EO 13514 §17, in FY 11-12, the USACE SP will address only USACE activities, personnel, resources, and facilities that are located within the United States. During this time period, USACE will evaluate the mission implications of the potential expansion of the SP scope to address certain USACE activities, personnel, resources, and facilities that are located outside the United States (e.g., Europe, Far East, and Japan Districts).

Each of the following internal assessments of USACE performance relative to the 8 sustainability goals is structured in the same manner:

a. Goal Description
This paragraph lists the Federal requirements that make up the overall goal, as well as USACE targets, when applicable, to meet the requirements or the intent of EO 13514.

b. USACE Lead Organization(s)
This paragraph lists the USACE organization(s) that have responsibility for target development, implementation, monitoring, evaluation and oversight for meeting the SP goals. These organizations will ensure implementation of appropriate policies and achievement of the desired results.

c. Implementation Methods
This paragraph describes USACE's strategic approach to achieving the goal in the near to mid-term (1-5 years). It addresses implementation cost and schedule, and methods for directing, enabling and managing performance, as well as specific milestones for each planned activity in FY11 and FY12, when applicable. This paragraph addresses implementation in both the central office and in the field, including how Environmental Management Systems (EMS) and workforce training and education support achievement of Sustainability and Energy goals. Existing USACE plans, policies, and initiatives relevant to

Sustainability and Energy are incorporated by reference in this paragraph, as well as discussion of any updates to existing documents, and synergies between the EO13514 goals and related initiatives.

d. Positions

This paragraph discusses the human resources needed (if any) to achieve the goal, and how USACE staffs the development and implementation of the SP with full-time, dedicated and/or part-time/collateral duty employees.

e. Planning Table

This table depicts the annual Federal requirements for progress toward goals as well as the USACE interim targets. USACE is committed to assisting its customers in meeting their sustainability targets, which may be different from USACE's internal sustainability targets described within the planning tables. USACE resources/investments for each SP goal is consistent with information submitted for OMB Circular A-11, Section 25, including data for FY10 and 11 appropriations, as well as the FY12 President's Budget.

f. Status

This paragraph describes USACE's current status in achieving the SP goal targets. Baselines are included here if they have been established. It addresses initiatives planned to achieve the agency targets that are underway but not yet completed and how they will impact goal achievement. This section provides an overall summary, not an itemization, of all goal-relevant Sustainability and Energy initiatives completed by USACE in the past year. It also includes goal relevant content of the Sustainability and Energy Scorecard for Jan-Jun 2011, and the draft Scorecard for Jul-Dec 2011.

g. Return on Investment

This section addresses any significant projects or initiatives included in the submission of the previous year's Sustainability Plan that have been deliberately cancelled or suspended due to a lower than expected return on investment (ROI), as well as projects or initiatives that have been expanded due to higher than expected return on investment (ROI).

h. Highlights

This section succinctly identifies and describes specific projects or initiatives that USACE would like to highlight as successes or challenges.

IIb. Goal 1: Scope 1 & 2 Greenhouse Gas Reduction

a. Goal Description

EO 13514 §2(a): USACE established a 23% reduction target for GHG Scopes 1 and 2 emissions by FY20 relative to the FY08 baseline. The primary means of achieving this reduction will be through the energy and petroleum sub-targets below.

Buildings:

EISA §431: Reduce building energy intensity 3% annually through 2015, or 30% total reduction by 2015 (baseline FY03). USACE extended this target to 30.5% by FY20 to meet its 23% GHG scopes 1 and 2 reduction target by FY20.

EPAct 2005 §203: Increase renewables to 3% in FY07-09, increasing to 5% in FY10-12, increasing to 7.5% in FY13 and beyond. EO 13423 §2(b) requires that 50% of statutorily required renewables comes from "new" (as of 1999) sources.

Non-Tactical Vehicle (NTV) Fleet:

EO 13514 §2(a)(iii)(C): Reduce fleet total consumption of petroleum products 2% annually through end of FY20 relative to the FY05 baseline.

EISA §142: Achieve 10% increase per year in non-petroleum fuel use (compounded annually) by 2015 (baseline FY05).

EO 13514 §2(a)(iii)(B): Optimize number of vehicles in fleet.

EO 13514 §2(a)(iii)(A): Use low-GHG-emitting vehicles.

Floating Plant:

USACE established a 7.7% GHG reduction target for floating plant petroleum consumption by FY20 (baseline FY08) to help meet the overall USACE 23% GHG scope 1 and 2 reduction target by FY20.

b. USACE Lead Organization(s)

Civil Works Operations (CECW-CO), Directorate of Research and Development (CERD-ZB), Directorate of Logistics (CELD-ZA)

c. Implementation Methods

Overarching Implementation Methods:

The overarching USACE approach to resource (e.g., energy, water and petroleum) efficiency is to focus first on conservation and efficiency, and then to look into renewable energy opportunities. In addition to the goal-specific implementation methods discussed below, USACE has developed a number of management tools and other enablers to accelerate progress toward the 23% USACE GHG Scope 1 and 2 emission reduction target. First and foremost is the USACE leadership decision to set-aside $10M in the FY12 Civil Works O&M portion of the President's Budget specifically for investments in energy, water, petroleum and greenhouse gas reduction. The overarching program is entitled, "Sustainability and Energy". The Sustainability and Energy Program is intended to improve energy, water and petroleum efficiency at USACE facilities and in the USACE NTV fleet, as well as to positively influence USACE employees, contractors and visitors to support sustainable practices. The Sustainability and Energy program funds, through a centrally-administered competitive process, the energy, water and petroleum

reduction projects providing the best return on investment for USACE, as a whole. USACE has entitled this initiative under the Sustainability and Energy Program the "Climate Change Mitigation Challenge" (CCMC). While the types and numbers of project s actually selected and funded through the $10M CCMC in FY12 is not known as of the date of the SP, the competitive selection process will emphasize FEMP goal subject energy and water efficiency as well as petroleum reduction in the NTV fleet and the USACE vessel fleet. Because one of the evaluation criteria used in the CCMC competitive selection process will be cost-sharing, USACE estimates the $10M set-aside coupled with funds contributed by the competing facilities provides USACE some potential to achieve its FY12 internally-established energy reduction target of 12% (see planning table for Goal 1).

Along with the FY12 CCMC, USACE has expanded and improved the sustainability content of its FY13 Civil Works budget development guidance. USACE Civil Works budget development guidance now includes data requirements to support quantification of the sustainability benefits of individual budget packages such as reductions in energy and water consumption and greenhouse gas emissions. Coupled with the new data requirements for sustainability and energy budget packages, HQ USACE established early in FY11 centralized access to USACE facility energy and water consumption data for FY08 and FY10 to assist USACE organizations in identifying, quantifying and budgeting for energy and water efficiency opportunities.

The third overarching enabler for sustainability is apportionment of the USACE Scope 1 and 2 GHG reduction target across USAC E organizational elements. Specifically, the USACE Strategic Sustainability Committee (SSC) agreed during the 9 Feb 2011 SSC meeting to apportion the USACE 23% reduction target to the individual Major Subordinate Commands (MSCs). USACE leadership intent is to "operationalize" the USACE target by apportioning to each MSC a fraction of the USACE 23% reduction target equivalent to the ratio of the MSC's emissions relative to the overall USACE Scope 1 and 2 GHG emissions as reported for in the USACE Comprehensive GHG Inventory for FY10. To ensure that the underlying Federal goals for facility energy, and NTV fleet and floating plant petroleum are fully addressed, the USACE apportionment of the Scope 1 and 2 GHG target breaks-out the portion of each MSC's target associated with NTV fleet petroleum consumption versus facility energy consumption.

USACE Recreation Strategic Plan

As discussed in the introductory paragraph under SP section 2.II. "Goal Performance", the SP includes initiatives to improve energy, water, and petroleum efficiency at recreation facilities and positively influence visitors to support sustainable practices. In April 2011, the USACE Recreation Business Line issues, under DCG-Civil Works and Emergency Operations signature, a new USACE Recreation Strategic Pan that details how sustainability will be promoted through visitor education by setting the standard on the importance of resource stewardship and sustainability. The sustainability goals laid-out in the Recreation Strategic Plan include (1) Maintaining a recreation program that is consistent with the USACE Environmental Operating Principles by building environmental considerations into day-to-day decision making and long-term planning; (2) Enhance community-based stewardship opportunities at recreation

areas by leveraging existing national-level stewardship opportunities and expanding partnership initiatives; (3) Promote sustainable behavior and incorporate sustainability into Corps messages related to recreation areas and activities. As the Recreation Strategic Plan is implemented, visitor behaviors contributing to the sustainable use of recreation areas will be recognized and commemorated through interpretive activities and community based stewardship partnerships.

Optimizing USACE Long-term Investment Strategy

Achieving the FEMP goals and continuing to reduce resource consumption and GHG emissions within and beyond the goal timeframes, requires a strategic approach that takes into account all USACE operations and the interactions between short and long term opportunities for changes in these operations.

Because the energy intensity goal is rapidly approaching (2015), USACE has an initial focus on goal subject facilities, but our overall planning for more efficient and sustainable operations will require coordinated actions across many years, and across goal subject and goal excluded energy consumption, as well as NTV fleet and floating plant petroleum consumption. The USACE strategy to optimize investments in this timeframe and beyond requires a holistic corporate approach that optimizes the types of investments required across the various types of facilities and operations in USACE, including Corps-unique facilities and operations. The strategy must consider the opportunities for alternative investments (such as ESPCs and UESCs), constraints on investments due to different funding categories, differing investment thresholds, facility and equipment aging, and other factors, as well as the organizational challenges that must be overcome to ensure success. The strategy will also consider innovative approaches such as space management initiatives to reduce per capita energy consumption. Ultimately, this long-term holistic strategy should result in lower costs and ensure that USACE is an agile agency into the future.

Beginning in FY11, USACE is preparing an investment strategy structured to optimize where and how investments in resource efficiencies can occur across all operations and facilities and within our NTV fleet and floating plant over a multi-year time frame. This strategy begins with an understanding of where and how our consumption is taking place. The collection of data began in FY10 with the GHG inventory and the process will be refined each year. The resource efficiency investment strategy will guide and inform development of future USACE EO13514 Sustainability Plans. The need for a USACE resource efficiency investment strategy became apparent upon initial evaluation of FY08 and FY10 USACE energy and water consumption data used for the purpose of designating Covered Facilities as required by EISA Section 432. During the evaluation, USACE determined that only about 22% of total USACE energy consumption actually takes place at USACE Covered Facilities where Civil Works O&M funds are authorized for use for efficiency improvements, while over 53% of USACE total energy consumption occurred at Covered Facilities that would require specific congressional authorization to use Civil Works O&M funds.

The largest subset of USACE Covered Facilities in terms of their contribution to USACE total energy consumption is funded through the Plant Repair and Improvement Program (PRIP). Specifically, among USACE Covered Facilities, roughly 40% of USACE total energy consumption occurs at 17 PRIP-funded facilities – facilities that are not eligible to use Civil Works O&M funding for efficiency improvements without specific congressional authorization. The situation with PRIP facilities illustrates why USACE is preparing a resource efficiency investment strategy. Other factors to be addressed in the USACE strategy include energy consumption and savings to investment ratio for typical Civil Works mission facilities and activities other than buildings, e.g., locks, dams, and pumping stations.

Beyond the issues of funding source and return on investment for energy and water efficiency, greenhouse gas reductions bring yet another dimension into resource efficiency investment decisions. Considering that only about half of the GHG emissions generated by USACE facilities were from goal subject buildings, USACE must invest effectively to reduce its goal excluded consumption and the associated GHG emissions. In order to succeed on all fronts – energy, water, petroleum and GHG reduction – USACE, consistent with its authority, will need to make the most of effective use of different funding sources from within the organization as well as private investments from industry, such as through UESC and ESPCs. In addition, USACE will need to take advantage of statutorily authorized opportunities to work with public and private partners consistent with its authorities.

Further understanding of how each consumption reduction goal contributes to the USACE GHG reduction target and how each of the goals interact with each other is crucial to place investments in the right areas at the right time. Federally mandated reductions in facility energy consumption and NTV fleet petroleum usage and planned floating plant petroleum use reductions will not by themselves allow USACE to make its GHG reduction goal by 2020. This is due to the significant contribution of goal excluded facilities and the rise in petroleum use in FY10. Consequently, a strategy of reducing energy consumption in both goal-excluded facilities as well as additional reductions in goal-subject facilities and in our fleet will be required. Additional considerations for reduction include the timing of investments in equipment replacement within their lifecycle. For instance, what gains can be expected from planned upgrades versus accelerated upgrades to more efficient engines and motors? Also for consideration is the analysis of operational changes that can affect reductions such as load shedding and power use during low rate periods.

This long term resource efficiency investment strategy will be dynamic, as each investment opportunity and the resulting impacts of that investment, will affect future plans. But the planning framework will help decision making at each organizational tier, and improve with each subsequent year, as we attempt to gain maximum value from each investment opportunity.

<u>Goal-Specific Implementation Methods:</u>

Facility Energy Intensity and Renewable Energy

In its initial SP as submitted on 2 June 2010, USACE described a general approach for achieving its facility energy intensity and renewable energy goals as follows: (1) develop and implement a standard set of energy efficiency measures at appropriate USACE facilities, (2) identify and execute facility-specific opportunities for energy-reducing investments, (3) increase the generation and use of "new" hydropower at Civil Works projects through both internal USACE hydropower modernization and public-private (FERC) partnerships at USACE dams, and (4) invest in renewable energy generation at USACE facilities and/or in partnerships with other local or regional public and private entities. While this general approach remains fundamentally sound, USACE is adding a fifth element in this year's SP, as follows: (5) purchase Renewable Energy Credits (RECs) when economically advantageous at individual USACE facilities.

(1) Develop and implement a standard set of Energy Conservation Measures (ECMs) at all USACE facilities: In FY11-12, USACE will continue the work it started in FY10 to conduct energy and water evaluations at USACE covered facilities. The types of standard ECMs USACE is targeting include upgrades to facility heating and cooling systems lighting and lighting fixtures, pumps/motors, and building envelope. Because of the high degree of commonality in missions and facilities at USACE Civil Works operating locations, energy and water evaluations conducted at a relatively small number of facilities will identify energy efficiency opportunities and ECMs with potential applicability at a many other similar facilities. USACE will establish an environmental management program within the USACE environmental management system to track implementation of appropriate subsets of these ECMs across USACE facilities. Projected FY12 costs (currently in the FY12 President's Budget) for improvements in energy and water use efficiency in Civil Works facilities are distributed under Goal 1 and Goal 4 as an integral part of consolidated O&M requirements for energy and water efficiency and compliance with the Guiding Principles.

(2) Identify and execute facility-specific opportunities for energy-reducing investments: In FY11-12, USACE is beginning to take a strategic look at energy, water, and petroleum consumption at Corps-unique facilities such as locks, dams, and pumping stations in an effort to identify and prioritize energy conservation measures and to optimize Corps-wide efforts to reduce resource consumption and GHG emissions (See discussion of "Optimizing USACE Long-term Investment Strategy" above). USACE established a central capability for access to and analysis of facility-level energy, water and petroleum consumption data from FY08 and FY10. USACE will continue refining and formalizing a list of Covered Facilities to focus efforts to identify and prioritize energy reduction opportunities. USACE has developed a list of all energy-reporting facilities in order of decreasing total energy consumption and identified a set of 47 USACE facilities that collectively account for 75% of USACE total energy consumption. The on-going evaluation of this list has identified 10 locations, such as laboratories and large administrative complexes, that may offer larger energy reduction opportunities than those associated with the standard ECMs discussed above. Identifying and executing these types of opportunities will require substantial investments in resources, and careful consideration of benefits, costs, and risks – some of which is enabled by the USACE FY13 budgeting processes and the FY12 Climate Change Mitigation

Challenge, and all of which is informed by the broad scope of scientific, technical, and mission-based knowledge of USACE employees.

The energy and water audits and follow-on actions described above will be closely aligned with Goal 3 requirement for “High Performance Sustainable Design/Green Buildings” to ensure appropriate ECMs are considered for adoption when they are life cycle cost effective. If appropriate funds are available in FY12, USACE plans to conduct facility-level energy and water evaluations in conjunction with HPSB assessments at its covered facilities, and if funding allows, conduct initial surveys to identify advanced metering requirements. Projected costs associated with the energy/water and HPSB evaluations are included in Goal 3 projections.

(3) Increase the generation and use of “new” hydropower at Civil Works projects through both internal USACE hydropower modernization and public-private (FERC) partnerships at USACE dams: According to Federal guidance for implementation of EO13514, “new” renewable energy is that which is generated by expansions in capacity that have occurred after 1 January 1999.

Late in FY10, the USACE hydropower community completed the initial phase of a hydropower asset planning program called the Hydropower Modernization Initiative (HMI), which identified the best locations among current USACE hydropower dams for future investments to increase hydropower generation capacity. The HMI is discussed in detailed in the Renewable Energy Status section, below.

Another opportunity to expand hydropower generation at USACE facilities is the FERC program. In excess of 200 FERC license applications are expected in the next 12-24 months, suggesting significant opportunities for new hydropower generation capability on USACE lands and waters. We will also work closely with other Federal agencies and FERC licensees to identify opportunities to power additional USACE facilities from hydropower capabilities developed under FERC. Hydropower opportunities at USACE projects will be evaluated on a case-by-case basis with consideration of factors such as existing dam safety conditions, and environmental and endangered species restrictions.

(4) Invest in renewable energy generation at USACE facilities and/or in partnerships with other local or regional public and private entities. In FY11-12, we are evaluating the potential for partnership based renewable energy projects on corps facilities. The most significant partnership opportunity identified (but not funded) to date is in the Galveston District and involves multiple Federal agencies.

(5) Purchase Renewable Energy Credits (RECs) when economically advantageous at individual USACE facilities. USACE will encourage the purchase of RECs as a means to achieve our renewable energy goals. USACE will evaluate options for the purchase of RECs through DLA contracts and other mechanisms to reach targets. USACE success in implementing the multi-faceted approach, described in Implementation Methods 1-5 above, will rely heavily on leadership support from within USACE, Army, DoD, and the Administration, as well as continual improvement in the availability and quality of data to guide, support, and evaluate progress. Equally critical to success will be USACE-wide collaboration in a systems-based approach that applies the diverse talents of USACE people and organizations, and uses integrated

knowledge of USACE missions, lands, waters, and energy and petroleum consumption characteristics to inform and conduct a GHG wedge analysis in which facility energy consumption will be one of many elements.

NTV Fleet Petroleum Reduction, Alternative Fuels, Right-sizing and Low Emission/High Fuel Economy Vehicles

USACE is committed to reducing petroleum consumption and achieving all NTV fleet-related goals. USACE priorities in FY11-12 will be to reduce the number and size of vehicles in the NTV fleet in order to reduce operating costs and petroleum consumption. USACE will use the enhanced governance provided by the Strategic Sustainability Committee (SSC), increased emphasis on NTV fleet metrics (linked to the USACE NTV Petroleum Reduction Strategy and Action Plan), and the apportioned GHG reduction target as means to effectively inform and engage leadership at all levels of the Corp regarding their local performance relative to the NTV fleet management goals and metrics. By informing and engaging fleet managers, commanders, and Civil Works Chiefs of Operations and Operations project managers regarding their performance relative to NTV fleet goals, USACE will improve its performance in terms of right-sizing and right-positioning the fleet, while simultaneously increasing the average fuel efficiency of the fleet by requisitioning the most fuel efficient NTV capable of meeting the local mission requirements.

The Corps is also looking into establishing Corps-wide mission-based, objective criteria to guide and streamline fleet size, distribution, and vehicle capabilities. The criteria USACE envisions would be based on existing GSA criteria, but they would be refined and expanded to address the mission and environmental conditions “on the ground” at USACE Civil Works project locations. USACE intent is to apply these criteria systematically at all Corps facilities and to evaluate effectiveness through the USACE environmental management system.

USACE Floating Plant Petroleum Reduction

In the near term (FY11-15), the major environmental aspects of the floating plant being addressed by the Marine Design Center (MDC) are air and water emissions, fuel consumption, and overall vessel efficiency (maneuvering, speed, operations, etc.).

Work is already underway to repower a number of USACE hopper dredges with engines designed to meet both Federal and California Tier 2 air emissions requirements, which are the most stringent in the nation. The Tier 2 engines, coupled with changes in hull design and hull coatings, have been shown to reduce vessel fuel consumption by up to 15%. MDC is also evaluating use of bio-based hydraulic fluids and greases, as well as environmentally benign hull coatings, all of which will lead to reductions in chemical leaching and releasing to waterways.

In the period from FY15 through FY20, USACE plans to continue the investigation and application, as appropriate, of various methods of improving the operational efficiency and lessening the negative

environmental impacts of its floating plant fleet. These methods include alternative fuel technology, alternative power sources, power management improvements, and vessel design, operation, and maintenance improvements.

d. Positions

We believe two full-time facility energy/water manager positions are required for HQUSACE based on application of criteria (one energy manager per 5 million GSF) cited in the FEMP Facility Energy Management Guidelines and Criteria for Energy and Water Evaluations in Covered Facilities, 25 November 2008. In addition to the two energy managers at HQUSACE, USACE is evaluating options to establish Energy Manager and/or Resource Efficiency Manager capabilities at the District level.

e. Planning Table

Table 2-1 Goal 1 Planning Table

	SCOPE 1&2 GHG TARGET	Unit	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	….	FY 20
Buildings	Energy Intensity Reduction Goals (BTU/SF reduced from FY03 base year)	%	15	18	21	24	27	30	….	30
	Planned Energy Intensity Reduction (BTU/SF reduced from FY03 base year)	%	5.6	6	12	18	24	30	…	30.5
	Renewable Electricity Goals (Percent of electricity from renewable sources)	%	5	5	5	7.5	7.5	7.5	…	7.5
	Planned Renewable Electricity Use (Percent of electricity from renewable sources)	%	1.6	2	5	7.5	7.5	7.5	…	7.5
Fleet	NTV Petroleum Use Reduction Targets (Percent reduction from FY05 base year)	%	10	12	14	16	18	20	….	30
	Planned Petroleum Use Reduction (Percent reduction from FY05 base year)	%	-14.7	2	6	10	15	20	….	30
	Alternative Fuel Use in Fleet AFV Target (Percent increase from FY05 base year)	%	61	77	95	114	136	159	….	159
	Planned Alternative Fuel Use in Fleet AFV (Percent increase from FY05 base year)	%	156	156	156	156	156	156	….	156
	Senior Executive Fleet Replaced with Low-GHG, High-Efficiency Vehicles (Percent replaced from the FY08 base year)[13]	%	n/a	n/a	n/a	n/a	n/a	n/a	….	n/a
	USACE Floating Plant Petroleum Reduction (% reduction (GGE) from FY08 base year)	%	2.8	3.25	3.75	4.75	5.25	5.30	…	7.70

[13] USACE does not have a Senior Executive Fleet

	Total Scope 1&2 GHG Emissions (comprehensive)	MMT CO2e	0.369	0.324	0.310	0.295	0.282	0.267	…	0.261
	Total Scope 1&2 GHG Emissions (subject to USACE Scope 1&2 GHG Reduction Target)	MMT CO2e	0.368	0.324	0.310	0.295	0.282	0.267	…	0.261
	Overall Scope 1 & 2 - Reduction Target (reduced from FY08 base year)	**%**	-8.7	4.5	8.6	12.8	16.9	21.1	….	23.0

f. Status

Facility Energy Intensity and Renewable Energy

Facility Energy Intensity – Scorecard Status: Red

Although the USACE FY10 FEMP GHG-Sustainability Data Report as submitted on 31 Jan 2010 indicated that USACE progress on the facility energy intensity goal was an 18.9% reduction, USACE determined that the baseline data used to calculate the percent reduction was inaccurate. The major issue with the USACE baseline was inclusion of Goal Excluded energy for some of the Corps largest energy consuming facilities. USACE has since corrected its baseline data, and the recalculated reduction value as of the end of FY10 is 5.6%, which is on track with respect to the USACE internal glide path as shown in the FY10 SP, but well below the Federal interim target of 15% for FY10. USACE status on the facility energy intensity goal is rated as "red" on the USACE Sustainability and Energy Scorecard.

USACE expected that its performance relative to the Federal interim target for energy intensity would lag behind the federally required glide paths. Accordingly, USACE established in its FY10 SP "internal USACE" glide paths for each of the SP goals. Each of the "internal USACE" glide paths lags significantly behind the analogous Federal glide path in the initial years because USACE is just getting started in the long-standing Federal Sustainability and Energy program. However, each of the USACE-established glide paths reflects USACE intent to strive to come into alignment with each of the Federal glide paths by stepping-up the rate of USACE progress toward the respective goals in FY12 and the out years. It is important to note that FY12 is the first year in which USACE had opportunity to impact the budget with EO13514 requirements.

As shown in the FY10 USACE SP planning table for Goal 1, the projected annual rate of progress toward the facility energy intensity goal increases from 3% to 6%, and for renewable energy the annual rate of progress increases from 2% to 3%. To achieve these increased levels of progress, USACE requested (in its initial budget request as submitted to OMB in Sep 2010) a $20M plus-up to provide for a Sustainability and Energy set-aside. The requested plus-up was intended to take the place of the FY12 $19.1M Leveraged Investment of O&M funds projected in the FY10 SP because the individual requirements comprising the $19.1M investment were determined to provide very low return on investment in terms of dollars invested per unit of energy reduction. OMB subsequently declined the USACE request for a $20M plus-up. As a result, USACE allocated $10M of in-ceiling funds for the Climate Change Mitigation Challenge (CCMC) under the Sustainability and Energy section of the FY12 President's budget. With the

$10M set-aside for sustainability and energy investments in FY12,USACE anticipates it will again fall short of the Federal interim target for FY12 (21%). However, depending on the effectiveness of FY12 investments, USACE does have a fighting chance to achieve it internally-established interim target of 12% in FY12.

The FY12 CCMC is a critical initiative for the newly established USACE Sustainability and Energy Program, because, if successful, it will provide the first major "wins" for the new program, and it will set the stage for future successes. From a USACE Sustainability and Energy Program perspective, getting the best possible return on investment from the FY12 $10M set-aside for the USACE Climate Change Mitigation Challenge is critical. For this reason, USACE is focusing the FY12 CCMC on reduction of Goal Subject facility energy and non-tactical vehicle petroleum. Focusing specifically on these priorities will provide return on investment in terms of progress toward three scorecard metrics: facility energy intensity, NTV fleet petroleum consumption, and the associated GHG Scope 1&2 reductions. As of the date of the SP, the specific facility-level investments resulting from the FY12 CCMC have not been selected. Thus, the reduction values in the planning table are not based on objective data but rather are estimates indicating the magnitude of progress USACE needs to make in each fiscal year for facility energy, NTV fuel, and GHG.

Renewable Energy – Scorecard Status: Red

USACE status on the Federal Sustainability/Energy Scorecard was rated "Red" with only 1.6% progress compared to the interim target (for FY10) of 5%. In spite of this, USACE has chosen ***not*** to include renewable energy generation infrastructure as a high priority for the FY12 CCMC, although the CCMC does support purchase of renewable energy credits at USACE facilities. This is due, in part, to the limited funding available in FY12 and the relatively high cost of investments in renewable energy generation. However, it also reflects the reality that USACE has not done the planning necessary to undertake a cost-effective, systematic program of investments in renewable energy infrastructure, with the exception of the planning done in the USACE Hydropower Modernization Initiative (Refer to the Long-term Investment Strategy from Implementation Methods section in Goal 1). USACE's 1.6% progress on the renewable energy goal in FY10 is the result of consumption of "new" hydropower on-site at USACE hydropower facilities. Based on planning done to date, USACE believes expansions in generating capacity and improvements in efficiency will provide the most cost-effective means to increase renewable energy generation and consumption at USACE hydropower facilities. USACE will begin to explore the possibility of using "enhanced-use leases" as a vehicle for establishing a non-hydropower, renewable energy generation on some of the 12 million acres of land the Corps manages on behalf of the United States.

The Corps operates and maintains 75 hydropower plants with 353 generating units and an installed capacity of 21,000 megawatts, 25 percent of the Nation's capability. In FY10, USACE generated approximately 65,900,747 MWH of hydropower. The vast majority (99.98%) of the hydropower USACE generates resulted from installed capacity that predates January 1999. Therefore, for purposes of Federal greenhouse gas (GHG) accounting, USACE hydropower is not considered "renewable energy."

While we understand the rationale behind the Federal GHG accounting rules, and we are reporting USACE GHG emissions according to the Federal rules, we believe it is necessary to look at hydropower generation from a more "global" GHG emissions perspective to appreciate the climate change mitigation benefits of hydropower. Using the US EPA's GHG emissions calculator, the hydropower USACE generated in FY10 avoided GHG emissions from fossil fuel-fired power plants that would have totaled over 47,439,000 MTCO2e (metric tons of carbon dioxide equivalent).

With regard to USACE hydropower infrastructure, USACE generator peak availability is approximately 86%, which lags some ten percent points behind the hydropower industry standards for fully modernized hydropower generating facilities around the globe. The Corps of Engineers is addressing its declining hydropower infrastructure performance through its hydropower asset planning program called the Hydropower Modernization Initiative (HMI). The Asset Investment Planning tool of HMI identifies capital investment needs and opportunities over a 20-year horizon that would reduce equipment failure risks, improve overall reliability, and quantify environment benefits. The FY12 President's Budget includes $11M in O&M for hydropower improvements that would increase hydropower capacity by an additional 31,000 MWH, which converts to a GHG emission avoidance of roughly 21,000 MTCO2e based on the EPA's *Greenhouse Gas Equivalencies Calculator* at http://www.epa.gov/cleanenergy/energy-resources/calculator.html.

USACE has a number of other renewable energy initiatives other than hydropower already under construction at USACE facilities, some of which were funded through the American Recovery and Reinvestment Act of 2009 (ARRA). We have excellent examples of renewable energy projects in California, where work is underway on a $1.26M contract to install nine solar photovoltaic (PV) systems at offices in Sacramento District and at the visitor center at the San Francisco Bay Model in Sausalito. The PV systems are now operational at eight of the nine project sites. The three earliest PV system installations have been operational since May/June of 2010. These three PV systems have met about 25% of each project's electrical energy needs during the first six months of FY2011 with a total electrical energy output of about 35,500 kWh over this time period. If cost and energy savings are extended to an annual basis for all 9 projects, the estimated annual savings are $33,000/year and the estimated annual energy output is 213 MWh. These performance values are conservative since they were gathered during low insolation months (winter).

Using our experiences and lessons-learned in these and other ongoing renewable energy projects, coupled with strong corporate commitment to increasing the generation and use of renewable energy at USACE facilities, we will begin in FY10-11 to identify the best opportunities for solar, wind, and other renewable energy projects, as well as REC purchases, at facilities USACE-wide. We have integrated EO 13514 requirements into our FY13 budget guidance, and we are considering innovative approaches to resource sustainability initiatives, in general, including site-specific renewable energy/REC purchase projects conducted by USACE or in partnership with local and regional entities working to generate and use renewable energy.

NTV Fleet Petroleum Reduction, Alternative Fuels, Right-sizing and Low Emission/High Fuel Economy Vehicles

The paragraphs below address USACE status and significant changes in USACE NTV fleet performance since the previous SP. The significant changes include:

* NTV fleet petroleum consumption has increased by 14.7% relative to the FY05 baseline

* USACE NTV fleet size grew from 8,069 in FY09 to 8,412 vehicles in FY10

* Alternative fuel consumption increased from 17,857 GGE in FY09 to 19,463 GGE in FY10

NTV Fleet Petroleum Consumption – Scorecard Status: Red

The FY10 USACE NTV fleet petroleum consumption as reported in FAST was 5,724,947 Gallons of Gasoline Equivalent (GGE). Relative to the FY05 baseline of 4,936,769 GGE, USACE NTV fleet petroleum consumption has increased by 788,178 GGE, or approximately 15%. In an effort to understand the why its NTV fleet petroleum consumption is increasing, USACE evaluated data for FY08-10, and identified that in FY08, USACE had achieved a 5% ***reduction*** relative to FY05, with a total FY08 consumption of gasoline and diesel at 4,678,062 GGE. After FY08, USACE petroleum consumption increased sharply from 4,678,062 GGE (gasoline and diesel) to 5,705,514 GGE – which is roughly a 22% increase in a 2-year period. During the same period, USACE fleet size increased by 868 vehicles (11.7%) and miles driven increased by 8.7 million miles (12.9%). Also, not surprisingly, overall NTV fleet operating costs (GSA lease and fuel costs) over the same two year period increased by roughly $2 million.

These trends between FY08 -10 suggest increasing OPTEMPO was a major factor in the increases across virtually all indicators of NTV fleet performance. Anecdotal information from the field indicates that USACE OPTEMPO did indeed spike in FY09-10 primarily as a result of mission activities supporting execution of the American Reinvestment and Recovery Act (ARRA) and Base Realignment and Closure (BRAC).

USACE issued its Non-Tactical Vehicle Petroleum Reduction Compliance Strategy and Action Plan (the Plan) in March 2009; however, it has not made satisfactory progress on Federal NTV fleet goals. The USACE approach for improving performance on NTV fleet petroleum consumption is described under Goal 1, paragraph c., Implementation Methods.

Alternative Fuel Consumption

USACE alternative fuel consumption has increased by 156% since FY05, which is well beyond the FY10 interim target of 61%. USACE consumption of alternative fuel, virtually all of which is E85, was 19,463 GGE in FY10, which is roughly a 9% increase relative to the FY09 total of 17,857 GGE. Note that the FY09 alternative fuel consumption reported in the USACE SSPP (June 2010) as 101,490 GGE was the result of an error in GSA data systems. This error has been corrected. In spite of the fact that USACE NTV fleet in FY10 was comprised of roughly 33% E85 (Flex Fuel) vehicles, USACE consumption of E85 totaled less

than 1% of total USACE fuel consumption. The low consumption of E85 results largely from the fact that the majority of the USACE NTV fleet is garaged at locations lacking access to E85 fuel sources. Also, because the USACE NTV fleet is widely dispersed with relatively small numbers of vehicles at most operating locations, it is not economically advantageous for USACE to develop on-site alternative fueling capability.

USACE identified in its FY10 SP an issue with its FY05 NTV fuel baseline. USACE continues to work with DoE and GSA to resolve the baseline issue. Specifically, USACE is continuing its work with DOE to correct the FY2005 fuel baseline data. To date, USACE has presented an acceptable method to DOE by which to correct the inaccurate reporting in FY2005.

In FY10, USACE initiated procurement actions for over 300 gas-electric hybrid vehicles, which is roughly 25% of the total number of vehicles acquired (both new acquisitions and replacements). USACE hybrid vehicle requisitions resulted in delivery of 146 hybrids, bringing the USACE inventory of hybrid vehicles to 207 early in FY11. Also in FY10, USACE established the Civil Property Authorization Document (CPAD) to improve accountability, visibility, and management control of the size, distribution, and composition of the fleet, USACE-wide. The CPAD is an essential, requirements-based, foundation for USACE efforts to right-size and right-position the NTV fleet. The CPAD provides an important foundation for all USACE NTV fleet management initiatives.

USACE Floating Plant Petroleum Reduction

USACE operates a fleet of over 2,500 vessels nationwide; ranging from small patrol boats to seagoing hopper dredges displacing 10,000 tons. When USACE established its GHG Scope 1&2 reduction target in January 2010, ASA(CW) chose to include USACE floating plant in the USACE GHG baseline and subsequent reduction efforts. The decision by ASA(CW) was based on the magnitude of floating plant petroleum consumption coupled with recognition of the potential for the advancement of substantial, mission-enhancing, GHG reduction opportunities. In FY08, USACE floating plant petroleum consumption totaled 8.42 million gallons of diesel fuel, which accounted for 26% of total USACE Scope 1 and 2 GHG emissions. In FY10, USACE floating plant consumed 8.29 million gallons of diesel fuel, which is a 1.5% reduction relative to FY08. This appears to put USACE roughly 0.5% behind its 2% interim reduction target for FY10, but this may be a somewhat misleading indicator of true performance because it does not consider variations in hours of operation or OPTEMPO. USACE is working to improve data tracking for floating plant petroleum consumption.

Collection of petroleum consumption data for the USACE floating plant has been a challenge because of the variety of government purchase cards, contracts and logistical arrangements involved in fuel purchases. For example, in FY10 USACE gathered floating plant fuel data from Wright Express, SeaCard, and contract purchases, some of which involved vessel-specific purchases and some involved bulk fuel purchases that served multiple vessels. USACE is considering options to simplify data gathering, and also working to utilize a Maximo-based system entitled “Facility and Equipment Maintenance” (FEM) system to track fuel consumption and hours of operation.

The USACE Navigation community, with the support of the Marine Design Center (MDC), has long been making vessel improvements in response to stringent environmental regulatory requirements, close scrutiny in the maritime sector, the age of the USACE fleet, and the requirement of PL 95-269 that, "Federal fleet shall be maintained to technologically modern and efficient standards."

Some opportunities for improvement directly reduce environmental impacts, while others, primarily intended to improve efficiency, will also produce benefits in terms of GHG reduction. Some examples include:

1. Equipment Replacement. "In-kind replacement" of older, out-dated equipment with more capable, modern equipment leads to energy savings.

2. Hydrodynamic Improvements. Improvements in vessel hull forms, propulsion and steering systems, and other vessel features can enable vessels to move more efficiently through the water, which in turn reduces energy consumption.

3. Power Management. Vessel power management can be designed to maximize the efficiency of the vessel's available power. Efficient distribution of power among vessel systems such as propulsion, winches, cranes, and other operating gear allows installed total power to be minimized.

4. Supplemental Alternative Power Sources. Non-traditional sources of power may be readily available based on specific vessel type and vessel use. These sources could include solar power and regenerative power, both of which may essentially be "free" power.

Operational Improvements. Improve the actual operation of the vessels to accomplish the mission by enabling vessels to accomplish the same amount of work in less time or with less power utilization. Improvements in this area are increasingly practical with modernized monitoring systems, especially for fuel.

g. Return on Investment

To date USACE has very little quantitative information from USACE facilities regarding return on investment for Goal 1. The lack of quantitative information results largely from the fact that sustainability and energy requirements were not built into FY11 USACE budget development guidance; accordingly, no funding was identified for the associated requirements. Although the FY10 SP Goal 1 Planning Table identified an FY11 total of $59.4M, only the $23M Alternative Investment was actually funded. USACE has made the following qualitative observations with regard to sustainability and energy investment since June 2010:

- The $23M identified in the FY10 SP as Alternative Investment was used in repowering of major vessels in the USACE floating plant. The repowering (as funded in FY10) was completed on one major vessel. Although preliminary data show roughly a 14% improvement in petroleum efficiency resulting from the FY10 repowering, USACE does not yet have sufficient petroleum consumption and vessel

operational data to quantitatively describe the return on investment. The $23M Alternative Investment was continued in FY11, and is projected to be continued in FY12 at level of $18M.

- The FY10 SP proposed a $1.4M investment in acquisition of hybrid (gas-electric) NTVs. This was a continuation of a hybrid NTV replacement program that started in FY09. The $1.4M investment was applied to pay the incremental increase in GSA daily vehicle lease charges, which are roughly 25% more than for an equivalent gasoline or flex-fuel vehicle. In FY10 USACE acquired 146 replacement hybrids, and the per-vehicle surcharge went from $7.00/day per NTV to $12.00. The 146 additional hybrid NTVs initially projected for acquisition in FY11 would have resulted in a surcharge rate of $28/day, so acquisition in FY11 was reduced to 122, which limited the per vehicle surcharge to $13.00, an increase of only $1 per NTV. In order to control future surcharge increases, USACE will "pace" acquisition of hybrids while more closely evaluating more fuel-efficient non-hybrid conventional or alternative-fueled NTVs.

h. Highlights

- Established the USACE Strategic Sustainability Committee (SSC) comprised of military and civilian leadership at the USACE Headquarters and the Major Subordinate Commands. The SSC provides strategic direction and management review to guide and enable improvement of USACE sustainability performance.
- Established the USACE Sustainability and Energy Program in the FY12 President's Budget, allocating $10M for facility-level investment in energy, water, and petroleum efficiency and greenhouse gas reduction.
- Completed and issued a new USACE Recreation Strategic Plan that includes sustainability as one of six major goals, and provides detailed objectives that integrate sustainable practices into USACE operations at recreation facilities, in USACE interactions and interpretive activities with visitors, and in community-based stewardship partnerships.
- USACE took delivery of 146 gas-electric hybrid vehicles to bring the number of hybrids in the USACE non-tactical vehicle fleet at the end of second quarter of FY11 to 207.
- Completed repowering of the USACE hopper dredge Essayons, the result of which (based on preliminary data) is roughly a 14% increase in petroleum efficiency.
- USACE conducted pilot testing to convert some of its floating plant assets from diesel to biodiesel (B100). Four pilot projects were identified and baseline measurements of engine performance and emissions for diesel and B100 performed. Baseline (diesel) tests and candidate (B100 biodiesel) tests have been completed with initial results showing no loss of performance and significant emission reductions. The effort is proceeding to further testing in the winter months to assure the fuel does not gel at the temperatures associated with our equipment's operating environment. This testing has been done in collaboration with other Federal agencies[14].

[14] Leitch, Robert, Timothy Welp and Dennis Donahue. In Search of Sustainability – Evaluation of Biodiesel Fuel for Potential Use in Corps Floating Plant. Proceedings, WEDA XXXI Technical Conference & TAMU 42 Dredging Seminar, Nashville, TN, June 5, 2011.

- Significant fuel consumption and GHG reduction initiatives within USACE's floating plant operation are making significant advances in several vessels. This includes new, more efficient engines, more efficient propeller blade design, a new electrical system which better matches generator load to power needs, and new engine/generator controls which allow full engine shut down when dredge pumps are not on line, all of which contribute to the improved fuel efficiency. The hopper dredge YAQUINA is being repowered with similar technology as the ESSAYONS and is scheduled for completion in March 2012. In addition, the hopper dredge WHEELER will also be similarly repowered starting in 2012. A similar amount of reduction in fuel consumption for both vessels is expected. These changes done across a number of areas to bring about improved fuel efficiencies are typical of the engineering improvements on Corps vessels[15].
- Completed installation of photovoltaic arrays at 8 of 9 Sacramento District park and dam operations in California to improve the sustainability of the district's projects. The earliest photovoltaic system installations at three projects show that about 25% of each office's electrical energy needs were met during the first six months of FY2011 with a total electrical energy output of about 35,500 kWh.
- The USACE flood control reservoir at Abiquiu Dam in New Mexico was the site of an amended Federal Energy Regulatory Commission (FERC) license that involved the US Department of Energy adding a new 3 megawatt, low-flow turbine project. Although the project does not involve a USACE hydropower facility, the Memorandum of Agreement negotiated between the US Department of Energy, the Los Alamos DPU, and the Albuquerque District Corps of Engineers allows USACE to receive renewable energy credits for the entire Abiquiu Dam project's electrical consumption.

IIc. Goal 2: Scope 3 Greenhouse Gas Reduction & Develop and Maintain USACE Comprehensive Greenhouse Gas Inventory

a. Goal Description

EO 13514 §2(b): USACE established a 5% reduction target for GHG Scope 3 emissions by FY20 (baseline FY08).

To meet the above GHG Scope 3 target and following CEQ guidance, USACE established the following sub-targets:

> 5% reduction in GHG Scope 3 emissions associated with Federal employee business travel (ground and air) by FY20 (baseline FY08).
>
> 3.2% reduction in GHG Scope 3 emissions associated with Federal employee commuting by FY20 (baseline FY08).

[15] Keyser, Timothy and Greg Lee. Sustainable and Green Improvements in Army Corps Hopper Dredges. Proceedings, WEDA XXXI Technical Conference & TAMU 42 Dredging Seminar, Nashville, TN, June 5, 2011.

23.8% reduction in GHG Scope 3 emissions associated with the transmission and distribution losses (T&D) losses from purchased electricity by FY20 (baseline FY08).

EO 13514 §2(c): Report a comprehensive GHG emission inventory for FY10 by 31 January 2011, and annually thereafter by the end of January.

b. USACE Lead Organizations

Civil Works Operations Division (CECW-CO), Directorate of Research & Development (CERD-ZB), Directorate of Logistics (CELD-ZA), and Directorate of Human Resources (CEHR), Environmental CoP (CEMP-CEC)

c. Implementation Methods

Scope 3 Greenhouse Gas Reduction

USACE is focusing on its comprehensive GHG inventory as the primary means to inform its approach to Scope 3 GHG emissions reduction. The following sections of Goal 2, below, address near-term (FY11-12) actions planned to support Scope 3 emissions reductions.

Federal Employee Commuting - Employee commuting comprised 76% of USACE scope 3 emissions in FY10, and changes to employee commuting travel are likely to result from policy changes alone. Therefore, there are no funding requirements for reducing this category of Scope 3 emissions. The new USACE Telework regulation is under review at this time with publication anticipated by the end of FY11.

The Telework Program regulation promotes implementation of telework throughout USACE to help in reducing greenhouse gas emissions that would otherwise result from commuter vehicles. The Telework Program regulation also requires that the number of days an employee is in telework status per pay period be tracked in the Corps of Engineers Financial Management System (CEFMS) so that USACE Scope 3 greenhouse gas emissions reductions can be more accurately estimated.

The regulation encourages supervisors to allow eligible employees to take full advantage of alternative work schedules, credit hours, and teleworking to reduce the average number of commuter days per pay period across the entire organization. It is recognized that many positions within USACE are not eligible for teleworking due to the types of duties performed.

Federal Employee Travel - The next largest category of FY10 Scope 3 emissions is business air and ground travel at 13%. For purposes of the SP and managing its Scope 3 GHG reduction initiatives, USACE is tracking business air and ground travel through the Defense Travel Management Office (DTMO). As we further address business air travel, we will increase the availability and use of high quality meeting tools and facilities across USACE, such as videoconferencing, teleconferencing, web conferencing, webinars, and internet broadcasting (webcasting). While USACE emissions from TDY travel (air and ground) increased by approximately 8% between FY08 and FY10, we attribute this largely to increased OPTEMPO in support of BRAC and ARRA execution. Accordingly, the anticipated return to a more routine OPTEMPO

in FY11 and FY12, as well as diminishing travel budgets, should put USACE on track for measureable Scope 3 reductions in the foreseeable future.

Contracted Solid Waste Disposal and Contracted Waste Water Treatment - USACE-controlled Scope 3 emissions in these two categories are insignificant (totaling less than 5% of USACE FY10 Scope 3 emissions) compared to employee commuting and TDY travel (air and ground). As of the close of FY10, USACE did not have a means for direct quantification of USACE solid waste generation. Based on estimates of solid waste disposal generated using USACE employee population and accepted per capita solid waste generation rates, USACE GHG emissions from contracted solid waste disposal are not a driving force for reducing USACE Scope 3 GHG emissions. Therefore, USACE will focus its solid waste management efforts on increasing diversion. Diversion efforts are discussed in Goal 5.

An important consideration in USACE solid waste management and waste water treatment is the very large relative contribution of USACE visitors. Considering the FY10 USACE employee population of 35,438, and the fact that visitation at USACE facilities in FY10 was comprised of over 80 million camper-days and over 118 million day-use visits, the vast majority of waste water and solid waste-related emissions are attributed to visitors. Therefore, USACE will focus its solid waste and waste water initiatives on efforts to encourage visitors through educational materials and interpretive programs to use resources responsibly in order to conserve water, minimize waste, and increase solid waste diversion.

Transmission and Distribution Losses from Purchased Electricity - Emissions associated with this category will be reduced through efforts discussed in Goal 1.

USACE Comprehensive Greenhouse Gas Inventory

As mentioned in the discussion of Goal 1 implementation, success in achieving the USACE GHG reduction targets relies on continual improvement in the availability and quality of data to guide, support, and evaluate our progress. In FY10-11, USACE took a number of coordinated actions intended to improve the availability and quality of data needed to develop and maintain the USACE comprehensive greenhouse gas inventory:

- Evaluated the baseline data used in establishing the USACE GHG reduction targets, the associated data gathering processes, and Federal data requirements (such as the Federal Greenhouse Gas Accounting and reporting Guidance (6 Oct 2010) to identify data issues, corrective actions, and opportunities for improvement.
- Conducted GHG footprinting pilot studies at selected USACE Civil Works Operations projects to characterize the sources, chemical forms, and magnitudes of GHG emissions, including those under Scopes 1, 2, and 3.
- Evaluated existing IT systems and USACE databases for “data mining” opportunities to support the development and annual update of the comprehensive USACE GHG inventory.

- Identified and requested IT system and database modifications necessary to enable, streamline, and standardize data gathering for the comprehensive USACE GHG inventory.
- Developed USACE-specific software tools to systematically collect GHG emission and energy and water data at the project level throughout USACE.

d. Positions

At this time, there is no reliable process to determine how many personnel will be required to meet this specific goal.

e. Planning Table

Table 2-2 Goal 2 Planning Table

SCOPE 3 GHG TARGET	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	…	FY 20
Total Scope 3 GHG Emissions (Comprehensive)	MMT CO2e	0.182	0.161	0.161	0.160	0.159	0.158	…	0.154
Total Scope 3 GHG Emissions (Subject to Agency Scope 3 GHG Reduction Target)	MMT CO2e	0.182	0.161	0.161	0.160	0.159	0.158	…	0.154
Overall Agency Scope 3 Reduction (reduced from FY08 base year)	%	-12.1	0.5	1.0	1.5	2.0	2.5	…	5.0

f. Status

Scope 3 Greenhouse Gas Reduction

Scope 3 category emissions increased by 12.1% to 181,845 MTCO2e from the FY08 base year total of 162,274 MTCO2e. The increase was consistent across all of the categories with the largest increase coming from commuting. While USACE has initiated policy actions to reduce emissions in the largest categories (employee commuting and business travel), their effects have not yet been realized.

The USACE FY2020 target end state for Scope 3 emissions (based on achieving the USACE 5% reduction goal) is 154,160 MTCO2e, which means USACE must reduce its Scope 3 emissions by a total of 27,685 MTCO2e from the FY10 level. The Goal 2 Planning Table allocates this total reduction across FY11-20 by projecting equal incremental reductions in each fiscal year. USACE anticipates that actual annual reductions are virtually certain to vary from these projections, with the rate of reduction being lower in the early years (FY11-13) and increasing in later years (FY14-FY20). This will occur as changes to the most significant activities generating the USACE Scope 3 emissions (employee commuting and business travel) will require not only policy changes but also fundamental cultural and management adjustments.

Federal Employee Commuting – Employee commuting accounts for the largest portion of USACE Scope 3 emissions. In FY08 and in FY10, commuting via car pool, mass transit, or by biking/walking accounted for

18% of the miles traveled for the year. These data are the result of the employee commuting survey conducted as a part of the FY10 GHG inventory which was completed by about 50% of the 35,438 employees. USACE has focused on reducing the number of days an employee must be in the office rather than taking actions affecting modes of transportation. This will be accomplished primarily through telework policy and by encouraging supervisors to allow eligible employees to take advantage of alternative work schedules.

Federal Employee Travel – Business travel increased from FY08 by 8.6% in miles traveled. USACE is committed to reducing business travel through the use of high quality meeting tools and facilities across the Corps such as videoconferencing, web conferencing and webcasting. The recent issuance of USACE OPORD 2011-28 (4 May 2011) on business travel for conferences, symposia, and various other types of meetings, is designed to reduce business travel. Although OPORD 2011-28 focuses primarily on budgetary drivers, it is expected to have the ancillary benefit of reducing USACE Scope 3 emissions.

Contracted Waste Disposal – This category encompasses two sub-categories, contracted solid waste, which represents 4.3% of Scope 3 emissions, and contracted wastewater treatment, which represents less than 0.1% of Scope 3 emissions. Neither emissions category is large enough to be a significant factor in overall Scope 3 emission reduction strategy. However, it became clear during the development of the FY10 GHG inventory that USACE doesn't have a direct way to measure solid waste generated at Corps sites. This is because vendor contracts don't require quantification of solid waste being hauled offsite. Consequently, USACE relies upon estimation methods based on population figures, both USACE and visitors, and per capita generation rates.

Transmission and Distribution Losses from Purchased Electricity – This category makes up 6.8% of the Scope 3 emissions. Emissions associated with this category and actions to reduce it are discussed in Goal 1. However, it is noted that discussions have begun between USACE ERDC and the local utility supplying power to USACE's research and development site in Vicksburg, MS to locate a new substation adjacent to the Information Technology Laboratory. This action will result in a reduction of distribution losses to that energy intensive facility - a facility that is the top energy-consuming facility in all of USACE. This resultant energy and cost savings is an incentive for both the utility as a provider and the user.

Comprehensive Greenhouse Gas Inventory

USACE developed its greenhouse gas inventory based on the *Federal Greenhouse Gas Accounting and Reporting Guidance* and the *Federal Greenhouse Gas Accounting and Reporting Guidance - Technical Support Document* (the Guidance). The details of the inventory's development were documented in the Greenhouse gas Inventory Management Plan: U.S. Army Corps of Engineers (the IMP) which was submitted along with the FY2010 greenhouse gas inventory. All FY2010 greenhouse gas inventory information was reported using the FEMP GHG Sustainability Data Report spreadsheet.

USACE collected information for the FY2010 inventory using processes that depended on the greenhouse gas emission source type. Data came from several sources including centrally managed

databases such as GSA's Federal Automotive Statistical Tool (FAST), credit card fuel purchase records, recreation visitor counts, Corps of Engineers Financial Management System (CEFMS) database records, visitor records and the O&M Business Information Link (OMBIL) data warehouse. Additional emissions data requirements, such as stationary combustion, purchased electricity, and bulk fuel consumption were collected in a standardized electronic format directly from facility managers and responsible personnel at USACE Districts and Projects.

For Scope 1 greenhouse gas emissions from stationary combustion, mobile combustion not captured by GSA or centralized fuel purchase (Wright Express) credit cards and Scope 2 greenhouse gas emissions from purchased electricity; USACE developed a data collection spreadsheet. The spreadsheet was based on the FEMP reporting spreadsheet as was called the Corps of Engineers Reduced and Abridged FEMP Tool (CRAFT). The spreadsheet provided for entry of location and name information for each USACE Project facility, and incorporated informative comments and USACE-specific terminology and examples to guide users in entering the correct category of activity data into the spreadsheet. A set of instructions for downloading the spreadsheet, entering data, and uploading the spreadsheet after performing quality assurance/quality control (QA/QC) was made available to each facility manager responsible for entering data. CRAFT spreadsheets were uploaded to a USACE FTP site. Sections 4 and 5 of the USACE IMP contain details about the data collection process.

Project Managers responsible for Corps Project sites and the DPW at ERDC were responsible for collecting source emission data and checking to make sure it was accurately collected and entered into the CRAFT tool. POCs responsible for collecting and compiling centrally managed data or other data (e.g. renewable energy, hydropower, business travel) were responsible for the completeness and accuracy of their data. This included the Chief of Logistics who collected non-tactical vehicle fleet data, OMBIL hydropower database managers, HQ staff, and staff from the Center for the Advancement of Sustainability Innovations (CASI) of ERDC. Several layers of quality control (QC) existed through the pre-submission review.

USACE used a very comprehensive process for the pre-submission review of CRAFT data. A USACE QC team reviewed CRAFT submissions for completeness and errors. QC team members kept track of problems and resolved errors after checking with the data entry organization. Identification of errors was greatly enhanced through the use of sophisticated data visualization techniques that allowed the QC team to check that energy consumption was consistent with the baseline, the Project size, and the Project type. When required, the individual CRAFT spreadsheets were modified and saved with new version numbers. The CRAFT data checking process in Section 7 of the USACE IMP provides more details about the QC process.

There were issues associated with the use of the CRAFT spreadsheet. These included problems with file naming conventions, overwriting of formulae, overwriting pick list entries, and addition of rows. These types of errors will be minimized for the FY2011 greenhouse gas inventory through using a database for information storage and data entry through a web form.

The greenhouse gas inventory data has already become part of the USACE process for developing greenhouse gas reduction strategies. The inventory has been used to identify the largest GHG emissions by Major Subordinate Commands (MSCs) (e.g. HQ, Division, District, Laboratory and Center), project types (e.g., Locks and Dams, recreation centers, laboratories, and pumping plants), individual Projects, and greenhouse gas emission source types (e.g., office buildings, pumps, laboratories, vehicles, commuting, and travel). USACE is using this information to focus emission reduction efforts on the areas of most concern and potential for reduction.

g. Return on Investment

As discussed under Goal 1 Implementation Methods, USACE set-aside $10M in FY12 for investments in sustainability, with specific emphasis on Goals 1-4. The $10M set-aside will be allocated to Civil Works project-level requirements through a centrally administered competitive process that leverages cost sharing and the on-going FY13 budget build to identify and fund resource efficiency investments that can be substantially executed in FY12. The overall process is referred to as the Climate Change Mitigation Challenge (CCMC). Although the types and numbers of projects actually selected and funded through the $10M CCMC in FY12 is not known as of the date of the SP, one of the key evaluation criteria is rate of return in terms of dollars invested per BTU reduction in energy use. Following execution of the FY12 budget and evaluation of FY13 energy and water consumption data, USACE anticipates it will be in a better position to address return on investment in a quantitative manner.

IId. Goal 3: High-Performance Sustainable Design/Green Buildings & Regional Planning and Local Planning

a. Goal Description

EO 13514 §2(g)(i): Beginning in FY20 and thereafter, ensures that all new Federal buildings that enter the planning process are designed to achieve zero-net-energy by FY30.

EO 13514 §2(g)(ii): Ensure all new construction, major renovation, or repair and alteration complies with the *Guiding Principles*.

EO 13514 §2(g)(iii): Ensure 15% of existing facilities and building leases (above 5000 gross sq ft) meet the *Guiding Principles* by FY15 and that the agency makes annual progress towards 100% conformance with the Guiding Principles for its building inventory.

EO 13514 §2(g)(iv): Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.

EO 13514 §2(g)(v): Manage existing building systems to reduce the consumption of energy, water, and materials, and identify alternatives to renovation that reduce existing assets' deferred maintenance costs.

EO 13514 §2(g)(vi): Optimize the performance of the agency's real property portfolio and reduce associated environmental impacts.

EO 13514 §2(g)(vii): Ensure the rehabilitation of Federally owned historic buildings uses best practices and technologies in retrofitting to promote long-term viability of the buildings.

EO 13514 §2(f)(i): Participate in regional transportation planning and recognize existing community transportation infrastructure.

EO 13514 §2(f)(ii): Align Federal policies to increase effectiveness of local energy planning for energy choices such as locally generated renewable energy.

EO 13514 §2(f)(iii): Ensure that planning for new Federal facilities or new leases includes consideration of sites that are pedestrian friendly, near existing employment centers, and accessible to public transit, and emphasizes existing central cities, and, in rural communities, existing or planned town centers.

EO 13514 §2(f)(iv): Identify and analyze impacts from energy usage and alternative energy sources in all Environmental Impact Statements and Environmental Assessments for proposals for new or expanded Federal facilities under the National Environmental Policy Act.

EO 13514 §2(f)(v): Coordinate with regional programs for Federal, State, Tribal and local ecosystem, watershed, and environmental management.

b. USACE Lead Organization(s)

Planning and Policy Division (CECW-P); Engineering & Construction CoP (CECW-CE); Real Estate CoP; Directorate of Logistics (CELD-ZA)

c. Implementation Methods

High-Performance Sustainable Design/Green Buildings

(a) USACE is committed to taking the actions necessary to be prepared by FY2020 to ensure that all new buildings that enter the planning process are designed to achieve zero net-energy by 2030. As part of this, USACE will use cost-effective, innovative building and sustainable landscape strategies to minimize energy, water and materials consumption. Sustainable building designs are already in USACE design guides for all military construction. In FY11, USACE is working to issue a sustainable buildings policy for USACE-owned facilities that is designed to incorporate similar sustainability requirements into new construction and major renovation of USACE facilities. The current draft of the policy requires attainment of LEED silver (or better) ratings for new construction, and compliance with the "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings" (Guiding Principles). USACE plans to resume energy and water evaluations of its Covered Facilities early in FY12 once appropriate funding is received. As part of these evaluations, USACE will document the degree to which target buildings (those greater than 5,000 GSF) at USACE facilities meet the Guiding Principles. Using the

annual Sustainability Plan update, USACE will document conformance of its inventory of target buildings to the Guiding Principles by 2015.

(b) With respect to operating and maintaining existing building systems to reduce energy, water and materials consumption in a manner that achieves a net reduction in agency deferred maintenance cost, this too will become standard practice within USACE. As discussed in Section V.e. Operations and Maintenance Deferred Investments, USACE has significant challenges to address in the prioritization and funding of O&M investments in its facilities.

Through the USACE Real Estate function, the Corps acquires, manages and disposes of real estate for the Department of the Army; executes DoD Executive Agent responsibilities; provides real estate services on an as-needed basis to our government Partners; and performs unique contingency capabilities. The USACE Real Estate function is an important lynchpin in ensuring that sustainable building operations and maintenance practices are integrated into new Federal facilities and leases, and into lease renewal strategies; that the USACE Real Estate portfolio is optimized by disposing and consolidating excess and underutilized property, co-locating field offices, and consolidating across metropolitan and regional locations. To ensure these actions are being taken, the HQUSACE Sustainability POCs are working with the Chiefs, ECoP and Real Estate to fully integrate sustainability requirements into USACE Real Estate policy and planning. USACE is already striving to reduce office space and facility energy needs by facilitating telework opportunities (reference Scope 3 green house gas) and making teleconferencing capabilities available to all who need them.

Regional and Local Planning

USACE continues to emphasize collaboration with regional and local interests regarding programs for ecosystems, watershed, and environmental management. Since last year, the Civil Works Directorate completed a comprehensive review of existing guidance that identified where revisions were necessary to incorporate EO13514. The necessary revisions are on schedule to be completed by mid-2012. With regard to other elements of this goal, within its existing authorities, USACE will participate in regional transportation planning and local energy planning initiatives.

The Civil Works Directorate foresees further changes to its policy and guidance to correspond with the forthcoming revisions to “Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies” and the related Principles and Requirements Additionally, the requirements of this Executive Order and, when finalized, CEQ’s proposed NEPA “Guidance on Consideration of the Effects of Climate Change and Green House Gas Emissions” are being incorporated into our Planning Guidance Notebook (ER 1105-2-100) and other policy guidance.

As part of its Campaign Plan, USACE has committed to collaboration with partners and stakeholders to find holistic and sustainable solutions to water resources needs. Within Civil Works, the overarching strategy is Integrated Water Resources Management (IWRM), which focuses on water resource challenges and opportunities that reflect coordinated development and management of water, land,

and related resources. At the same time, IWRM optimizes both economic services and environmental quality, ensures public safety, and provides for the sustainability of their associated ecosystems. Compliance with this executive order is consistent with this commitment. To meet this goal, USACE will use a systems approach. For larger studies and projects, this means that w ater resources planning and management should be watershed, in scale, using systems analysis methods and tools. Regional transportation will be considered and addressed in the study and environmental compliance documentation as appropriate as part of the integrated water resources management approach during planning efforts. However, all of these concepts and goals must be understood within the reality that the Civil Works program is limited to individual studies and projects; only as authorized and funded by Congress.

Similar to other Federal agencies, USACE participates in Federal and local programs that encourage the use of mass transit and alternate means of transportation such as bicycles. It promotes teleworking arrangements for its employees (see discussion in Goal 2). It also considers the effects of project locations on transportation as part of the planning process for new facilities.

Currently, there is also no direct Congressional authority for participation in local energy planning, but as with transportation planning, utilization of alternative energy technologies will be considered as part of integrated water resources management, especially hydropower options.

With respect to ensuring coordination and consultation with Federal, State, Tribal and local management authorities regarding impacts of new or expanded USACE facilities on local ecosystems, watersheds and environmental management, it is USACE long-standing policy to do so with all of these parties. As an example of USACE efforts to work in coordination and consultation with Tribal authorities, USACE recently affirmed its legal responsibility to engage in pre-decisional consultation with federally recognized Tribes.

The USACE is integrally involved in several regional and national partnerships that focus on environmental restoration and natural resource stewardship. These partnerships depend upon transparent communications and rely on partnerships with local communities, and state and federal leaders. One example of a regional partnership is the Chesapeake Bay Restoration efforts. Another is partnership for the Comprehensive Everglades Restoration Plan (CERP). In both examples, the federal government, state and local authorities are joining together for some of the largest environmental restoration efforts in history. Both examples involve the Corps working with others to restore wetlands to valuable natural landscape.

d. Positions

Most of the revisions to Civil Works policy and guidance will be accomplished by existing staff.

e. Planning Table

Table 2-3 Goal 3 Planning Table

SUSTAINABLE HIGH PERFORMANCE BUILDINGS (Buildings Meeting Guiding Principles)	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	…	FY 20
Owned Buildings	%	0	2	4	8	12	15	…	25
FRPP-Reported Leased Buildings	%	0	2	4	8	12	15	…	25
Total Buildings	%	0	2	4	8	12	15	…	25
REGIONAL AND LOCAL PLANNING									
Other, as defined by agency	n/a	n/a	n/a	n/a	n/a	n/a	n/a	…	n/a

f. Status

Collaboration is ongoing and already included in guidance. The review to determine what additional changes to guidance are required will commence later this fiscal year.

g. Return on Investment

As discussed under Goal 1 Implementation Methods, USACE set aside $10M in FY12 for investments in sustainability with specific emphasis on Goals 1-4. The $10M set-aside will be allocated to Civil Works project-level requirements through a centrally administered competitive process that leverages cost sharing and the on-going FY13 budget build to identify and fund resource efficiency investments that can be substantially executed in FY12. The overall process is referred to as the Climate Change Mitigation Challenge (CCMC). Although the types and numbers of projects actually selected and funded through the $10M CCMC in FY12 is not known as of the date of the SP, one of the key evaluation criteria is rate of return in terms of dollars invested per BTU reduction in energy use. Following execution of the FY12 budget and evaluation of FY13 energy and water efficiency consumption data, USACE anticipates it will be in a better position to quantitatively address return on investment.

h. Highlights

- Everglades - our partnership is adding 55,000 acres of habitat to the Everglades system.
- Chesapeake Bay –habitat improvement, wetlands creation, Poplar Island, Oyster Bed restoration eastern shore.
- NRCS Mississippi Valley Partnership – looking at reducing nutrient sediment flow caused by human development;
- Sacramento River Delta – improving wetlands and habitat and removal of salt ponds.

IIe. Goal 4: Water Use Efficiency and Management

a. Goal Description

EO 13514 §2(d)(i): Reduce potable water use intensity by 2 percent annually through FY20, or 26% by the end of FY20 (baseline FY07).

EO 13514 §2(d)(ii): Reduce industrial, landscaping, and agricultural water consumption by 2% annually or 20% by the end of FY20 (baseline FY10).

EO 13514 §2(d)(iii): Consistent with State law, identify, promote, and implement water reuse strategies that reduce potable water consumption.

EO 13514 §2(d)(iv): Implement and achieve the objectives identified in the Environmental Protection Agency's stormwater management guidance.

FY11-12 Sustainability Plan Template §4.e: Incorporate appropriate reduction strategies for non-potable water use into agency policy and planning.

b. USACE Lead Organization(s)

Civil Works Operations Division (CECW-CO), Directorate of Research & Development (CERD-ZB), Directorate of Logistics (CELD-ZA).

c. Implementation Methods

Because USACE has limited direct operational control over visitor activities in our campgrounds, day use facilities, and lands and waters, visitor activities will be excluded from each of the GHG emission targets. Associated facility-based GHG emissions will be reported as part of its Comprehensive GHG Inventory. USACE is committed to providing quality recreation facilities and services to accommodate the needs of our visitors. Accordingly, the Sustainability Plan (SP) includes initiatives to improve energy, water, and petroleum efficiency at recreation facilities and positively influence visitors to support sustainable practices.

As discussed under Goal 1, USACE has developed a number of management tools and other enablers to accelerate progress toward its sustainability goals. First and foremost is the USACE leadership decision to set-aside $10M in the FY12 Civil Works O&M portion of the President's Budget specifically for investments in energy, water, petroleum and greenhouse gas reduction. The overarching program is entitled, "Sustainability and Energy." The Sustainability and Energy Program is intended to improve energy, water and petroleum efficiency at USACE facilities and in the USACE NTV fleet, and to positively influence USACE employees, contractors and visitors to support sustainable practices. USACE leadership chose to set-aside $10M in the FY12 President's Budget to jump-start the Sustainability and Energy Program (Please refer to Goal 1, Implementation Methods, for additional background on the Sustainability and Energy Program and the $10M FY12 set-aside). While the types and numbers of projects actually selected and funded through the $10M CCMC in FY12 is not known as of the date of the SP, the competitive selection process will emphasize FEMP goal subject energy and water efficiency as

well as petroleum reduction in the NTV fleet and the USACE vessel fleet. USACE estimates the $10M set-aside coupled with cost-share funds contributed by the competing facilities should enable measurable progress toward its FY12 incremental water reduction target of 3% of goal subject potable water consumption.

Along with the FY12 CCMC, USACE has expanded and improved the sustainability content of its FY13 Civil Works budget development guidance. USACE Civil Works budget development guidance now includes data requirements to support quantification of the sustainability benefits of individual budget packages such as reductions in energy and water consumption and greenhouse gas emissions. Coupled with the new data requirements for sustainability and energy budget packages, HQ USACE established early in FY11 centralized access to facility energy and water consumption data for FY08 and FY10 to assist USACE organizations in identifying, quantifying and budgeting for energy and water efficiency opportunities.

Projected costs for improvements in water use efficiency are included in the Goal 1 and Goal 3 Planning Tables as an integral part of consolidated O&M requirements for energy and water efficiency and compliance with the Guiding Principles.

Water Consumption

An important part of the USACE approach to reducing potable water use by facilities will be through the high performance building requirements of EO 13514, including:

- Complying with the Guiding Principles for all new construction and major renovation of buildings
- Working toward the Federal goal of having at least 15% of DoD's existing buildings and building leases over 5000 sq ft meet the Guiding Principles (or a third-party certification system) by FY15
- Demonstrating annual progress toward 100% conformance with the Guiding Principles (or a third-party certification system) for the entire building inventory
- Operating, maintaining, and managing facilities to reduce water consumption.

One of the main avenues by which USACE envisions meeting Goal 4 is through implementing water efficiency programs that install water efficient toilets and urinals, low-flow faucets and showerheads, as well as other water use controls appropriate for facilities used by USACE personnel and visitors to USACE facilities. In FY12, USACE will work to continue a series of facility energy and water evaluations that it initiated in FY10, but was temporarily suspended in FY11 due to lack of funding. These energy and water evaluations, as required by DOE guidance issued pursuant to 42 USC 8253(f)(2) and (3), will be designed to characterize in detail USACE facility water consumption characteristics. The set of facilities targeted inn FY12 will be USACE-designated Covered Facilities. One outcome of these studies will be a set of practices to improve water efficiency at USACE facilities. USACE will establish an environmental management program within the USACE environmental management system to track implementation of appropriate subsets of these practices across USACE facilities. USACE will also look closely at water

consumption at its Covered Facilities for larger, facility-specific or mission-unique water efficiency opportunities.

Another path to assist in achieving Goal 4 is to substitute non-potable, reclaimed, or rainwater for needs currently being met with potable water, especially landscaping and industrial uses. Reclaimed water is defined as previously used water that has been processed with at least a secondary level of wastewater treatment to produce high quality though not potable water. USACE will consider opportunities for water reuse in wastewater treatment systems it operates, and we will look into options for storage and use of rainwater in ways that simultaneously enable reductions in potable water use and compliance with the requirements of EISA §438 requirements.

Storm Water Runoff Management

Reducing the impacts of storm water runoff associated with new development and re-development helps to protect and sustain our water resources. In October 2004, the DoD issued Unified Facilities Criteria on Low Impact Development (LID) (UFC 3-210-10), a storm water management strategy designed to maintain the hydrologic functions of a site and to mitigate the adverse impacts of storm water runoff from DoD construction projects. In December 2007, Congress passed the Energy Independence and Security Act (EISA). Section 438 of the Act sets forth specific storm water management requirements for Federal development and re-development projects. It requires that any Federal entity sponsoring development or re-development of 5000 square feet or more "… shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

In December 2009, EPA's Office of Water prepared Section 438 Technical Guidance on Implementing the Storm water Runoff Requirements for Federal Projects under Section 438. EPA developed this guidance based on knowledge gathered over the past 20 years of study on the effectiveness of conventional approaches to storm water quantity and quality management. That knowledge led to the conclusion that, "… conventional approaches to control runoff are not fully adequate to protect the nation's water resources" (National Research Council 2008). EPA guidance states: "Implementation of Section 438 of the EISA can be achieved through the use of the green infrastructure/low impact development (GI/LID) infrastructure tools described in this guidance."

The balancing of potential added cost for more-sustainable design/re-design and construction against decreased long-term operating costs and future sustainability goals is one of the agency challenges presented in Section I of this Plan.

USACE plans to partner with EPA, OSD, and the Military Departments in the development of general awareness and specialized storm water training. The general awareness training will be broadly disseminated and the specialized training will be required construction training for, planners, engineers, architects, inspectors, contract managers, and related personnel. Using this training, USACE will develop or update storm water management related policies for USACE owned and operated facilities, as well as

services (such as Engineering and Construction) provided by USACE to its customers. USACE will also work with OSD and the Military Departments to revise the 2004 Unified Facilities Criteria (UFC) 3-210-10 on Low Impact Development (LID) to reflect recent DoD storm water policy and incorporate EPA's recent Technical Guidance design requirements for the use of GI and LID to manage the quantity and quality of storm water. In addition, USACE will continue working with EPA and other Federal agencies to incorporate storm water management requirements on Federal lands in the Chesapeake Bay watershed into the Federal Coordinated Strategy as required under EO 13508, Chesapeake Bay Protection and Restoration (2009).

d. Positions

We believe two full-time facility energy/water manager positions are required for HQUSACE based on application of criteria (one energy manager per 5 million GSF) cited in the FEMP Facility Energy Management Guidelines and Criteria for Energy and Water Evaluations in Covered Facilities, 25 November 2008.

e. Planning Table

Table 2-4 Goal 4 Planning Table

WATER USE EFFICIENCY & MGMT	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	….	FY 20
Potable Water Reduction Targets (gal/sq ft reduction from FY07 base year)	%	6	8	10	12	14	16	….	26
Planned Potable Water Reduction (gal/SF reduced from FY07 base year)	%	-5.8	5	7	9	12	16	…	26
Industrial, Landscaping, and Agricultural Water Reduction Targets (gal reduced from FY10 base year)	%	-	2	4	6	8	10	….	20
Planned Industrial, Landscaping, and Agricultural Water Reduction (gal reduced from FY10 base year)	%	-	2	4	6	8	10		20

f. Status

Water Consumption Intensity - Scorecard Status: RED

In FY10-11, USACE developed tools and procedures to improve and standardize its facility water consumption data (as well as energy and petroleum consumption data), and implemented the tools and procedures using an official Operations Order (OPORD 2010-71) dated 25 Oct 2010. The primary tool used in facility-level data gathering was a spreadsheet that USACE developed by adapting and expanding the July 2010 version of the FEMP electricity tool. The USACE tool is referred as the CRAFT, "Corps of Engineers Refined and Abridged FEMP Tool". The USACE CRAFT was developed centrally, tested, and made available to the field via a SharePoint site. OPORD 2010-71 initiated the data call for facility-level energy, water and petroleum consumption, and MSC commanders and their staffs directed a standardized and comprehensive data call for FY08 and FY10 consumption. All data was up-loaded to a

central FTP site, and then rolled-up, subjected to QA/QC, refined, and stored in a database that supports Corps-wide access to facility, District, and MSC-level energy, water and petroleum consumption data. One of USACE's most fundamental accomplishments in FY10-11 was refining and finalizing the USACE facility energy and water intensity baselines. USACE did this by evaluating and revising the legacy baseline data discussed in the FY10 SSPP. The resulting baseline data reported to DoE FEMP in April 2011 included an FY07 potable water intensity baseline of 42.2 gallons/gross square foot. Relative to this baseline, USACE overall progress toward the FY2020 26% reduction was -5.8% at the end of FY10, i.e., USACE potable water intensity in FY10 was 5.8% higher than it was in the baseline year of FY07. USACE faces a significant challenge (roughly 12%) in catching-up with the Federal requirement for a 2% per year reduction in potable water intensity, which puts the FY10 interim Federal target at 6% reduction. USACE's plan for accelerating progress toward this goal is discussed under Goal 4, Implementation Methods, above.

For industrial and irrigation uses of water, FY10 was the first year that USACE facilities were asked to collect and submit this data. The initial data received through the CRAFT data call indicates USACE consumption of non-potable water in FY10 was 4,755,868,488 gallons; however, the nature and magnitude of mission activities that comprise this consumption total are not sufficiently documented to enable high-level assessment of reduction requirements or opportunities. Characterization of USACE water usage and management practices, and identification of water management issues, remains an area of emphasis for FY11-12. As was the case with potable water, some USACE facilities with irrigation and industrial water usage report water metering issues that make separate reporting of potable and irrigation/industrial water usage difficult.

Storm Water Runoff Management

The USACE plan for Sub-goal 6.d is to plan, design, and execute development and redevelopment construction projects in accordance with DoD policy memo, DoD Implementation of Storm Water Requirements under Section 438 of the Energy Independence and Security Act *(EISA)*, which was issued by DUSD (I&E) in January 2010 and the EPA Technical Guidance for Stormwater Runoff Requirements for Federal Projects under Section 438 of EISA, December 2009. The overall design objective for each project is to maintain predevelopment hydrology, prevent any net increase in storm water runoff, and manage the negative impacts to the natural water balance resulting from site development. The DoD defines "predevelopment hydrology" as the pre-project hydrologic conditions of temperature, rate, volume, and duration of storm water flow from the project site. EPA characterizes the consequences of site development impacts as: (1) increased volume of runoff, (2) increased peak flow of runoff, (3) increased duration of discharge, (4) increased pollutant loadings, and (5) increased temperature of runoff.

These provisions will be implemented in projects in the planning and pre-implementation phase where the nature of the project allows it to be added.

USACE responded to EO 13508, Chesapeake Bay Protection and Restoration (2009) with a regional CW perspective that aligned comprehensive watershed restoration planning efforts and integrated water resource management projects with the goals of the Executive Order. The watershed plans were developed in collaboration with Federal, State, local government and stakeholder groups and identified the full array of actions needed to achieve restoration objectives.

g. Return on Investment. To date USACE has very little quantitative information from USACE facilities regarding return on investment for Goal 4. The lack of quantitative information results largely from the fact that sustainability and energy requirements were not built into FY11 USACE budget development guidance; accordingly, no funding has been identified for the associated water efficiency requirements. Although the FY10 SP Goal 1 Planning Table (which included facility-level projected investments in both energy and water efficiency) identified an FY11 total of $59.4M, this requirement remained unfunded in FY11.

g. Highlights

- Established the USACE FY07 potable water baseline. USACE did this by evaluating and revising the legacy baseline data discussed in the FY10 SSPP against the more complete and accurate data submitted in USACE CRAFT sheets (as discussed above) for FY08-10. The result was a FY07 potable water intensity baseline of 42.2 gallons/gross square foot.
- Documented the first-ever Corps-wide set of facility-level of data on non-potable industrial/irrigation/agricultural water use in FY10, totaling 4,755,868,488 gallons. The information gathering this year provides a foundation for understanding and improving USACE performance relative to the new Federal metric for 20% reduction by FY2020.

IIf. Goal 5: Pollution Prevention and Waste Reduction

a. Goal Description

EO 13514 §2(e)(i): Minimize the generation of waste and pollutants through source reduction.

EO 13514 §2(e)(ii): Divert at least 50% of nonhazardous solid waste, excluding construction and demolition debris, by the end of FY15.

EO 13514 §2(e)(iii)): Divert at least 50% of construction and demolition materials and debris by the end of FY15.

EO 13514 §2(e)(iv): Reduce printing paper use and increase use of uncoated printing and writing paper containing at least 30% postconsumer fiber.

EO 13514 §2(e)(v)): Reduce and minimize the acquisition, use, and disposal of hazardous chemicals and materials.

EO 13514 §2(e)(vi): Increase diversion of compostable and organic material from the waste stream.

EO 13514 §2(e)(vii)): Implement integrated pest management and other appropriate landscape management practices to reduce and eliminate the use of toxic and hazardous chemicals and materials.

EO 13514 §2(e)(viii)): Increase agency use of acceptable alternative chemicals and processes.

EO 13514 §2(e)(ix): Decrease agency use of chemicals where such decrease will assist the agency in achieving greenhouse gas emission reduction targets under section 2(a) and (b) of this order.

EO 13513514 §2(e)(x): Report in accordance with Section (301-313) of the requirements of sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (42 U.S.C. 11001 et seq.)

b. USACE Lead Organization(s)

Civil Works Operations Division (CECW-CO), Directorate of Engineering and Construction (CECW-CE), Directorate of Information Management and Directorate of Logistics (CELD-ZA)

c. Implementation Methods

As a recreation provider, USACE is committed to ensuring quality facilities and services to accommodate the needs of our visitors. In terms of direct control over visitor behavior with respect to solid waste generation at our campground and day use facilities, however, USACE has limited direct operational control. As such, USACE has chosen to exclude solid waste generation by visitors to recreation facilities from the targets associated with this goal. The USACE SP will, however, include initiatives to positively influence visitors to support sustainable practices and improve solid waste generation, management and diversion at recreation facilities. USACE is also moving to define and implement a Corps-wide solid waste management and diversion policy by benchmarking with DoD components and other Federal agencies. Tools such as the Tri-Services Pollution Prevention Opportunities Software have potential applicability in solid waste management at Civil Works facilities and are under review as USACE strives to achieve solid waste reduction and diversion goals.

Solid Waste Generation and Recycling at USACE Facilities and at USACE Recreation Facilities

USACE made very limited progress with respect to solid waste and recycling initiatives to achieve the EO 13514 goal of diverting 50% of its nonhazardous solid waste (excluding construction and demolition debris) by the end of 2015. Progress was limited to an initial survey conducted to identify solid waste practices at Corps owned facilities, but no estimates of solid waste generation rates was obtained. The survey of practices for solid waste management at Corps owned facilities did find that the solid waste practices are mainly that of collection, compaction and land filling of the solid waste. Collection of separate waste streams such as metal and concrete are limited. Recommendations for improvement that drawn from the survey include:

- Work with contractors and concessionaires to leverage the existing, and expand where possible, capability of handling separated waste streams and directing recyclable materials to the appropriate recycler.

- Quantify solid waste by weight (rather than volume) where the capability exists, in order to better align with SP program units of measure.
- Establish multiple waste-stream collection points at appropriate locations within USACE facilities along with appropriate signage.
- Provide informational brochures at ranger stations or camping ground entrances regarding solid waste management and recycling options.
- Use visitor contact with Rangers and other Corps personnel as opportunities to advocate for recycling and other sustainable practices.
- Continue to encourage and enable campers and visitors to reduce solid waste generation and increase recycling.

The USACE general approach to improving its solid waste management and diversion performance will be to establish first the capability to quantify solid waste generation at large, centralized facilities such as Corps-owned District HQ complexes and laboratory facilities. Building on lessons-learned at these initial facilities, USACE will work to improve solid waste management and diversion capabilities at other USACE facilities, beginning generally with larger USACE industrial and recreation facilities where the local community and business infrastructure is available to support waste quantification and diversion. As solid waste disposal and recycling contracts come up for renewal, USACE facilities will strive once again, where practicable and cost effective, to include in new contracts requirements specifying quantification (by weight) of solid waste generation and recycling rates. USACE will establish within its environmental management system a mechanism to track the implementation of sustainable solid waste management practices as well as performance of solid waste reduction and recycling programs. In accordance with the requirements of Public Law 104-52, Section 608, USACE will also implement programs to recover and sell recyclable materials from waste streams and to receive and use the resulting funds for statutorily authorized purposes such as pollution prevention, waste reduction, and other programs as authorized by the head of the agency.

Reducing Use of Paper

No solid waste reduction effort can be successful without addressing paper, which on average accounts for more than 60% of office waste. HQ USACE issued a policy, dated November 18 2010, establishing reduction of paper as a priority and directing all USACE organizations to implement practices for minimizing the use of paper. The USACE CIO enabled the automatic duplexing capability in printers as a default setting. Behavioral changes take time, so these strategies need to be reinforced throughout USACE to ensure consistent implementation.

In situations where multiple copies of large reports are still required, it may be more efficient to have a minimum number of hard copies printed along with electronic copies on DVD+RW. Moving to electronic copies DVD-RW would be especially helpful to people who telework and find carrying hard copies of multiple feasibility studies, for example, an inconvenience.

Diversion of Construction and Demolition Debris

USACE is committed to initiate solid waste and recycling initiatives to achieve the EO 13514 goal of diverting 50% of construction and demolition materials and debris by the end of 2015. To achieve this, USACE will establish within its environmental management system a mechanism to track the implementation and performance of sustainable solid waste management practices within construction and demolition activities at USACE facilities and at facilities where USACE is providing engineering and construction services to its customers. USACE will benchmark with DoD components and other Federal agencies to identify and adapt best practices to advance USACE progress toward the goal of 50% C&D waste diversion at appropriate USACE facilities. Additionally, a key component of planning charrettes for new construction needs to be the consideration of reuse of any of demolition material. Doors, windows, and plumbing fixtures usually have some reuse capability. Planning charrettes should also ensure that contracting experts on the Project Delivery Team consider the use of small business recycling contractors to achieve the 50% diversion. DoD and other relevant Federal agency training programs incorporating recycling (contractors) into contract acquisition can be adapted for facilities owned and operated by USACE.

d. Positions

USACE is striving to institute goal requirements through by instituting business process changes and training existing staff in these changes. No additional staff requirements are anticipated.

e. Planning Table

Table 2-5 Goal 5 Planning Table

Pollution Prevention & Waste Elimination	Units	FY10	FY11	FY12	FY13	FY14	FY15	----	FY20
Non-Hazardous Solid Waste Diversion Targets (non C&D)	%	0	10	20	30	40	50	-----	50
C&D Material & Debris Diversion Targets	%	0	1 0	20	30	40	50	-----	50
Waste to energy estimated total weight	tons	0	0	0	0	0	0	-----	0
Number of sites with on-site composting programs	#	n/a	n/a	TBD	TBD	TBD	TBD	-----	TBD
Number of sites recycling through off-site recycling programs	#	TBD	TBD	TBD	TBD	TBD	TBD	-----	TBD
Estimated total weight of materials diverted to recycling programs	tons	n/a	n/a	n/a	n/a	n/a	n/a	-----	n/a
% of agency-operated sites with a recycling program	%	n/a	n/a	n/a	n/a	n/a	n/a	-----	n/a
% of buildings that have recycling programs and are multi-tenant bldgs.	%	n/a	n/a	n/a	n/a	n/a	n/a	-----	n/a
% of USACE-operated residential housing with recycling programs	%	n/a	n/a	n/a	n/a	n/a	n/a	-----	n/a

f. Agency Status

Very limited progress has been made with respect to solid waste quantification and diversion at Corps-owned facilities, including recreation facilities. The specifics of USACE's next steps are identified in previous paragraphs. With respect to diversion of C&D (construction and demolition) materials, USACE already has policy and programs in place to divert C&D (construction and demolition) materials within its Military Program construction mission and, under them construction debris is routinely segregated, measured, and diverted to commercial recycling facilities or reconstituted for use on the construction site. Within its Civil Works program, however, USACE has no formal policy in place to divert C&D debris and will be moving quickly to adapt appropriate diversion policies to meet the needs of facilities owned and operated by USACE.

With respect to pollution prevention, USACE is moving to adapt the Tri-Services Pollution Prevention Opportunities Software to its Civil Works operations. The latter is anticipated to be a useful evaluation of various USACE waste-generating activities, such as the floating plant service centers.

g. Return on Investment

No specific ROI metrics have been established yet because USACE is in the early stages of implementing projects and initiatives in the areas of pollution prevention and solid waste.

h. Highlights

A significant challenge for USACE in achieving reductions in solid waste generation, increasing in solid waste diversion and in efforts to reduce pollution is the cultural change needed to ensure all members of the USACE team know the principles of sustainability. Thus, all communities of practices within USACE need to be engaged in education and training for sustainability.

IIg. Goal 6: Sustainable Acquisition

a. Goal Description

a. Ensure 95% of new contract actions, including task and delivery orders under new contracts and existing contracts, require the supply or use of products and services that are energy efficient (Energy Star or FEMP-designated), water efficient, bio-based, environmentally preferable (excluding EPEAT-registered products), non-ozone depleting, contain recycled content, or are non-toxic or less toxic alternatives.
b. Update agency affirmative procurement plans (also known as green purchasing plans or environmentally preferable purchasing plans), policies and programs to ensure that all mandated Federally-designated products and services are included in all relevant acquisitions.

b. USACE Lead Organization(s)

National Contracting Organization (CECT), Military Programs (CEMP), and Civil Works (CECW)

c. Implementation Methods

Policies, Procedures and Guidance

By the end of FY12, USACE will issue a green procurement policy addressing all Federal sustainable acquisition and green procurement requirements. This policy will be developed by a multi-functional HQ-level team. The policy will establish USACE processes for ensuring that sustainability requirements are considered early in the acquisition life cycle, during requirements definition, and are incorporated into the contracts statement of work/specifications, the appropriate solicitation and contract provisions and clauses are included, verification that the products or services delivered meet the sustainability requirements, and that the contract action is appropriately reported as sustainable in the GSA's Federal Procurement Data System – Next Generation (once the system has been updated to allow such reporting). It will set forth the roles and responsibilities of both the requirements community (Program/Project Managers, Engineering, Construction, etc.) and the contracting community regarding sustainable acquisition. The policy will set forth recommended or required training for USACE acquisition personnel to include but not limited to: Program/Project Managers, Contracting Officers and Specialists, Contracting Officers Representatives, Specifications Writers, and Government-wide commercial purchase card holders. The policy will set forth the oversight framework to monitor and report sustainable acquisition compliance.

Training

USACE provides federal procurement and contractor purchasing staff with substantial training and guidance on the Federal Acquisition Regulation. By the end of FY12, USACE plans to require training on green acquisition by way of such sites as the U.S. EPA's Environmentally Preferable Purchasing Training site. Additionally, within USACE Acquisition community of practice website, green acquisition information will receive prominent placement. Corresponding green acquisition information will be provided to the functional areas that rely on acquisition for inclusion on their websites and in their guidance so they are knowledgeable of the sustainable acquisition mandates.

d. Positions

At this time, there is no reliable process to determine how many personnel will be required to meet this goal.

e. Planning Table

Table 2-6 Goal 6 Planning Table

SUSTAINABLE ACQUISITION	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	…	FY 20
New Contract Actions Meeting Sustainable Acquisition Requirements	%	0	95	hold	hold	hold	hold	hold	hold
Energy Efficient Products (Energy Star, FEMP-designated, and low standby power devices)	%	TBD once a federal measurement system is available.							
Water Efficient Products	%								
Biobased Products	%								

Recycled Content Products	%
Environmentally Preferable Products/Services (excluding EPEAT – EPEAT in included in Goal 7)	%
SNAP/non-ozone depleting substances	%

Table 2-7 Acquisition Contracts

SUSTAINABLE ACQUISITION CONTRACT REVIEW	1st QTR FY 11	2nd QTR FY 11	3rd QTR FY 11 (Planned)	4th QTR FY 11 (Planned)
Total # Agency Contracts	15,982	22,420	24,779	41,174
Total # Contracts Eligible for Review	799	1,121	1,239	2,059
Total Contracts Eligible Contract Reviewed (i.e., 5% or more eligible based on previous OMB guidance)	0	0	0	TBD
# of Compliant Contracts	Unknown	Unknown	Unknown	Unknown
Total % of Compliant Contracts	Unknown	Unknown	Unknown	Unknown

f. Status

USACE is in the process of forming a multi-functional HQ level team to develop and issue the USACE policy described above under Paragraph C - Implementation Methods by the end of FY12. One challenge to creating internal USACE policy is that the requirements of Executive Order 13514 have yet to be integrated into the Federal Acquisition Regulation (FAR). FAR Case 2010-001, a proposed change to the FAR for compliance with EO 13514, is still pending.

USACE does not have metrics or reporting processes in place to track agency status and progress against the 95% sustainable acquisition goal. The current system used to track and report most contract related data, the Federal Procurement Data System – Next Generation (FPDS-NG), does not have the capability to track and report these sustainability metrics. FPDS-NG is a Federal government-wide system managed by the General Services Administration. The GSA, as part of their FY2010 Strategic Sustainability Performance Plan, has stated that by September 30, 2011, GSA, in coordination with the FPDS Change Control Board and other Federal partners, will update FPDS-NG to include new PSC Codes, will develop special FPDS Sustainability Reports, and will provide training to the government-wide acquisition workforce. Once these updates are made USACE will be able to establish a baseline of non-compliant acquisitions for calculating performance against the 95% goal.

Until these updates are made, the only alternative to track and report compliance with the 95% sustainable acquisition goal would be a manual review process involving personnel from the requirements community (Program/Project Management, Engineering, Construction, Operations, etc.) and the contracting community conducting a physical review of the contracts to determine if applicable sustainability requirements were incorporated into the statement of work/specifications and that the appropriate contract clauses were included. Based on current projections for FY11 to meet or exceed the 5% review requirement, over 5,200 contract actions will have to be reviewed manually. Given this volume of contract actions, it is not feasible to conduct manual reviews of greater than 5% of all contract actions. In the 4th Quarter of FY11 USACE will manually examine a sample of 4th Quarter contract actions for compliance with sustainability requirements. The sampling methodology is still being developed, however, the sample size will be considerably smaller than the 5% review requirement.

g. Return on Investment

At a HQ level, USACE identified no specific investment of funds in sustainable acquisition, and USACE has no direct, automated means to quantify investments made by the Major Subordinate Commands at this point in time. Therefore, USACE has no basis on which to quantify return on investment for sustainable acquisition.

h. Highlights

The USACE Engineering and Support Center, Huntsville (HNC), through its Centralized Furnishings Program in FY10 evaluated Federal requirements for sustainable products. The Centralized Furnishings Program office then implemented the requirements in the performance specifications issued as part of each solicitation for administrative and barracks furnishings, fixtures and equipment procurement. In so doing, the Centralized Furnishings Program "greened" its solicitation documents to incorporate higher standards for reducing VOC content, adding certifications and testing requirements for sustainable materials (steel, wood, fabrics, and manufactured products), specifying energy efficient appliances and fixtures, and requesting bio-based content in more of its projects.

IIh. Goal 7: Electronic Stewardship and Data Centers

a. Goal Description

EO 13514 §2(i)(i): Ensure procurement preference for EPEAT-registered electronic products.

EO 13514 §2(i)(ii): Establish and implement policies to enable power management, duplex printing, and other energy-efficient or environmentally preferable features on all eligible agency electronic products.

EO 13514 §2(i)(iii): Employ environmentally sound practices with respect to the agency's disposition of all agency excess or surplus electronic products.

EO 13514 §2(i)(iv): Ensure the procurement of Energy Star and FEMP designated electronic equipment.

EO 13514 §2(i)(v): Implement best management practices for energy-efficient management of servers and Federal data centers.

b. USACE Lead Organization(s)

Directorate of Corporate Information (CECI)

c. Implementation Methods

IAW with AR 25-1 computing services require the purchase of energy-efficient computer equipment. All purchases of microcomputers, including PCs, monitors, and printers, will meet the Environmental Protection Agency Energy Star and green requirements for energy efficiency per EO 13423 and EO 13514.

USACE established and implemented two internal policies on 31 December 2010 that promoted the use of power management and duplex printing on all eligible electronic products. Currently, USACE network printers and multi-function machines that have the capability to duplex are configured to default to duplex printing. PCs that are eligible to have the power management settings have had the setting pushed to them and the user do not have the capability to change them.

IAW AR 25-1, the screening, redistribution, and disposal of IT equipment are completed through the Defense Reutilization and Marketing System (DRMS). DRMS is the DOD-wide program for asset visibility, resource sharing, and asset redistribution. The Defense Logistics Agency is the responsible official of DRMS for DOD. The process for disposal of IT equipment is consistent with the process used for all other excess property.

DRMS supports EO 12999 through the DOD Computers for Learning Program. In accordance with Executive Order 12999, surplus computer equipment can be donated to schools and educational nonprofit organizations. School/nonprofit organizations must request surplus computers by submitting a letterhead memo to include the name, address, telephone number, POC, and for nonprofit organizations, the type of educational program it will be used to support.

Per DOD policy, all hard drives of unclassified computer equipment leaving the custody of DOD must be overwritten, degaussed, or destroyed in accordance with the associated security risk of the information contained within the drive.

Currently, there is not a policy from the Department of Army on implementation of best management practices. Department of Army has issued a data call to answer the memo signed by the Federal CIO on 26 February 2010. USACE will be participating in the Department of Army's response to this memo and will comply with associated Army policy when developed.

USACE has worked with the various applications developers and support teams to migrate from an environment where multiple smaller SUN systems are used to an environment were high levels of sharing and virtualization are in place using SUN M9000 systems. USACE's service provider manages 2,880 servers at major sites (Divisions, Districts, and Centers). These will be consolidated to about 300

servers using technology called virtualization. USACE is also looking at the "power-off" features of VMware to support those applications where a large number of servers operate in a pool. In this way, as workload decreases, customer sessions can be moved to fewer servers and those servers not in use can be powered off until workload increases to a point where they need to be used. This project will lower energy costs, reduce space requirements and reduce manpower resulting in millions of dollars in cost savings to USACE.

There are FY11 and FY12 approved initiatives to modernize systems at USACE's two processing centers to increase capability, better support virtualization, and increase system overall usage. In addition, USACE was able to improve the density and performance of our storage infrastructure, while reducing the power usage per TB dramatically. We are further looking to automate migration of Enterprise OLTP data to lower-power storage. This year, we are reducing our new server load 4 to one. We are also reducing our power usage by replacing systems whose design consume more power than newer systems. For example, Exchange 2003 requires fast Fiber Channel Drives, but Exchange 2010 can utilize SATA drives due to its design. This is a great savings in dollars and power.

d. Positions

No additional positions are required.

e. Planning Table

Table 2-8 Goal 7 Planning Table

ELECTRONIC STEWARDSHIP & DATA CENTERS	Units	FY 10	FY 11	FY 12	FY 13	FY14	FY15
% of electronic product acquisition covered by current Energy Star specifications that must be energy-star qualified	%	85	90	95	95	95	95
% of covered electronic product acquisitions that are EPEAT registered	%	95	95	95	100	100	100
% of covered electronic product acquisitions that are FEMP designated	%	TBD	TBD	TBD	TBD	TBD	TBD
% of agency eligible PC, laptops, and monitors with power management actively implemented and in use	%	80	100	100	100	100	100
% of agency eligible electronic printing products with duplexing features in use	%	95	95	95	100	100	100
% of electronic assets covered by sound disposition practices	%	90	95	100	100	100	100
% of agency data centers independently metered, advanced metered, or sub-metered to determine monthly (or more frequently) Power Utilization Effectiveness (PUE)	%	TBD	TBD	TBD	TBD	TBD	TBD
Reduction in the number of USACE data centers[16]	%	0	0	0	0	0	0

[16] USACE already reduced its data centers down to two and will not be consolidating further based on Army guidance

ELECTRONIC STEWARDSHIP & DATA CENTERS	Units	FY 10	FY 11	FY 12	FY 13	FY14	FY15
% of agency data centers operating with an average CPU utilization greater than 65%	%	15	50	75	75	75	75
Maximum annual weighted average Power Utilization Effectiveness (PUE) for USACE	%	TBD	TBD	TBD	TBD	TBD	TBD

f. Status

USACE reduced its number of data centers several years ago to two processing centers located in Portland OR and Vicksburg, MS. USACE is well on its way to reducing power further, by removing systems from remote server rooms and locations that are not equipped for hosting, and moving them into this more efficient environment. This improves our overall greening as an Enterprise even further (AKA Centralization).

g. Return on Investment

USACE has little quantitative information regarding return on investment for some actions take under Goal 7 such as instituting centralized power management of electronic equipment or the use of duplex printing on all eligible electronic products. With respect to determining the cost of centralized power management compared with the benefits it produces, e.g. energy cost avoidance and reduced carbon footprint from conservation of power at the desktop, such an analysis can be accomplished over the next year given available data.

In terms of ROI analysis for the modernization and consolidation at USACE two processing centers, such analysis is routinely done and will be obtained from the USACE Corporate Information Office for inclusion in the next update to the USACE Sustainability Plan.

h. Highlights

- Servers within USACE will be consolidated from 2,880 to about 300 using technology called virtualization.
- USACE network printers and multi-function machines that have the capability to duplex are configured to default to duplex printing.
- PCs that are eligible to have the power management settings have had the setting pushed to them and the user does not have the capability to change this setting

IIi. Goal 8: Agency Innovation & Government-wide Support

a. Goal Description

This goal includes innovative practices, technologies, and techniques used by USACE to achieve EO 13514 goals and beyond, including climate change adaptation (for which a separate report is provided), as well as activities that help other agencies achieve their goals. The sustainability outcomes supported by USACE on behalf of a Federal customer will be accounted for in the customer's SP, hence only short descriptions are listed in Goal 8 below.

a. Innovations Supporting Civil Works
    - Climate Change Adaption for Water Resources
    - Channel Improvement
    - GHG, Energy and Water Reduction Studies
b. Innovations Supporting Other Federal Agencies
    - Innovations Not Related to a Particular Goal
    - Innovations Related to Goal 1 & 2: GHG and Energy Reduction
    - Innovations Related to Goal 3: High Performance Sustainable Design/Green Buildings; Regional and Local Planning
    - Innovations Related to Goal 5: Pollution Prevention and Waste Elimination

Table 2-9 Goal 8 Planning Table

AGENCY INNOVATION & Government-Wide Support	Units	FY 10	FY 11	FY 12	FY13	FY 14	….	FY 20
Programs, Projects, Initiatives that support Government-wide efforts	$ M	2.4	8.7	16.4	5	5		

Innovations Supporting Civil Works

Climate Change Adaption for Water Resources

Responses to Climate Change Program (RCC). In FY10-14, the RCC began developing and implementing practical, nationally consistent, and cost-effective policies, methods, and approaches for effective adaptation of our projects, systems, and programs to climate change. The RCC is developing and conducting vulnerability stress tests within the Civil Works (CW) portfolio of constructed and natural projects, both planned and existing, with a focus on highest priorities and the existing portfolio. The results of the vulnerability assessments will assist in prioritizing further actions. Climate change adaptation pilot projects that span the project life cycle and business lines continued in river basins, coastal regions, and ecosystem projects. The lessons learned are helping USACE to mainstream climate change adaptation, improve our planned detailed vulnerability assessment methods, and develop an adaptive management strategy for climate change and variability. This ultimately will improve water resources management and planning methodologies. Additional information is included in the USACE Adaptation Plan and Report. Projected costs (currently funded) for this initiative are included in the Goal 8 Planning Table ($2.4M in FY10; $8.5M in FY11; $5M in FY12 - FY14).

IPET/HPDC Lessons Learned Implementation Team. Since 2007, t he Team has been working on assessing our existing flexibility in reservoir regulation, assessing USACE capabilities to adaptively manage our water resources projects, and reviewing sustainability principles in the context of USACE projects and programs. During FY10 and FY11, we will complete a number of studies supporting climate change adaptation, including improved vertical control, adaptive management, incorporation of new

and changing information, and assessing the impacts of incremental changes on project performance. A new guidance on "Procedures to Evaluate Sea Level Change Impacts, Responses, and Adaptation" will be published in 2011. Other activities include several sustainability pilots in various phases of the project life-cycle. Additional information will be included in the USACE Adaptation Plan and Report. Projected costs (currently funded) for this initiative are included in the Goal 8 Planning Table ($0.2 M in FY11; $2.4XM in FY12).

Sustainable Water Partnership Planning. USACE, through the South Atlantic Division, has been developing new partnerships, among states and other water planning and management stakeholders, to address higher variability in water availability in the southeastern United States.

Global Change Sustainability (GCS) Program. USACE has a requirement to successfully perform its missions, operations, programs, and projects in spite of an increasingly dynamic environment. Dynamic global changes such as changes in demographics, land use and land cover, socioeconomic and political conditions, and subsidence can adversely impact USACE missions, programs, projects and operations. It is safer and more cost-effective to assess, plan, and prioritize now for adaptation to global change effects within an integrated water resources management context, rather than simply reacting on an ad hoc basis to future impacts as they emerge. The Global Change Sustainability (GCS) program enhances the sustainability and resilience of our built infrastructure and the natural environment by providing a proactive, nationally consistent, and regionally sensitive framework and program of actions that will reduce the impacts and costs of global change effects. The GCS is a FY11 start, and is hampered by the current federal budget crisis. If funded in FY11, the GCS will address the following areas of highest need: updating drought contingency plans, performing a comprehensive evaluation of USACE projects with respect to sea-level change, developing consistent strategies for dealing with global changes in coastal zones, and updating reservoir sedimentation studies according to strategic and priority needs. Additional information is provided in the USACE Adaptation Plan and Report. Projected costs (currently funded) for this initiative are included in the Goal 8 Planning Table ($0M in FY11, $9M FY12) and Goal 3 Planning Table ($0M in FY11 and $1M in FY12).

Inter-Agency Climate Change Forum. USACE has partnered with NASA in managing an informal inter-agency forum on climate change impacts and adaptation. The forum meets regularly in the DC area, with participants attending in person or by telephone. The forum maintains a web presence on FedCenter, at: http://www.fedcenter.gov/programs/greenhouse/ccforum/ and all briefings are posted on a FedCenter working group site. This forum, now in its 4th year, has helped agencies across the government develop strategies for assessing their climate change impacts and potential adaptation approaches . This activity is supported by in-kind funding; no costs are shown in the Goal 8 Table.

GHG, Energy and Water Reduction Studies

Greenhouse Gas Emission Inventory Pilot Studies in the Mississippi Valley Division. In FY2010 USACE performed pilot studies at two Civil Works Project sites. The projects included a lock and dam and a flood-risk management facility with recreation facilities. Each pilot study determined greenhouse gas

emissions from Scope 1 source; Scope 2 purchased electricity; and Scope 3 commuting, contracted wastewater treatment, and contracted solid waste disposal. When possible, the inventory was broken into more granular emission source types. The pilot studies show the need for greater metering of electrical energy consumption, the need to study the potential for carbon sequestration on USACE lands, and the need to add contract language for vendors to track fuel and electrical energy consumption for contracted services.

Field Guidance Package for Assessment of Energy and Water Conservation Opportunities at USACE Facilities. In FY2011, USACE developed a draft field guide for assessing energy and water conservation opportunities. The field guide provides tools, guidance, and template assistance to Corps of Engineers Civil Works (CW) Project Offices and District Office Personnel to identify and develop energy conservation projects in facilities for which they are responsible. The field guide focuses on energy conservation measures that will reduce energy intensity in buildings and water use efficiency improvements that will reduce potable water consumption intensity. The field guide lists potential energy and water conservation measures and for each of these conservation opportunities provides assessment techniques, expected costs savings, and expected investment costs. The Field Guide remains in draft pending feedback from users during the FY13 budget build.

USACE Unique Greenhouse Gas Emission Sources. In FY2011, USACE will perform a study to determine the energy and greenhouse gas emission reduction potential for emission sources that are unique to USACE Civil Works Projects. These Civil Works projects include locks and dams; hydropower facilities; large pumping plants; fish barriers; the floating plant; and canals, channels, harbors, and other navigation waterways. The study will identify large energy consumers and greenhouse gas emission sources and determine if the use of more current equipment, technologies, or procedures can economically reduce energy consumption and greenhouse gas emissions. These energy and emission reduction opportunities will be compared to potential investments for reducing energy and emissions in more common facility and mobile energy consumers such as office space, laboratory space, vehicle fleets, visitor centers, and outdoor lighting.

Innovations Supporting Federal Agencies *Innovations Not Related to a Particular Goal*

Center for the Advancement of Sustainability Innovations (CASI). CASI was established by USACE in 2006 to promote sustainable approaches within USACE and across the military services; CASI has activities (forums, projects, reports) related to most of the goals in EO 13514 including most of the projects noted in this Innovations goal. CASI information is available through URL: https://casi.erdc.usace.army.mil/.

FedCenter (http://www.fedcenter.gov). FedCenter.gov is the Federal government's home for comprehensive environmental stewardship and compliance assistance information for all agencies. FedCenter major program areas include Executive Orders 13514 and 13423, Environmental Compliance, Acquisition, Cleanup, EMS, Energy, Greenhouse Gases, High Performance Buildings, NEPA, Electronics Stewardship, Pollution Prevention, Chemical Management, Sustainability, Transportation and Natural Resources. Additional compliance assistance information, collaboration tools and support services are

also provided. It also contains the Sustainability Program Area which includes the latest guidance, examples, and information resources to aid Federal facilities in developing and maintaining sustainable facilities and helping to develop and promote sustainable practices within their environmental programs or activities. USAC E maintains this clearinghouse of information for all agencies in the government.

USACE Support for Water Resources and DoD Sustainability Goals. The thousands of USACE research, planning, design, and construction professionals serve as a primary resource for sustainable innovations implemented on military installations. Numerous advances in building design, energy and water conservation, and other sustainability-related practices have assisted DoD military programs toward their goals. These will be reported, as appropriate, within the Department of Defense Sustainability Plan. In addition, many of these USACE innovations supporting military customers are leveraged for Civil Works.

USACE Involvement with ASCE Infrastructure Rating System. USACE is closely following American Society of Civil Engineer (ASCE) efforts to develop a sustainable infrastructure rating system and weighing possible adoption of this rating system. In partnership with the Institute for Sustainable Infrastructure (ISI), ASCE has developed a comprehensive project rating for infrastructure sustainability called Project Rating for Infrastructure Sustainability and Management (PRISM) that involves certification for projects. The certification program will be a "single comprehensive system to help designers, contractors and suppliers to advance innovative solutions that support sustainable infrastructure". USACE conducted a pilot of the precursor of the PRISM system with ASCE at Randolph Jennings Lake in West Virginia (NAB). PRISM is intended to become for unoccupied infrastructure sustainability certification what LEED certification is for vertical structures.

Water Security activities - Through its water resources planning and develop experts, USACE provides DoS, USAID and COCOMS with sustainable water security support.

Wind Turbine Interference Testing. Galveston District is working with a multi-service partnership involving the Coast Guard, Army and DoD services to test wind turbine interference of aviation and marine radar and radio and to identify mitigation. The results from the "stealth" wind turbine test will be shared across services.

Native American Perspectives on USACE Missions – A Cultural Immersion Course. Native Americans have historically held to the “seven generations” rule, meaning that all decisions should take into account the impact on seven generations into the future. This on-going course supports USACE Environmental Operating Principles to achieve: (1) awareness of sustainable options and programs; (2) alternative ideas to protect and preserve natural and cultural resources; and (3) an understanding of the environment from a cross-cultural perspective. Representatives from all agencies participate.

Innovations Related to Goal 1 & 2: GHG/Energy Reduction and GHG Inventory

Energy-Efficient Communities. USACE is pursuing collaboration with a new International Energy Agency (IEA) initiative for energy-efficient communities. The main objective of this effort is to use an integrated, multidisciplinary approach as a basis for providing tools, guidelines, recommendations, best-practice examples, and background material for designers and decision makers in all fields concerned with reducing energy use and greenhouse gas emissions.

Standardized Tools for GHG Inventory Collection and Analysis. USACE developed software tools to collect, store and analyze GHG, energy and water data at the project level from across USACE. Enhancements to the software this year will allow data entry via web forms and standardized data storage and accessibility. These tools greatly facilitated agency reporting and they enabled a rich understanding of the sources and levels of resource consumption and GHG generation. Tableau Reader data visualization software was utilized to allow generators of the data from the field to view their data at multiple levels and categories.

Innovations Related to Goal 3: HPSD/Green Buildings & Regional and Local Planning

Sustainable Design Directory of Expertise (SDD-DX). Established in 2007, this sustainable design resource, led by Savannah District and CASI, provides sustainable design guidance and training for all of USACE. There are now over 180 accredited LEED professionals across USACE. Sustainable Design classes are regularly conducted through the USACE Learning Center (ULC). In addition, the DX will provide technical expertise, analysis, coordination, support, and training for USACE activities in support of sustainable design and development of high performance buildings and life cycle costing. Services will be available to military and civil mission areas and other Federal agencies on a reimbursable basis.

USACE Master Planning and BIM Utilization. USACE master planners are assisting USACE's ERDC laboratory in Hanover, New Hampshire in a site-wide master planning effort that will incorporate sustainability. This follows AR 210-20 and allows a unique opportunity to embed sustainability concepts of energy and water intensity reduction and efficiency into the campus. Master planning efforts will be coming to the ERDC Vicksburg campus where a BIMStorm™ for facilities and master planning has already taken place. Developing and utilizing Building Information Modeling (BIM) technology to understand the site's facilities and infrastructure promises to raise understanding of their lifecycle and prepare for O&M needs. At other places within USACE, BIM technology has been used to facilitate design and construction as well as the O&M work order process for structures such as Rock Island's Lock #22 and the fish passage at Cougar Dam, Portland District.

Chesapeake Bay Regional Analysis. USACE's North Atlantic Division (NAD) has had a long standing engagement in the Chesapeake Bay Program (Program), a regional partnership of state, federal, academic, and local watershed organizations that has led and directed the restoration of the Chesapeake Bay since 1983. Through collaborative support of the Program's goals and objectives, NAD and our Norfolk and Baltimore Districts have contributed to the development and implementation of watershed planning and ecosystem restoration projects, contributing significantly to restoration of the native oyster, a keystone Chesapeake species. NAD actively participated in the development of the

Army Chesapeake Bay Strategy signed by DASA-ESOH and DCG in July 2009. NAD and the Norfolk and Baltimore Districts, as well as the USACE labs, supported by ACSIM, are also actively participating in the Army Chesapeake Bay Strategy and are working towards improved regional analysis for the bay area, including LID on the numerous regional military bases.

On 12 May 2009, President Obama issued Executive Order (EO) 13508 for protecting and restoring the Chesapeake Bay with a call to harness public and private resources "to protect and restore the health, heritage, natural resources, and social and economic value of the Nation's largest estuarine ecosystem." Many agencies were assigned responsibilities, including the Department of Defense (DoD) which has many military bases in the region and was assigned responsibilities with the EO, leading for all military services to conduct facility-wide load assessments, develop Federal Facility Implementation Plans to meet State TMDL waste load reduction targets, reduce stormwater runoff through implementation of DoD's policy to address the Energy Independence and Security Act, Section 438 requirements, and integrate DoD's Readiness and Environmental Protection Initiative land buffer program with Chesapeake Bay land conservation goals. In order to fully represent the USACE Civil Works (CW) mission and numerous CW projects in the region, the Assistant Secretary of the Army for CW, [ASA(CW)] joined the Federal Leadership Committee in January of 2010.

Innovations Related to Goal 5: Pollution Prevention and Waste Reduction

Environmental Benefits of Reusing Wood Building Materials. USDA/FPL and CERL are developing data and guidance on the reuse of wood building materials, specifically how to reduce carbon emissions. Life cycle inventory data was acquired for the extraction, processing, transportation and resale of wood building materials. While LCA data exists on virgin wood materials, it didn't on wood materials salvaged for reuse. Life cycle impact data was then developed.

Section Three: Agency Self Evaluation

I. Evaluation Table

Table 3-1 USACE Self Evaluation Table

Does your Sustainability Plan incorporate and align sustainability goals, GHG targets and overarching objectives for sustainability with the Agency Strategic Plan?	Yes
Does it provide annual targets, strategies and approaches for achieving the 2015 and 2020 goals?	Yes
Is the Sustainability Plan consistent with the FY2012 President's Budget?	Yes
Does the Sustainability Plan integrate all statutory and Executive Order requirements into a single implementation framework for advancing sustainability goals along with existing mission and management goals, making the best use of existing and available resources?	Yes
Does your plan include methods for obtaining data needed to measure progress, evaluate results, and improve performance?	Yes

II. Key Questions for 2011

1. Did your agency meet by 12/30/10 due date and/or is it now able to demonstrate comprehensive implementation of the EO 13423 Electronic Stewardship goals?

   • Acquire at least 95% EPEAT-registered electronics
   • Enable energy star or power management features on 100% of eligible PCs
   • Extends the life and/or uses sound disposition practices for its excess or surplus electronics

   Yes, reference Goal 7 for details of USACE actions in support of the Electronics Stewardship goals.

2. Is your agency tracking and monitoring all of its contract awards for inclusion of requirements for mandatory federally-designated green products in 95% of relevant acquisitions?

   No. See discussion under Goal 6, paragraph f. USACE will implement the capability of FPDS-NG to execute the required tracking and monitoring when the required FPDS-NG capabilities become available.

3. Has your agency completed energy evaluations on at least 75% of its facilities?

   No. USACE plans to fund energy and water evaluations of its Covered Facilities in FY12, assuming that sufficient O&M funds are received and that the funds are authorized for expenditure at all Covered Facilities. If restrictions on O&M funding prevent completion of evaluations at all USACE Covered Facilities, USACE plans to achieve roughly 64% of its EISA Section 432 required audit by the end of FY12.

4. Will your agency meet the deadline of October 1, 2012 (EPACT'05 Sec 103) for metering of energy use? (Agency should provide current status of buildings metered and plans for meeting the deadline).

No.

5. If your agency reports in the FRPP, will it be able to report by December 2011 that at least 7% of its inventory meets the High Performance Sustainable Guiding Principles? (If no, agency needs to provide schedule and plan for actions to be taken in the next six months.)

   No. USACE will develop a listing of FRPP-reported buildings subject to the requirements of the HPSB metric in the next 6 months. The listing will be coordinated with the MSCs for validation. In 6-12 months, USACE will issue the final listing with appropriate policy guidance directing appropriate MSC-level actions.

Appendix 1: Acronyms and Abbreviations

Term	Spelled Out
ACSIM	US Army Assistant Chief of Staff for Installation Management
AEPI	Army Environmental Policy Institute
ARRA	American Recovery and Reinvestment Act
ASA(CW)	Assistant Secretary of the Army for Civil Works
BRAC	Base Realignment and Closure
CASI	Center for Advancement of Sustainability Innovations
CEFMS	Corps of Engineers Financial Management System
CEQ	Council on Environmental Quality
CMR	Command Management Review
CoP	Community of Practice
CONUS	Continental US
CW	Civil Works
CRAFT	Corps Reduced and Abridged FEMP Tool
DART	Development of Agency Reduction Target
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoE	Department of Energy
DRMS	Defense Reutilization and Marketing System
DTMO	Defense Travel Management Office
DTOD	Defense Table of Distances
EC	Engineer Circular
ECM	Energy Conservation Measure
E&C	Engineering and Construction
EKO	Engineering Knowledge Online
EUL	Enhanced Use Lease
EO	Executive Order
EOP	Environmental Operating Principles
EPA	Environmental Protection Agency
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ESPC	Energy Savings Performance Contract
ESTCP	Environmental Security Technology Certification Program
FAST	Federal Automotive Statistical Tool
FEMA	Federal Emergency Management Agency
FEMP	Federal Energy Management Program

Term	Spelled Out
FERC	Federal Energy Regulatory Commission
FY	Fiscal year
GCS	Global Change Sustainability
GHG	Greenhouse Gas
GSA	General Services Administration
GSF	Gross square feet
HMI	Hydropower Modernization Initiative
IMCOM	US Army Installation Management Command
IPET	Interagency Performance Evaluation Task Force
IPlan	Implementation Plan
IWR	Institute of Water Resources
LEED	Leadership in Energy and Environmental Design
MDC	Marine Design Center
MILCON	Military Construction
MP	Military Programs
MSC	Major Subordinate Command
MT	Metric tons
NED	National Economic Development
NEPA	National Environmental Policy Act
NEQ	National Environmental Quality
NOAA	National Oceanic and Atmospheric Administration
NTV	Non-Tactical Vehicle
O&M	Operations and Management
OMB	Office of Management and Budget
OSE	Other Social Effects
OMBIL	O&M Business Information Link
PAO	Public Affairs Office
PDT	Product Delivery Team
PROSPECT	Proponent-Sponsored Engineer Corps Training
PWTB	Public Works Technical Bulletin
QRP	Qualified Recycling Programs
RCC	Response to Climate Change
RED	Regional Economic Development
REMIS	Real Estate Management Information System
RFMIS	Rental Facilities Management Information System
ROI	Return on Investment
RPAO	Real Property Accountable Officer

Term	Spelled Out
SBIR	Small Business Innovative Research
SMS	Strategic Management System
SPiRiT	Sustainable Project Rating Tool
SSO	Senior Sustainability Officer
SSPP	Strategic Sustainability Performance Plan
SST	Strategic Sustainability Team
T&D	Transmission and Distribution
UESC	Utility Energy Services Contract
ULC	USACE Learning Center
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USGS	US Geological Survey
USSC	USACE Sustainability Steering Committee
WBDG	Whole Building Design Guide