



Greenhouse Gas Mitigation Update

June 2010

Contents

Introduction	3
Denver Water	5
Metropolitan Water District of Southern California	6
New York City Department of Environmental Protection	6
Portland Water Bureau	7
San Francisco Public Utilities Commission	9
Southern Nevada Water Authority	10
Tampa Bay Water	13

[This page intentionally left blank]

Introduction

The Water Utility Climate Alliance (WUCA) was founded in February 2008 by the San Francisco Public Utilities Commission, Seattle Public Utilities, Portland Water Bureau, the Metropolitan Water District of Southern California, San Diego County Water Authority, Denver Water, Southern Nevada Water Authority and the New York City Department of Environmental Protection. In 2009, WUCA welcomed two new member utilities: Tampa Bay Water and the Central Arizona Project.

The goals of the alliance have included fostering research on climate impacts to water utilities, advocating for effective policy responses and propagating innovation in greenhouse gas emissions reduction.

In December 2008, WUCA released the first composite statement of member utilities' greenhouse gas reduction efforts. This document serves as an update on continued progress in this critical policy area.

The summary statements for Denver Water, Portland Water Bureau, New York City Department of Environmental Protection, San Francisco Public Utilities Commission, Southern Nevada Water Authority and Tampa Bay Water were authored by staff working on energy efficiency and greenhouse gas reduction efforts at each of these organizations. The summary for Metropolitan Water District of Southern California was compiled from official press releases. The contributions of all are gratefully acknowledged.

[This page intentionally left blank]

Denver Water

Denver Water has a long tradition of operating a highly efficient water delivery system. Seven hydroelectric generating plants with a combined capacity of 25 MW are employed as water is collected in the mountains and conveyed to the city. In most years, Denver Water adds enough clean, renewable hydropower to the local power grid to equal or exceed electricity used to operate its potable water distribution system. This generation was about 75,000 MWH in 2008.

Denver Water also has an extensive recycling program that has been in place for over 13 years. In 2008, over 70 tons of materials were recycled. Most of this bulk is office paper and cardboard, but aluminum, plastic, glass, batteries, and used motor oil is also included. Denver Water also employs several hybrid vehicles in its fleet and looks to expand its inventory and biodiesel is a significant part of its truck fuel supply.

Denver Water joined the Climate Registry in May 2008 and subsequently completed a greenhouse gas emissions inventory. It is currently working through the inventory verification process in accordance with Climate Registry protocols.

Denver Water has also formed a 'Green Team' comprised of representatives from across its organization. The Green Team is oriented around six work streams: water, energy, site planning, transportation, materials, and communications. The Green Team's initiatives include leading Denver Water's GHG inventory, pursuing small-scale energy efficiency projects, educating staff on green practices, enhancing the recycling program, and improving water efficiency at Denver Water facilities. An engineering team is conducting a preliminary investigation on the potential for renewable energy as a source of power for utility operations.

In 2009, the Green Team and other key staff began developing a Sustainability Plan. As part of the Plan, Denver Water hopes to develop baseline measurements of resource reliance to improve its environmental stewardship. The greenhouse gas inventory, energy use analysis, tracking of purchases, waste recycling, and improved water efficiency by Denver Water operations will inform the development of performance indicators.

Metropolitan Water District of Southern California (MWD)

In April 2009, MWD announced that its Diamond Valley Lake Visitor Center and Western Center for Archaeology & Paleontology had earned LEED-platinum certification, the highest level awarded by the US Green Building Council. The buildings feature heat-blocking glass, automated lighting controls and solar panels that meet 50% of power needs. A drip-irrigation system distributes reclaimed water to the facilities' drought-resistant/native species landscaping.

In May, MWD activated the 1 MW solar power facility at its Robert A. Skinner Water Treatment Plant. The ten-acre installation can generate approximately 2.4 million kWh each year, meeting almost 25% of the plant's power needs. MWD will receive over \$5 million in rebates from Southern California Edison over the next five years, and anticipates it will recoup the \$10 million construction cost in six to eight years.

In November, the Association of Metropolitan Water Agencies announced MWD as one of six water providers that had earned its Platinum Award for Utility Excellence. MWD was recognized for its investments in energy management and water conservation as well as those in reliability and water quality.

New York City Department of Environmental Protection (DEP)

Pursuant to Mayor Mike Bloomberg's call for city government to reduce its carbon footprint 30% by 2017, the New York City Department of Environmental Protection is developing a comprehensive database of energy use across its operations. When completed, the database will allow facility managers to understand their consumption patterns, manage consumption more efficiently, and develop predictive maintenance protocols.

Building on this effort, DEP has also recently contracted with a major engineering consulting firm to:

- Develop a standardized tracking and reporting mechanisms of annual GHG emissions
- Identify gaps in data collection
- Analyze capital projects for opportunities to reduce emissions and
- Modify contract specifications to include emissions reduction strategies in new design and construction projects.

DEP's emissions control strategy begins with:

- Increasing process efficiencies to reduce energy demand
- Eliminating of all gross methane emissions
- Optimizing gas production

- Developing distributed power projects to put this energy source to beneficial use and
- Providing residual gas to the local utility distribution system to offset generation from more traditional and polluting sources.

Toward this end, DEP is currently working with a regional natural gas provider to refine gas generated at the Newtown Creek treatment plant for commercial distribution. When complete, the project will yield approximately 2.775 million therms of natural gas each year – enough to heat 2,000 homes.

Portland Water Bureau

The Portland Water Bureau works to reduce the carbon emissions impact of the water system, both by taking action within our own bureau and by participating in citywide efforts. (Not all of Portland’s sustainability-related actions are listed below; see <http://www.portlandonline.com/water/index.cfm?c=31525> for more information.) In 2007, the bureau adopted a Sustainability Action Plan. The September 2008 update of the action plan summarizes our initial calculation of the bureau’s GHG emissions and defines a set of mitigation strategies. Strategies for carbon footprint mitigation at the Portland Water Bureau include:

Reducing Fuel Emissions

- More than 75,000 gallons of biodiesel purchased annually. Many WB vehicles use B99 (99% biodiesel) during the warmer months (April 1- November 1). These vehicles include backhoes, dump trucks, graders, excavators, and water service trucks.
- Six Toyota Prius Hybrids boast improved fuel efficiency and reduced emissions over traditional combustion engines. The bureau continues to evaluate alternative fuel and more efficient vehicles.
- Two electric-powered Segues used for security patrols at in-town reservoirs.
- Video surveillance at remote facilities reduces vehicle miles driven responding to reported incidents.
- Emissions offsets purchased for 100% of employee air travel in CY08.
- A city-wide engine idling reduction policy has also been adopted.

Using/Encouraging Alternative Modes of Transportation

- City sponsors cash incentives (‘Bike/Walk to Work Bucks’) to encourage employees to bike or walk to and from work.
- City sponsors discounted Tri-met bus passes to employees.
- Bureau provides bicycles for commuting between the downtown and Interstate facilities and for collecting water quality samples in water supply operations.

- Bureau provides free Tri-met passes (bus, light rail) to employees for commuting during work hours on bureau-related business.

Renewable Power

- ~86 million kilowatt-hours of hydroelectric power generated each year from two dams in the Bull Run Watershed. This is approximately three times our average annual electric power used to operate the water system.
- ~1 million kilowatt-hours of micro-hydroelectric power generated each year using hydraulic head within the distribution system. The bureau is evaluating additional micro-hydro power opportunities, and has a project planned for a neighborhood tank site (replacing a pressure reduction valve with a microhydro unit).
- Currently building a 270 kW capacity photovoltaic project. Working with a third party equity partner who will own, operate and sell power back to the bureau for an initial period. Power generated from this facility will partially offset the power used at the bureau's groundwater pump station. Excess power will be fed into the local power grid under a net-metering agreement.
- 12kW photovoltaic system installed during LEED-Gold remodel of our meter shop.

Green Building

- City-wide green building policy requires incorporation of green building practices into the design, construction, remodeling and operation of all City-owned facilities.

Reducing Paper Use

- 100% post consumer recycled paper used for all 20 lb print and copy needs. (More than 80% of the bureau's annual paper use falls in this category).
- Currently developing electronic billing and bill pay for customers.

Maximizing Energy Efficiency

- Implemented system to minimize peak power loading.
- Performed energy audits, replaced lighting, and made HVAC performance improvements.
- Installed Variable Frequency Drives and refined operating procedures at several pump stations.
- Evaluated and modified pump station operations to favor most efficient pumps. One of these projects saved 950,000 kWh per year.
- Formed an energy committee and joined a peer networking project with other Portland area industrial energy users.

San Francisco Public Utilities Commission

SFPUC's Energy Efficiency program has implemented several projects throughout City departments and facilities. Since the inception of the program in 2003, our energy efficiency projects are saving over 34,000 megawatt-hours of electricity and 600,000 therms of natural gas per year, resulting in 22,126 tons of eCO₂ emissions reduced annually. Projects completed in FY 2008/09 and 2009/10 to date include lighting retrofits at SFPUC's wastewater treatment plants, Port facilities, the City's Opera House and Symphony Hall, police and fire stations and Hall of Justice, as well as an extensive HVAC controls optimization and boiler replacement project at San Francisco International Airport (the project was capitalized by the Airport).

SFPUC's Renewable program has installed several solar photovoltaic (PV) projects on facilities throughout City departments. Since the inception of the program in 2003, our solar PV installations are saving over 2,400 MWhs of electricity per year, resulting in 1,348 tons of CO₂ emissions reduced annually. These projects include installations at the Airport, Moscone Convention Center, two wastewater treatment plants, a medical facility, library, and Port facility. A 5 MW PV installation at the Sunset reservoir, projected to be operating in 2010, will generate over 6,500 MWh per year.

The total estimated current annual greenhouse gas emissions reduction from these programs is 27,026 tons eCO₂ per year.

SFPUC has attained an electricity emissions reduction factor of 1,083 lbs CO₂/MWh (per EPA eGRID 2007, version 1.1, WECC California). It has also attained a natural gas emissions reduction factor of 11.7 lbs CO₂/therm (per California Climate Action Registry General Reporting Protocol, Version 3, April 2008)

Southern Nevada Water Authority (SNWA)

SNWA's energy efficiency and renewables implementation strategy will help enable us to source 20% of our energy needs from renewable sources by 2015 (paralleling Nevada's Renewable Energy Portfolio Standard).

Hoover Dam Hydropower

SNWA contracts with the [Colorado River Commission](#) for power generated at Hoover Dam. Approximately 10% of the Water Authority's annual power needs are met by Hoover Dam hydropower.

Hydroelectric Turbines

SNWA has developed hydropower projects at three Rate of Flow Control Stations (ROFCS) in Las Vegas and Henderson:

- Linden ROFCS – 522 kilowatts (kW)
- Sloan ROFCS – 933 kW
- Horizon Ridge ROFCS (Henderson) – 605 kW

The projects include a small turbine and induction generator at each site. As water passes through the pipeline, it turns the turbine and generates electricity. Over 2 megawatts of electricity can be generated from these systems.

Photovoltaic Systems

SNWA is currently designing 450 kW of solar photovoltaic systems to provide solar power to the [Alfred Merritt Smith Water Treatment Facility](#) and the [River Mountains Water Treatment Facility](#). The projects include high-concentration photovoltaic (HCPV) systems at RMWTF and solar panels that will provide covered parking at both water treatment facilities. Combined, these projects will generate approximately 920,000 kWh (kilowatt hours) per year - the equivalent energy usage of more than 60 Las Vegas households.



Silverhawk Power Generation Facility

The [Silverhawk Power Generation Facility](#) is a 570-megawatt power plant located approximately 35 miles north of Las Vegas. Nevada Power maintains 75% interest in the facility while SNWA holds the remaining 25%.

To ensure that Silverhawk optimizes the use of Nevada's water resources, the power plant operates using 'dry cooling,' a technology that produces electricity using one-tenth of the water consumed by traditional 'wet-cooled' power plants. The facility was designed per strict emissions limits and the Best Available Control Technology (BACT)

for air quality.

Silver State Energy Association

SNWA is a member of the Silver State Energy Association (SSEA), a cooperative association between public agencies with the common goal to jointly plan, develop, own and operate power resources to meet their own needs and those of their customers. Membership in this organization offers improved power purchasing capabilities and project development opportunities, the opportunity to share resources and expertise and the opportunity to jointly manage energy needs. Other members of the SSEA include Boulder City, the Colorado River Commission of Nevada, Lincoln County Power District No. 1 and Overton Power District No. 5.

SNWA has created a cross departmental team of 15 employees representing every department in the organization. This team is centered on four action areas- Water, Energy, Internal Sustainability, and Public Education, and Outreach. Through these four focus areas short and long term goals are managed and implementation plans developed.

As a result, SNWA is currently seeking approval on a comprehensive Sustainability Plan that engages the entire organization. This proposed plan uses a holistic approach through the integration of the four defining areas of focus. Employee education is emphasized as the root of establishing a culture of sustainability capable of reducing green house gas emissions from both organizational and personal sources.

SNWA is also actively addressing climate change through the following to programs:

LEED Building Certification – Platinum certification for seven buildings at the Springs Preserve, a 180-acre cultural institution designed to commemorate Las Vegas’s dynamic history and to provide a vision for a sustainable future.

Molasky Corporate Center (MCC) – Located in the heart of downtown Las Vegas, the Molasky Corporate Center is an environmentally friendly office building and home to the SNWA. Based on the United States Green Building Council’s ‘Leadership in Energy and Environmental Design’ (LEED) criteria, MCC qualifies for gold certification. Key features of MCC include:

- A design that maximizes sunlight to interior space, minimizing glare and heat from direct sunlight.
- An underfloor air distribution system yielding energy savings and health benefits
- Wall insulation made from mulched denim.
- Improved indoor air quality due to the exclusion of materials containing volatile organic compounds (adhesives, sealants, paints and carpet products).
- Restrooms equipped with low-flow plumbing fixtures.
- A recycling center for paper, cardboard, glass, metal and plastics.
- A water recycling system that uses captured water for landscape irrigation, saving 3,000 gallons of water per cycle.
- Access to showers and lockers at 24 Hour Fitness for those traveling to and

- from MCC by bicycle.
- Offices equipped with Energy Star rated equipment and appliances.

Pollution Prevention – An organization-wide dynamic recycling program recycles an extensive list materials including water. A combined total of 1,238,185lbs of materials were recycled in 2008, a 5 % increase from the previous year. Revenue from contractor bids for scrap metal, auction materials, PC hardware, and wood pallets generated enough funds to offset management costs of this program. Revenue from selling used oil also generated funds to offset management costs of the program.

Conservation – innovative programs to promote sustainable desert living include:

- Water Smart incentive programs
- Water Smart Landscapes
- Water Smart Homes
- Water Smart Car Wash
- Water Smart Coupons
- Water Efficient Technologies
- Water Smart Contractor (training in English and Spanish)
- Water Conservation Coalition
- WaterSmart Innovations Conference and Exhibition
- Mandatory watering restrictions
- Water-waste enforcement

Habitat/Wildlife – Stabilization and vegetation enhancement and management of the Las Vegas wash has resulted in collaborative efforts to monitor water quality, habitat management, erosion control and develop long-term management plans. This has dramatically increased this wetland ecosystem's ability to support wildlife and naturally filter water that flows into Lake Meade.

Green Cleaning Products – 99 percent of operations utilize green cleaning products. This contributes to the goal of 100% conversion due to the inability to effectively utilize "green" disinfection products.

Vehicle Fleet – SNWA's goal is to have a 100% alternative-fueled vehicle fleet by 2015. SNWA currently has 16 hybrid vehicles, 87 that run on biodiesel and 3 that run on compressed natural gas.

During the plan review and approval process, SNWA continues to work toward full implementation of the following mid and long-term goals:

1. 20% of energy needs to be met by renewable sources by 2015
(parallels Nevada's renewable energy portfolio standard)

2. A 20% reduction in energy consumption by 2011

To aid in the assessment process, SNWA has developed an enterprise wide carbon management tool designed to assess the greenhouse gas footprint from

all aspects of authority operations, and energy consumption,

3. Reduce landfill waste 25% by 2010

To reduce paper consumption, SNWA aims for 75% of internal documentation to be electronically administered.

4. Implementation of Pilot Environmental Management System by 2010

The EMS is currently in the piloting stage in two of SNWA's operating divisions.

Tampa Bay Water

Tampa Bay Water is a regional water supply authority that supplies drinking water to six Member Governments in the Tampa Bay region (Hillsborough, Pasco and Pinellas counties and the cities of New Port Richey, Tampa and St. Petersburg). Our Member Governments together supply water to more than 2.5 million people in the region. Tampa Bay Water is one of the most unique utilities of its kind in terms of meeting customer demand from diversified supplies developed from groundwater, surface water and desalinated seawater sources. To champion environmental stewardship, Tampa Bay Water has committed to determine the feasibility of implementing energy conservation and efficiency strategies, the feasibility of renewable energy sources at its facilities, and effective water use efficiency advocacy, to help reduce its carbon footprint and sustain the region.

Energy Conservation and Efficiency Strategy

Tampa Bay Water's goal is to achieve 10% or greater reduction in current power consumption over the next decade, through a series of energy conservation and efficiency projects. To meet this goal, Tampa Bay Water has identified in its Capital Improvement Program the "Energy Conservation and Efficiency Pilot Study" to explore the feasibility of Energy Conservation and Efficiency Strategies in one of its facilities. Currently, Tampa Bay Water is developing a scope of work for this project.

Alternative Energy Strategy

Tampa Bay Water's goal is to meet 10% of its energy needs through alternative energy sources, within the next 10 years. To meet this goal, Tampa Bay Water has identified in its Capital Improvement Program the "Alternative Energy Feasibility Study" to evaluate the feasibility of either wind and/or solar energy in any of its facilities. The study will take place in three phases:

- Phase No. 1: Roadmap and Data Collection Program Development
- Phase No. 2: Data Collection Program Implementation
- Phase No. 3: Final Feasibility Study

Tampa Bay Water has completed Phase No. 1 and is set to start Phase No. 2 in 2010. Phase No. 2 will focus on the collection of site-specific wind data at several agency facilities.

Water Use Efficiency

Tampa Bay Water has adopted end use water conservation goals through a demand management plan implemented by its Members in five-year steps. These goals are measured through an annually submitted, regionally compiled five-year water conservation plan that quantifies active conservation and demand management programming. (These goals are currently being updated by Tampa Bay Water).

To optimize the relationship between conserved water, energy use and greenhouse gas emission reductions, in early 2007 the agency developed a methodology to calculate greenhouse gas emissions directly associated with energy use in water production. This methodology provides a relationship between reduced water demand (conserved water), reduced electrical use by Tampa Bay Water, and how reductions in greenhouse gas emissions are associated with saved water. The results are updated annually in the regional conservation plan. Regional water conservation-related nitrous oxide reductions for 2007 and 2008 were estimated at 38.35 and 34.09 tons, respectively, and carbon dioxide reductions for the same years were estimated to be 19,307 and 17,161 tons. In 2009, the agency added an indoor residential hot water use reduction component that calculates the percentage of energy and greenhouse gas emissions reductions created through water use technology change-out/installation.