
Appendix: Bureau of Overseas Buildings Operations: Overseas Sustainability FY10-FY20

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OBO Energy and Sustainable
Design

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Section One: Bureau Policy and Strategy

- I. **Bureau Statement:** The Department's Bureau of Overseas Buildings Operations (OBO) has long pursued sustainability and environmental stewardship. Though OBO's stated mission is to "...provide safe, secure, and functional facilities"; OBO also strives to green the Department's embassies and consulates around the world to build international models of sustainability as solid platforms of eco-diplomacy. More than an inspired vision and lofty goal, OBO has been applying the tenets and the principles of sustainability for the last decade, as the Bureau works to reduce its resource consumption, conserve energy and water, and provide enhanced indoor environments for embassy and consulate staff and visitors. Though OBO's long-term goal is to achieve climate-neutral operations overseas, the Bureau's biggest challenge is the lack of funding for sustainability, as well as the lack of resources available at many overseas posts to facilitate such implementation on a global basis.

- II. **OBO Sustainability and Relationship to the Agency Mission:** Although Executive Order 13514 applies only to facilities located within the continental United States, OBO is committed to achieving the goals of the EO to the extent practicable, and integrates sustainability into standard planning, design, and construction practices. OBO is not included in the Department's reporting metrics for EO 13514 only due to the current inability to capture the data that will allow us to report on goal progress and achievement with any accuracy. However, as a Bureau in the Department's Management family, and an integral part of the Department's Greening Diplomacy Initiative, OBO works collaboratively with the Department's domestic bureaus in developing strategies for compliance, and views its efforts as closely related to the Agency's mission of policy and diplomacy. To support this effort, OBO is in the process of establishing an Energy & Sustainable Design Division to formalize and further augment the sustainability work currently being executed by OBO's Green Team.

OBO is proud to have taken active steps to reduce its environmental footprint, as noted in the descriptions provided in the following pages, and we look towards the future as an opportunity to further our work in this area.

Section Two: Voluntary Report on OBO Sustainability Achievements

GOAL 1: Scope 1 and Scope 2 Greenhouse Gas (GHG) Reduction

Project Implementation. OBO's energy strategies are consistent with those articulated in the Department of State's *Agency Sustainability Plan*: that of reducing energy intensity and energy demand in our buildings and expanding our portfolio of renewable energy sources. This goal takes on great importance and particular relevance to OBO due to the unreliable nature or unavailability of utility infrastructure in many of our overseas mission locations. Coupling the lack of energy infrastructure with the need for uninterrupted power to maintain security operations, some of our missions are required to operate primarily on diesel-powered generators, with a substantial carbon footprint.

Though the Department submission did not include reporting on overseas facilities, OBO is fully committed to the goal of reducing Scope 1 and Scope 2 greenhouse gas emissions, and is in the process of tracking Scope 1 & 2 data at overseas facilities in order to baseline current usage, benchmark progress, and achieve compliance. To this end, OBO has increased its effort to monitor consumption by requiring data entry into a web-based Utility Portal, and has developed a global meter installation program and guidance protocol to continue to expand the Bureau's ability to capture this information. In addition, a contract has just been awarded to assist OBO in identifying key performance metrics and to select and implement appropriate software that can help summarize and analyze data for reporting purposes. Note that significant resource implications exist in order to allow OBO to **fully** document and analyze building utility data required for the Departmental sustainability survey and Scope 1 & 2 reporting: at present, out of a total of 245 posts, 172 posts have provided some data, 31 have provided complete data through 2009, and 42 posts have not provided any utility data at all. Further, less than one third of posts worldwide currently have building-level meters. OBO's current strategy is to analyze and interpolate data from the utility information provided, sampling different building vintages, regions, and sizes to provide a representative subset of utility consumption from the range of overseas mission facilities.

Beyond metering, OBO has been steadily reducing the energy intensity at its overseas facilities, by incorporating more energy-efficient technologies

into embassy and consulate design for new construction and major renovation, and by scheduling system run times through a central building automation system (BAS). OBO conducts audits at facilities whose initial data show high utility cost and consumption, to gather more detailed information and identify appropriate opportunities. Technologies such as magnetic levitation (maglev) chillers in Tokyo and Geneva; dedicated heat recovery chillers in Sofia, Santiago and Istanbul; cool roofs in Ouagadougou, Guangzhou, Dubai and Podgorica; vegetated roofs in Athens, Berlin, Kyiv, and Guangzhou ; district heating in Stockholm, Moscow, and Oslo; district cooling in Paris; cogeneration (combined heat and power) in Dakar and Monrovia; solar thermal water heaters in Canberra, Frankfurt, Santiago, and Mali; LED site lighting at missions in Frankfurt, Bogota, and Taipei; and thermally-broken blast and forced entry/ballistic-resistant (FE/BR) glazing all reduce energy demand and contribute to more energy efficient buildings. OBO-required building energy modeling provides a discovery process to identify additional sustainability strategies to achieve OBO's desired 10 year payback. These building models indicate performance on average 20% better than ASHRAE requirements.

To identify additional energy conservation measures (ECMs), in conjunction with DOE's Federal Energy Management Program (FEMP), OBO has entered into an interagency agreement for the National Renewable Energy Laboratory (NREL) to provide energy audit services and reports. Through these efforts, as well as through the use of OBO's current indefinite delivery/indefinite quantity (IDIQ) contractors, OBO has recently conducted audits in Amman, Stockholm, Frankfurt, Munich, Buenos Aires, Santiago, San Salvador, Tokyo, Prague, Madrid and Barcelona. A portion of current appropriated funds each year is set aside to perform energy audits and generate a pool of valuable ECMs for implementation as a best practices use of funds. Additional audits are scheduled utilizing these means. The current EO requires each Agency to audit 25% of their facilities located in the continental United States every four years. While not required by the Order, under current funding levels, OBO is able to contribute to this effort by auditing roughly 3% of overseas facilities per year.

Additionally, OBO is in the process of rolling out a widespread Energy Savings Performance Contract (ESPC) program to augment efforts to implement (ECMs) where there are insufficient appropriated funds. With a

2010 Earth Day release of a broadcast cable to all posts, the program includes the following stipulations:

- o ESPCs are a funding strategy, not a mandate, to achieve compliance with E.O.s and EISA 2007
- o DOS signed an MOU with DOE/FEMP to facilitate OBO's ESPC program, enabling the use of DOE's 16 prequalified Energy Savings Performance Contractors (ESCOs)
- o Intended roll-out includes three phases:
 - OBO-led pre-contract phase
 - Includes audit and data collection
 - Post-managed contract phase
 - Includes solicitation and award
 - Post-managed performance phase
 - includes Measurement & Verification (M&V) and contractor payment

In addition to the DOE/FEMP program, OBO is in the process of drafting an interagency agreement with Unicor, a division of the Federal Prison Industries, to implement a small-scale ESPC program with Unicor contractors. This option will permit the flexibility to institute ESPCs on a smaller scale, allowing a greater range of ECMs to be implemented.

OBO has also been proactive in increasing its portfolio of renewable energy sources, recently installing or in the process of designing photovoltaic (PV) installations at our missions in Athens, Abuja, Kigali, Valletta, Lisbon, Rangoon, Monrovia, Dakar, Santo Domingo, Taipei, Bujumbura and Monterrey. A total of more than one megawatt of power is currently provided via photovoltaic installations, offsetting reliance on grid-provided and prime-generated power. OBO's current standards for new construction include many renewable strategies, including PV and solar thermal.

It should be noted that although not all pilot technologies are implemented on a wide-scale basis, OBO continues to examine the applicability of these technologies and strategies in conjunction with OBO's specific security and maintenance needs. Further, it should be stressed here that some sustainability strategies are implemented for diplomatic reasons, to underscore US commitment to environmental stewardship and to showcase American technologies, even when they do not provide the desired 10-year payback.

Lastly, OBO has partnered with posts to encourage responsible employee actions geared to reducing energy demand. One indication of this partnership is the actions that have been inspired by the information contained in OBO's *Green Guide for Embassy & Consulate Operations* (<http://www.state.gov/documents/organization/128748.pdf>). As an example, at Mission Geneva, a composting program was initiated by an employee's family member, who led the community in building five composting bins. As a result of this effort, Mission Geneva is reducing the quantity of yard waste delivered to the landfill. Further, this initiative has led to an effort to replace the topsoil with organic topsoil, to be able to produce rather than purchase its own garden soil. Published in 2008, and gearing up for a second edition, *Green Guide* is organized according to the LEED categories, with the addition of a chapter on fleet management. The *Guide* is written for a range of audiences at post, from the Chief of Mission to locally employed staff. In addition to providing general context of sustainability issues and how they impact our overseas missions, the *Guide* provides specific guidance and includes case studies and post success stories, to encourage other posts to follow suit. Other actions inspired by the *Green Guide* include the installation of water-saving plumbing fixtures, occupancy sensors for lighting, establishing a wake-on LAN system and the reprogramming of the BAS to maximize efficiency.

GOAL 2: Scope 3 Greenhouse Gas Reduction

Implementation methods. OBO is not currently reporting on Scope 3 emissions, but is following the Department's lead in capturing the data on employee air travel, waste disposal, and transmission and distribution losses from purchased energy. OBO will contribute to this goal through its reforestation program that has been implemented at several posts, including Tunis and Abidjan. Although not a direct carbon offset, planting trees provides the added benefits of shade, erosion control, privacy, and aesthetic beauty.

Given the difficulty in capturing utility and infrastructure information at some overseas posts, waste disposal and purchased energy data varies greatly from post to post. OBO also works with posts to promote the

acquisition of residential leases that reduce commuting time for employees.

Construction activity is one of OBO's largest contributions to Scope 3 emissions. OBO is working toward estimating green house gas emissions associated with new construction activity.

GOAL 3: Develop and Maintain Agency Comprehensive GHG Inventory

Implementation methods. OBO is following the Department's lead in looking for established public sector guidance to identify and inventory green house gases to apply to our overseas missions.

GOAL 4: High-Performance Sustainable Design/Green Buildings

Implementation methods. As the Department of State Bureau with the express purpose of planning, designing, constructing, and operating buildings, OBO's contributions to the achievement of Goal 4 are most critical. OBO is leading the Department's initiative in requiring sustainable design and construction, practicing environmental stewardship and eco-diplomacy in the following ways:

- OBO has used the LEED tool for design guidance for the last ten years, to incorporate sustainability features even without the goal of LEED certification
- Prior to FY 2008, OBO required LEED-compliant design for all capital embassy and consulate projects, which now total over 100 facilities
- As of FY2008, LEED certification has been a contractual requirement for all capital projects
- OBO now has 4 LEED® certified diplomatic missions, the latest of which, the Brazzaville New Embassy Compound (NEC), received LEED Gold
- As of FY2010, OBO requires certification at LEED silver level
- OBO embeds significant amounts of sustainability criteria as requirements in standard contract language, addressing the majority of points necessary for LEED certification and substantially complying with the MOU for Federal High Performance and Sustainable Buildings guidance

- These requirements establish criteria for energy, water, and materials reduction; increased reliance on renewable sources of energy; and enhanced indoor environmental quality
- OBO currently has an additional 30 projects in the LEED pipeline, registered with the intent to certify
- OBO is looking for opportunities, within current funding levels, to increase sustainability requirements to pursue the stretch goal of zero net energy buildings
- OBO is implementing automated methods of sensing and reducing demand through building automation systems (BAS), such as aligning run times with occupancy and using demand-controlled ventilation

GOAL 5: Regional and Local Planning

Implementation methods. OBO uses site selection criteria that, whenever feasible, result in sites proximate to transportation options and existing community amenities and infrastructure. To achieve the required security setbacks, OBO has previously selected 10-acre sites, which often precluded overseas missions being located in urban centers. In order to accomplish the regional and local planning goal, our current strategy is to select smaller, urban sites and pursue more vertical design solutions. OBO site selection criteria supports this by identifying urban site characteristics on the OBO Real Estate checklist submitted for each site under consideration as beneficial attributes. Locating in urban centers allows OBO standard parking requirements to be reduced. Further, wherever feasible OBO eliminates support spaces in new embassy and consulate design when a similar community-provided amenity is available.

GOAL 6: Water Use Efficiency and Management

Implementation methods. Water conservation is a critical objective for OBO, due to the severity of water shortages in many of our overseas mission locations. To address this issue, OBO focuses on incorporating both interior and exterior water conservation standards into new construction criteria, resulting in achievement of approximately 30% water savings over the baseline. Indoor strategies that OBO incorporates include low-flow

plumbing fixtures, faucet aerators, dual flush toilets and waterless urinals. OBO further supports posts with a waterless urinal replacement program for older, more water-intensive plumbing fixtures in facilities that demonstrate high consumption and high cost. OBO has moved to air-cooled rather than water-cooled chillers, even at the expense of the additional energy consumed by air-cooled systems, in recognition of water scarcity issues. The air-cooled chiller replacement in Tokyo avoids an estimated 1,030,000 gallons of water annually.

OBO's exterior water conservation strategies focus on irrigation, stormwater management and repurposing existing representational uses of water. Irrigation water needs are reduced by practicing xeriscaping—the specification of native and adapted plant species—to the extent possible, by grouping like plantings together, and by providing metered and programmable drip irrigation with rainwater sensors. Greywater capture is treated and used for irrigation purposes in Ouagadougou, Antananarivo, Djibouti, Abu Dhabi, Lusaka, and Karachi. OBO landscape standards further recommend minimizing lawn areas and decorative fountains as needed to create “representational” spaces.

OBO addresses stormwater management in its standard requirements and is developing rainwater harvesting strategies where practical to do so. OBO has developed vegetated roof guidance, in order to capture stormwater runoff as well as provide additional insulation to reduce energy consumption.

Lastly, re-commissioning is implemented to assist with water goal target achievement. Portfolio water use is tracked by both facility personnel and OBO personnel via OBO's Utility Portal.

GOAL 7: Pollution Prevention and Waste Elimination

Implementation methods. OBO includes specifications for recycled content in a variety of materials, including steel, concrete, carpet, wallboard, ceiling tile, and furniture. OBO works with posts to develop and encourage recycling programs to divert as much of the ongoing consumables waste stream as possible from the landfill. In addition, OBO's specifications require construction waste management plans that identify percentage of construction and demolition waste diverted from the

landfill. New embassy construction documented diversion of over 75% of construction waste in Antananarivo and 95% in Brazzaville.

OBO's specified air filtration systems at embassies and consulates ensure high efficiency filtration and eliminate contaminants to provide superior air quality.

OBO's office of Safety, Health & Environmental Management (SHEM) produced its *Checklist for Mold Prevention, Recognition, and Clean Up* in 2005, which has proven highly effective at preventing and promptly remediating indoor mold problems. In addition, the Department of State has practiced integrated pest management program (IPM) at overseas facilities including residences. Emphasis is on elimination or at least reduction in conditions that attract pests. As a result, demand for indoor application of liquid pesticides has been all but eliminated.

In response to the Clean Air Act, OBO's Facility Management Office (FAC) implemented a Chlorofluorocarbon (CFC) Recovery and Recycling Program to prevent the venting of these ozone-depleting substances into the atmosphere. Banned by the Montreal and Kyoto Protocols, a single release of these substances in the US would result in a \$25K fine. This equipment and subsequent hands-on training—including translations of user manuals into 43 languages—has been supplied to over 150 Posts to maintain refrigerant and comfort cooling HVAC units. FAC continues to provide equipment and retraining of newly hired HVAC staff and will be doing a web-based training application for future refresher updates.

GOAL 8: Sustainable Acquisition

Implementation methods. In addition to including requirements for sustainability in our building contracts (Goal 4), OBO specifications require the acquisition of locally and regionally procured products, as well as the use of no- and low-VOC products, recycled content materials, energy-efficient systems, and bio-based and environmentally preferable products to the extent feasible. OBO is also currently partnering with several selected posts interested in LEED® for Existing Buildings to establish green cleaning and sustainable procurement policies.

GOAL 9: Electronic Stewardship and Data Centers

Implementation methods. OBO does not directly purchase electronic equipment, obtaining our equipment instead through the Department. However, OBO is working with posts globally to institute “thin client” where possible for remote computing, as well as to create Joint User Computer Rooms (JUCRs) that consolidate tenant computing needs into de facto data centers at post. In addition, websites such as the Utility Portal have been developed to consolidate data and make optimum use of electronic bandwidth.

GOAL 10: Agency Innovation

Implementation Methods. OBO has been at the forefront of sustainable innovation. OBO has installed three maglev chillers at posts in Europe and Asia, the first such installations of their size. OBO is installing sustainable technologies such as ground source heat pumps for energy efficiency and constructed wetlands for wastewater treatment, and continues to work to explore cutting edge technology in pilot projects for broader application. In addition, OBO requires Building Information Modeling (BIM) for better integration of sustainability requirements, and is currently embracing a Design Excellence program strongly aligned with sustainability. The New London Embassy project is an example of the creative design and sustainability results achieved when competition is used to sponsor innovative solutions.