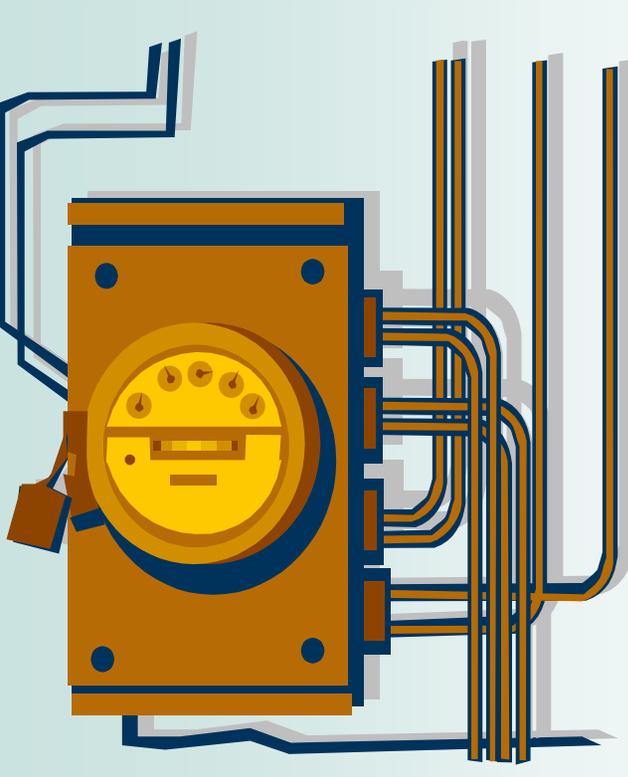


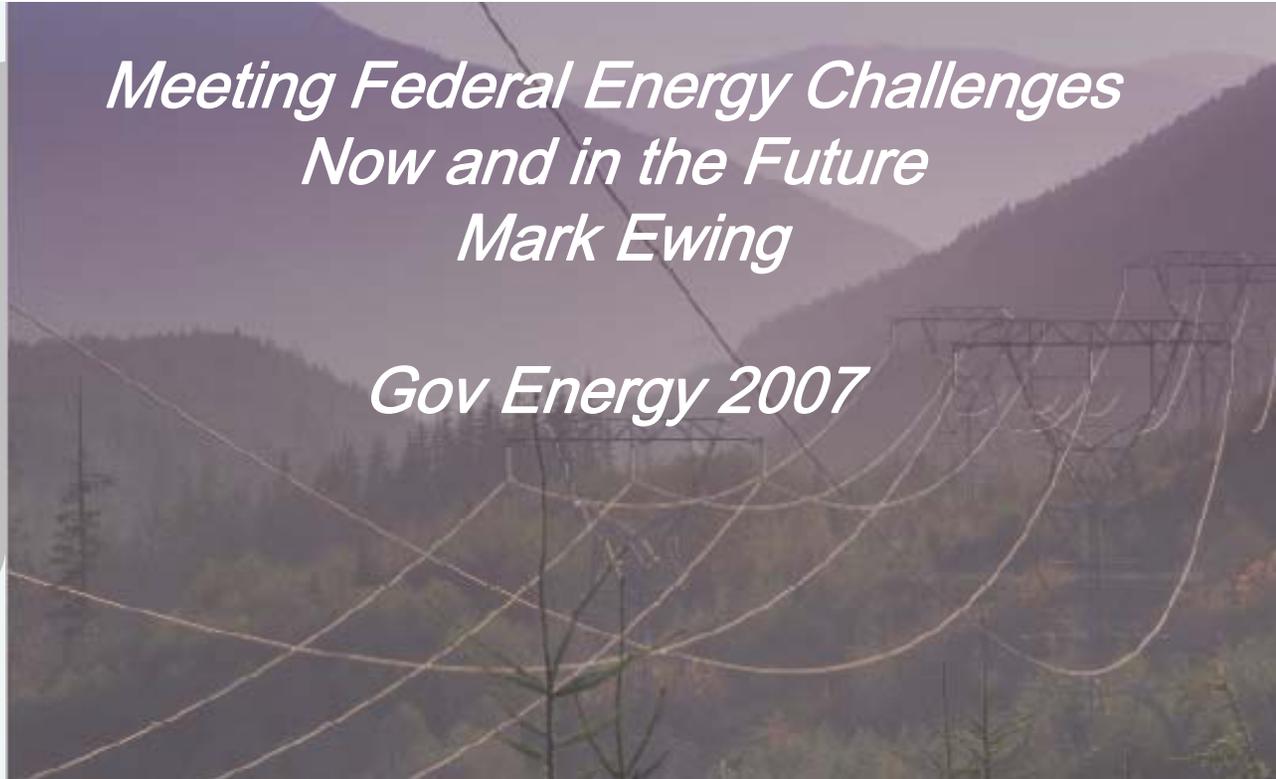


GSA Initiatives



*Meeting Federal Energy Challenges
Now and in the Future
Mark Ewing*

Gov Energy 2007





What's New at GSA

- Agency Show cases
 - New Solar Roof
 - Advanced Meters work!
- Challenges Met – A progress update
 - ESPCs and GAO
- Green Lease
- Design Targets for new construction and major modernization
- GSA Energy Procurements - Why not join?





Energy Center of Expertise



Waltham, MA BIPV Roof

New England Region project

- 300 KW building integrated Photovoltaic system
- Inter connected to NSTAR grid
- At peak can produce approximately 50% of buildings electricity need.
- Often returns power to grid
- Region 1
- Twice the cost of traditional roof.



BIPV Solar Roof

- Learn all the facts and monitor real time production on the internet
- <http://gsanara.rem-systems.com/>





EPACT 05 New Design Targets

- In addition to the above requirement, all projects shall use EnergySTAR Target Finder to establish a site use BTU/GSF target for the project. This tool is available at:
- http://www.energystar.gov/index.cfm?c=new_bldg_design.bus_target_finder
- The following process will be used for this effort:
- 1.) Following the final prospectus approval, the GSAS project manager will use initial projections for gsf, space use and # of personnel to generate a target necessary to achieve a site specific score. This score that will be used to generate the target will be based on the performance of other GSA facilities in the close geographic proximity and similar space use and will be set by the Energy Center of Expertise working with the GSA project manager.
- 2.) The target may be adjusted to reflect any significant changes to one of the determining factors, which are gsf, space use, # of personnel. All changes to the target must be agreed upon by GSA and the A/E firm.
- 3.) The energy performance of GSA facilities can be found through the <http://euas.gsa.gov> Directions for where to go to for assistance for running reports is identified on the website.



GAO ESPC Audit Impact

- GAO Audit GAO-05-340 recommendations
 - Collect and use ESPC-related data more effectively
 - Use appropriate expertise when agencies undertake and ESPC.
 - Require audit agencies to conduct audits of ESPC projects
 - Strengthen contracting centers of expertise
 - Strengthen competition including the IDIQ recompetete
 - Collect agency ESPC information more extensively (DOE)
- <http://www.gao.gov/highlights/d05340high.pdf>





GAO Audit - GSA Specific Recommendations

1. GSA compile info on key contract terms such as interest rates and mark-ups for energy-efficiency equipment for each ESPC and as a key part of best practices, make info accessible to agency officials in negotiating subsequent ESPCs.
2. GSA ensure that the agency officials responsible for ESPC decision-making use appropriate expertise when they undertake and ESPC. Cost in acquiring this expertise should be considered in deciding whether to use an ESPC.
3. GSA require inspectors general or other audit offices to conduct audits of ESPC projects to ensure the projects are achieving their expected results.

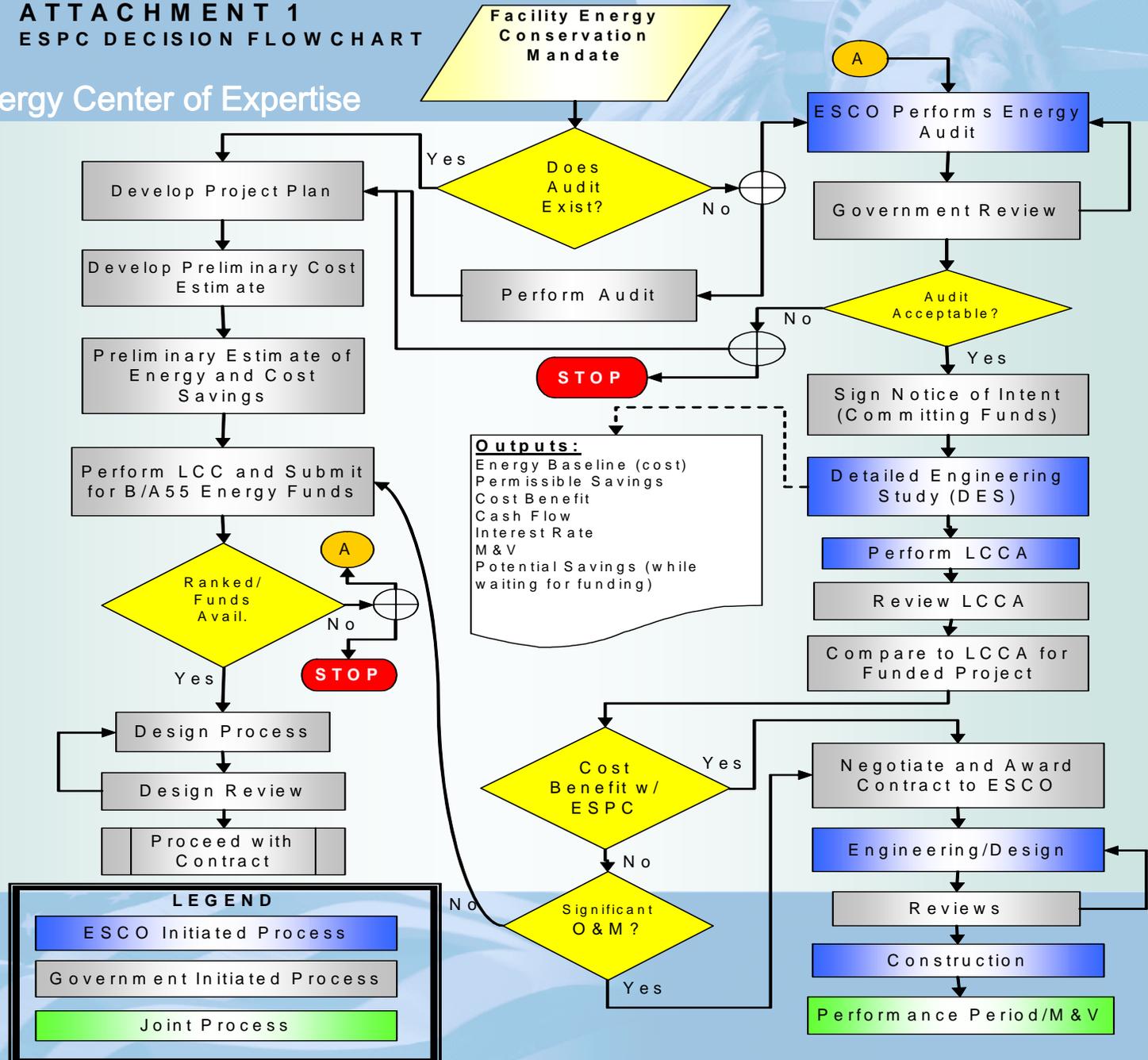


Alternative Financing – GSA Actions

- **Memo #1- Appropriate Use of ESPCs**
 - Issued November 29, 2005
 - GSA established a process for determining if and when an ESPC constitutes a good business decision to secure energy conservation work
 - Business Case Analysis must be completed before entering into any new ESPC
 - Developed a Decision Flowchart to be followed

ATTACHMENT 1 ESPC DECISION FLOW CHART

Energy Center of Expertise



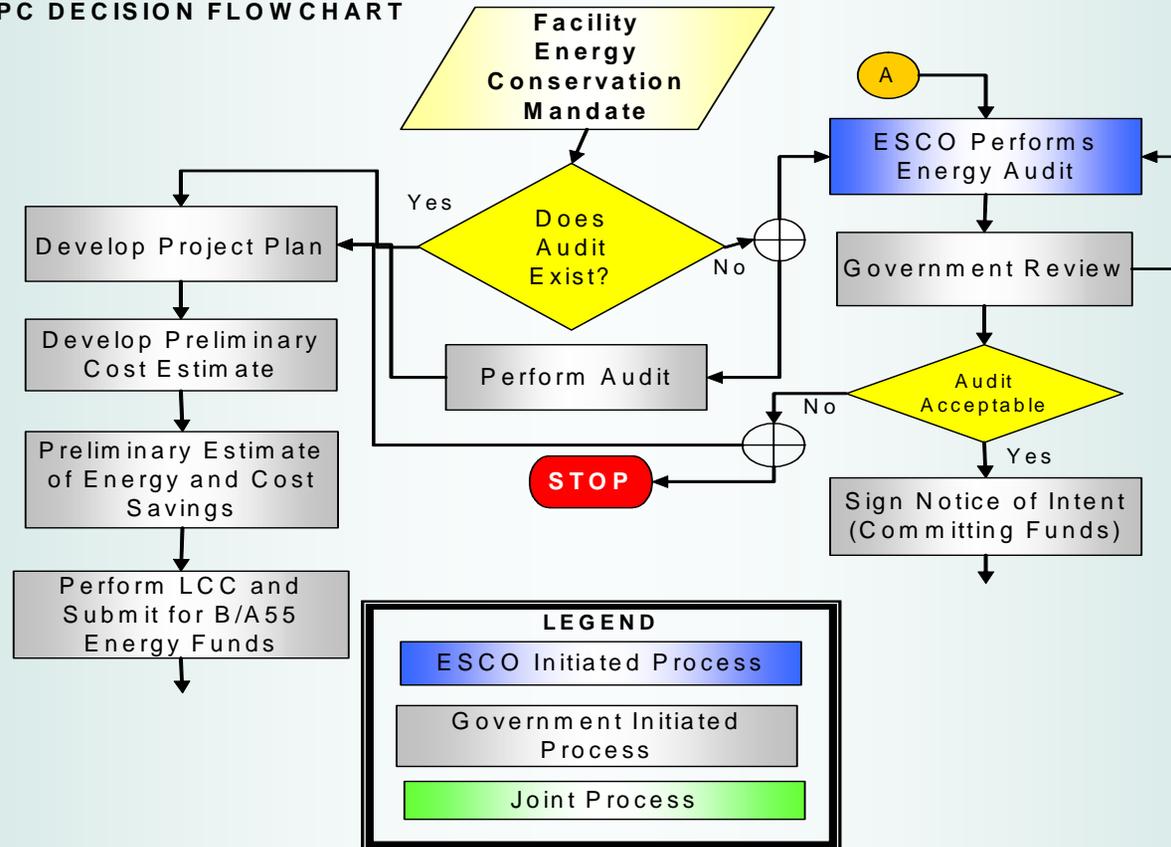


Initial Step by Step – Flowchart

- Establish whether a viable energy survey/audit has been completed for facility
- If one exists – project should proceed as a funded project
- If not – region may request a free survey from an ESCO and proceed as an ESPC project
- Depending on findings the Region may decide to stop the project after review of the audit.
- If project seems like good value, Region may sign a NOI letter, committing the Government to reimburse the ESCO for costs incurred in the DES should govt not proceed.



ESPC DECISION FLOWCHART

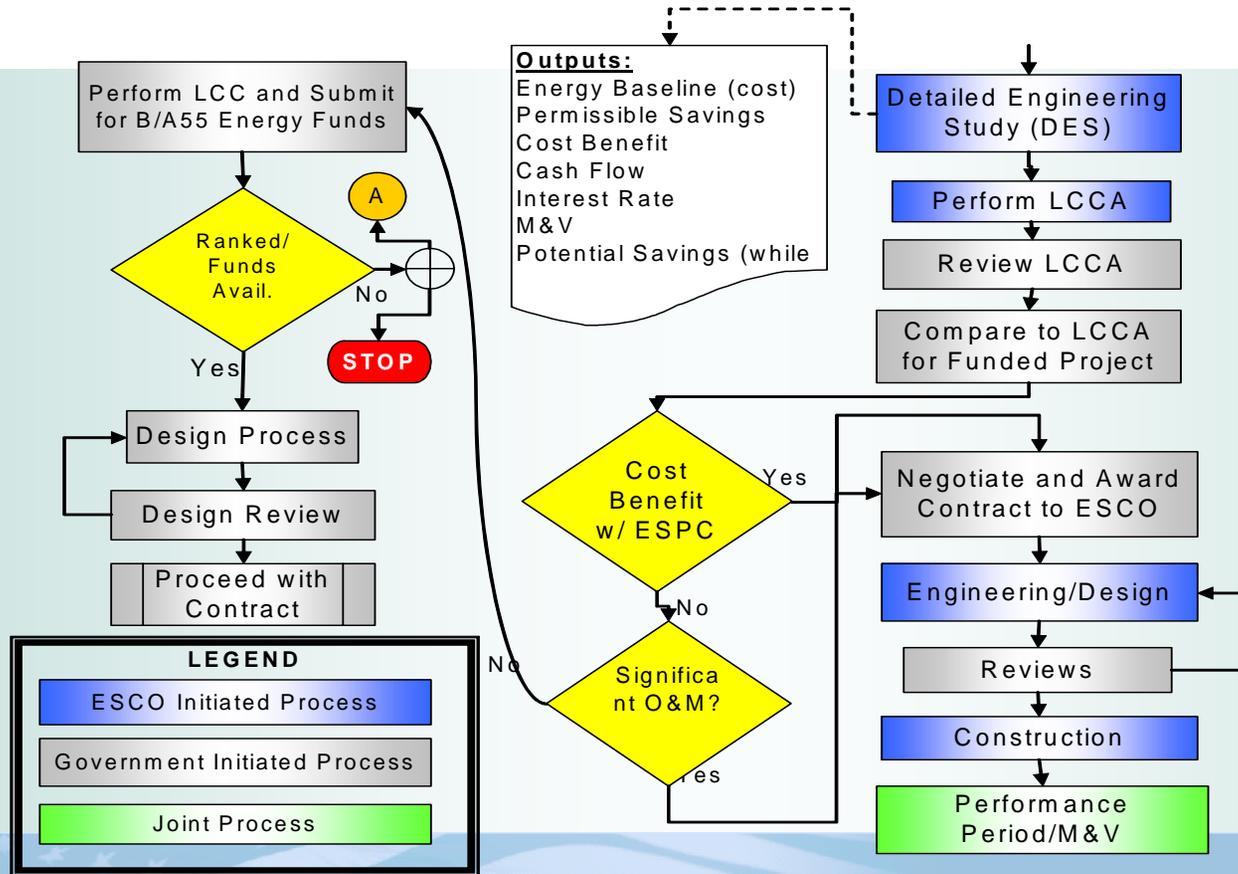




Next Level – Step by Step

- As part of DES, Region should request that ESCO prepare a LCCA in order to calculate present value of project plus related costs. Again, study period must not exceed 25 years plus 2 yrs for planning.
(Typically hasn't been occurring in past ESPCs)
- Before proceeding with ESPC process, Region must prepare estimate of cost to accomplish work as a funded project and perform a LCCA for the funded project. For example, if an ESPC project is being considered, a LCCA for a fully funded project must be prepared, with appropriate time frames for the process and in-service date.
- The LCCA for direct funding should be compared to the LCCA for the ESPC case. The lower resulting present value should generally determine the method of contracting selected. Note in comparing LCCAs, the costs for savings “lost” prior to energy project in-service date should be accounted for.





More

- In event that substantial cost savings are attributable to O&M improvements, and these savings are not otherwise attainable through the appropriated funding approach, a reasonable justification to continue the project as an ESPC can be used as basis to proceed. Note these savings must be real and documented.
- This framework cannot consider every possibility that exists; therefore Regions should document external factors that are applied in the decision process.

Alternative Financing – GSA Actions

- Memo #2 –Appropriate Review of Documentation and Expertise Acquired
 - ESPC contract data required to be inputted into Integrated Project Database (internal GSA database) and should be periodically reviewed for information accuracy
 - Used for compilation of data and tracking of savings
 - Key part of best practices to be shared within the agency
 - GSA ESPC contracts must use DOE Project Facilitators
 - Designated Regional Energy Coordinators as Regional ESPC experts
 - Issued June 16, 2006



Green Lease

- GSA is in the process of issuing a new green lease
- Features very stringent energy efficiency requirements
 - Energy Star certification within one year of lease signing





GSA's Advance Metering Plan

- GSA's Plan is intended to serve as the General Services Administration's Agency Metering Plan as required by Section 103 of the Energy Policy Act of 2005 (42 USC 8253(e)(3)).





GSA, PBS A/E Design Guide (P-100)

- EPAAct 2005 Advanced Metering
- *All projects shall include installation of advanced meters which will better enable GSA to track and continuously optimize performance. In order to take advantage of demand response programs, and to enable the GSA to respond effectively during a power curtailment event, facilities must be prepared to reduce demand quickly and effectively. New construction and modernization projects must include intelligent electric meters capable of bi-directional monitoring of: phase voltages, phase currents, power consumption (demand), power factor, kVAR, and availability. These meters must be capable of communicating via MODBUS/TCP/IP. Meters must meet at a minimum the definition stated in the Guidance for Electric Metering in Federal Buildings issued pursuant to Energy Policy Act of 2005. New construction and modernization projects must also include demand reduction logic in the building automation system that is capable of activation upon input from the building operator or the intelligent meters. Ideally the logic would be capable of three tiers of demand reduction – low/no occupant impact, minor occupant impact, some impact. The equipment curtailed or set-points changed during each level must be identified by the A/E and agreed to by the Project Manager*



GSA Centralized Advanced Metering Data Effort

- System provides individual users quick access to customized screens, delivering up-to-the-minute data consistent with their needs.
- System will utilize the existing wide area network (WAN) infrastructure to transmit data from field devices to the server(s).
- Data storage and warehousing will be handled by the National Capital Region's IT staff under an agreement with GSA's Energy Center of Expertise.



Communications Requirements

- ION EEM operates on historic data only, as opposed to real-time data.
- Data is typically time stamped in 15 minute intervals. The “front end” is provided by ION Enterprise. This system allows the presentation of real-time and historic data.
- A software module loads data from the ION Enterprise database into the ION EEM database for analysis in ION EEM.
- In order to get data into the system, meters will need to satisfy specific communications protocol and media.





Funding Strategy

- Field devices will be funded on a prioritized schedule; using funds approved for metering in GSA's annual budget based on the 2005 Advanced Metering Strategic Assessment Plan Initiative.
- GSA has received \$6 million in FY07 as a result of this request and will continue to request additional funds each budget cycle until the plan is adequately funded.
- Priority funding for regional hardware purchases and connection to the agency wide software program will occur based four factors:
 - (1) total annual cost of electricity (most recent 12-month period);
 - (2) annual electricity use per GSF;
 - (3) annual electricity consumption;
 - (4) demand response program is available either from the grid operator or local utility.





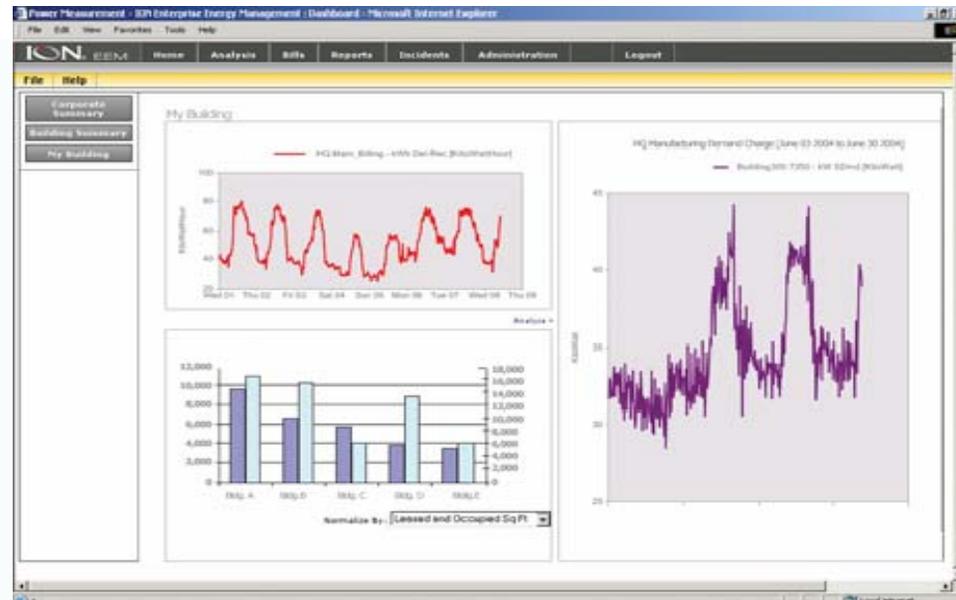
Data Integration

- *Historic Data for ION Meters*
 - ION meters feature on-board logging. This means that data is stored in a circular memory block in the meter. New data replaces the oldest data, so that one always has the most recent data stored on the meter e.g. the last 30 days. The effect of this is that any temporary loss of communications will not mean a loss of data in the ION Enterprise and ION EEM systems. As long as the communications downtime is not longer than the depth setting of the data recorder, data will not be lost.
- *Historic Data for 3rd Party Meters*
 - Although 3rd party meters might have similar on-board logging capability, ION Enterprise and ION EEM do not support the reading of these historic data logs. Data from 3rd Party meters must be logged using a software module of ION Enterprise, using a protocol other than ION protocol e.g. Modbus RTU. This means that in order to log data, continuous communications is required.
- *Historic Data from other sources*
 - Historic data can be loaded into the ION EEM database from e-mail, .xml and flat file formats. This means that historic data can also be sourced from 3rd party databases, ftp sites etc. A software module receives and transforms the data and loads it into the ION EEM database.



What is ION EEM?

- Innovative web-based software that answers the energy information needs of organizations that want to make better energy decisions
- Designed to support real-time monitoring within a data warehousing architecture
- Suitable for virtually any type of business: institutional, office and retail buildings, universities, industrial and research facilities, health centers, and utilities
- Offers a unique ability to provide a fully integrated look at all levels of your business



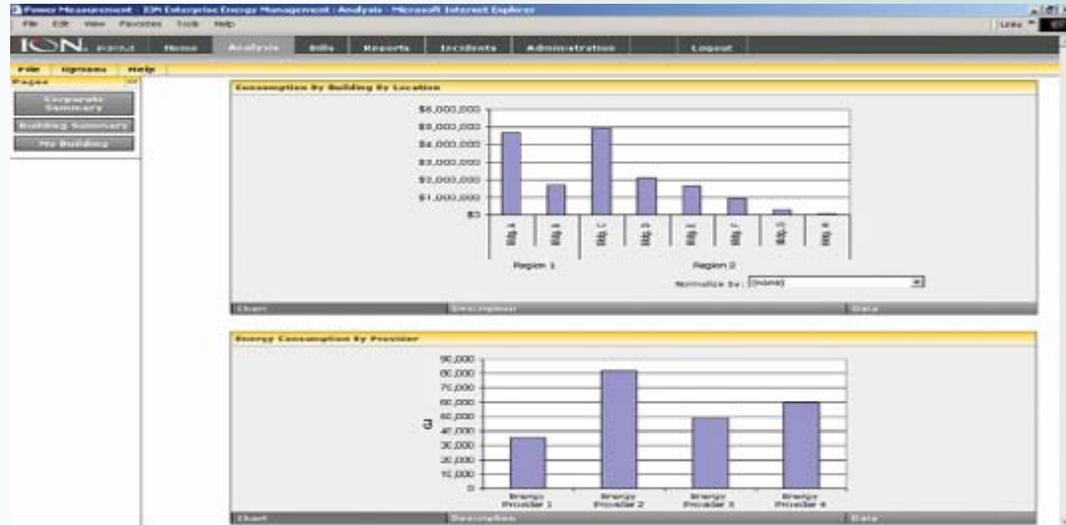


Key Benefits of ION EEM

- Translate real-time and historical data into actionable information
- Proactively reduce energy-related business risks
- Control energy costs
- Unite energy management and business strategies
- Gather, cleanses and integrate info from disparate systems
- Easily add capabilities as you need them

Application - Benchmarking, Base-lining and Forecasting

- Benchmark facility conditions
- Carry out comparisons between locations to identify best practices
- Create baselines to track conditions within a single facility
- Compare results over time to measure the effectiveness of retrofits, upgrades, etc.
- Use normalization routines to remove independent variables to ensure accuracy
- Model future results, then alter variables to gauge dependencies and see possible outcomes of different scenarios



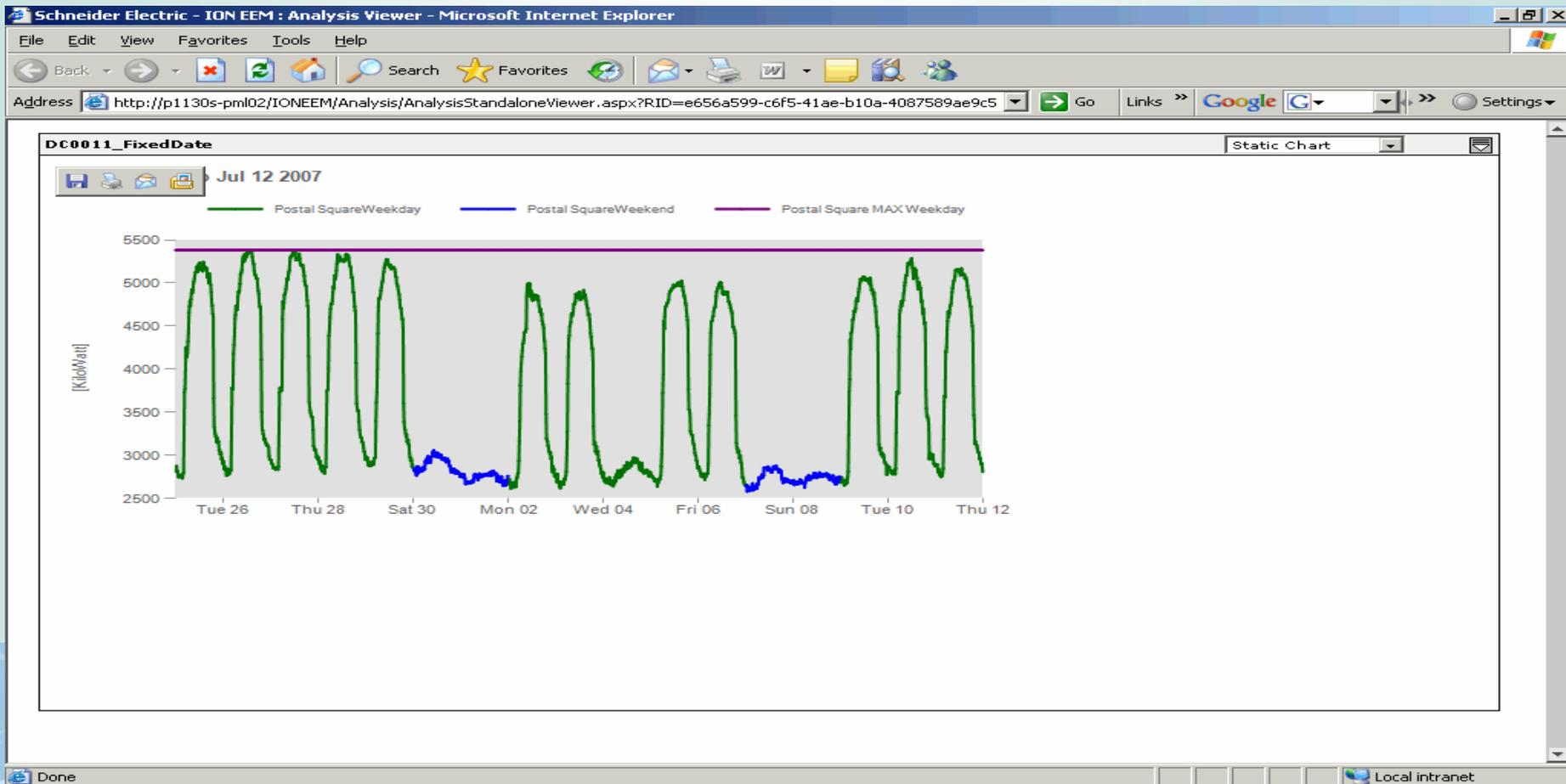


Recent Success

- GSA needed good example of real energy savings effort in response for Congressional Testimony
- Real time metering capabilities allowed GSA to verify our abilities to react to conditions using technology and pre-determined load shedding plans



Real Life Example of Energy Savings!





GSA Energy Procurements

- Deregulated Electricity and Transportation Natural Gas
- New Block and Index approach for mitigating volatile electricity prices has been approved by GSA Commissioner
- New gas contractors expanding coverage nationwide
- Join a growing list of federal agencies using this free service





Conclusion

For more details on any of these initiatives please visit our booth at the expo and talk to the experts firsthand!

