



The Premier Energy Training Workshop
and Trade Show for Federal Agencies

A River of Energy Solutions

Federal Data Center Consolidation Initiative – Partnerships For Success

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FDCCI & SSPP – Partnerships for Success

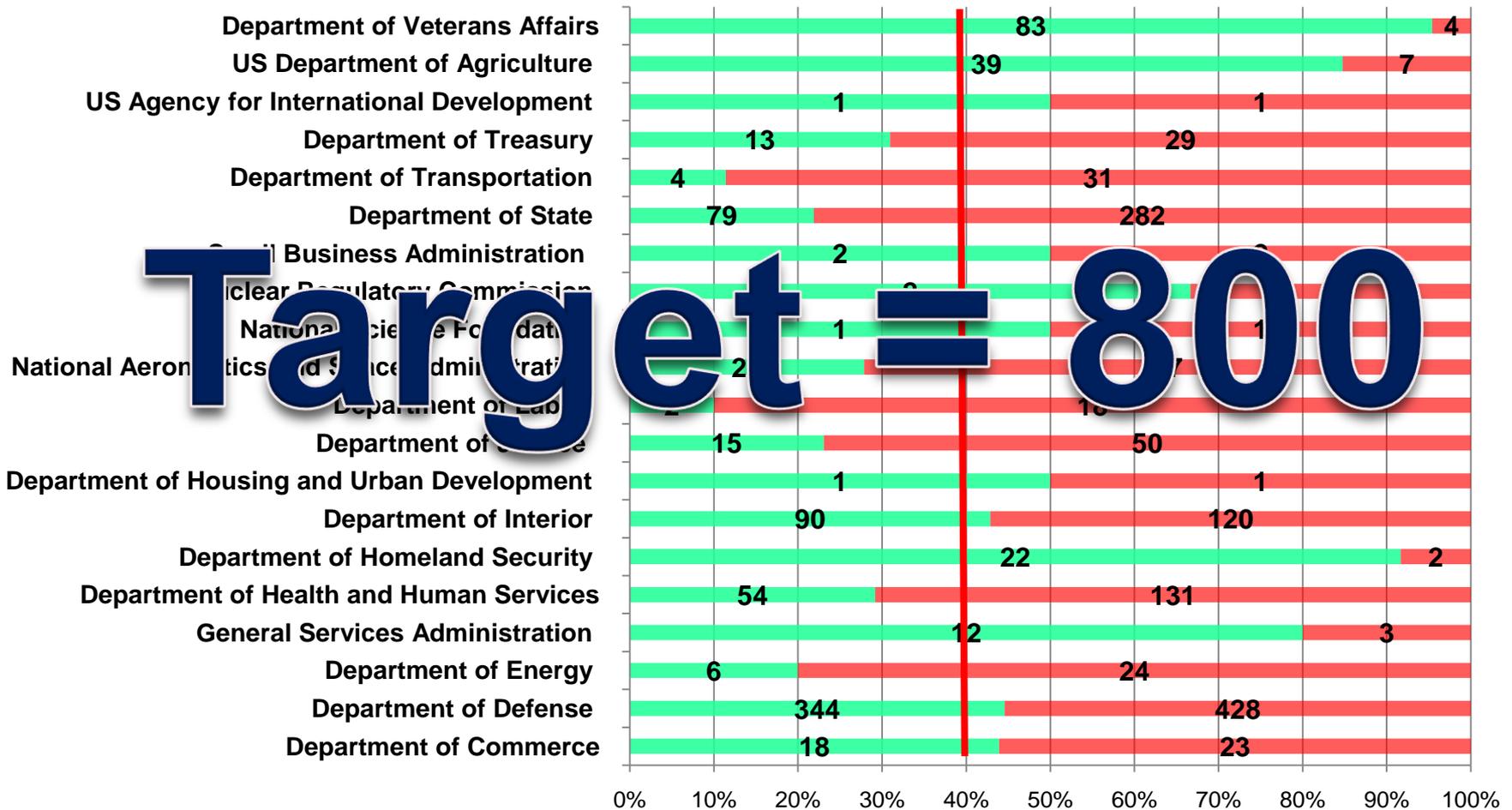
- What is success?
- How is it measured?
- DOE’s “holistic approach”
- What are the challenges?
- What are the options?
- How do you get started?



How Is Success Measured?

- FDCCI
 - At least 800 data centers closed by FY15
 - Alignment of federal data center TCO with industry
- SSPP
 - Metering data centers
 - Improved energy efficiency
 - Implementation of data center infrastructure and operations best practices

FDCCI Projected Data Center Closures

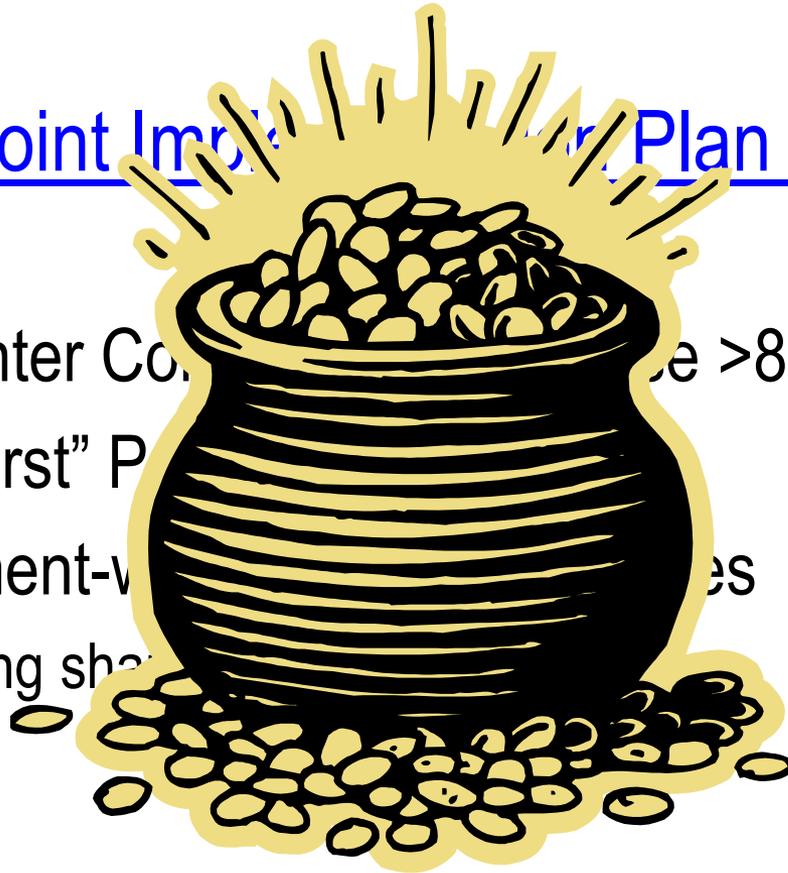


■ Number of Data Centers to be Decommissioned by 2015

■ Number of Data Centers Remaining in 2015

Transformation of Federal IT

- OMB [25-Point Implementation Plan to Reform Federal IT](#)
 - Data Center Consolidation to >800 by CY15
 - “Cloud First” Policy
 - Government-wide IT Modernization
 - including shared services



Significant Capital Investment is Required

SSPP Performance Measures

	Unit	FY11	FY12	FY13	FY14	FY15
% of data centers metered to measure PUE	%	40%	60%	80%	90%	100%
% of data centers w/ average >65% CPU utilization	%	50%	100%	Hold	Hold	Hold
Maximum annual weighted (sqft) PUE for agency	#	1.8	1.7	1.6	1.5	1.4
% of data centers assigned a certified DCEP	%	50%	100%	Hold	Hold	Hold
% of data centers that have annual DC-Pro energy profile	%	50%	100%	Hold	Hold	Hold

23% (estimate)

29% (estimate)

2.0 – 2.5 PUE

Take Away: Lack of metrics make tracking efficiency and savings impossible

Why a “Holistic Approach”?



DOE’s Broad Data Center Missions:

- Improving DOE Data Centers – Both Facilities and IT
- Bring Innovation to the Practice of DC Energy Management

Data Center *missions* and *processes* vary:

We need a *comprehensive approach* that
recognizes differences in purpose yet
drives efficiencies.

Data Center Variability

- Energy/GHG Efficiency vs. IT Efficiency

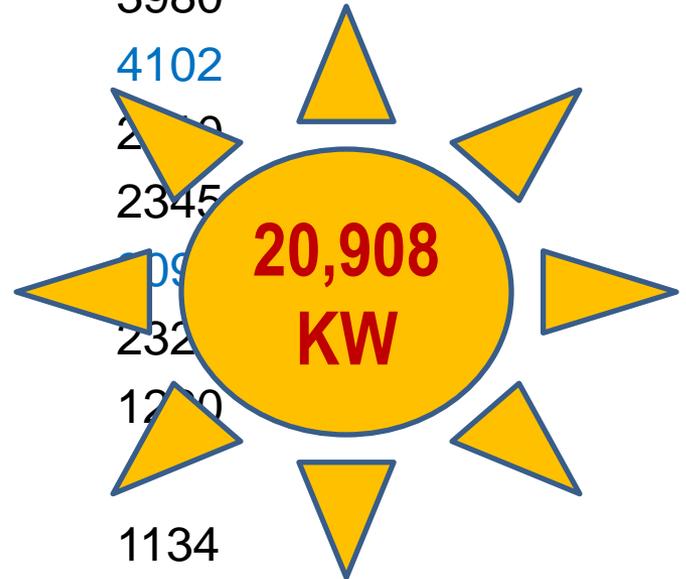
Energy / GHG Efficiency	IT Systems Efficiency
<ul style="list-style-type: none">• Power sources• Power loses• Cooling• CPU Utilization	<ul style="list-style-type: none">• Staffing• Systems consolidation• Space costs• Lifecycle replacement

- Facilities vs. IT Systems Management
- High Performance Computing vs. Business Automation



Top 20 Super Computers

Rank	Site	Year & Vendor	Power (Kw)
3	DOE/SC/ORNL	2009 Cray	6950
6	DOE/NNSA/LANL/SNL	2011 Cray	3980
7	NASA/Ames Research	2011 SGI	4102
8	DOE/SC/LBNL/NERSC	2010 Cray	2100
10	DOE/NNSA/LANL	2009 IBM	2345
11	NICS/Univ of Tenn	2011 Cray	2090
14	DOE/NNSA/LLNL	2007 Cray	2320
15	DOE/SC/ANL	2007 IBM	1200
16	DOE/SNL/NREL	2010 Oracle	1200
18	DOE/NNSA/LLNL	2009 IBM	1134
19	USAF Research Lab	2010 Cray	1134



Data Centers are 2 Lines-of-Business with Different Incentives

IT Infrastructure

IT Systems Performance & Availability

Operational Control of Floor Space

Energy Efficiency **Not** an Incentive
(if you don't pay the power bill!)

Facilities Infrastructure

Utility Service Provider – Only

Pay the Electric Bill

No Operational Control
(therefore, no way to lower the costs)

DC Efficiency Requires Unified Management!

Innovation is ESPC Contracting:

Combining Facilities and IT Private
Funding for Federal Efficiency Gains

DOE HQ ESPC Project (Proof of Concept)

Data Center Consolidation

- Consolidate IT systems into one data center
- Implement advanced metering
- Retrofit data center infrastructure to achieve 1.4 PUE
 - Power Management
 - Cooling
 - Airflow Management
 - Lighting

IT Infrastructure Modernization

- Server virtualization
- Commodity IT services to “The Cloud”
- Virtual desktop environment
- Mobile computing environment
- Tiered storage
- Data deduplication
- Duplex printers
- Video teleconferencing
- Telework hoteling
- Power management

Alternative Financing Challenges

- Why hasn't ESPC / UESC been used before?
- IT investments only have 3-5 years lifecycle.
- Sounds complicated
- Outside comfort zone

➤ Target CIO's for ESPC & UESC awareness training



Drivers For Success

- 25 Point Implementation Plan to Reform Federal Information Technology Management
 - Agency CIO's have made commitments
 - Cloud First
 - Data Center Consolidation
 - OMB is tracking progress
- SSPP
 - Mandated by EO 13514
 - Agency top-level commitment
 - Sustainability Scorecard

- ✓ Ensure close collaboration between these initiatives
- ✓ Recommend Agency FDCCI Program Mgr be (co)-Lead for SSPP Goal 7

Success Factors

- Establish partnerships with:
 - Agency CIO,
 - Facility / Energy Manager, and
 - Sustainability Performance Office (SPO)
- Get smart on alternative financing options
- Work to a common goal
- Integrate governance

