General Services Administration Case

You are a Senior Advisor in the U.S. General Services Administration (GSA) within the Office of High Performance Green Buildings. GSA has tasked you to provide them with a set of strategic alternatives, with associated value propositions and cost-benefit analyses, for meeting or surpassing its requirement to measure and report energy consumption. You have also been asked to identify ways to encourage other building stakeholders, such as Federal agencies, other tenants, and building owners, to undertake activities that will help to achieve GSA's energy measurement and reduction goals.

GSA is the largest public real estate organization in the United States, providing workspace for more than 1.2 million federal workers in 375.7 million square feet (SF) of leased (52%) and owned (48%) space through its Public Buildings Service (PBS). In 2009, the President signed Executive Order (EO) 13514, requiring Federal agencies to measure, report, and reduce greenhouse gas (GHG) emissions, among other mandates to conserve energy, water and minimize waste.

In addition to the executive order, GSA must meet statutory energy reduction goals. Congress requires federal agencies, including GSA, to reduce energy use by of 3% per year in GSA-owned buildings.[1] Recently, the President's Council on Environmental Quality (CEQ) developed voluntary reporting guidance for agency-leased buildings, which they indicate may become a federal mandate.

GSA has begun investigating strategies to use energy consumption tracking and reporting as a way to reduce energy use including sub-metering, equipment controls, and stakeholder engagement. But, both as lessee and landlord, GSA faces a split incentive issue related to competing interests of tenants and building owners/managers.

GSA would like you to address the following key issues: What is the minimum activity and cost needed to meet the federal mandate to measure and report energy use? What are the options for going beyond the mandate to different levels of sub-metering, equipment controls and building stakeholder engagement? What is the incremental cost and benefit of each option? What are the key decision criteria to guide GSA and tenant agencies in selecting which strategy and technology to deploy for which spaces in their portfolio? What are the implications of different strategic options on leasing, capital decisions and exposure to risks related to variations in energy consumption? Your solution may include modifications to GSA leases or policies among other things.

1 42 USC §8253(a), National Energy Conservation Policy Act. See http://www1.eere.energy.gov/femp/pdfs/necpa_amended.pdf

Overview of Federal Mandates and GSA Goals

Federal goals and mandates over the past several years have established a government focus on energy efficiency, sustainability, and the environment. The 2007 EO 13423[2] mandated energy and water use reductions at the federal agency level through 2030, specifically reducing scope 1 and 2 GHG emissions 28.7% below FY 2008 levels by 2020 in federal agency (including GSA) owned buildings. It also required reducing potable water consumption intensity by 2% annually, or 26% from fiscal year 2007 by the end of FY 2020.[3]

In October 2010, the Council on Environmental Quality (CEQ) issued its Federal Greenhouse Gas (GHG) Accounting and Reporting Guidance.[4] In 2011, all federal agencies started reporting GHG data to the Federal Energy Management Program (FEMP), including energy use and costs, using a standardized worksheet, known as the GHG and Sustainability Data Report.[5] Scope 1 and 2 emissions are required to be reported, and scope 3 emissions (e.g. employee commuting), are encouraged.[6]

Leased spaces are receiving an escalating degree of attention in reporting and conservation requirements. In June 2012, CEQ released revised guidance regarding the voluntary reporting of agency-leased facilities greater than 10,000 gross square feet (gsf), and framed it as a prelude to a future reporting requirement.[7] Previously, agencies in leased spaces, such as privately owned, fully serviced leases, were excluded from energy reduction goals and FEMP reporting requirements for lack of necessary energy consumption data.[8] Now estimation is encouraged using proxies and available space or building level energy data.

In January 2012, Congress enacted HR 6582, "The American Energy Manufacturing Technical Corrections Act". This statute, among other things, promotes energy management, data collection, and advanced metering best practices that all federal agencies, including GSA, should adhere to.

Every five years, GSA must evaluate green building certification systems, as mandated by the Energy Independence and Security Act of 2007 (EISA), applying statutory criteria.[9] GSA must then transmit its findings to the Secretary of Energy. Congress in turn requires DOE to identify a system and certification level, in consultation with GSA and the Department of Defense, "deem(ed) to be most likely to encourage a comprehensive and environmentally sound approach to certification of green buildings."[10]

In addition to mandated activities, GSA has shown voluntary leadership. GSA was one of 19 federal agencies that signed a Memorandum of Understanding (MOU) for Federal Leadership in High Performance and Sustainable Buildings[11] in 2006 which resulted in the development of the "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings Guiding Principles"[12] for implementing building design and operation strategies to maximize life-cycle asset value.

2 White House, EO 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," January 24, 2007. http://www.gpo.gov/fdsys/pkg/FR-2007-01-26/pdf/07-374.pdf

3 White House, EO 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," October 5, 2009. http://www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf.

4 Federal Greenhouse Gas (GHG) Accounting and Reporting Guidance, October 6, 2010. http://www.whitehouse.gov/sites/default/files/microsites/ceq/ghg_guidance_document_0.pdf

5 GHG and Sustainability Data Report spreadsheet available under "GHG Accounting Tools" at http://www1.eere.energy.gov/femp/program/greenhousegases_resources.html#pubs.

6 GSA (2012) "Sustainable Design" http://www.gsa.gov/portal/content/104462

7 "FEMP Reporting Portal" http://www.fedcenter.gov/programs/greenhouse/inventoryreporting/fempceqresources/portal/

8 DOE FEMP, "Reporting Guidance for FY 2009."

9 42 USC §17092(h)

10 42 USC §6834(a)(3)(D)(i)(III)

11 Office of Federal High-Performance Green Buildings http://www.gsa.gov/portal/category/101107

12 "High Performance and Sustainable Buildings Guidance" http://www.fedcenter.gov/_kd/Items/actions.cfm?action=Show&item_id=11130&destination=ShowItem

Additionally, GSA has adopted a policy, from the Guiding Principles for New Construction and Major Renovation, stating that all new federal building construction projects or major renovations will be designed to achieve LEED Gold certification, be at least 30% more energy efficient than industry standards, and meet EPA's ENERGY STAR building standards.[13]

GSA Role and Federal Agency Partnerships

The GSA supports federal agencies by, among other things, providing and managing office space for federal employees and developing cost-saving policies. In December 2007, Congress authorized the Office of Federal High-Performance Green Buildings under the Energy Independence and Security Act to enable and enhance Federal leadership in the field of sustainable real property portfolio management and operations. The Office works to promote, coordinate and stimulate green building across the entire Federal government.[14]

The Office of Federal High Performance Green Buildings (OFHPGB) is statutorily mandated with setting standards for high performance sustainable federal buildings. GSA also bears statutory responsibility for chairing the Green Building Advisory Committee as required by the Energy Independence and Security Act of 2007. The Green Building Advisory Committee is a FACA committee comprised of federal and private sector experts, and advises GSA on the acceleration and successful transformation of the Federal building portfolio to sustainable technologies and practices. The Committee focuses on reviewing strategic plans, products and activities of the Office of Federal High-Performance Green Buildings and providing advice and expertise regarding how the Office can most effectively accomplish its mission.[15]

Because sustainable building design and operation are inseparable from energy efficiency and conservation practices, GSA coordinates closely with two sub-agencies of the Department of Energy: the Building Technologies Office (BTO) and the Federal Energy Management Program (FEMP). GSA collaborates with BTO on metering technology development and collaborates with BTO and FEMP in projects that use DOE's National Laboratories to conduct research and development of cutting edge energy efficiency technologies. GSA also collaborates with the FEMP on evaluation and installation of technologies supporting energy efficiency in federal buildings; standard-setting, including evaluation of third party green building rating systems; sharing data on energy efficiency successes and challenges in federal buildings, and collaborating on innovative energy efficiency project financing. GSA also joins FEMP in chairing the Interagency Sustainability Working Group.

GSA Building Portfolio and Lease Structures

GSA represented over 14% of the federal government's total procurement spending in FY 2010. There are around 1,523 GSA-owned properties and 7,661 GSA-leased properties, for a total of 375.7 million gross square feet. Though GSA has many more leases than owned buildings, the square footage breakdown is roughly equal since GSA may own the entire building, but often only leases parts of buildings. Approximately, 52% of total square footage is leased versus 48% owned. In FY 2010, GSA consumed 18.9 trillion BTUs of energy in the 212 million square space where it pays utility bills directly to utility providers (this includes 100% of the owned properties but only about 13% of its leased properties). The total FY 2010 operating budget was $26.6 billion.[16] An inventory of leased and owned

13 DOE (2006) "Guidance for Electric Metering in Federal Buildings." http://www1.eere.energy.gov/femp/pdfs/adv_metering.pdf

14 http://www.gsa.gov/hpgb.

15 42 USC §17092(c)(3)

16 "U.S. General Services Administration FY 2011-2016 Strategic Sustainability Performance Plan" http://www.gsa.gov/graphics/ogp/SSPP.pdf

property is posted publicly and updated monthly.[17] The Energy Usage Analysis System (EUAS) data sheets offer utility energy data of buildings where GSA is paying utilities and are thus covered by the GHG reporting mandate. Energy data from 1985 through 2012, square footage, building portfolio data and locations of GSA owned building portfolio is available on the sheets.[18]

Federal facility leasing arrangements are typically between GSA and an external landlord, and there is a standard lease[19], that is modified based on lease arrangement, within which GSA contracts for all its buildings. The standard lease, in a fully-serviced format, requires an electric service allotment of 4W/SF About 95% of GSA owned and leased spaces are offices, and the rest are warehouses or laboratories which could have significant plug load differences from offices.

Regional client service managers, agency staff which manages the leasing process within GSA, have analyzed average energy use and believe that the electric service allotment may be able to be reduced. This raises one common tenant-landlord issue wherein the tenant often overstates the expected energy use per square foot (SF) to protect themselves, causing the landlord to act accordingly to compensate and the costs to be magnified on each end.

In addition to the electric service allotment issue, different lease structures can create a range of disincentives for either the landlord or tenant, depending on how responsibilities for capital costs and operating costs are allocated. The GSA engages in a number of types of leases, primarily fully serviced (full service gross), single-net (modified gross), or triple-net.

In addition, GSA has recently been incorporating "green" or energy-aligned lease language as a way to overcome some of the barriers they face. Typical leases and leasing terms are available on the GSA website and in the Commercial Building Green Leasing Library.[20&21] Table 1 shows the percentage breakdown by lease type and tenancy of GSA's lease portfolio as of August 2012.

Table 1. GSA Federal Tenant Lease Portfolio (by percentage of the total number of leases)

Type of Lease	Sole Tenant	Majority Tenant	Minor Tenant
Total	*22%*	*26%*	*43%*
Fully serviced	93%	93%	95%
Single-net	7%	7%	4%
Triple-net	<1%	<1%	<1%

As shown in Table 1, the large majority of the leased buildings operate under a fully serviced lease. The type of lease affects the reporting responsibility under the various statutes discussed above. A recent change to GSA's leasing contract requires landlords to provide GSA with energy data upon request, in whatever form is available. In some cases, this could be the energy bill for the entire building, of which GSA is only one tenant.

GSA and Tenant Agency Roles

As the manager for real estate for federal agencies, the GSA has a wide array of tenant relationships, responsibilities and costs. In all cases the GSA manages the lease with the building owner and passes

17 GSA (2012) "Inventory of Owned and Leased Properties" http://www.gsa.gov/portal/content/100783

18 https://explore.data.gov/Energy-and-Utilities/Energy-Usage-Analysis-System/v5vw-qjgu

19 Standard Lease http://www.gsa.gov/graphics/pbs/Standard_Lease_L201C_6-1-12_final_508c.pdf

20 GSA (2012) "Leasing Overview" http://www.gsa.gov/portal/content/104480

21 DOE Better Buildings Alliance. (2012) "Green Lease Library" http://www.greenleaselibrary.com/

costs on to tenant agencies under various arrangements. The GSA either receives the utility bill directly from the utility provider (in owned buildings) or it can receive it from the building owner/manager (in leased buildings). In all cases, utility and rent costs are passed on to each tenant agency and paid from the tenant agency's budget.

At least three types of federal actors are directly involved across the spectrum of estimating, reporting, and acting on energy consumption reduction requirements which were established, or have developed, from EO 13514: a senior sustainability officer (SSO), portfolio energy managers (PEM), and facility energy manager (FEM). An SSO is a designated official at the tenant agency level who is accountable for signing off on a designated federal agency GHG emission report, including energy cost reporting. The SSO ensures progress toward meeting the agency's energy and GHG reduction goals and targets, as well as advanced metering mandates. Though not ultimately responsible for the inventory, portfolio energy managers (PEM), also at the tenant agency level, oversee the compilation and reporting of agency energy data across their portfolio of buildings, and may perform analysis and performance monitoring or develop policies guiding energy management at the headquarters, bureau, or regional level. In addition, the Energy Independence and Security Act (EISA) of 2007 mandated that federal facilities identify an FEM at the facility agency level. At the facility or portfolio level, FEMs maintain building equipment and systems, identify opportunities for cost reduction and increasing system efficiency, and support the value of funding energy conservation projects to upper management. These roles vary by agency based on the number of facilities they occupy.

GSA communicates with tenant federal agencies and via guidance, memos, and etcetera. On a building level, GSA interacts with a tenant council made of representatives from each agency. GSA assigns a Client Services Manager to interact with each of the tenant councils, which vary in level of engagement. GSA has a top down avenue for communication through the SSO at each agency.

GSA employees can communicate through an internal GSA Twitter-like platform. A recent initiative involves developing a sustainability network where employees with sustainability expertise answer questions posed on group forums. GSA also operates a Sustainable Facilities Tool which is a platform for agencies and individuals to communicate and learn about technologies, initiatives, and occupant behaviors that could affect the sustainability of the agency.[22]

Table 2 below describes the level of data access and control over energy consumption that tenants have under different leasing arrangements. While the type of lease and building ownership can provide general types, the GSA does not have this data at the building level. Note that the availability of cost and energy data (column 3) does not specify at which level that data is available. In this instance, "available upon request" means that GSA has added lease language deeming that the private landlord will supply energy data should GSA require it. However, this may be achieved by providing whole-building data, when the GSA space might only account for a portion of the building. In addition, this specific lease language has only been included in leases entered into after September 2011; it applies to roughly 900 of GSA's leases today. Likewise, the table reflects control over the equipment but it does not reflect the extent of the occupant's use of those systems, which is an acknowledged gray area in federal and GHG reporting requirements. Any solutions which are designed to address behavior or purchasing in leased and owned spaces would need to consider each of these control scenarios.

22 http://www.sftool.org/

Table 2. Lease Types, Building Ownership, and Control[23]

Type of	Building ownership	Tenants: data they receive /	GHG reporting
Fully serviced /Full service gross[24]	Private	Energy data: available upon request Cost data: no Control: plug load only	Federal tenant reports all emissions voluntary as Scope 3.
	Federal agency[25]	Energy data: no[26] Cost data: no Control: plug load only	Federal tenant reports all emissions as Scope 3. Federal landlord reports as Scope 1 or 2 emissions.
Single-net / Modified Gross	Private	Energy data: partial Cost data: partial Control: lighting and plug load only	Federal tenant reports the Scope 2 electric usage emissions for which they are billed. Federal tenant reports all remaining electricity use centralized system emissions as Scope 3.
	Federal agency	Energy data: partial Cost data: partial Control: lighting and plug load only	Federal tenant reports the Scope 2 electric usage emissions for which they are billed. Federal tenant reports all remaining electricity use centralized system emissions as Scope 3. Federal landlord reports as Scope 1 or 2 emissions, except those reported as scope 2 by the tenant agency.
Triple-net / Net Lease	Private	Energy data: yes Cost data: yes Control: HVAC, lighting, and plug load	Federal tenant reports Scope 1 and 2 emissions.
	Federal agency[27]	Energy data: yes Cost data: yes Control: HVAC, lighting, and plug load	Federal tenant reports Scope 1 and 2 emissions.

Measurement Technologies

GSA has begun investigating metering and equipment controls as a solution to the absence of granular data in leased and owned buildings, and to help tenant agencies measure and manage energy use, operational costs, and GHG emissions. GSA has been able to conduct energy analyses using estimates from regional energy cost data and applied to total square feet of space in that region, along with some submetered data to determine that energy use intensity averages around 4W/SF. However, without more granular data, they are not able to track improvements or impacts of certain measures, nor determine individual federal agency energy use in many cases.

23 Table courtesy of GSA.

24 For fully serviced leases, data centers and server farms should be excluded. Furthermore, strict differentiation should be made between succeeding / superseding and new / new replacing leases in this category.

25 In such cases, these leases may be referred to as an "occupancy agreement" between federal departments.

26 Connection between energy use and cost is not present, but the leasing federal agency may be able to collect energy and GHG data without contract modification.

27 In such cases, these situations may be referred to as a "delegation" from the federal landlord to the tenant agency.

GSA is charged to report accurate data and reduce energy use; it seeks to consider multiple technology/equipment and solution options at varying costs and levels of effort for GSA and its tenant federal agencies.[28] GSA is amenable to implementing portfolio-wide improvements, or permitting tenant agencies to choose from a suite of measurement and reporting technology options. Tenant occupancy and tenant agency mission profiles (8-hour office or 24/7 server farm) are additional elements in determining which metering or controls are useful and at what level.

The full implementation costs and benefits of measurement and reporting systems must be considered carefully. [29] In contrast with capital upgrades, data collection does not in and of itself save energy; it must be used to support energy use management, procurement, and operations decisions.[30]

Finance and Procurement

There is a federal standard, issued by the President (EO 13514), for purchasing energy efficient equipment: "95 percent of new contract actions including task and delivery orders, for products and services with the exception of acquisition of weapon systems, are energy- efficient (Energy Star or Federal Energy Management Program (FEMP) designated)..." Purchases must also meet other environmental standards where such products and services meet agency performance requirements and are not cost prohibitive.[31]

If a tenant agency were to deploy energy conservation measures (ECMs) in their space, they would have to work through GSA whether they were in a GSA-leased or GSA-owned space. GSA has often funded the initial cost of the improvements and then recovered the costs through an amendment in the lease, but multiple arrangements would be possible. However, GSA experience demonstrates that tenants in full service, leased buildings are uninterested in investing in ECMs.

To fund building improvements, GSA has limited O&M funds which they could utilize to assist with building improvements. GSA could also request funds from the Office of Management and Budget if they have a very strong case. Where available, public and utility energy efficiency incentive funds could be utilized, as well as emerging financing options such as Property Assessed Clean Energy (PACE) bonds or Energy Savings Performance Contracts (ESPCs) with Energy Service Companies (ESCOs) or building owners.[32&33] GSA has experienced that building owners, although rationale, are very hesitant to invest in upgrades due to the issue of split incentives.

28 There are a number of federal and private resources for cost and technology data. Some key sources are the Federal Energy Management Program: http://www1.eere.energy.gov/femp/; Commercial Buildings Technologies Program: http://www1.eere.energy.gov/buildings/commercial/index.html; and the Commercial Buildings Resource Database: http://apps1.eere.energy.gov/buildings/commercial/resource_database/.

29 DOE (2006) "Guidance for Electric Metering in Federal Buildings." http://www1.eere.energy.gov/femp/pdfs/adv_metering.pdf

30 A recent study reviews sub-metering: "Sub-metering of Building Energy and Water Usage: Analysis and Recommendations of the Subcommittee on Building Technologies" found at: http://www.whitehouse.gov/sites/default/files/microsites/ostp/sub-metering_of_building_energy_and_water_usage.pdf

31 2009. http://www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf

32 NREL (2012) "Database of State Incentive for Renewables and Efficiency" http://www.dsireusa.org/

33 District Department of the Environment (DDOE) (2012) "DC Sustainable Energy Utility". http://dcseu.com/