EXECUTIVE SUMMARY

In 2009 President Obama signed Executive Order 13514 requiring Federal agencies to measure, report, and reduce greenhouse gas emissions, among other mandates to conserve energy, water and minimize waste. The purpose of this proposal is to detail an effective strategy to meet the General Service Administration's (GSA) energy reporting requirements and provide a platform from which they can begin to reduce energy use.

GSA owns 1,523 properties and leases 7,661 properties, which combine for a total of 375.7 million gross square feet. The properties are mainly office space but also include laboratories and warehouses. There are a range of different leases (fully serviced, single-net, triple-net), each of which have different terms.

Our proposed solution rests upon implementing a decision tree style plan for installing energy consumption metering systems throughout the GSA portfolio. For properties owned by GSA or where GSA is the sole tenant we propose investing in sub-metering systems to allow the GSA access to a more fine-tuned understanding of how the properties utilize energy. For those leased properties where GSA directly pays for energy consumption we recommend sub-metering shared building services while modifying lease arrangements to allow building owners and the GSA to jointly invest in and profit from building energy efficiency modifications. For fully serviced leased properties we recommend that the GSA modify leases to get building owners to install sub-meters while passing the costs to GSA through a fee program which could be reduced through tenant energy savings.

Beyond the ability to accurately report energy consumption the implementation of a comprehensive metering plan will allow the GSA to build a baseline understanding of how energy is consumed across their portfolio. This understanding will allow GSA to effectively identify energy efficiency best practices that can be applied across a variety of building types while also allowing individual property owners to compete against each other in energy use reduction competitions. Most importantly, meters combined with a landlord-tenant capital expense sharing program will allow GSA properties to cost-effectively invest in energy efficiency building upgrades such as lighting or HVAC controls.

A complete sub-metering roll-out is estimated to cost about $35 million. While the most effective means of financing will likely be through costs incurred at the property owner level, the GSA will also be able to look to other innovative financing schemes including accelerated depreciation, property assessed clean energy bonds, a revolving green load fund, local utility incentives, or energy savings performance contracts.

By working with portfolio energy managers to implement the lease modifications and meter installations we expect a one-year baseline energy consumption profile of tier 1 GSA properties to be completed by July 2015 with full roll-out beginning in 2015.

1 PURPOSE

In 2009 President Obama signed Executive Order 13514 requiring Federal agencies to measure, report, and reduce greenhouse gas emissions, among other mandates to conserve energy, water and minimize waste. Additionally, congress requires federal agencies, including GSA, to reduce energy use by 3% per year in GSA-owned buildings. In order to meet these requirements GSA must first be able to determine energy usage in both the buildings it owns and the buildings that it leases. The purpose of this proposal is to detail an effective strategy to meet the GSA's energy reporting requirements and provide a platform from which they can begin to reduce energy use.

2 THE CURRENT SITUATION

2.1 CONTEXT

GSA owns 1,523 properties and leases 7,661 properties, which combine for a total of 375.7 million gross square feet. The properties are mainly office space but also include laboratories and warehouses. There are a range of different leases (fully serviced, single-net, triple-net), each of which have different terms.

In many of the leased properties, GSA only occupies a portion of the building and in a large number of cases the landlord is only required to provide energy use data upon request. Additionally this data is unlikely to be specific to the GSA leased property and may represent energy usage for the entire building. For the buildings that GSA owns, they are able to get monthly data from utility bills but have limited information regarding the details of energy use by systems such as heating, ventilation, and air conditions (HVAC), plug loads and lighting within the building.

2.2 KEY OPPORTUNITIES / PROBLEMS

Improving the recording of energy usage data across GSA facilities provides a number of opportunities, beyond meeting statutory responsibilities, which include:

- Access to itemised real time energy use of energy intensive appliances would facilitate optimisation of energy consumption.
- The ability to publish energy usage in communal areas to create a 'halo effect' perhaps reducing energy use as people are more likely to connect their actions to facility energy use.
- The capability to track energy use across comparable facilities around the nation and identify top energy savers would enable GSA to build nuanced baseline metrics of facility energy use and identify and implement best practices across facilities.
- Opening up new revenue streams including participation in demand response programs or Energy Services Company (ESCO) contracting.
- The ability to identify equipment, like boilers or appliances, which are working inefficiently and can be repaired or those that are close to failure and can be replaced.

Along with these opportunities comes a range of problems which will need to be addressed in order to effectively track and reduce energy consumption, these problems include:

- There are issues accessing energy use data for single-net or fully serviced lease spaces as landlords only have the requirement to provide data at the macro level and upon request. Many buildings do not have the ability to provide itemised energy usage by tenant.

- There are split incentive problems with leased properties. When the landlord pays for energy, the benefits in cost reduction from any action that may reduce energy usage are accrued to the landlord rather than the tenant. When the tenant pays for energy the landlord gains no benefit from improving the energy efficiency of the building. This makes cost justification difficult for energy reduction projects under the terms of the GSA standard lease.
- Knowing energy consumption is the first step to reducing consumption. However, converting knowledge of energy use into energy use reductions is difficult, requiring technical expertise and a commitment from building management to implement measures that may be disruptive to the office environment.

2.3 THE FOCUSING QUESTION

"What is the most cost effective metering strategy that will allow GSA to meet their reporting targets and how could this strategy be leveraged to reduce energy use by GSA facilities?"

3 THE GOALS

3.1 ORGANIZATION GOALS

GSA's mission is to use their expertise to provide innovative solutions for their customers in support of their missions and by so doing foster an effective, sustainable, and transparent government for the American people. They aim to achieve this with a focus on innovation, and operational excellence.

3.2 PROJECT GOALS

1. Identify the minimum necessary actions to meet the federal mandates for measuring and reporting energy use and greenhouse gas emissions.
    a. Determine the level of metering and sub-metering required to provide sufficient information to report energy usage, to make decisions regarding energy reduction activities and to accurately track the effectiveness of energy reduction actions.
    b. Decide what modifications need to be made to lease terms to enable better reporting of energy usage in fully service leases and to address split incentive issues which reduce the impetus for tenants to implement energy reduction measures.
    c. Evaluate how scope 3 emission reporting and reductions should be incorporated into the reporting and reduction scheme.
2. Strategically implement solutions to reporting emissions that set-up GSA owned or leased properties for future energy use reductions.
3. Identify any 'low hanging fruit' energy reduction measures that are likely to have a payback period of less than 2 years.

The goals of our project strategically align with the values and organizational mission of GSA. As a large property owner accounting for 14% of the federal government's total procurement spending in FY 2010 GSA has a unique opportunity to be a role model in the field of energy use tracking and reduction. By being a leader in the energy use tracking field GSA can publically promote their goals of sustainability, transparency, and the elimination of waste while actively engaging their customers in solving these complicated problems.

4 THE PROPOSED SOLUTION

We propose that the reporting should be tackled through strategic facility metering implemented via a GSA-wide decision tree. For buildings under lease the two main considerations should be whether GSA is the sole tenant and what type of lease the building has. Figure 1 demonstrates how such a system may be constructed while details on the proposed structure of lease modifications and meter installations are provided below.

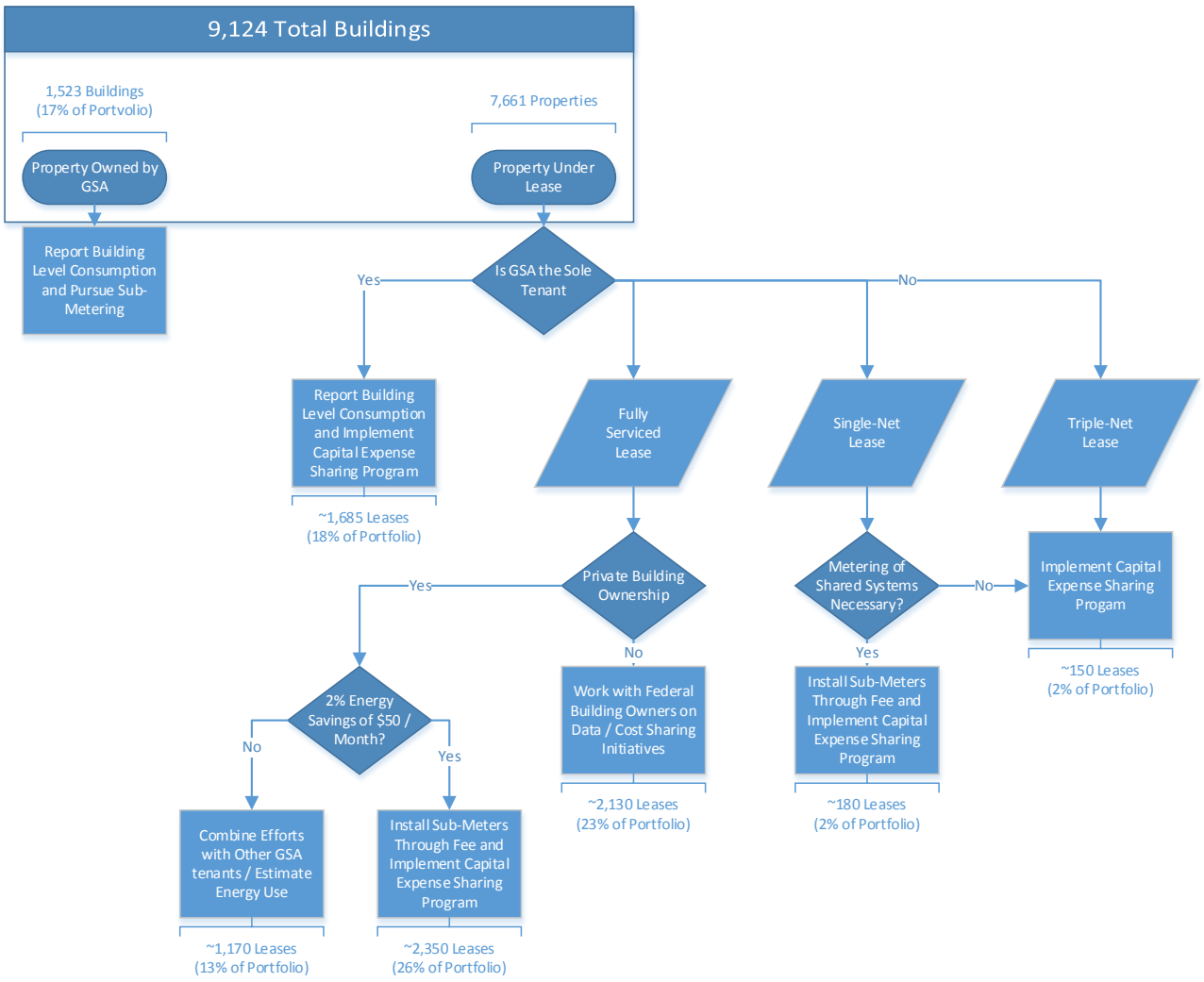

Figure 1: Decision tree

4.1 IMPROVING MEASUREMENT AND REPORTING

4.1.1 GSA Owned Properties

For buildings that are owned by GSA, the reporting issue is simpler as GSA already haves access to, and reports, monthly energy use as well as having strong incentives to reduce energy consumption. In this case the major decision is whether to install sub-metering to provide better granularity to energy use.

4.1.2 Lease Considerations

The most challenging hurdle to implementing energy metering and energy use reduction programs is the split incentive problem facing leased properties. For fully serviced and single-net leased

properties, tenants do not necessarily pay all of their energy bills and thus do not have a monetary incentive to reduce energy use. Alternatively, for triple-net leased properties building owners do not receive any monetary benefits from reduced energy use associated with building modifications. Thus, restructuring lease agreements that align the costs and benefits of building modifications, whether metering or energy efficiency upgrades, with the same individual is vital to building a sustainable energy use reduction program. As the lease structure defines the scope of the split incentive issue we will address if and how lease agreements should be modified by type of lease.

Fully Serviced Leases – Private Building Ownership

Currently, emissions reporting from fully serviced leases in privately owned buildings is purely on a voluntary basis. Given that the Council on Environmental Quality's Federal Greenhouse Gas Accounting and Reporting Guidance notes that emissions reporting from these leased buildings will likely be required in the future (CEQ, 2010), we recommend that GSA take the proactive approach and begin emissions reporting from all facilities.

If available, GSA tenants under a fully serviced lease should seek out tenant specific energy use data from the building owner. The likelihood of this data being available is low and thus tenants should negotiate with the landlord to install sub-meters for the GSA properties. GSA leases should be modified to include a small, monthly fee for the building owner to recoup their capital investment. Due to the relatively low costs associated with sub-meters (more detail provided in section 4.1.2) tenants could expect negotiated sub-meter fees to be in the range of $80 - $150 per month. Furthermore, in order to incentivize the tenant to use the sub-meter data to reduce energy consumption the lease should be modified so that after a 1 year baseline energy use measurement the monthly sub-meter fee should be reduced by an amount equivalent to the monthly energy savings. As the tenant may potentially reduce energy use by an amount greater than the sub-meter fee these savings would accrue to the building owner and they would then also be incentivized to promote energy conservation.

Two issues may arise in negotiating with a landlord on implementing these lease modifications. First, tenants may have such a small energy use that sub-meter installations would unlikely result in energy savings large enough to at least partially offset the sub-meter fee. Tenants are encouraged to estimate their likely energy costs as a percent of the total building energy costs and apply a 2% baseline monthly cost reduction to determine their estimated savings. If savings appear limited, the tenant should look to partner with other building tenants (especially other GSA tenants) in an attempt to bring down sub-meter fees. Where unavailable the tenant may consider simply reporting estimated energy usage. Second, building owners may be reluctant to recoup sub-meter costs through a monthly fee when the tenant has a limited amount of time remaining on the current lease. In these situations the tenant should either work with the landlord to extend the life of the lease or report estimated emissions until the current lease is to expire.

Finally, even though a building owner would benefit from energy efficient building modifications capital expenses may limit their appetites for such building upgrades. To foster a culture of energy efficiency tenants may further modify lease agreements with landlords so that the building owners are able to pass through a portion of the capital expense and share a similar portion of the costs savings with the tenant[1]. Such a modification allows the building owner and tenant to share in the costs and benefits of energy efficiency modifications.

[1] Sample language could include "Landlord should have the right to pass through capital expense to the extent of *(Projected/Actual)* dollar savings (CapEx PassThrough). Savings associated with a capital investment that exceeds Landlord's lease obligations (i.e. beyond what is required to maintain proper functioning of the Building, such as an innovative resource efficiency project, e.g. cogeneration) should be shared at a ratio of *% Landlord / % Tenant* of *(Projected/Actual)* dollar savings" (Green Lease Forum, 2012)

Fully Serviced Leases – Federal Agency Ownership

Federal building owners take on the bulk of the emissions reporting requirements when GSA is a fully serviced tenant. In these situations GSA is encouraged to work with their federal partner to negotiate an energy data sharing plan. Sub-metering is the preferred method and could be implemented under the sub-meter fee system outlined above or through the capital expense sharing program. Because federal building owners will also likely face similar statutory reporting and energy reduction requirements tenants are encouraged to work closely with landlords on achieving incentive aligning lease conditions.

Single-Net Leases – Federal Agency or Private Building Ownership

GSA tenants should work closely with building owners on obtaining data for non-tenant billed energy uses. In many cases, such systems may already have built in meters and the GSA tenants could reliably estimate energy usage from these systems. Where this is not feasible GSA tenants are to install sub-meters through the fee system or capital expense sharing program.

Again, federal building owners will also likely face similar statutory reporting and energy reduction requirements tenants are encouraged to work closely with landlords on achieving incentive aligning lease conditions

Triple-Net Leases – Federal Agency or Private Building Ownership

GSA tenants have full access to energy use data under a triple-net lease. Thus tenants should work to modify leases to incorporate a capital expense sharing program to promote the implementation of building energy efficiency modifications. If lease modifications are difficult, stand-along expense sharing programs could also be implemented.

4.1.3 Metering Considerations and Energy Saving Potential

In addition to helping to meet reporting requirements, the installation of metering has the potential to reduce energy consumption by 2-3%. However, in order to achieve these savings incentives have to be aligned through the above mentioned lease modifications.

Metering Costs

The costs for metering vary a lot depending on the type of meters. The potential range of costs for a meter, associated equipment such as CTs, required software, and installation activities is from $1,900 to $5,400. On-going costs for a single meter range from $10 to $50 per month. More recent information regarding installation of electrical meters at Federal sites indicates an average cost of $2,000 per meter. Other information indicates a range of $1,500 to $2,500 based on installed modem, and supervisory control and data metering systems (DOE, 2011). Applying these estimates to the level of metering discussed across the various tiers in the decision tree above suggests an overall expense of about $20 to $50 million across the 7,661 properties leased by GSA (Appendix A).

Observed Benefits of Metering

Studies have shown that installing new meters can have an initial but temporary effect of saving up to 2% of energy due to the ability to understand usage patterns (DOE, 2006). Metering can further create savings of up to 5% through improved awareness among facility occupants and positive behavioural changes. If metering is used effectively as a stepping-stone to performing a thorough energy audit, identifying sources of waste and implementing simple maintenance improvements or demand response programs can lead to energy savings as high as 5-15% (DOE, 2006). Campus-focused sub-metering initiatives have reported significant benefits due to increased facilities knowledge and a concerted conservation campaign backed by detailed data. Sub-metering allows

for the identification of “low-hanging fruit” that offered high energy savings at a relatively low cost. Coupled with rebates, such improvements (e.g. chiller replacements, occupancy detectors, compact fluorescents, auto-shutoff for electronics, T-8 retrofits, etc.) can offer a payback period of under a year (EPA, 2007).

Sub-metering and Behavioural Change

Sub-metering is essential to getting a more granular view of usage patterns for individual buildings and tenants. Sub-metering also facilitates to implement charge backs to tenants and helps to identify poor-performing equipment. Sub-metering itself doesn’t save energy but makes it easier to implement demand response programs in coordination with the utility. Metering is absolutely necessary for data collection so that the people who operate the building equipment have a better idea of usage and can thus work to reduce energy consumption. GSA should also standardize the data collection and reporting processes across its facilities so that the facilities can be benchmarked by energy usage.

This leads to the other major avenue for savings: behavioural energy efficiency methods. Compiling monthly reports about energy usage for each facility and dividing them into tiers based on energy efficiency can lead to healthy competition between facilities to reduce their usage. The “winning” facilities can be rewarded through recognition or other incentives. The reports should not only be circulated among the facility and portfolio managers but should also be posted on public bulletin boards within the facility to create awareness around energy efficiency. The best performing facilities can also get a mention on the twitter-like platform that GSA has created or through its Sustainability Tool, so that other facilities can aspire to improve and learn from the top performers. The reports can come with energy saving tips like “lowering the brightness of computer and TV screens can reduce energy usage” or “installing occupancy sensors for lights can reduce usage” each month as well. Private companies that use these behavioural aspects claim energy savings of 1.5% to 3.5% on average and across all geographies, seasons and hours of the day (Opower, 2012).

Building upon Meter Installations

About 13% of the leased facilities pay at least some of the energy costs directly to the local utility. In such cases, the utility can be engaged in demand response programs or smart metering initiatives to induce energy savings. GSA can make the landlords more receptive to providing GSA tenants energy data and implementing energy efficiency measures by giving them access to financing or tax benefits. There are only about 1% of the leased facilities that have triple net leases and can entertain the possibility of technology and behavioural methods for energy efficiency. The remaining 6% to 7% are single-net leases where HVAC is out of scope but lighting and plug loads can be reduced.

About 17% of GSA properties, and 48% of the square footage, are GSA-owned. In these facilities GSA can implement any combination of technologies such as sub-metering, occupancy and daylight sensors for lighting, or HVAC optimization using software tools to reduce the energy consumption, as long as it has a positive cost-benefit. GSA has also previously worked with National Laboratories and can try using some of the innovative technology developed in these locations. One example is a “humans as sensors” technology which consists of sensors on USB sticks that are plugged into the office employees’ computers and which measure temperature and humidity periodically as well as asks the employees if they “feel warm or cold”. This data gets transmitted over the local area network to a program that in turn optimizes the HVAC system. Other measures may include precooling or preheating the building in the early hours in order to reduce energy consumption during the peak hours. A variety of SaaS solutions are available to help reduce energy consumption and these tend to be low-cost alternatives to more capital intense measures like equipment retrofits. Occupancy sensors and daylight sensors provide energy savings on lighting ranging from 40-70% for low-traffic areas like warehouses, to 25-50% for private offices, 22-65%

for conference rooms and 30-75% for bathrooms (Opower, 2012). HVAC optimization solutions reduce HVAC energy use by 5-25% (Optimum Energy, 2012).

4.1.4 Scope 3 emissions

The main sources of Scope 3 emissions include travel (commuting and business travel), waste disposal (solid and waste water), and transmission losses from purchased electricity. Currently Scope 3 emissions are reported voluntarily, collected through a combination of leveraging internal travel arrangement software, existing energy use data and employee surveys. Such an arrangement remains suitable for the time being as the more accurate reporting of scope 1 and 2 emissions should take preference. More granular reporting of Scope 3 emissions can be administratively onerous and offer fewer immediate returns. Additionally, the largest source of these emissions come from the transmission and distribution losses from power purchases (about 60%), and the main method for reducing these emissions is from decreased energy use, which will be facilitated by addressing Scope 1 and 2 emissions.

As such, any decrease in power consumption driven by the metering initiative described above and resulting conservation efforts will directly help the GSA achieve its Scope 3 targets[2]. Such complimentary accomplishments should be considered as part of the benefits of the metering upgrade plan. Outside of the emissions from power distribution and transmission, additional Scope 3 reductions should be achieved by reducing travel needs through increasing telework, technology-assisted meetings, and flex schedules as part of a comprehensive energy conservation effort.

4.2 PROJECT ANALYSIS – VALUE & RISK

4.2.1 Analysis of Costs & Value Delivered

The costs are very dependent upon the amount of metering that is required to be installed. As discussed above the cost of an individual meter is likely to be between $1900- $5400 dollars and will incur on-going costs of $100 to $500 per year. At a facility level this cost may be able to be absorbed by a number of sources of value to be derived, which include:

- Monetary: decreased energy bills
- Intelligence: access to new data on energy use
- Environmental: decreased greenhouse gas emission, waste elimination, sustainability
- Leadership: trend setter in the energy monitoring and efficiency space

4.2.2 Project Risk

It may prove difficult to incentivize the landlords to renegotiate terms in the lease arrangements without providing significant monetary incentive. This may in turn reduce the payoff to implementing metering or energy efficient measures.

Particularly in more modern office buildings, there may not be many cost effective energy efficiency improvements beyond simple behavioural improvements. Various abatement cost curves show that for such buildings, retrofits other than HVAC improvements are cost prohibitive. If not, many opportunities exist beyond behavioural modifications and a few minor building upgrades. A policy of only renting, building or buying new facilities that meet high energy efficiency standards may be more a effective way of meeting longer term reduction targets.

[2] As part of its sustainability initiatives, by 2020 the GSA has pledged to reduce Scope 3 GHG emissions by 43.9% from a 2008 baseline of about 198,000 tons of carbon.

4.3 IMPLEMENTATION

4.3.1 Project financing

As is typical in leasing arrangements, aligning the incentives between the GSA, tenants and building owners is likely to be a significant challenge in implementing the metering plan described above. The GSA has limited operation and maintenance (O&M) funds available for a large-scale metering operation, and the current state of federal budget negotiating makes it difficult to rely on any substantial new funding. As a result, funding the metering improvement program will likely require an innovative combination of several sources.

Encouraging the current tenants to pay for the upgrades in order to meet the mandated reporting requirements would be the easiest financing mechanism to implement. This is most viable when accompanied by a direct cost-savings feedback, whereby the tenant can make up for the cost of the metering improvements by paying less for energy in the future. The sub-metering fee and capital expense sharing lease modifications would help to set-up such a situation. This strategy can further be incentivized by taking advantage of the accelerated depreciation for electric meters. The Internal Revenue Service allows taxpayers to depreciate most electric meters over a 10-year period, ultimately deferring tax costs to later years and potentially saving building owners and tenants on tax payments (IRS, 2011). Where funds or cost savings are restricted the GSA could look to external types of financing described below.

4.3.2 Alternative financing options

Where GSA owns the property they may look to emerging financing options that concentrate on "green" infrastructure improvements. Property Assessed Clean Energy (PACE) legislation has been enacted in 27 states and the District of Columbia, though the programs are still in development in many of these areas. PACE financing allows building owners to receive financing from municipal governments for "green" energy improvements which is then repaid over time (generally 15-20 years) through a higher-assessed property tax. The rates are generally structured so that the savings in energy costs is still larger than the increased tax rate, thus providing a net savings to the property owner. Should the owner decide to sell the building the repayment requirements stay with the property. This simple transfer of repayment obligations reduces risks associated with changing office locations or unsettled long-term outlooks.

Another alternative financing option could be a "green" revolving loan fund, initially seeded through a combination of contributions from across government agencies such as GSA, Department of Energy, or Department of Defence. Such funds are geared for relatively small investments, with repayments, driven by energy savings, re-funding the loan pool on a revolving basis. The size and duration of dispersions would depend on the ultimate timeline of the metering improvement project.

Many local utilities also offer financing incentives to undertake efficiency improvements, and while metering is not always covered by such plans, it can sometimes be lumped in with other infrastructure improvements or negotiated separately if on a large enough scale. Coordination with the regional utilities will be necessary in order to determine eligibility and availability.

Another promising option for GSA-owned facilities or where GSA is the sole or majority tenant includes entering Energy Savings Performance Contracts (ESPC) with an ESCO. Such a contract involves partnering with a local ESCO to develop broad energy-savings plans. Metering could be factored in as part of such plans, enabling the cost of meter upgrades to be lumped together with more direct energy-saving improvements (e.g. HVAC efficiency, lighting improvements or increased insulation). In such an agreement, the ESCO fronts the money and guarantees that the energy bill savings will cover the cost of repayments over the contract period.

4.3.3 Segmenting Facilities for Implementation

Our proposed metering plan can be implemented in stages starting with the sites that have the lowest pay back period. Typically these tier 1 facilities would be in states with higher electricity and natural gas costs (like California and New York), would be large in size (about 300 facilities are larger than 50,000 square feet) and fall in the A or B building classification (i.e. newer facilities). It's easier to justify the cost of installing meters in such buildings and the benefits from monitoring the baseline as well as measuring improvements from energy efficiency measures are more pronounced. 5% of the facilities in the GSA portfolio are labs or warehouses and these tend to have stricter energy reliability requirements, large plug loads and different occupancy hours, making them ideal candidates for metering, energy efficiency software solutions and on-site energy sources like solid oxide fuel cells.

4.3.4 Project Communication

As much of the behavioural improvement will be driven by inter-office competition, the communication of the strategy is very important in driving the reduction in energy use. As such, the implementation of this program should be communicated clearly to all stakeholders. To guide decision making, decision trees are to be handed out to regional portfolio energy managers (PEM) as guidance with PEMs being ultimately responsible in instructing senior sustainability officers (SSO) and facility energy mangers (FEM) to implement the desired strategy. As PEMs will ultimately be responsible for ensuring implementation of reporting requirements, working closely with SSOs and FEMs will help ensure project success.

4.3.5 Final Implementation

From March 2013 to December 2014 GSA officials will hold meetings with regional PEMs to discuss the decision tree and required implementation. GSA officials (along with PEMs) will also begin to engage energy meter suppliers and installers to confirm pricing and explore partnerships and cost savings in the regional installation of meters. Meter installation would then begin in January 2014 for tier 1 facilities as the pilot phase of the program.

- March 2013 – December 2013: Stakeholder outreach and technology/vendor selection
- January 2014 –June 2014 – Meter installations in tier 1 facilities
- July 2014 – July 2015: Baseline energy use measurements for tier 1 facilities
- January 2015 – January 2017: Role out meter installations to remaining facilities

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APPENDIX A: COST ANALYSIS

Owned/Leased	**Owned property**	**Leased properties**						
Share of portfolio	17%	83%						
Tenant Status		Sole tenant 22%	Not Sole Tenant 78%					
			Fully-serviced lease 95%			Single Net 5%		Triple Net 1%
First cut			Private Building Ownership		No private building ownership	Need metering of shared systems	Don't need metering of shared systems	
Second Cut			Not 2% energy savings of $50 / month	Yes 2% savings				
Result		Report building-level consumption & implement capital expense sharing	Combine efforts with other tenants	Instal sub-meters through fee and implement capital expense sharing	Work with federal building owners on initiatives	Instal sub-meters through fee and implement capital expense sharing	Implement capital expense sharing program	
Number of buildings	1,523	1,685	1,173	2,346	2,127	179	120	30
Share of total buildings	17%	18%	13%	26%	23%	2%	1%	0%
Meters per building/lease	2	1.5	1.1	1.6	1.5	1.3	1.1	1.5
Cost per meter/approach	$2,200	$2,100	$1,200	$3,200	$2,850	$3,200	$900	$850
Base Case	**$6,701,200**	**$5,309,073**	**$1,548,403**	**$12,013,780**	**$9,094,846**	**$745,752**	**$118,316**	**$38,094**
Low Case	$0	$3,539,382	$1,337,257	$9,611,024	$6,063,230	$573,656	$100,569	$30,475
High Case	$10,801,800	$6,105,434	$1,858,083	$15,617,914	$11,823,299	$857,615	$177,475	$49,523

Totals:

Number of buildings	**9,184**
Avg. cost per approach	**$ 2,458**
Base Case	**$ 35,569,465**
Low Case	**$ 21,255,594**
High Case	**$ 47,291,144**