

Charrette #2 Report



Rocky  
Mountain  
Institute



# DEEP ENERGY RETROFITS IN GSA BUILDINGS

ISSUED JUNE 4, 2013

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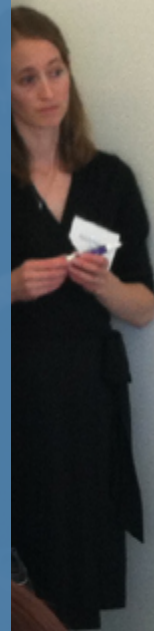


# EXECUTIVE SUMMARY

# ES

UN: heart  
PW: V@13+in3#13

- Transparency - Requirement. Probably can't change.
- Need 'well developed' plan. Sooner.
- Goal action energy goals - ESRC the way to get there.
- Regions - less separation of larger proj.
- Deep vs. ESRC - diff. reasons for Regions.
- Open lines during + after PAs. - 'Practicing engineers' don't want to come to the table. TO schedules make them panicked. ECM's are ok. B kind phrase rollout helps review process. G-sender M&V to make more time.



# EXECUTIVE SUMMARY

Achieving deep energy retrofits through energy savings performance contracts (ESPCs) is an essential part of achieving our nation's energy reduction targets and requires reevaluating current federal ESPC practices. The General Services Administration (GSA), Office of Federal High Performance Green Buildings (OFHPGB), and the Federal Energy Management Program (FEMP) launched an effort to increase per-project savings and expand the use of ESPCs in GSA buildings. While the effort centers on the National Deep Energy Retrofit Program (NDER), GSA recognizes the opportunity to mobilize all ESPC stakeholders to improve the process and achieve higher savings in current and future projects. This effort is predicated on the Presidential Performance Contracting Challenge (PPCC), which requires the Federal Government to enter into a minimum of \$2 billion in performance-based contracts in federal building energy efficiency before December 31, 2013.<sup>1</sup>

GSA, DOE, FEMP, and Rocky Mountain Institute (RMI) convened a charrette at GSA offices in Washington, D.C. on March 4, 2013 to explore opportunities for deep energy retrofit ESPCs. The goals of the charrette were to:

1. Solicit input from energy service companies (ESCOs) on achieving deep retrofits and provide an opportunity for open discussion, continuing the process that began at the 2011 Boulder charrette;
2. Discuss barriers and solutions to “raise the bar” on energy savings provided through ESPCs;
3. Develop a list of lessons learned and best practices to increase the potential cost savings across the GSA portfolio;
4. Renew enthusiasm at the agency and ESCOs.

Charrette attendees included GSA, DOE, DOD, and representatives from 12 of the 16 ESCOs qualified under FEMP's ESPC IDIQ contract.

*GSA AND ESCOs HAVE MADE SIGNIFICANT PROGRESS IN THE PAST YEAR TO INCREASE THE SAVINGS AND THE NUMBER OF ESPCs. ALTHOUGH THE NDER PROJECTS ARE CURRENTLY ONLY AT THE PA STAGE, THE AVERAGE SAVINGS OF 39% REPRESENTS A SIGNIFICANT INCREASE OVER PREVIOUS LEVELS, WHICH WERE AROUND 18%. THE NUMBER OF GSA ESPCs EXECUTED HAS INCREASED FROM AN AVERAGE OF 3 PER YEAR TO 30 THIS YEAR, AND THERE ARE ESPC PROJECTS IN ALL 11 GSA REGIONS.*

However, realizing GSA's ambitious vision (to achieve net zero projects) will require further progress. The charrette solicited input on how to continue improving the ESPC process (not confined to NDER projects), as well as regenerating enthusiasm and increasing savings. The charrette was a collaborative and transparent environment that enabled candid input from the ESCOs and reactions and commitment from GSA.



<sup>1</sup> <http://www.whitehouse.gov/the-press-office/2011/12/02/presidential-memorandum-implementation-energy-savings-projects-and-perfo>



## KEY THEMES FROM THE CHARRETTE INCLUDED:

OPPORTUNITIES FOR DEEP RETROFITS	PROPOSED STRATEGIES
<p><b>1. Use integrative design charrettes to:</b></p> <ul style="list-style-type: none"> <li>Identify and engage all key stakeholders and get buy-in (GSA national, regional, site/public building services, tenants, industry experts);</li> <li>Inform stakeholders of integrative design process and the bundling of energy conservation measures (ECMs) for deep retrofits;</li> <li>Leverage GSA resources and support (demonstrate how a project supports agency goals, provides recognition);</li> <li>Get creative—generate interdependent bundles of ECMs.</li> </ul>	<ul style="list-style-type: none"> <li>ESCOs to host an integrative design charrette in conjunction with the kickoff meeting for every project.</li> </ul>
<p><b>2. Expand revenue streams</b></p>	<ul style="list-style-type: none"> <li>ESCOs to include and GSA to accept savings from tenant operations (including data centers) and O&amp;M savings (while accommodating small business goals).</li> <li>Include avoided capital costs—first need to understand limitations (e.g. cost has to be in current year's budget).</li> </ul>
<p><b>3. Shorten preliminary audit (PA) phase</b></p>	<ul style="list-style-type: none"> <li>PA deliverable should be compressed and more succinct (~20 pages depending on size of project, # of opportunities and # of buildings, +/- 20% energy savings) with a presentation to the building manager.</li> <li>GSA to allow ESCOs to provide informal status reports.</li> </ul>
<p><b>4. Engage tenants</b></p>	<ul style="list-style-type: none"> <li>GSA to identify the top 10 agency tenants of GSA buildings and create a strategy to work with them on tenant fit-out and behavior strategies.</li> <li>Share sample tenant guidelines and occupant engagement programs.</li> </ul>
<p><b>5. GSA to continue sharing lessons learned from NDER</b></p>	<ul style="list-style-type: none"> <li>Continue the current charrette process annually; gather feedback from ESCOs.</li> </ul>

## KEY THEMES FROM THE CHARRETTE INCLUDED: (CONT'D)

OPPORTUNITIES FOR DEEP RETROFITS	PROPOSED STRATEGIES
<p>6. Use Measurement and Verification (M&amp;V) Option C for whole-building solutions</p>	<p>When applying Option C:</p> <ul style="list-style-type: none"> <li>• ESCOs should limit Option C to three years.</li> <li>• ESCOs should provide ongoing remote access to monitoring data.</li> <li>• GSA should ensure the operating strategies identified in the investment grade audit (IGA) are followed by building managers.</li> <li>• ESCOs should provide a standardized report card in the M&amp;V report that summarizes agency responsibilities and overall energy savings.</li> </ul>
<p>7. Standardize building data provided to ESCOs</p>	<p>GSA should provide data to ESCOs during down-selection that includes:</p> <ul style="list-style-type: none"> <li>• Typical list of requested data (years of building data, occupancy, operating hours, etc.).</li> <li>• Decision framework for GSA reviewers and approvers of project (who needs to decide what, and when).</li> </ul> <p>(Note: Remote auditing and tracking efforts are underway that will help. Having this data will also help GSA select buildings that are 'ripe' for a deep retrofit.)</p>
<p>8. Continue dedicated project resources</p>	<ul style="list-style-type: none"> <li>• GSA will continue with dedicated Program Management Office (PMO) resources; add in technical.</li> </ul>
<p>9. Improve selection of sites/buildings for new ESPCs to get the best deep retrofit candidates</p>	<ul style="list-style-type: none"> <li>• GSA should increase the use of remote auditing to gather data, prioritize deep retrofit potential, and continue to issue projects.</li> </ul> <p>(Note: now 100 GSA buildings—half of all covered facilities—are included in the virtual audit tool.)</p>

Moving forward, GSA will continue build on past successes and lessons learned. GSA will continue to foster open communication with the ESCOs and drive streamlining through the project management office. The tools and best practices that are developed in the first round of the NDER program will help inform the next batch of projects that will likely start in 2014. Also in 2014, GSA will compile lessons learned and host a similar workshop to openly review the process and identify areas for improvement. GSA will share its findings and experience with DOE-FEMP and with the rest of the Federal Government, and seek for the broadest possible adoption.



GSA HAS MADE  
SIGNIFICANT  
HEADWAY ON  
ESPCs

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01



# GSA HAS MADE SIGNIFICANT HEADWAY ON ESPCs

GSA has been utilizing ESPCs for over 10 years with a total \$440 million invested between 1999 and 2011.

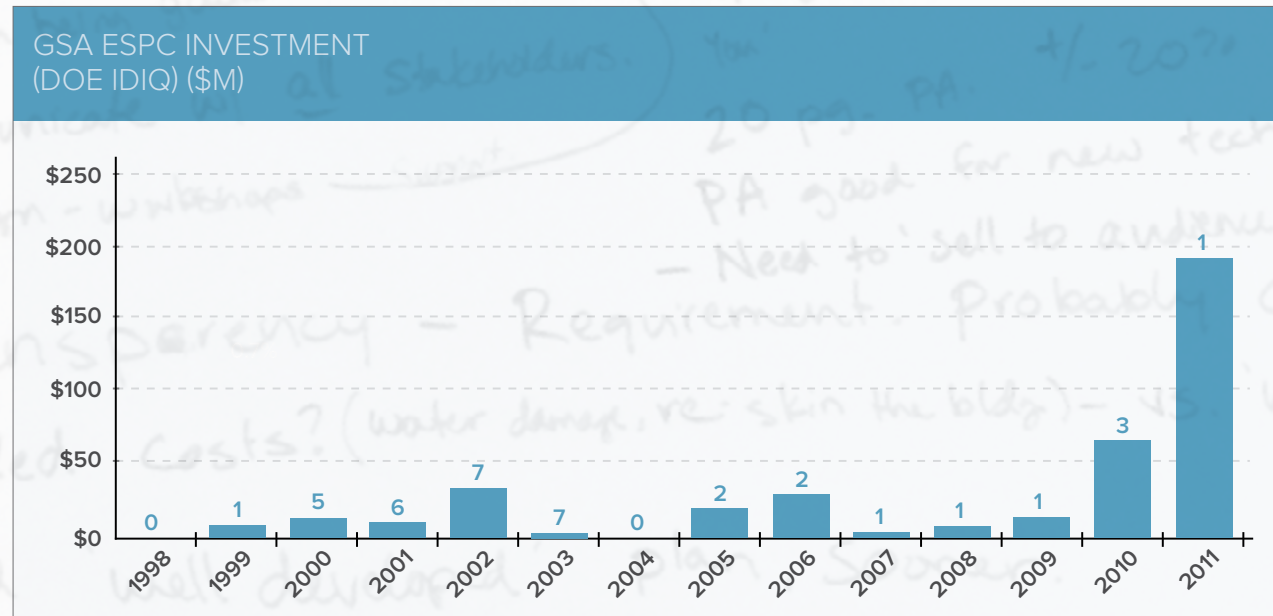


Figure 1: GSA's track record with ESPC projects, averaging just under three contracts per year. The single, large contract in 2011 is for the White Oak complex in Maryland (Source: GSA).

Though many regions historically have not embraced this mechanism and ESPC experience varies among those regions, there are now more ESPCs within GSA than ever before. Through the NDER program launched in March 2012, GSA has paved new ground on several fronts. All regions are doing an ESPC project, and ten of the eleven regions are using the standardized DOE IDIQ process. Eight regions participated originally in the NDER project and currently six are moving forward. GSA will be issuing contracts for over 30 buildings in 2013, up from an average of

three projects per year over the past 14 years. Those projects are being executed by a relatively large group of seven different ESCOs. GSA has created an internal project management office to manage the flow of ESPC projects, which has been critical to the program—with the high volume of projects, the NDER program could not sustain without this dedicated office. It should be noted that other government agencies have struggled by not having this management structure in place.



*DEEPER SAVINGS THAN AVERAGE ARE BEING ACHIEVED. PRIOR TO THE NDER PROGRAM, THE AVERAGE ENERGY COST SAVINGS FOR ESPC PROJECTS WAS ON THE ORDER OF 18%. BASED ON PRELIMINARY AUDITS RECEIVED IN THE NDER PROGRAM, THE AVERAGE SAVINGS HAS INCREASED TO 39%. INDIVIDUAL PROJECTS HAVE REACHED OVER 60% ENERGY SAVINGS.*

A few key verified factors will enable GSA to flag projects that are good candidates for a deep retrofit. The first are fairly obvious: high utility rates and the condition of buildings matters significantly to make the project deep. GSA continues to develop standardized practices and tools in order to select 'ripe' buildings that are ready for a deep retrofit. Another driving factor is the process that the ESCO used to identify and verify ECMs and, simply stated, the innovativeness of the ESCO. This aspect varied widely among existing NDER projects. Lastly, ESCO teams that have a consistent project manager from start to finish on a project were more successful.

Some of the major challenges noted to date associated with deep retrofits (and in particular with the NDER program) include:

- Applying a truly integrative design process to select interactive ECMs,
- Limited communication between ESCOs and GSA,
- Education and enthusiasm at the region and site levels,
- Energy escalation rates,
- Timeline of program rollout.

GSA continues to advance and improve ESPC projects on multiple fronts. One potent opportunity is by using remote auditing to identify deep buildings for ESPCs. Remote auditing

with software tools such as FirstFuel provides a quick, cost-effective, and high-level assessment of opportunities in a building and perhaps more importantly, enables deep retrofit candidates to be selected from within the portfolio as priority projects. In April 2013 GSA awarded a contract to FirstFuel to add 75 more buildings to the database. Combined with the initial 25 buildings, GSA will have 100 buildings in the virtual assessment tool by the middle of 2013. This accounts for half of the 'covered facilities.'<sup>3</sup>

*USING FIRSTFUEL OUTPUTS IN COMBINATION WITH OTHER BUILDING PERFORMANCE DATA, GSA HOPES TO IDENTIFY THE 200 HIGHEST-ENERGY-INTENSITY BUILDINGS FOR DEEP RETROFITS. IT IS HIGHLY LIKELY THAT ALL THOSE PROJECTS WILL BE UPGRADED USING ESPCS.*

<sup>3</sup>EISA Section 432 amends Section 543 of NECPA and establishes a framework for facility project management and benchmarking. Agencies must identify all "covered facilities" that constitute at least 75% of the agency's facility energy use. A covered facility may be defined as "a group of facilities at a single location or multiple locations managed as an integrated operation."





# THE PROCESS TO ACHIEVE DEEP ENERGY RETROFITS

02





## THE PROCESS

## TO ACHIEVE DEEP ENERGY RETROFITS

*This section summarizes the deep energy retrofit process, as discussed during GSA's Deep Energy Retrofit Charrette #1, held in Boulder, Colorado, in 2011. This information was not covered during the #2 charrette, held in Washington, D.C. in 2013. However, it is all relevant to the discussion and included here for valuable context.*

Deep energy retrofits involve projects achieving over 50% reduction in energy use, but as importantly, they use an integrative design process to get there. Buildings are composed of numerous systems (lighting, heating, envelope, cooling, IT, etc.) and integrative, whole-building strategies recognize how individual efficiency measures can affect other building systems and attributes. Improvements to the building envelope, for example, can reduce mechanical system loads and equipment, which in turn may increase usable floor area and reduce operating costs.

One of the most important and often overlooked pieces of a deep retrofit process is the initial design charrette, during which aggressive, synergistic measures are identified. Equally important, this charrette should involve key stakeholders from the owner, occupant, and ESCO entities to not only get a unique and comprehensive perspective on the opportunities but to also gather buy-in for the project. If owner agencies are vested in the process and understand the fundamental integrative design principle of interactive efficiency measures, the bundle of measures will be less likely to be stripped apart down the road.

Stakeholder groups to include in project charrettes are the building tenants, site staff, Public Building Services stakeholders, contracting officers, and both GSA regional and national stakeholders. Also, facilities management, design engineers, energy modelers, financiers, vendors, and the utility should be present. Integrating finance professionals early in the project process can reveal opportunities to reduce the cost of capital and make more energy cost savings available. Some of the most insightful and effective ideas often come from sources typically not core to the design process.

Occupants are the ultimate end users of buildings and primary consumers of energy. In GSA buildings, occupants may have strict yet customized tenant-space requirements depending on the agency and their work activities. However, their contributions to a successful ESPC are critical and can make or break a deep retrofit project. Occupant impact on energy use derives from a combination of tenant interior fit-out and occupant behavior. Engaging occupants during the retrofit design phase, typically through charrettes, can offer significant benefits to the overall design and drive results. A comprehensive discussion with the occupants on the goals, measures, and options of the ESPC will ease the transition and improve occupant engagement. Sample tenant guidelines (based on the Byron G. Rogers Federal Courthouse retrofit project) are available and can assist in involving occupants in an energy retrofit.



# DEEP RETROFIT OPPORTUNITIES AND STRATEGIES

BREAKOUT GROUP SUMMARIES

03





## DEEP RETROFIT OPPORTUNITIES AND STRATEGIES

# BREAKOUT GROUP SUMMARIES

The charrette was designed to encourage ambitious and audacious ideas. To facilitate this type of thinking, GSA and RMI asked each attendee to respond to the following question: “What single change in the ESPC process would be most impactful for achieving deep savings?” Responses revealed the following key themes:

1. Integrated design, which is a key element in the guiding principles for federal energy projects, is essential. ESCOs and GSA project managers need to take a more holistic look at the building, rather than ECM by ECM.
2. The process is still taking too long. All expect (hope) this will improve as both ESCOs and GSA decision makers get more comfortable with deep retrofits, the ESPC process, and financing, but all parties need to strive to expedite.
3. There needs to be significant improvements in communication—more upfront, consistent information and better coordination between agencies, ESCOs, and financiers.
4. A core driver is cash flow and there should be more focus on how energy savings can be used to finance innovative technologies.

To address those ideas, charrette participants divided into four breakout groups to discuss how to get deeper ESPCs and brainstorm possible next steps.

The objectives of each breakout group were to:

- Identify the most important opportunities for improvement
- Create strategies for each opportunity
- Determine responsible parties

The breakout group addressed:

TOPIC	DESCRIPTION OF THE ISSUE
Bigger and More Comprehensive is Better	Integrative, whole-building analysis and measures are not commonly included in ESPCs for a variety of reasons, including time constraints, risk, confidence in results, and unfamiliarity with the process.
Improving Communication	The current ESPC delivery process lacks consistency and stakeholder involvement among project managers in different agencies.
Measurement & Verification	M&V is complicated and current practices (Option A) may not be providing the highest value possible, particularly as deeper energy retrofits drive more interactive ECMs.
Time is Money	The project design and contracting cycle often stretches 18–24 months, which presents multiple challenges (financing, approvals, turnover, momentum).

Summaries from each breakout group follow. As expected, there were many overlapping topics, which added depth to individual groups and reemphasized overall priorities.

# BIGGER & MORE COMPREHENSIVE IS BETTER

Simply making projects larger will guarantee neither deeper savings nor more comprehensive projects. However, GSA and ESCOs identified methods to simultaneously increase project size and deepen energy savings. Many of these approaches require some evolution on the part of GSA, as well as new solutions from ESCOs.

ESCOs and GSA together need to continue driving towards truly bundled measures rather than provide a piecemeal approach based on the performance of individual ECMs. Savings that include measures for tenants continues to be a challenge yet holds significant opportunity to reduce overall building energy use. By including (reasonable) avoided capital costs, ESCOs can justify far greater investment in energy savings. Agency staff support for ESPCs can be increased by offering recognition for participation and by creating a culture of competition for energy savings.

MOST IMPORTANT OPPORTUNITIES	SPECIFIC STRATEGIES	KEY PARTIES
Overcome agency resistance	<ul style="list-style-type: none"> <li>Leverage GSA's goals, national policy, and the DOE Federal Finance Specialist</li> <li>Project viability should be determined based on lifecycle costing of bundled ECMs, and should be created inclusive of building personnel</li> </ul>	GSA ESCOs
Expand revenue streams	<ul style="list-style-type: none"> <li>Include savings from tenants (e.g. data centers), O&amp;M (while dealing with small business goals)</li> <li>Include avoided capital costs by first understanding what the limitations are (cost has to be in current year's budget)</li> </ul>	GSA/DOE
Improve project financials	<ul style="list-style-type: none"> <li>Build on commodity purchase legislation and the timing of commodity contracts, potentially using individual task orders</li> </ul>	ESCOs
Leverage internal resources and support and provide recognition	<ul style="list-style-type: none"> <li>Demonstrate how project meets agency goals, show all benefits</li> <li>Use the ECM database to apply lessons learned and crosscheck potential ECMs</li> <li>Offer recognition for participating in ESPCs</li> <li>Create internal competition for excellence in energy savings</li> </ul>	ESCOs/ Government
Maintain deep retrofit scope	<ul style="list-style-type: none"> <li>Maintain deep retrofit goals, continue to challenge ESCOs</li> </ul>	Government



# COMMUNICATION

There is a strong need for improved communication on all fronts. Streamlining and improving communication will save a significant amount of time and money. The key stakeholders in an ESPC include the tenant, site/Public Building Services, GSA region, and GSA national. Each stakeholder has a very different level of knowledge about ESPCs and deep energy retrofits, as well as different expectations about process and outcomes. GSA needs to be clear about who the decision makers are; from there, the ESCOs can help provide coaching on the ESPC process.

As the team moves through the process, constant communication between all parties is essential, especially during and after the Preliminary Assessment (PA). A shorter PA phase can help ESCOs focus more on addressing the requirements of key stakeholders and less on contract requirements. The easiest way to streamline the PA would be to redefine the output, focusing more on the high-level opportunity, and leave the detailed engineering to the investment-grade audit when there is sufficient time for analysis. Ongoing communication between GSA and all the ESCOs— independent of particular projects—can improve involvement and buy-in, while letting the industry offer input and constructive guidance.

*AS THE TEAM MOVES THROUGH THE PROCESS, CONSTANT COMMUNICATION BETWEEN ALL PARTIES IS ESSENTIAL. STREAMLINING AND IMPROVING COMMUNICATION WILL SAVE A SIGNIFICANT AMOUNT OF TIME AND MONEY.*



# COMMUNICATION (CONT'D)

MOST IMPORTANT OPPORTUNITIES	SPECIFIC STRATEGIES	KEY PARTIES
Identify key decision makers and point people on both ESCO side and GSA side	<ul style="list-style-type: none"> <li>• GSA to provide a list of reviewers and approvers with roles for each project</li> <li>• ESCO to provide a consistent point person throughout the project</li> </ul>	GSA ESCOs
Shorten preliminary audit phase and simplify deliverables	<ul style="list-style-type: none"> <li>• Shifting more time to IGA phase will provide more developed ECMs</li> <li>• Deliverable should be 20 pages, +/- 20% energy savings, and a presentation to the building manager</li> </ul>	FEMP/GSA, ESCOs
Get tenant engagement and buy-in	<ul style="list-style-type: none"> <li>• Identify the top 10 tenants of GSA buildings and create a strategy to work with them on tenant engagement strategies</li> <li>• Share sample tenant guidelines and occupant engagement programs</li> </ul>	GSA
Continuous communication during and after PA	<ul style="list-style-type: none"> <li>• ESCOs to provide informal progress and feedback, not specifically on task order schedules—this allows engineers to discuss and gather input on ECMs and costs before they are considered 'final'</li> </ul>	ESCOs
Integrated design is good! It aligns with a shorter PA phase. Charrettes provide multi-stakeholder input, find more interactive ECMs resulting in deeper savings	<ul style="list-style-type: none"> <li>• Use charrette process with all key stakeholders to inform the PA report — the IGA phase will support more integrative analysis</li> </ul>	ESCOs
Open communication in and out of NDER—lessons learned	<ul style="list-style-type: none"> <li>• Continue the current charrette approach semi-annually</li> </ul>	GSA



# MEASUREMENT & VERIFICATION

ESCOs have generally used Option A or Option B M&V retrofit isolation methods, which independently measure and verify the performance of an ECM. Option C (or Option D) consider whole-building solutions and will properly account for the savings realized from whole-building, bundled measures. Deep retrofits require Option C (or Option D) in order to identify, guarantee, and verify interactive bundles of measures, particularly if they include envelope measures, which can be challenging to measure independently.

The focus of this group was on expanding the use of Option C. The group acknowledged the paradox of having simpler M&V practices to reduce confusion and perceived risk, yet a desire to make M&V stronger, potentially adding more complexity and rigor. Several ESCOs are using Option C currently, although not all.

## Pros of using Option C:

- Increase the confidence agencies will have in the projected savings
- Verify interactive ECMs, enabling more envelope and load-reduction ECMs to be included

## Cons of using Option C:

- Time intensive to collect and analyze the data
- Inconsistent interest rates for Option C from financiers
- Agency can cause the shortfall of savings by not meeting all the factors needed in keeping up performance, but blames ESCO—can become controversial between agency and ESCO

## Other considerations to increase the use of Option C:

- Allow ESCOs to prove savings were within a certain percentage of a threshold, rather than proving that savings were above a certain threshold
- Ensure that tenants and building managers follow the operating strategies identified in the investment-grade audit (challenging since GSA can't control tenants)
- Understand the financial implications of Option C for funding, including binding versus non-binding options. To what extent are costs balanced by commissioning or the increased confidence agencies will have if Option C is used? What are the incremental costs and savings for Option C?
- Provide a band of savings, rather than meeting a threshold, which would provide for a small margin of error
- Before using Option C, get an idea of the strategic plan for that building to understand if there will be significant changes to the building
- As Option C is implemented more frequently, the risk premium (and associated financing) will be reduced
- If it is analyzed monthly, not annually
- Better for individual buildings rather than campuses or military bases
- Use Option C for first 1–3 years, then revert to Option D in out years, with periodic recommissioning of ECMs

Similar to selecting buildings that are 'ripe' for a deep retrofit, GSA and ESCOs need to recognize that not every building or retrofit fits Option C. Projects should be deep and large enough to warrant the additional analysis and M&V.

# MEASUREMENT & VERIFICATION (CONT'D)

MOST IMPORTANT OPPORTUNITIES	SPECIFIC STRATEGIES	KEY PARTIES
<p>When Option C is used:</p> <p>Performance assurance (retro-commissioning) will mitigate many of risks of Option C.</p> <p>Resolution of issues early minimizes savings payment disputes, translating to reduced financing costs.</p>	<ul style="list-style-type: none"> <li>• Limit Option C to three years, since beyond that, the criteria for whole-building conditions have likely changed</li> <li>• Revert to Option D in out years, with continued monitoring of metered data to optimize equipment operation</li> <li>• Use ongoing remote access to monitoring data so ESCOs don't need to go to site. GSA's current enabling programs: AMI, Smart Buildings, Building Link</li> <li>• Ensure that tenants follow the operating strategies identified in the investment-grade audit</li> <li>• To the extent possible, get an idea of the strategic plan for that building to understand if there will be significant changes to the building</li> <li>• ESCOs should provide a standardized report card in the M&amp;V report that summarizes a) what the agency needs to do to maintain equipment, b) a snapshot of the savings, and c) any other items the agency needs to address</li> </ul>	<p>FEMP/GSA, ESCOs</p>





# TIME IS MONEY

Although saving time can reduce the costs of the project, a quick process is no substitute for a well-designed and smoothly run project. The participants in this session decided that despite this not being the primary concern, GSA has a number of opportunities for improvement. If ESCOs could be provided with pre-prepared data packets, more dedicated resources from GSA, easier lines of communication, and a plan of upcoming projects, then ESCO teams could be faster and more effective. Consistency and standardizing lessons learned at the national level can also help streamline efforts.

Looking at the GSA ESPC process thus far from start to finish, primarily through the lens of the NDER program, there are several ways to save time and money. The following diagram summarizes the current timeframes for each phase and provides recommendations. Keep in mind the streamlined scenarios assume a Project Management Office and Contracting Officer is already in place.



**ESCO selection based on responses to the Notice of Opportunity (NOO)**

*Recommended 1–4 weeks (with site selection, contracting officer and PMO in place)  
Review and selection took 8 weeks, which was record breaking.*

**Preliminary Audit (PA)**

*The current PA typically takes 90 days and the NDER program reduced it to an average of 45 days. The group recommends reducing this further to 30 days.  
Simplifying the deliverables to a presentation and collaborative meeting would save ESCO and GSA time.*

**Notice of Intent To Award (NOITA)**

*Typically 1 week.  
This process has been extremely timely so far.*

**Investment Grade Audit (IGA)**

*Typically 6 months.  
This process could be scaled based on complexity of the project and by providing interim reviews at 50% and 90% completion.*

**Contract Award**

*TBD*

# TIME IS MONEY (CONT'D)

MOST IMPORTANT OPPORTUNITIES	SPECIFIC STRATEGIES	KEY PARTIES
Standardize contracts	<ul style="list-style-type: none"> <li>Provide standardized contract forms or use track changes when making modifications to streamline review process</li> </ul>	FEMP, GSA
Standardize and distribute data packet containing key information when ESCOs are down-selected	<ul style="list-style-type: none"> <li>Typical list of requested data (years of building data, occupancy, operating hours, etc.)</li> </ul>	GSA, GSA Regions
<p>Instead of providing a PA report, convene a PA meeting (to discuss opportunities and questions)</p> <p>(Due to challenges in getting all the right people present for a meeting, consider holding the meeting in addition to the PA report.)</p>	<ul style="list-style-type: none"> <li>Involve PMO to define the deliverables for that meeting and time required to field questions</li> </ul>	GSA PMO
Dedicated project resources has been helpful	<ul style="list-style-type: none"> <li>Continue with dedicated PMO resources</li> <li>Add in technical expert if cost effective</li> </ul>	GSA and/or GSA Regions
Improve communication	<ul style="list-style-type: none"> <li>At ESCO selection, get all relevant parties involved and begin open communication</li> <li>Decision framework (who needs to decide what, and when) provided at downselect</li> </ul>	GSA PMO
Provide ESCOs with a (vague) idea of the number of upcoming ESPC projects	<ul style="list-style-type: none"> <li>Determine legality of this action</li> </ul>	GSA PMO
Scale duration of IGA phase based on project size or complexity	<ul style="list-style-type: none"> <li>Determine metrics (dollars or numbers of ECMs)</li> </ul>	GSA PMO



NEXT STEPS

04



# NEXT STEPS

Moving forward, GSA will continue to build on past successes and lessons learned to develop best practices and tools to drive deeper savings in future ESPC projects. GSA will continue to foster open communication with the ESCOs and work towards streamlining the process through the project management office.

The remainder of this year will be focused on getting signed contracts for the projects underway to meet GSA's commitment to the \$2M PPCC goal. An additional 75 projects will be added to

GSA's FirstFuel energy performance tracking data by June 2013, for a total of 100 buildings. This data will help inform the next round of buildings selected for ESPC work, which is anticipated to start in 2014.

Also in 2014, once contracts are awarded for the current round of NDER projects, GSA will compile lessons learned and host a similar workshop to openly review the process and identify areas for improvement.



This "word cloud" shows the key themes that were discussed during attendee responses to the initial question asking: "What single change in the ESPC process would be most impactful for achieving deep savings?" The size of the words is proportional to the number of times they were mentioned.



# APPENDIX 1

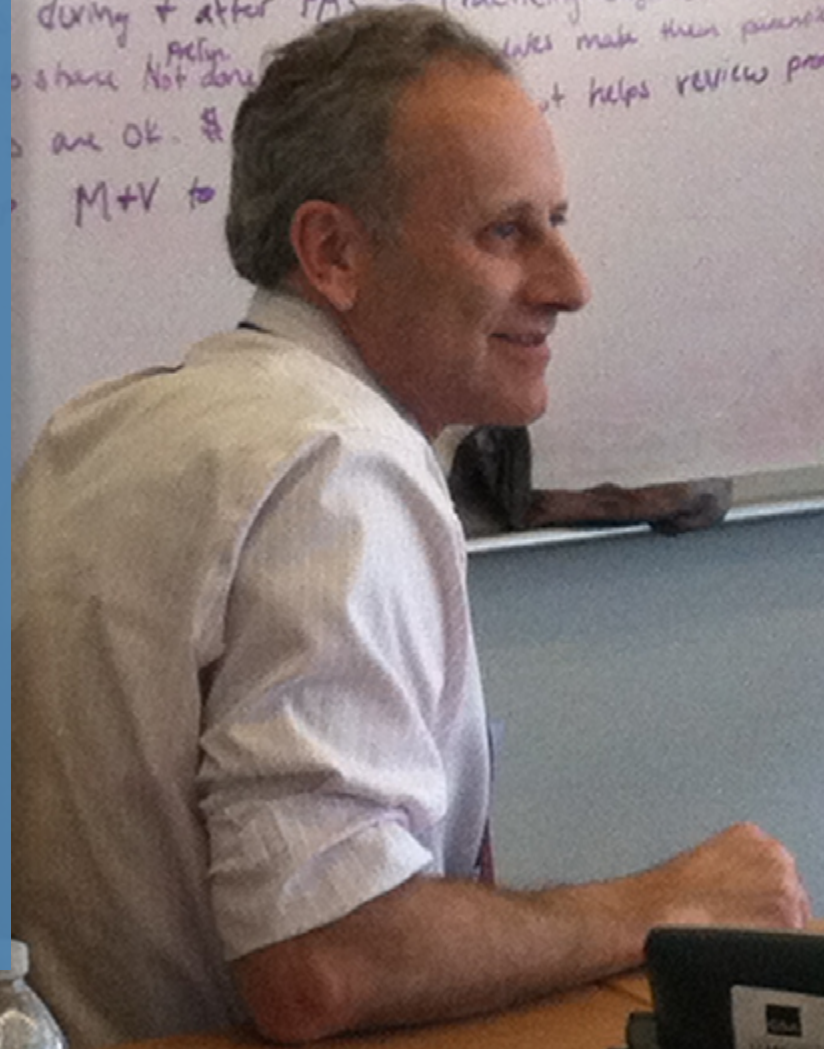
## LIST OF ATTENDEES

# A1

- Goal: achieve energy goals - ESPC the way to get there.
- Regions - less supportive of longer proj.

ESPC - diff. concerns for Regions.

during + after PA: - 'Practicing engineers' don't take make their presence  
Not done  
EOMs are OK. \$  
M+V to  
+ helps review process.



# LIST OF ATTENDEES

<b>Chris Abbuehl</b> Constellation	<b>John Dukes</b> Constellation	<b>Terrill Laughton</b> Johnson Controls Inc.	<b>Jeff Sherman</b> Schneider Electric
<b>Ron Allard</b> GSA	<b>Peter Flynn</b> Bostonia Partners	<b>Ben Leung</b> Siemens	<b>John Shonder</b> ORNL
<b>Morgan Blackwood</b> Clark Energy Group	<b>Karen Gierhart</b> Bank of America	<b>Andrew Morton</b> Johnson Controls Inc.	<b>Phil Smith</b> Honeywell
<b>Tom Bowen</b> McKinstry	<b>Brian Gilligan</b> GSA	<b>Karen Munson</b> LMI	<b>Roy Torbert</b> RMI
<b>Nicole Bulgarino</b> Ameresco	<b>Stephen Grumbach</b> DLA	<b>Cyrus Nasser</b> DOE/FEMP	<b>Bill Treadway</b> FPL Energy Services
<b>Kelli Canada</b> LMI	<b>Stephen Hochman</b> GSA	<b>Jeff Niesz</b> Pepco Energy Services	<b>Tim Unruh</b> DOE/FEMP
<b>Cara Carmichael</b> RMI	<b>Tom Hattery</b> DOE/ FEMP	<b>Richard Paroby</b> Pepco Energy Services	<b>Chris Van Horn</b> Noresco
<b>Phil Coleman</b> Lawrence Berkeley National Laboratory	<b>David Hayden</b> Trane	<b>Kinga Porst</b> GSA	<b>Kevin Vaughn</b> Schneider Electric
<b>Alicia Collier</b> Honeywell	<b>Jerrold Johnson</b> Pepco Energy Services	<b>Kurmit Rockwell</b> DOE/FEMP	<b>Bernard Volk</b> FPL Energy Services
<b>Sharon Conger</b> GSA	<b>Kevin Kampschroer</b> GSA	<b>John Saams</b> Siemens	<b>Jody Wilkens</b> Trane





Headline  
lacks credibility with some  
(bar chart issue). Affects  
Ability of F&PC overall  
Item C could restore

# APPENDIX 2

SUMMARY OF FINANCING DISCUSSION

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# A2

# SUMMARY OF FINANCING DISCUSSION

Presenters: Peter Flynn, Bostonia Partners and Karen Gierhart, Bank of America

\*\*NOTE: These are notes from the conversation that took place with some interpretation. These are not direct quotes\*\*

## How do you price ESPCs?

- Term/tenure, Project size, Allocation of risk / risk profile of project
- Investor prices to the risk that isn't mitigated (and has in-house engineers to assess this)

## What could go wrong over the period?

- Contract (term, rights of termination, debt service shortfalls)
- Contractor risk (ESCO experience and credit, Construction/acceptance risk)
- Project/Performance risk (equipment, M&V, O&M)
- Customer risk (closure, realignment, history of payment issues)
- Risk mitigation—How can an ESCO do it?
  - Project performance—once the savings are accepted and the first payment is made, risk is significantly reduced. Charrette attendees discussed the idea of putting a contract 'buffer' in place.

## How significant is risk in the final pricing?

- Financiers treat ESPCs as a commodity, but every project is different
- Risks around construction, acceptance of government, and payment issues, and M&V—these are the things that really drive pricing

## What can ESCO do to get better rates?

- Long-term capital allocation, as soon as these projects hit the books, are considered a fixed-rate obligation. Immediately putting a long-term investment on the balance sheet.

- ESPCs are very complex contractual obligations, but when looked at on a relative basis, ESPCs are a small percentage of the banks' overall business.
- Legal expenses associated with the deal are high, so if the ESCO can standardize the way the operative documents look this could reduce legal costs. A small deal takes almost as much as a large deal for legal costs.
- Allocation of risk—government is considered a low-risk customer, but the federal government still has a risk delivering timely payments
- Banks evaluate how each project is performing every quarter, but as projects are slow to develop, bankers could benefit from advance planning. If banks can set expectations early, this could contribute to lower pricing.
- Financiers look at expense reports on an annual basis (M&V reports), they are looking to see how the project is performing, to ensure project is meeting its targeted savings.

## Government pays interest when it pays late. So why does this increase risk/financing costs?

- Government has low penalty interest rate
- Helping to resolve payment issue
- Financiers could put structure into deals to alleviate payment concerns. Bostonia used to build in a lag, and the government should require the financier to build in a lag (buffer) for amortization, that would alleviate some payment issues.

## Could you do a cost-benefit analysis around late payments?

- Hard to quantify the cost of making late payments
- Late payments create overall degradation of the view of the quality of the program... could lead to long-term disinterest in financing ESPC projects
- Large payment deals go to the top of the organization... long-term effects on financing costs
- Financiers are supporting the ESCOs, but they have no direct access to the government; they can't go in and just collect the money



# SUMMARY OF FINANCING DISCUSSION Q&A (CONT'D)

## Why is termination for convenience such a terrible thing?

- Financiers are looking at 20+ year deals, which carry a lot of indirect costs. Depending on what's happened to the market they look at them as investments they want to have for the duration of the deal (instead of redeploying capital). This affects the program in the long haul.

## What is the impact of M&V on pricing? If the financier prices UESC vs. ESPC in terms of project size and risk profile, what is the effect of M&V?

- ESPC deals are longer term. Financiers want to know that during the construction period, the ESCO is responsible for taking financier out of project. From performance period stand point, financiers want to know that the ESCO is committed through the life of the project.
- There is a 15–20 (up to 50) basis points difference between ESPC and UESC.

## If the ESCO is very credit-worthy, does it matter?

- Yes, financiers look at how the bonds are trading on the ESCO
- Financiers look at history—a lot of things can happen in 20–25 years (e.g. Enron). Even though credit is great, still potential for a problem, so more than just good credit.

## How far in advance do the financiers plan on a project?

- Financiers have a pipeline, and they anticipate when things are coming due. Consistency is key; there is a huge difference between \$25 and \$200 million. If there is a consistent pipeline, we can allocate money and be more aggressive.
- GSA is not interested in continuing with option A. Option C seems to be priced to the greatest risk. What is the basis point increase from option A to everything else?

- It's not that the financiers can't do option A if you look at what deals have come to market in past 18 months, there have not been a lot of option B, C, and D deals. If this is the direction it's going, a flow of projects makes everything easier. There just hasn't been a consistent flow of this kind of business.

## Can a financier preliminarily price a project for different financing options?

- Yes, potential for huge differential in basis points as government shifts risk to the ESCO

## What would cause financiers to lower the project termination penalty?

- They've already lowered this by several percent and will never be able to eliminate this penalty completely

## Are there any economies of scale when an ESCO finances multiple task orders with one financier?

- Each deal stands on its own merits so there is no way to bundle task orders. But there is potential to reduce legal costs.
- What is the risk assessment associated with non-conventional ECMs.
- Financiers use a deeper dive due diligence process.

## Instead of having all ESCOs provide standard contracts as suggested, could ESCOs just red-line, track changes when a change to a contract is made so that the bank doesn't have to re-review the entire contract?

- Yes, that would be helpful.





# APPENDIX 3

PRESENTATIONS FROM CHARETTE

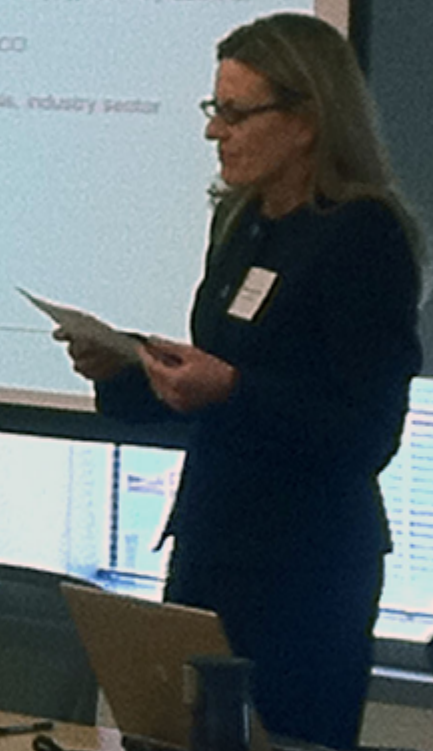
# A3

### ESPC Financing

Pricing Rational - Why ESPCs are not priced like a US Treasury

- Systemic risk capital allocation, Basel, complex contractual obligation
- Costs
- Expense - legal, indirect costs, hedge breakage cost associated with any type of buy down or termination
- Location of risk - M&V Protocol risk shifting from government to ESCO
- Reliability payments
- ESPC is sensitive to the financial markets - liquidity, comparable deals, industry sector
- Ongoing portfolio management
- ESPC expense management
- Relatively same analysis - \$25MM or \$100MM deal
- Need to develop, no consistent flow of business

Proprietary and Confidential






# PRESENTATIONS FROM CHARETTE

GSA / DOE ESPC DEEP RETROFIT WORKSHOP PRESENTATION - MARCH 4, 2013



U.S. General Services Administration




**GSA / DOE  
ESPC Deep  
Retrofit  
Workshop  
March 4<sup>th</sup>, 2013**




### Agenda

- 9:00am Introductions and welcome
- 9:30am Initial Input
- 10:00am GSA and FEMP Recap of Deep Retrofit
- 11:00am Breakout Groups
- 12:00pm Reconvene and brief report-out
- 12:30pm Lunch Boxed lunch \$10
- 1:00pm Financing Expert Presentation
- 1:45pm Breakout groups continued
- 3:00pm Break
- 3:15pm Breakout groups report-out
- 4:30pm Vision and Dream – Looking forward




Identify the most important area for both ESCOs and GSA to improve to make deep federal ESPCs successful



### FEMP Recap – Dr. Tim Unruh


- GSA Institutional and organizational changes
- Ideas and best practices from GSA deep retrofit project can benefit other agencies
- FEMP survey



### GSA Recap – Kevin Kampschroer

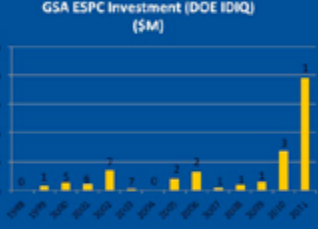
High Priority Solutions from Boulder Charrette:

- Reduce time to contract award
- Redefine eligible savings
- Share risk
- Combine funding
- Multi-building projects, bundling
- Consider occupant behavior programs



### GSA Utilization of ESPCs

- \$440M invested in ESPC since 1999
- Renewed GSA interest and investment in ESPC (\$262M in FY10-11)



Fiscal Year	Investment (\$M)
1999	~10
2000	~10
2001	~10
2002	~10
2003	~10
2004	~10
2005	~10
2006	~10
2007	~10
2008	~10
2009	~10
2010	~10
2011	~262

# PRESENTATIONS FROM CHARETTE

## GSA / DOE ESPC DEEP RETROFIT WORKSHOP PRESENTATION - MARCH 4, 2013

**GSA Challenge Goals 2011**

- Demonstrate best practices for maximizing overall ESPC project energy savings;
- Advance progress toward EISA goals;
- Accelerate deployment of underutilized and renewable technologies;
- Further expose GSA regions to DOE ESPC IDIQ contract process and resulting improvements in ESCO selection;
- Identify and understand processes necessary to get to net zero energy;
- Identify structural, contractual and technical impediments.

**GSA PMO – Sharon Conger**


1. Subjects not to be discussed
2. PAST Why ESPC's not used more
  - A. Procurement Process
  - B. Resources
  - C. Stigma
3. PRESENT
  - A. PMO
  - B. Almost all Regions are participating
4. FUTURE
4. Challenges
  - A. Differences in needs by regional teams
  - B. tenant issues- CH, data centers
  - C. Schedule
  - D. Resources

**DOE Recap – John Shonder**


1. Deep retrofit proposals
  - a. Utility prices
  - b. Current EUI of buildings
  - c. Savings opportunities available.
2. No new/innovative/previously unseen ECMs
3. Lack of integrated design approaches
4. Benefits of focused programs and centralized management

**Recovery Act Case Study**

- Net-zero energy target
- Platinum LEED rating goal
- Historic Building
- 123 kW PV array to produce 170,000 kWh a year (greater than 50% of the building's historical annual electricity use)
- Ground source heat pumps
- ECMs: lighting control and monitoring, demand controlled ventilation, plug load management measures, thermally improved building envelope.
- Building physics analysis used



CO, Grand Junction Wayne N. Aspinall Federal Building & US Courthouse



**Breakout Groups**

**Supporting Long Term Measurement and Verification**

Most Important Opportunities	Headline

AM Breakout PM Breakout

Most Important Opportunities	Specific Strategies	Key Parties

**Breakout Groups TBD**

Room	Title	Topic
#203 Skye Schell Rcy Torbert	Time is Money	Delivery process, transparency,
# 1005 Cara Carmichael Kelli Canada	Communication	Internal/external, tenants
# 1001 John Shonder Phil Coleman	M&V	Integrated Design Risk
#1007 Kings Porst Tom Hattery	Bigger is better	Expand project cashflows, capital avoidance



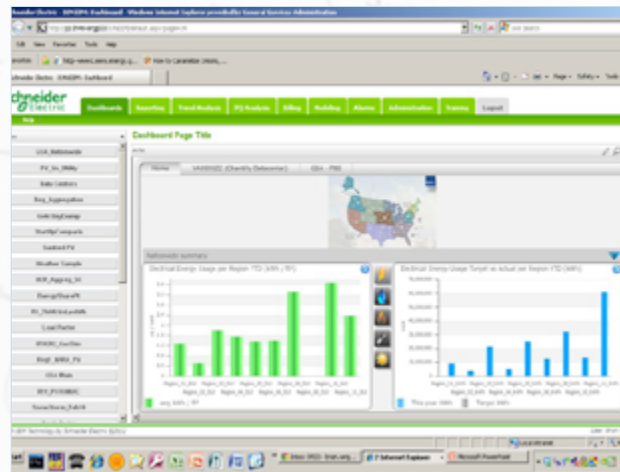
# PRESENTATIONS FROM CHARETTE

## GSA / DOE ESPC DEEP RETROFIT WORKSHOP PRESENTATION - MARCH 4, 2013

### GSA Vision – Moving forward

- GSA Portfolio review
- Virtual audit tools
- Building data management
- gBuild database

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### GSA / FirstFuel Project Summary: Data Analytics Driving Business Results

- 25 → GSA building energy audits completed and reviewed with the building managers
- 6 → Weeks to complete
- ~1 billion → kBtUs examined, both electric and gas
- ~\$4,500,000 → In savings identified
- 50/50 → Split between low/no-cost operational and retrofit savings
- 90% → Savings to GSA vs. the cost of onsite audits
- 8,760 → Hourly meter data points per building required to produce the analysis...all waiting in the GSA or utility databases
- 0 → Number of onsite visits required

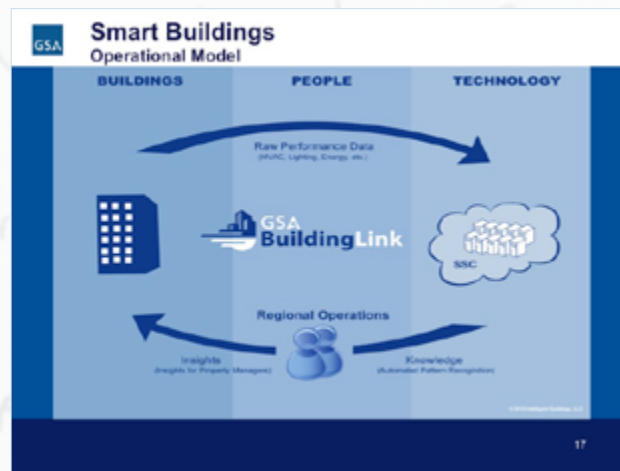
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### GSA Breakthrough Innovation in Remote Meter Data Analytics

- MINIMAL DATA INPUTS**  
Building address, 1 yr electric interval meter, Local weather data, GIS Mapping/Sensors Search
- FIRSTFUEL METER DATA ANALYTICS**  
Placed Pending RFA platform
- DEEP BUILDING INSIGHT**  
Annual Electric End-Use per SqFt, Pie chart showing Heating, Cooling, Water, and Ventilation

- No onsite visits or devices.
- No building simulations or buildings "like" this one

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# PRESENTATIONS FROM CHARETTE

## GSA / DOE ESPC DEEP RETROFIT WORKSHOP PRESENTATION - MARCH 4, 2013

**GSA BuildingLink Fast Facts**

- Targeting **200** most energy intensive building in GSA (75% of total energy use)
- Looking to capture 80% of Energy Use in Data Points
- These are "covered" facilities with advanced meters
- First phase rolling out in **50** buildings representing 30 MM SF
- **Every region** is represented with connected buildings
- Phase II will encompass another **50** building representing 25 MM SF
- Industry awards and recognition for analytics at **scale**

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**GSA gBuild - Green Building Upgrade Information Lifecycle Database**

- gBUILD standardizes and streamlines high performance green building (HPGB) data across project types and offers the following:
  - A *Scalable Framework* for maintaining flexibility for different project/program reporting needs
  - A *Lifecycle Approach* to help PBS implement HPGB related activities throughout the complete project lifecycle
  - *Streamlined Reporting* to coordinate data collection across business lines and project types to minimize redundancies
  - *Team Integration* using GSA's Salesforce platform to promote work force collaboration and knowledge sharing

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**GSA Continuous Improvement in the HPGB Project Lifecycle**

```

    graph LR
      subgraph Propose
        P1[Propose, Plan, Review]
      end
      subgraph Design_and_Construction
        P2[Project Compliance & Quality Control]
        P3[Project Tracking]
      end
      subgraph Operate_and_Maintain
        P4[O&M Performance Verification]
      end
      P1 --> P2
      P2 --> P3
      P3 --> P4
      P4 --> P1
      subgraph Feedback
        P5[Best Practices & Lessons Learned]
      end
      P4 --- P5
      P5 --- P1
    
```

- Maintain project tracking and transparency through all phases of project lifecycle
- Continue to develop requirements and information tracked as processes evolve
- Inform future projects, policies, processes and guidance with lessons learned/best practices

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**GSA Coordination will Maximize Benefits of Evolving Applications**

Project Tracking: RAHD, ePM, ECOE, GPG IS

Performance Tracking: POE, EUAS, Smart Buildings, ION EEM

Facility Tracking: ABP, LEED EBOM, CMMS, EPA Portfolio Mgr & CTS

\*Internal systems from GSA

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# PRESENTATIONS FROM CHARETTE

## GSA ESPC DEEP RETROFIT WORKSHOP: ESPC FINANCING CONSIDERATIONS PRESENTATION

MARCH 4, 2013



### GSA ESPC Deep Retrofit Workshop: ESPC Financing Considerations

Peter Y. Flynn, Executive Vice President  
Bostonia Partners

Karen H. Gierhart, Managing Director  
Banc of America Public Capital Corp

GSA Headquarters Building, Washington, D.C.  
March 4, 2013

### General Factors in Pricing ESPC Projects

- Term
- Project size
- Risk Profile
  - Price to weakest non-mitigated risk
- Spread is sensitive to market sentiments – comparable deals, industry sector, structure

### ESPC Risk Analysis

**Contract Risk**

- Longer terms
- Termination for Convenience
- Debt Service shortfalls

**Contractor Risk**

- ESCO experience and credit
- Construction/acceptance risk

**Project/Performance Risk**

- Equipment performance
- Measurement and Verification
- Operations and Maintenance

**Customer Risk**

- Closure/Reassignment
- History of payments/acceptance

### Energy Savings Performance Contracts – Risk Mitigants

**Contract Risk**

- Termination for Convenience - non-negotiable termination liability schedule
- ESCO indemnification for shortfalls
- Assignment of payments through Assignment of Claims Act

**Contractor Risk**

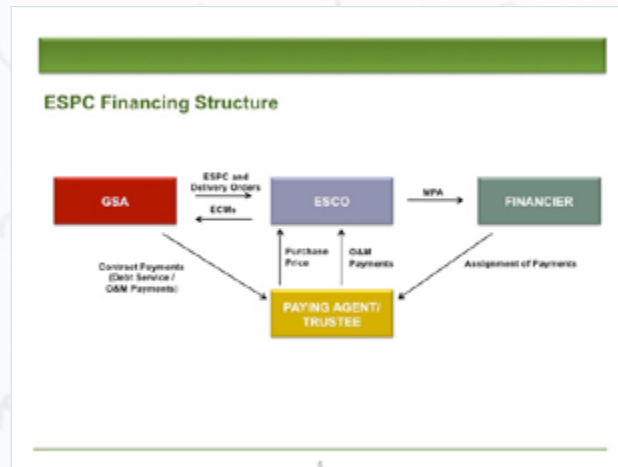
- Completion – 100% payment and performance bonds; Contract language re: replacement of ESCO; Lenders prefer date certain completion with "put" to ESCO

**Project/Performance Risk**

- Overall risk is reduced after acceptance
- MSV – Lenders prefer "Option A"
- O&M – Replacement of ESCO without contract termination; Government often responsible

**Customer Risk**

- Closure or termination potential – termination liability schedule; Due diligence relative to essentiality of facility



### ESPC Financing

**Pricing Rational - Why ESPCs are not priced like a US Treasury**

- Long term fixed capital allocation, illiquid, complex contractual obligation

**Factors**

- Term
- Expense – legal, indirect costs, hedge breakage cost associated with any type of buy down or termination
- Allocation of risk – M&V Protocol: risk shifting from government to ESCO
- Timely payments
- Pricing is sensitive to the financial markets – liquidity, comparable deals, industry sector
- Ongoing portfolio management
- OSM expense management
- Relatively same analysis - \$2MM or \$100MM deal
- Slow to develop, no consistent flow of business

# PRESENTATIONS FROM CHARETTE

## GSA ESPC DEEP RETROFIT WORKSHOP: ESPC FINANCING CONSIDERATIONS PRESENTATION

MARCH 4, 2013

**ESPC Financing**

**Project Termination Costs**  
 A termination penalty is required to recoup the financing costs associated with project.  
 Breakage Costs – redeployment of capital  
 Indirect costs – Legal, accounting, operations, time, profit

**Economies of Scale – Financing Multiple Task Orders with one Financier**  
 Potential to reduce legal costs by bundling TOs  
 Efficiency may be created by standardizing documentation, however each project stands on own merits

7

**ESPC Financing**

**Risk Assessment with Non-Conventional ECMs**  
 Deeper dive with due diligence process  
 Financial strength & experience of ESCO necessary  
 ESPC projects aren't priced to take project or resource risk, reliance on ESCO wrap

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- Need 'well developed' plan, sooner.

- Goal: achieve energy goals - ESPC the way to get there.

- Regions - less supportive of longer proj.

- Deep vs. ESPC - diff. concerns for Regions.

- 'Practicing engineers' don't





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