



U.S. General Services Administration

GSA Update Federal Utility Partnership Working Group

November 7, 2018

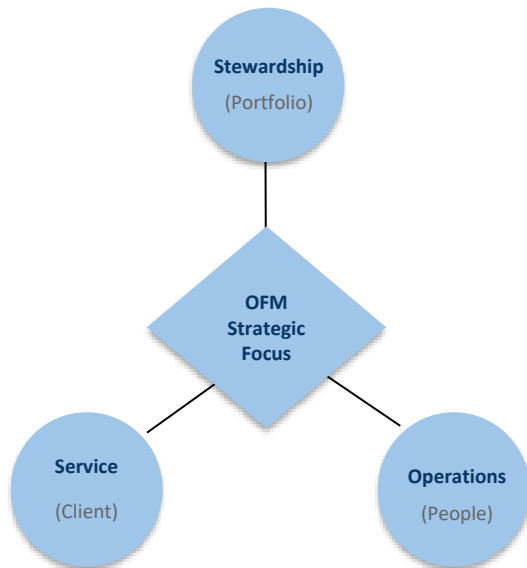


UNITED STATES COURTHOUSE

Office of Facilities Management

5 Year Plan - Organizational Health Indicators

1. Measure the portfolio across a variety of OFM "health" indicators, not just service contract costs.
1. Address workforce challenges by leveraging regional strengths and sharing best practices.
1. Achieve operational efficiency and effectiveness across the portfolio.



**Work Order
Throughput
(WOT)**



**Energy
Utilization**




**Total
OPS Cost**

**Workforce
Utilization**



**Tenant
Satisfaction**

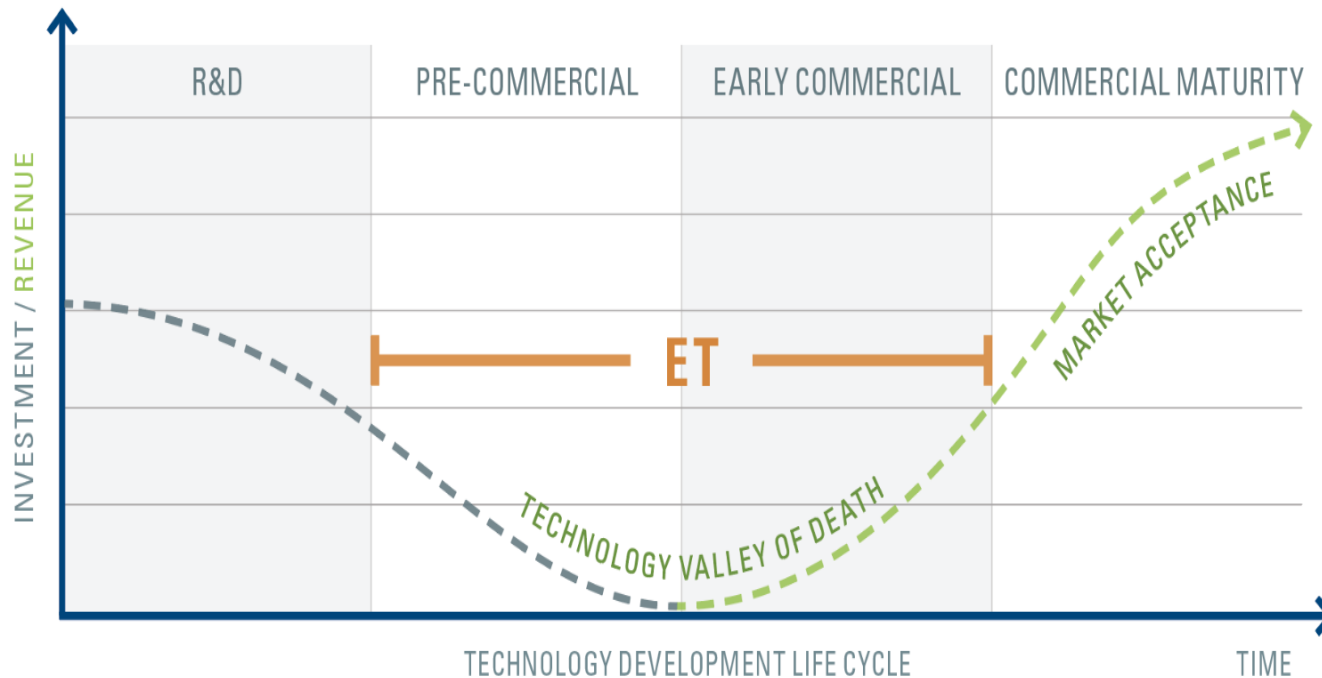




Emerging Building Technologies' two programs — GSA Proving Ground (GPG) and Pilot to Portfolio (P2P) — enable GSA to make sound investment decisions in next-generation building technologies based on their real-world performance.

Next Generation Solutions: Leading by Example

Emerging Building Technologies provides GSA a “one stop shop” for objectively assessing innovative building technologies in real-world environments (GSA Proving Ground), and deploying those that deliver (Pilot to Portfolio).




Emerging Technologies

- Mission : Enable GSA to make sound investment decisions in next generation building technologies based on their real-world performance
- GSA's Proving Ground (GPG) assesses real-world performance of next generation technologies
 - Identify promising technologies at the edge of commercialization
 - Pilot technology installations within GSA's real-estate portfolio
 - Partner with DOE labs to objectively evaluate real-world performance
 - Identify technologies with broad deployment potential for GSA
 - **600 technologies considered, 63 technologies evaluated, 33 reports published, 20 technologies proven for GSA**
- Pilot to Portfolio (P2P) supports the deployment of proven next generation technologies
 - Process influence supports the introduction of proven technologies at key lifecycle entry points: new construction, retrofits, end-of-life replacement
 - Portfolio analysis utilizes existing GSA databases to identify buildings with aging, inefficient equipment and tenant comfort issues
 - Project initiation support provides technology specifications and IT security approval
 - Dynamic training offers webinars, dashboards and interactive tools
 - **13 proven technologies deployed, \$7M in estimated annual savings**

Technologies Tested by GPG with Published Results

Building Envelope	HVAC	Lighting	Energy Management	Water	On-Site Renewables
Electrochromic Windows	Circulator Pumps	Integrated Daylighting Systems	Advanced Power Strips	Catalyst-Based Scale Prevention for Domestic Hot Water Systems	Honeycomb Solar Thermal Collector
Hi-R Low-E Window Retrofit System	Condensing Boilers	LED Fixtures with Integrated Advanced Lighting Controls	Chiller Plant Control Optimization System	Weather Station for Irrigation Control	Photovoltaic System Performance
Low-E Window Film	Fan Belts: Synchronous and Cogged	LED Downlight Lamps for CFL Fixtures	Socially Driven HVAC for Personal Control	Wireless Soil-Moisture Sensors for Irrigation Control	Photovoltaic-Thermal Hybrid Solar System
Nanocoating Solar Control Films	Indirect Evaporative Cooler	Occupant Responsive Lighting	Wireless Pneumatic Thermostats		Wood-Pellet Biomass Boilers
Thermochromic Windows	High-Performing Commercial Rooftop Units	TLED Lighting Retrofits with Dedicated Drivers	Wireless Sensor Networks for Data Centers		
Vacuum Insulated Panels for Roofing Applications	Smart Ceiling Fans	Wireless Advanced Lighting Controls			
	Variable Refrigerant Flow				
	Variable-Speed Maglev Chiller				
	Variable-Speed Screw Chiller				

 Proven Deployment Potential for GSA

Technologies Under Assessment

Building Envelope

HVAC


Lighting

Energy Management

Water

On-Site Renewables

Dual Zone Indoor Shades	Drop-In Smart Switched Reluctance Motor	Advanced Lighting Controls with LED	Adaptive Control for Chilled Water Plants	Electrochemical Water Treatment for Cooling Towers
	High Efficiency HVAC		Circuit-Level Energy Monitoring	Alternative Water Treatment for Cooling Towers
	Intelligent Energy Valves for Hydronic Systems		Predictive HVAC Optimization	Monitoring and Partial Water Softening for Cooling Towers
	Smart Scrubbers for HVAC Load Reduction		Wireless Sensors and Analytics	Catalyst based Water Treatment for Cooling Towers



Once a technology has been proven, it must fit within GSA's concept of Operational Excellence and have an attractive Total Cost of Ownership

Operational Excellence Goals

A holistic approach to evaluate building technology and design approaches for the long run

- Reduce overall total cost of ownership (TCO)
- Integrate operability and maintainability into designs
- Improve transition from building delivery to operations
- Incorporate feedback from operations to building delivery

Benefits of Operational Excellence

- Way to ensure maximum use of operations budget
- Have standardized tools and processes to evaluate Total Cost of Ownership
- Emphasis on capturing lessons learned and calibrating TCO Tool assumptions with actual data and outcomes



GSA continues to leverage our utility acquisition knowledge across government

GSA Public Utility Areawides

- 100 Areawide contracts with 2 more in negotiation
- GSA working with OMB to get Tier 2 Spend Under Management (SUM) Rating under Category Management
- Use of the Areawide Contracts steady
 - FY16: \$1.4B on 2,580 contract actions
 - FY17: \$1.0B on 3,006 contract actions
 - FY18: \$1.4B on 2,657 contract actions

Recent GSA UESC Projects

2017 - San Francisco, CA

Pacific Gas & Electric awarded \$4.4M investment value project for Appraisers Building

2018 - Philadelphia, PA

Philadelphia Gas Works awarded \$960K investment value project for 2 courthouses and a federal office building

Deregulated Electric and Natural Gas Commodity Programs

GSA's Deregulated Electric and Natural Gas Acquisition Programs assist agencies in purchasing energy in deregulated and competitive markets.

- \$345 million in annual third-party spend
- 1174 end-use accounts
- 30+ agencies
- 37 states
- 99 utility service territories
- 160 active supply contracts
- 40% of supply contracts served by small businesses
- 20% renewable included in electricity contracts on average

Legend:

- Blue: Gas Only
- Grey: Electric Only
- Green: Electric and Gas
- White: Limited Opportunities

Energy Rebates

FY17 Energy Rebate Program

- \$4.7M income; \$4.9M obligated for energy efficiency projects

FY18 Energy Rebate Program

- \$5.5 M income; \$5.0 M obligated for energy efficiency projects

GSA has issued updated national energy rebate guidance for regions to follow.

Demand Response

Authorized by Energy Policy Act of 2005 (PL 109-58)

GSA primarily participates in grid-based demand response programs

- Grid based DR is coordinated through a third-party contractor and only available in certain territories.
- GSA has enrolled approximately 25 megawatts demand
- \$1M in annual benefit

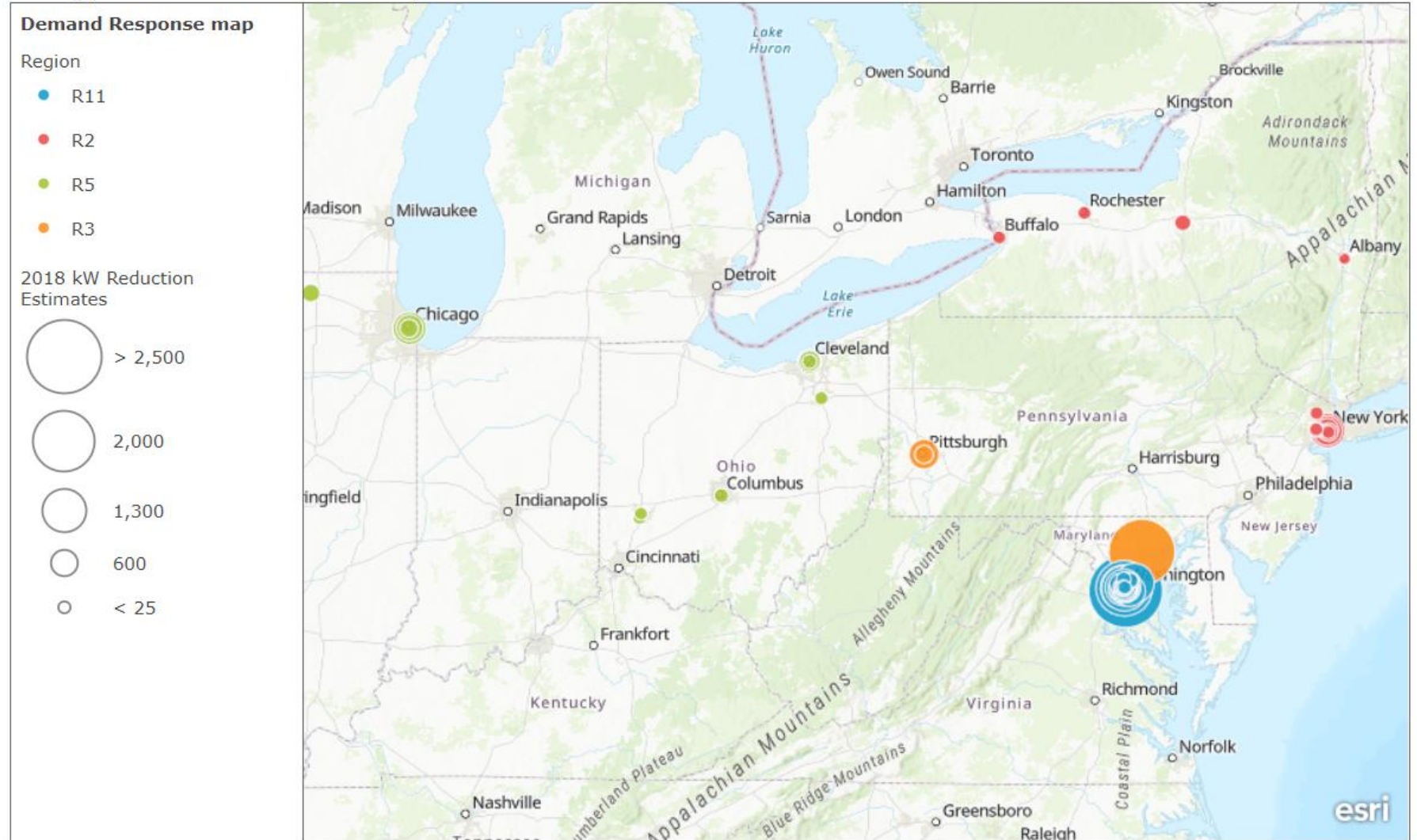
GSA looking to participate more in utility based demand response programs

Grid based rebates are added to energy efficiency fund

Utility based incentives are applied as a credit on the utility bill

GSA Locations Using Grid Based Demand Response

Energy Division - Demand Response



Renewable Energy

GSA obtains 13% of total electricity from renewable sources (statutory goal 7.5%)

Sources include

- Competitive electric supply procurements (typically 20% total supply)
- Renewable Energy Certificate purchases (RECs)
- Onsite renewable resources (112 active renewable systems that generate approximately 36,000 MWh annually)

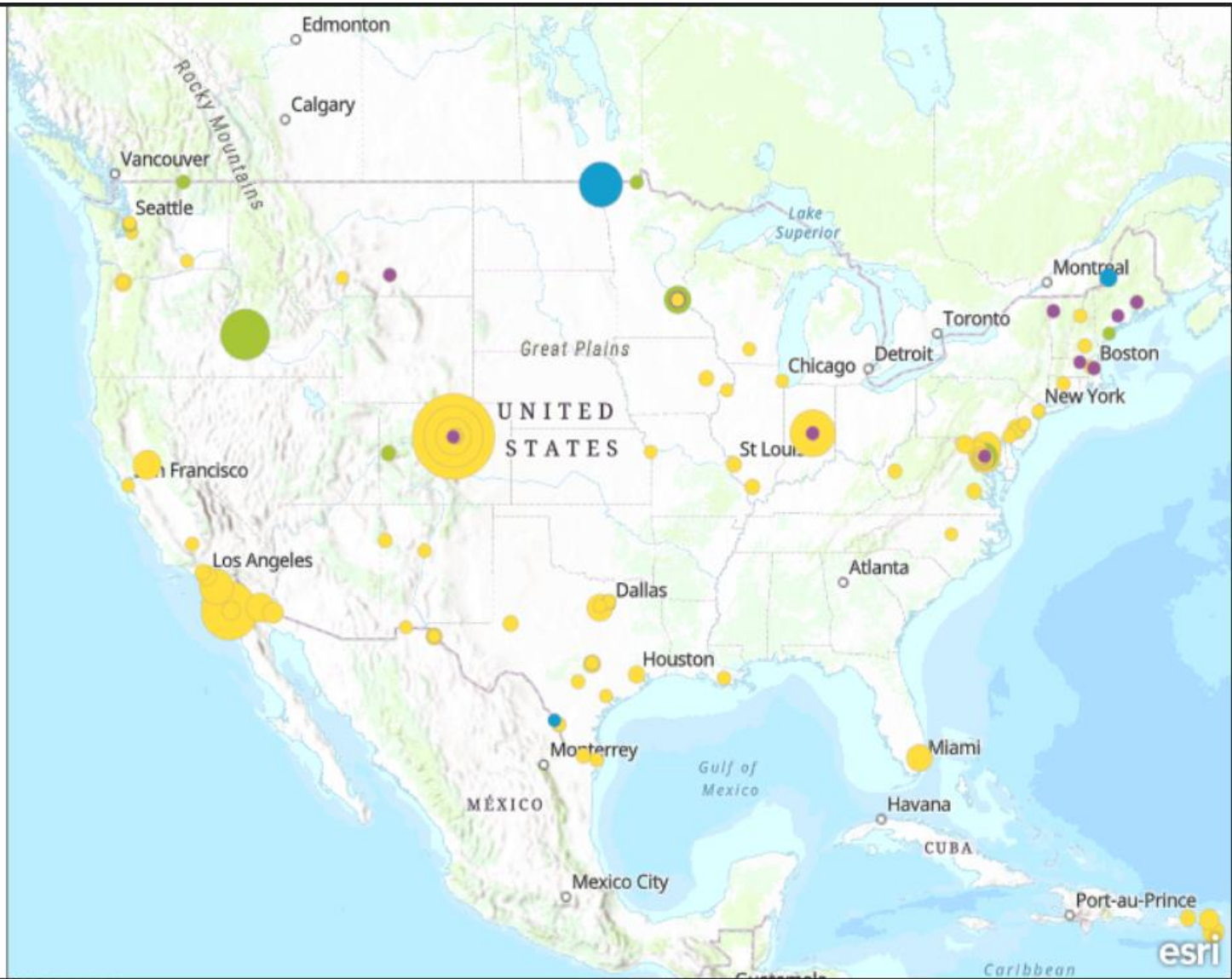
Renewable Energy Projects

Renewable Energy Production

RE Type

- Solar Photovoltaic
- Solar Thermal (including water and space conditioning)
- Geothermal Heat Pumps
- Geothermal
- Wind
- Wood and wood residuals

Energy Generated (kWh)



Total Cost of Operations

