THE STATE OF GENERAL PURPOSE INFRASTRUCTURE AT THE DEPARTMENT OF ENERGY

REPORT OF THE DOE INFRASTRUCTURE EXECUTIVE COMMITTEE
TO THE LABORATORY OPERATIONS BOARD
NOVEMBER 2016

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1 Purpose

The Department of Energy (DOE) is responsible for a vast portfolio of infrastructure that consists of world-leading scientific and production tools and the general purpose infrastructure needed to enable the use of those tools. DOE has the fourth largest inventory of real property in the Federal government by square footage, and its complex includes seventeen DOE National Laboratories, National Nuclear Security Administration (NNSA) plants, and Environmental Management (EM) cleanup sites. This portfolio of land, facilities, and other assets is the foundation of DOE's ability to conduct its mission, and represents one of America's premier assets for science, technology, innovation, and security.

DOE INFRASTRUCTURE

10,095 buildings totaling 119 million square feet (owned and leased)

36 years – average facility age

39 years – average support structure (utilities, roads, bridges, etc.) age

2 million acres

$131 billion Total Replacement Plant Value

$2 billion in annual operating and maintenance costs

$5.4 billion in deferred maintenance (operational facilities)

Source: FY 2015 Facility Information Management System snapshot

However, modernization of DOE's infrastructure has not kept up in all areas with evolving mission needs in science and technology. This infrastructure portfolio has been developed over the past 70 years, with origins in the Manhattan Project. The average age of DOE's facilities is 36 years and its utilities is 39 years. While the Department has made significant investments in world class experimental facilities, much of the supporting, or "general purpose" infrastructure – such as office space, general laboratory spaces, shops and utilities – that enables the mission and forms the backbone of the DOE enterprise is in need of greater attention. Modern, reliable general purpose infrastructure is critical to support DOE in successfully and efficiently executing its missions both today and in the years ahead.[1]

Based on updated Department-wide infrastructure assessments, the Department is facing a systemic challenge of degrading infrastructure. To help address this challenge, the Department, through the Laboratory Operations Board, established an integrated plan to conduct site-wide assessments of general purpose infrastructure across all 17 National Laboratories as well as NNSA plants and environmental management activities, for the first time using common standards and definitions. The assessments provided a detailed, uniform

[1] The Department's 2014-2018 Strategic Plan recognizes this in Strategic Objective 9, which is to manage assets in a sustainable manner that supports the DOE mission.

analysis of facilities and other infrastructure and information for decisions on future investments.

In its first year, the data developed as a result of this initiative provided the basis for over $100 million requested and appropriated in FY 2016, targeted for general purpose infrastructure projects. In order to build on the success of that effort, an Infrastructure Executive Committee (IEC) comprised of line managers and facilities experts from across the complex was charged with providing an annual update to the Secretary and other senior DOE leadership on the state of general purpose infrastructure. This report, prepared by the Infrastructure Executive Committee and presented to the LOB, is the first such update. This report is intended to provide a leadership-level assessment of the DOE infrastructure portfolio, and in so doing, provide information that decision-makers can use to improve infrastructure stewardship – including future investments and improvements to management processes.

2 Background

In 2013, the Secretary of Energy formed the Laboratory Operations Board (LOB) to provide an enterprise-wide forum to engage the Laboratories and DOE's programs in a joint effort to identify opportunities to improve effectiveness and efficiency. One of the transformational opportunities identified by the LOB was the need to focus on revitalizing the general purpose infrastructure across the DOE enterprise to better support mission activities today and in the future. Beginning in the fall of 2013 and under the leadership of the LOB, the Department began making significant improvements to its stewardship of general purpose infrastructure – those physical assets such as utilities and general office buildings or laboratory spaces that are used on a broad basis to enable the mission of the entire plant, site, and laboratory. These efforts were developed and executed by DOE headquarters, site office, laboratory, and plant employees, as a partnership across the complex. Notable outcomes include:

- The Department's processes for assessing the condition of its assets was overhauled to more directly measure whether the asset is physically able to support the mission it is intended to fulfill.
- Clear and consistent guidance for conducting those assessments was developed through the LOB infrastructure process and issued across the Department; approximately 80% of DOE's infrastructure[2] has been evaluated using the methodology.
- The Department established an IEC as a subcommittee of the LOB. The IEC includes senior leadership from across the Department and is co-chaired by line programs on a

[2] The "DOE infrastructure" included in this document is for the following DOE programs/offices and the respective laboratories, plants, and sites stewarded by those offices: Office of Energy Efficiency & Renewable Energy, Office of Environmental Management, Office of Fossil Energy, Office of Nuclear Energy, Office of Science, and the National Nuclear Security Administration. See Appendix. Of this infrastructure portfolio, 80% has been assessed using the new criteria.

one-year rotating basis. NNSA led the Committee in FY 2015, followed by the Office of Science in FY 2016. Nuclear Energy and the Office of Management will co-chair the Committee for FY 2017. The IEC is charged with preparing this report annually as well as presenting enterprise-wide, prioritized investment recommendations in infrastructure.

- The Department's FY 2017 Budget requests additional funding to address infrastructure challenges, including a 36% increase over FY 2016 in the Department's request for General Plant Projects (GPP) and similar projects to improve general purpose infrastructure.
- The Office of Science Operations Improvement Council partnered with other programs to develop a framework and guiding principles to foster consistency among DOE sites in accounting for repair needs and deferred maintenance – two measures that are important indicators of investment needs.
- NNSA has expanded its Asset Management Program, which uses supply chain management economies-of-scale to provide a more centralized and efficient procurement approach to replacing mission-critical aging infrastructure systems that are common throughout the enterprise, such as roof and HVAC systems.
- EM is pursuing coordination, analysis and concurrence of EM site submissions for infrastructure reporting, such as the Integrated Facilities Infrastructure Crosscut Budget and five-year plans.
- Within individual program offices, infrastructure planning is now included as an integral component of the annual planning and evaluation process. This has enhanced integration of infrastructure and mission planning and raised the visibility of infrastructure and its mission impact. For example, building from the Office of Science planning model, NNSA is deploying its Master Asset Plan which is a strategic, enterprise-wide, risk-informed, long-range view (25+ years) of NNSA infrastructure that will be updated on an annual basis.

3 Current State of DOE Infrastructure

This annual report is structured around seven questions that help to assess the current state of DOE infrastructure and, proceeding forward, the progress made in revitalizing that infrastructure. These measures of performance are included in DOE's recently-updated Real Property Asset Management Order (Order 4301.C), and are as follows:

- Is the percent of adequate facilities and other structures increasing?
- Is deferred maintenance decreasing?
- Is the square footage of underutilized space decreasing?
- Are excess space/buildings being eliminated?
- Are the costs of carrying excess facilities declining?

- Did the Department make the investments in general purpose infrastructure that it committed to make?
- Are fewer core capabilities at risk due to infrastructure deficiencies?

Many of the metrics discussed in this report will provide more insight into infrastructure condition and management as year-over-year trends, rather than a single data point in time. A focus for this first annual report is to establish methods to gather and evaluate these metrics consistently across the enterprise. As a result, this report establishes a baseline and future annual reports will provide additional information to evaluate trends and improve infrastructure stewardship.

3.1 Is the percent of adequate facilities and other structures increasing?

The LOB assessment process, commenced in 2014, indicated that one half of the Department's assessed infrastructure portfolio (by Replacement Plant Value) is rated "substandard" or "inadequate" to accomplish its intended mission objective. The asset condition categories developed through the LOB assessment process are defined in the chart below:

Asset Condition Definitions
Adequate: Fully capable of performing its current mission with only minor deficiencies that can be corrected within normal operating budgets. Substandard: Deficiencies limit performance of the mission and refurbishment is required to return the asset to adequate condition. Inadequate: Major deficiencies that significantly impair performance of the mission; major refurbishment is required.

Figure 1 shows the asset condition of DOE facilities at the end of FY 2015, with more than half rated as inadequate or substandard to meet the mission. [3] Figure 2 shows the condition of the Department's core non-facility assets (primarily utilities). As with facilities, many non-facility assets were rated at the end of FY 2015 as inadequate or substandard to meet the mission.

[3] Figures 1, 2, and 3 reflect percentages using Replacement Plant Value for the assets. Replacement Plant Value, or RPV, is defined as the funding needed to replace existing infrastructure assets at today's cost and standards.

Figure 1. FY 2015 Facility Condition

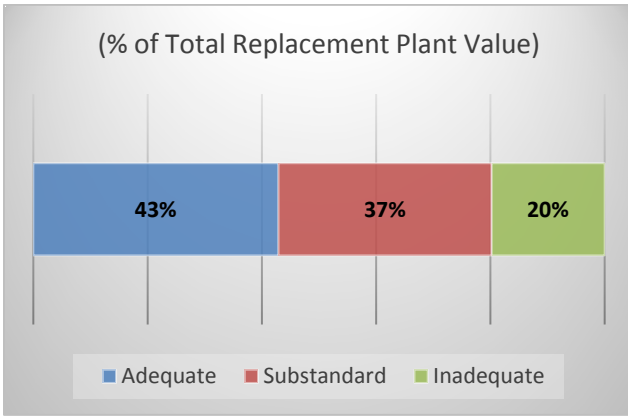


Figure 2. FY 2015 Non-Facility Condition

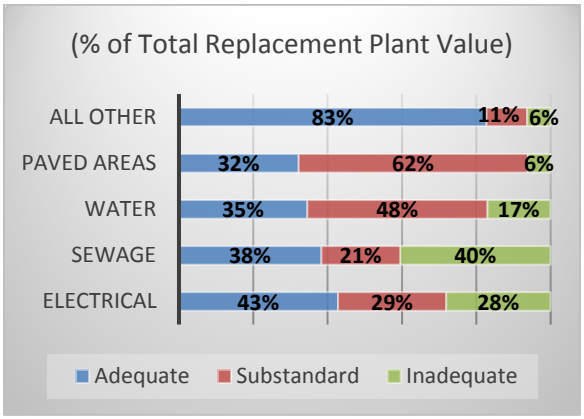
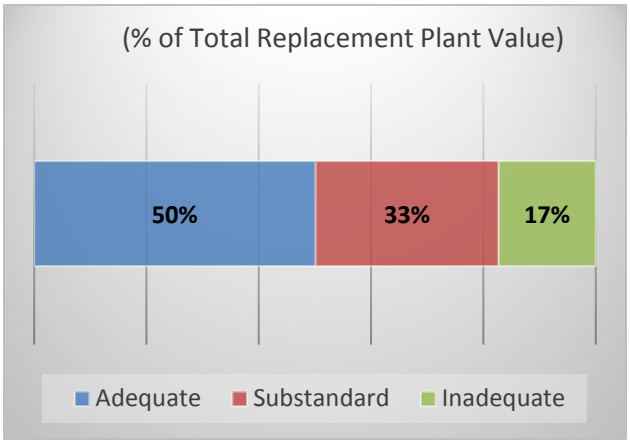


Figure 3 is an aggregate chart which shows the Department's Real Property Asset Condition for assessed assets around the DOE complex. As this chart reflects, as of FY 2015, 50% of DOE assessed assets (those that are owned by DOE, and active – not excess) were rated as "adequate" to meet the mission, 33% were rated as substandard, and 17% were rated as inadequate.

Figure 3. FY 2015 Real Property Asset Condition



Next Steps

The Department is focused on improving the condition of its assets to meet mission need and address potential risks to safety, security, and programmatic objectives. To track this progress, DOE has established an Agency Priority Goal for FY 2016-2017 that aims to increase the percentage of assets rated as adequate.

Agency Priority Goal: Deliver the highest quality R&D and production capabilities, strengthen partnerships with DOE headquarters, and improve management of the physical infrastructure of the National Laboratories to enable efficient leadership in science, technology, and national security.

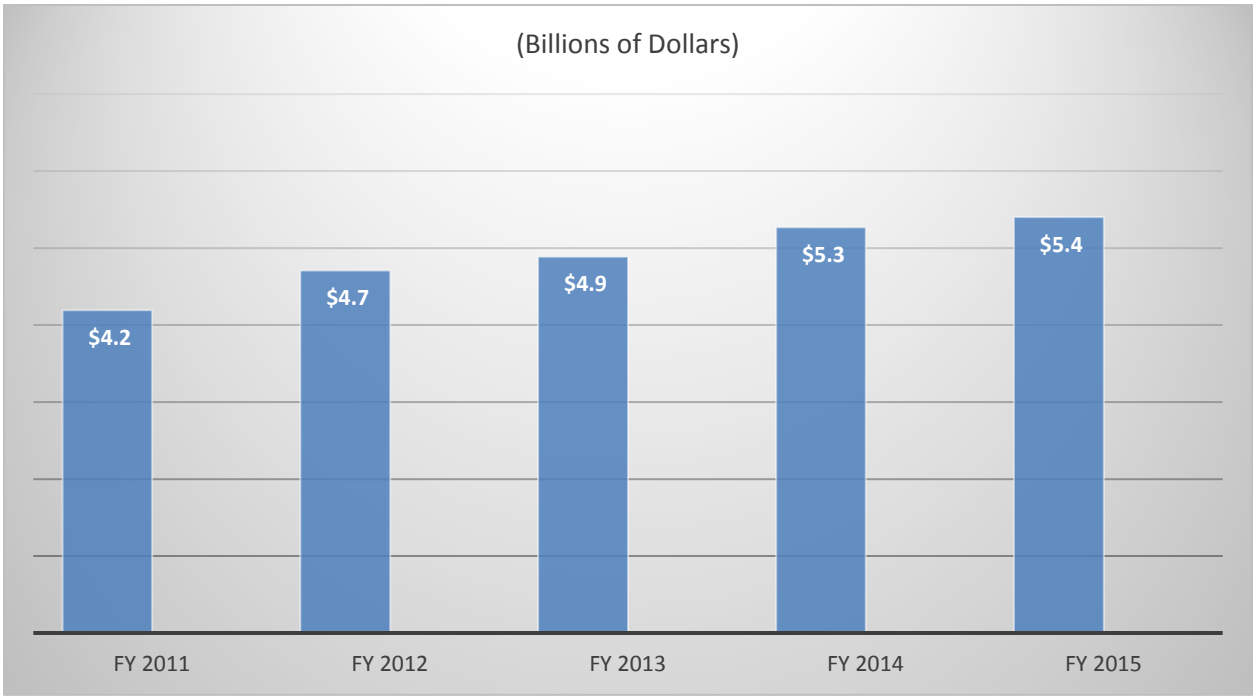
Strategy: By the end of FY 2017, the percentage of assessed DOE laboratory facilities categorized as "adequate" will increase by 2 percentage points from the FY 2015 baseline.

Going forward, the IEC will track year-over-year trends for infrastructure condition – both at the aggregate basis as reflected in Figure 3, and at the facility and non-facility asset level as reflected in Figures 1 and 2 – with the objective of increasing the percentage of assets rated as "adequate."

3.2 Is deferred maintenance decreasing?

When needed maintenance on a facility or utility system is postponed, it is referred to as "deferred maintenance." Increases in deferred maintenance could indicate aging infrastructure and associated challenges, such as those relating to reliability, mission readiness, and health and safety. Figure 4 shows the deferred maintenance trend for DOE since FY2011. As the chart shows, deferred maintenance for active, DOE owned assets has increased by almost 30% from $4.2 billion in FY 2011 to $5.4 billion in FY 2015.

Figure 4. Deferred Maintenance



Next Steps

Beginning with the FY 2016 Budget Request, and related to the LOB/IEC infrastructure effort, Secretary Moniz directed that each program's annual proposed investments in infrastructure should halt the growth of deferred maintenance. The Department is making other efforts to halt the increase of deferred maintenance. For instance, the annual laboratory planning efforts will include an assessment of deferred maintenance. In addition, the IEC will clarify data reporting in this area, including "deferred maintenance" and "repair needs," to better understand the mission impact of deferred maintenance and whether the Department's proposed investments in infrastructure are halting the growth of deferred maintenance.

3.3 Is the square footage of underutilized space decreasing?

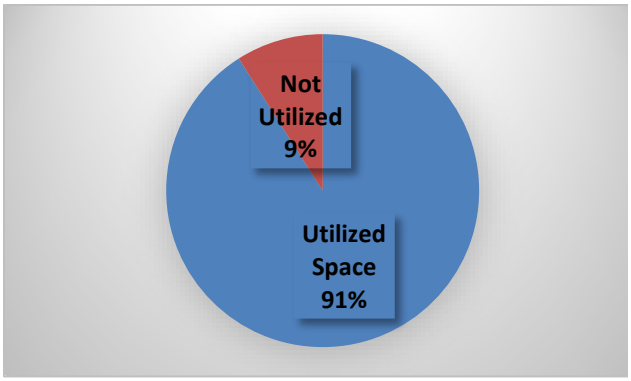
The Department is committed to maximizing the use of its space and assets. Identifying assets that are underutilized provides opportunities to either find ways to more fully utilize the space, or divest of it so it no longer requires resources to maintain. In addition to redefining asset condition, the LOB infrastructure assessment effort also re-defined metrics associated with utilization. Table 1 summarizes how space utilization is defined.

Table 1. Space Utilization Criteria

Utilization Rating	Office	High Bay, Ventilation Intensive, Power Intensive, General Space (Wet), General Space (Dry)	Storage
Over-utilized	95%	>85%	>80%
Fully Utilized	75%-95%	60%-85%	50%-80%
Under-utilized	<75%	30%-60%	10%-50%
Not Utilized		<30%	<10%

As these criteria were first used in the 2014 LOB assessments, annual trending data is not yet available; however, Figure 5 shows results from the end of FY 2015 indicating that 9% of the space measured is not utilized. This "not utilized" space includes whole facilities in some cases, but also can include portions of an otherwise utilized facility. "Not utilized" space is a candidate to be declared "excess" if there are no plans for future use.

Figure 5. FY 2015 Not Utilized Space



Next Steps

The IEC will continue to measure this data, ensuring that the assessments are uniform. Future years' reports will contain year-to-year data to indicate trends in this area. This data will be available for DOE to target investments to maximize the use of space, including reusing or repurposing infrastructure where possible to meet current mission needs.

3.4 Are excess space/buildings being eliminated?

In addition to its active infrastructure portfolio, DOE leads the largest nuclear cleanup effort in the world. The disposition of contaminated excess[4] facilities is an important part of this cleanup mission. Since the Office of Environmental Management (EM) was established in 1989, DOE's other Program Offices have transferred thousands of contaminated excess facilities for deactivation and decommissioning (D&D). EM has made substantial progress in D&D of these legacy contaminated excess facilities, having completed almost 3,000 facilities over the past 25 years.

Excess contaminated facilities are a drain on DOE's infrastructure resources, and can pose a risk to safety, security, and programmatic objectives. The Department faces a significant challenge with the number of aging excess facilities throughout the complex and the limited resources to deactivate, decontaminate, decommission, and demolish those facilities in the near term. As various DOE Program Secretarial Offices (PSOs) identify excess facilities they no longer need, they typically plan to request that contaminated excess facilities be transferred to EM. Until such transfer is formally completed, stewardship (management, surveillance and maintenance) responsibilities are retained with the owning PSO. Excess process contaminated facilities once accepted into the EM program are prioritized for deactivation as well as final disposition. However, as several external reports have recognized,[5] EM is unable to D&D all of the excess contaminated facilities already transferred in a timely manner or take in additional aging excess contaminated facilities from other PSOs in the foreseeable future.

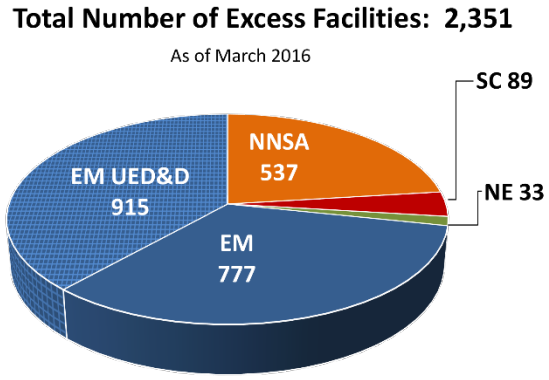
[4] For the purpose of this report, the term "excess" is synonymous with "nonoperational" and refers to a facility for which DOE no longer has a mission need.

[5] See Report of the DOE Office of Inspector General, "The Department of Energy's Management of High-Risk Excess Facilities," January 2015; report of the Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL), October 2015.

In 2015, Secretary Moniz directed the establishment of an Excess Contaminated Facilities Working Group (ECFWG). The working group developed and executed an enterprise-wide data collection effort to obtain information on potential risk and updated rough order of magnitude cost estimates to D&D excess facilities. The ECFWG used the updated data to define the scope of the challenge and to propose risk-informed approaches for addressing DOE's contaminated excess facilities.

As of March 2016, DOE has over 2,300 excess facilities. Figure 6 reflects the excess facilities across the Department, broken out by the program that currently has responsibility for the facility.[6]

Figure 6. Excess Facility Inventory



Next Steps

The ECFWG is updating and validating data gathered by the working group's efforts, and finalizing a report on its work, to include a discussion of actions that DOE has taken or is planning to take to demolish specific facilities and to mitigate risks at existing contaminated facilities awaiting disposal. This report will be issued in 2016 in response to a requirement of the 2016 National Defense Authorization Act, and will be updated every two years. Additional information on excess contaminated facilities will be provided in that report. Over the next year, the IEC will work to integrate its efforts with those of the ECFWG.

3.5 Are the costs of carrying excess facilities declining?

The information gathered as part of the ECFWG efforts included ROM costs for D&D; cost ranges for maintenance, surveillance, repairs, and operations (MSRO); and an assessment of

[6] The Energy Policy Act of 1992 authorized annual contributions to the Uranium Enrichment Decontamination and Decommissioning (UED&D) Fund, which came from both a special assessment on domestic nuclear utilities and annual Congressional appropriations, to support the EM responsibilities at the nation's three Gaseous Diffusion Plants (GDPs) at Portsmouth, Ohio; Paducah, Kentucky; and Oak Ridge, Tennessee.

potential risk to public health and the environment, worker safety, and mission. When the report of this work is issued in 2016, it will contain information on these factors – to include estimated MSRO, or carrying costs.

As a general matter, for the higher risk excess contaminated facilities, MSRO costs can run into the millions of dollars per year to keep the facilities safe and stable. These costs are avoided when a facility is demolished. In addition to incurring ongoing MSRO costs, delaying D&D may:

- Expose individuals and the environment to increasing levels of risk;
- Escalate disposition costs, especially if a building degrades while awaiting D&D; and
- Impede ongoing mission work (due to excess facilities located near ongoing mission work).

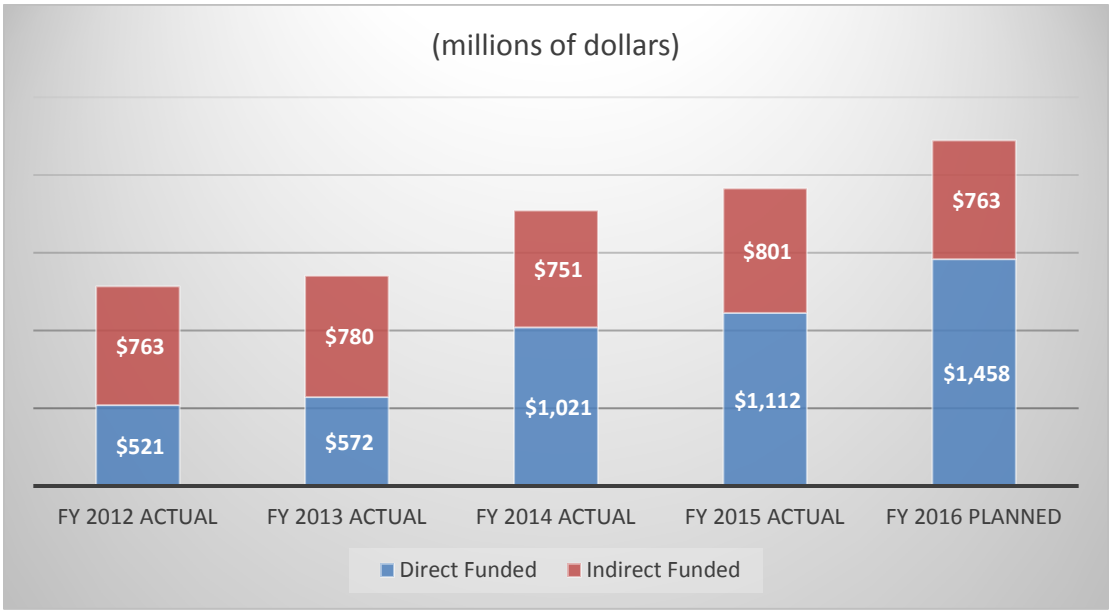
Next Steps

Over the next year, the IEC will work with the ECFWG to establish uniform measures and data validation in this area.

3.6 Did the Department make the investments it committed to make?

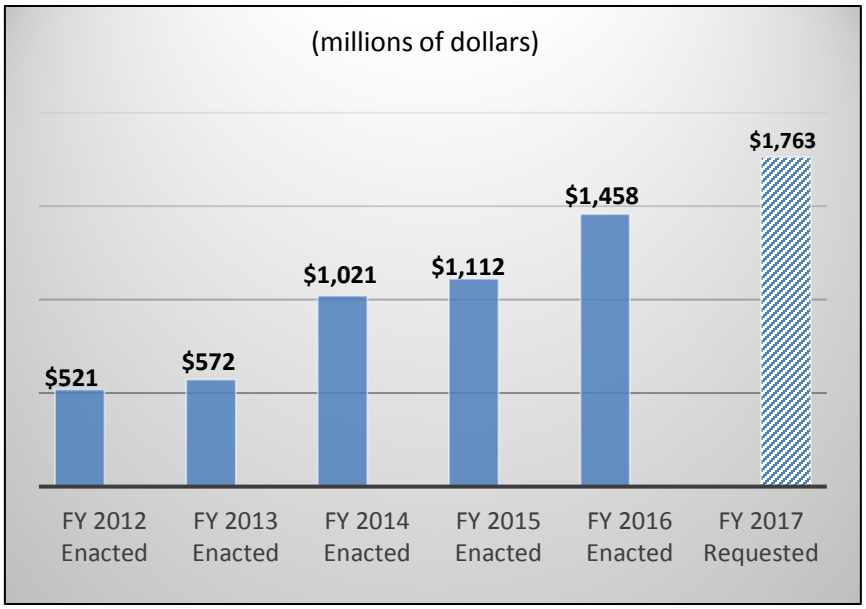
To evaluate the state of general purpose infrastructure, the IEC tracks what investments have been made to maintain and improve that infrastructure. Over the past five years (from FY 2012-FY 2016), more than $8 billion has been invested in general purpose infrastructure, either directly by the Department or through laboratory overhead (indirect investments). Over this period, investments in this area have steadily increased, rising by nearly 75% (Figure 7).

Figure 7. Investments in General Purpose Infrastructure



Stewardship of DOE infrastructure is a partnership between the federal line programs that oversee a laboratory or site (e.g., NNSA, EM, the Office of Science) and the individual laboratories, plants, and sites. This partnership is evident in Figure 7, which shows that infrastructure investments are a mix of direct-funded and indirect-funded activities, averaging 55% direct and 45% indirect when aggregated over FY 2012 through FY 2015.

Figure 8. Direct-Funded General Purpose Infrastructure Investments



Direct-Funded Investments

The direct-funded general purpose infrastructure investments include:

- Line item projects, which are capital improvements totaling greater than $10M;
- General Plant Projects, which are capital improvements of less than $10M;
- Excess Facilities Disposition Projects that are funded by direct appropriations; and
- Maintenance and Repair activities that are funded by direct appropriations.

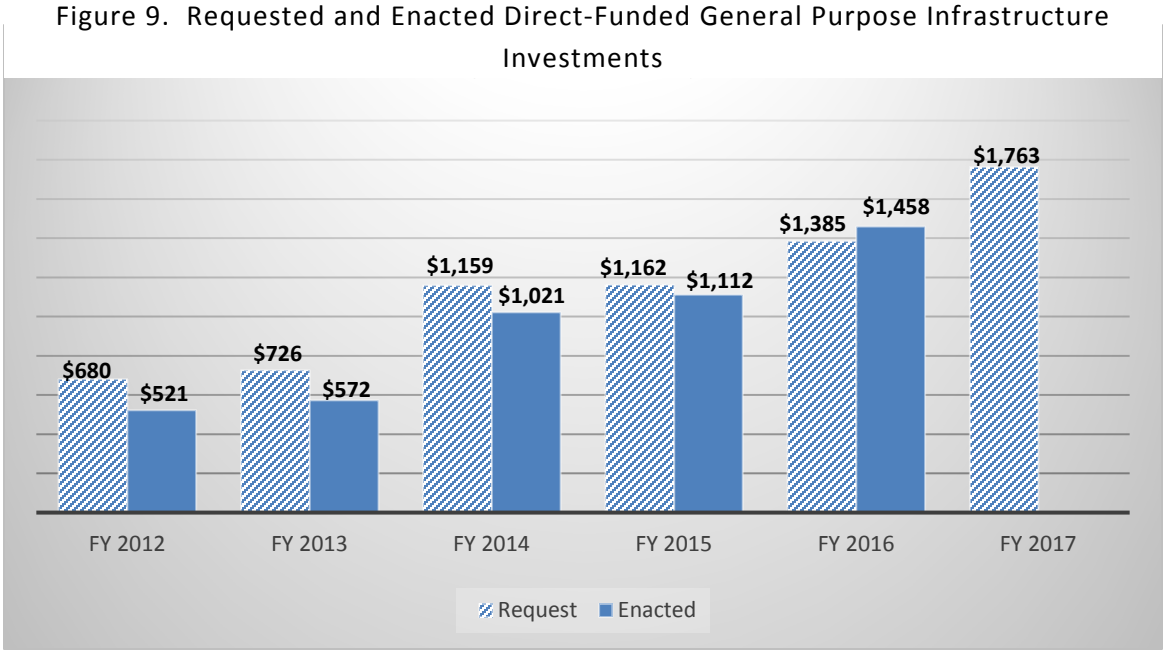
Figure 8 shows that direct investments in general purpose infrastructure have steadily increased over recent years. The increase in investments for FY 2016 is a result of LOB efforts to identify and prioritize investments in critical general purpose infrastructure projects, following the condition assessments. Table 2 shows some of the work supported by the FY 2016 appropriations to target critical general purpose infrastructure projects. The Department's FY 2017 request proposes further investments to arrest the decline in aging infrastructure and support mission activities.

TABLE 2. FY 2016 General Purpose Infrastructure Crosscut Investments

Fiscal Year	Funding ($M)	Work Scope
Enacted in 2016 - $109.9M	$12.3	Replacement of failing Heating, Ventilation, and Air Conditioning (HVAC) systems at several facilities across Lawrence Livermore National Laboratory
	$8	Replacement of critical mission equipment at the Kansas City National Security Campus
	$1.7	Upgrade of safety systems and waste disposal capabilities at Los Alamos National Laboratory
	$6.5	Upgrade of fire protection, electrical, and other core infrastructure systems at the Nevada Nuclear Security Site
	$5.8	Replacement of the Gas Laboratory at Pantex, as well as additional electrical and mechanical upgrades on site
	$5.5	Relocation of the Reservoir Storage Vault and replacement of glovebox oxygen monitors at the Savannah River Nuclear Security Site
	$8	Replacement of components of electrical and dehumidification systems at Y12
	$13.4	Replacement of core electrical infrastructure at SLAC National Accelerator Laboratory and Argonne National Laboratory
	$9	Renovation of 2 floors of Wilson Hall at Fermi National Accelerator Laboratory
	$16.5	Upgrades to the Savannah River National Laboratory firewater system, and replacement of hot cell windows and associated electrical control systems
	$23.2	Utility upgrades at Idaho National Laboratory, including power distribution infrastructure and control systems

Figure 9 shows enacted funding levels versus requested funding levels since FY 2012. Overall, DOE has been appropriated more than 90% of the direct-funded investments requested for general purpose infrastructure since FY 2012.

Figure 9. Requested and Enacted Direct-Funded General Purpose Infrastructure Investments



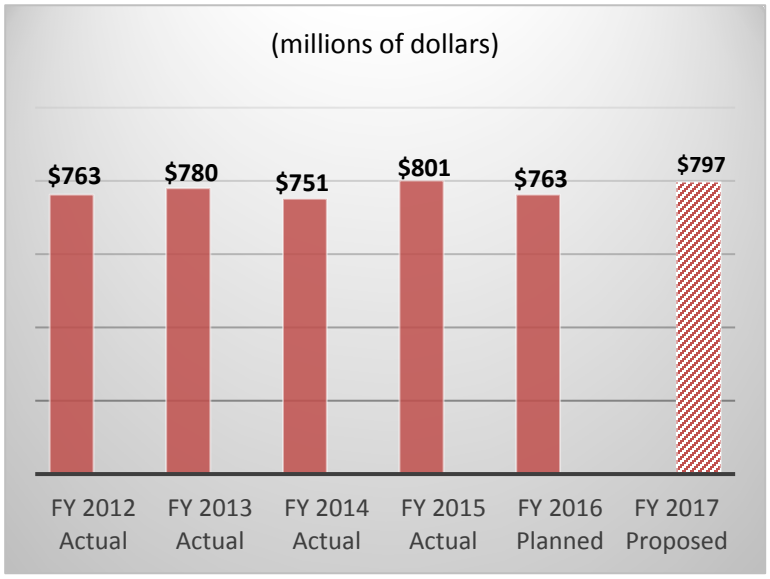
Indirect-Funded Investments

Indirect-funded general purpose infrastructure investments include:

- Institutional GPP, which are capital improvements of less than $10M that are of general benefit across the site;
- Excess Facilities Disposition Projects that are funded by site overhead; and
- Maintenance and Repair funded by site overhead.

Figure 10 shows that indirect investments have remained relatively steady over the past five years. These investment levels are largely managed by the individual laboratories and sites, and vary from program to program.

Figure 10. Indirect-Funded General Purpose Infrastructure Investments



Next Steps

In FY 2017, the IEC will again present enterprise-wide prioritized investments in infrastructure to senior DOE leadership.

3.7 Are fewer core capabilities at risk due to infrastructure deficiencies?

The IEC is focused on ensuring that general purpose infrastructure can continue to support each laboratory and site's core capabilities and contribute to the Nation's energy, environmental and nuclear security. The data and metrics in this report are intended to provide insight into the general question of whether fewer of those core capabilities are at risk due to infrastructure deficiencies.

Because many of the initiatives described at the outset of this report are new, and the data reflects a first year's effort to assemble this information in a uniform manner, this question will be addressed in future reports. The Department is committed to addressing the challenges posed by its aging infrastructure. This will involve attention from senior leadership, with guidance by the Laboratory Operations Board, and stewardship from the Infrastructure Executive Committee. A safe, reliable, and modern infrastructure is vital to supporting the critical work of the Department and the success of its mission.

4 Next Steps for Infrastructure Executive Committee

To sustain ongoing improvements to DOE's general purpose infrastructure, the IEC plans to accomplish the following actions in FY 2017:

- Draft the second annual State of General Purpose Infrastructure at the Department of Energy, to be issued by the end of FY 2017.
- Present proposed enterprise-wide prioritized investments in infrastructure to senior DOE leadership.
- Track year-over-year trends for infrastructure condition to determine whether the percent of facilities and other structures rated as "adequate" is increasing.
- Clarify data reporting, including "deferred maintenance" and "repair needs," to better understand the mission impact of deferred maintenance and whether the Department's proposed investments in infrastructure are halting the growth of deferred maintenance.
- Continue uniform assessments of space utilization to evaluate whether year-to-year trends demonstrate a decrease in the percentage of underutilized and not utilized space.
- Integrate efforts with the ECFWG to: assess whether excess space/buildings are being eliminated; assess whether the costs of carrying excess facilities are declining; and establish uniform measures and data validation in this area.
- Address in future reports whether fewer core capabilities are at risk due to infrastructure deficiencies.

Appendix: Data Source for Figures Presented in this Report

The "DOE infrastructure" included in this document is for the following DOE programs/offices and the respective laboratories, plants, and sites stewarded by those offices: Office of Energy Efficiency & Renewable Energy, Office of Environmental Management, Office of Fossil Energy, Office of Nuclear Energy, Office of Science, and the National Nuclear Security Administration. Data from the Power Marketing Administrations, Naval Reactors, Office of Legacy Management, and the Federal Energy Regulatory Commission is not included.

DOE Infrastructure Summary Box: Facilities and Information Management System (FIMS) Historical Report for FY 2015 with the following parameters – DOE Owned and Leased Assets, GSA Owned and Leased Assets, Permits and Withdrawn Land; all Laboratories and sites; Buildings, Trailers, Land, and Other Structures and Facilities (OSFs); all programs except Power Marketing Administrations; includes all assets.

Figure 1. Facility Condition: FIMS Ad Hoc Historical Report for FY 2015 with the following parameters – DOE-Owned Assets Only; all Laboratories and Sites; Buildings, Trailers and OSFs; Programs EE, EM, FE, NE, NNSA, and SC; excludes assets with Excess "Y" (Yes) Indicators; percentage calculation of total Replacement Plant Value (RPV) of those assets assessed.

Figure 2. Non-Facility Condition: April 1, 2016, FIMS Ad Hoc Historical Report for FY 2015 with the following parameters – DOE-Owned Assets Only; all Laboratories and Sites; Buildings Trailers, and OSFs; Programs EE, EM, FE, NE, NNSA, and SC; excludes assets with Excess "Y" Indicators; percentage calculation of total RPV of those assets assessed.

Figure 3. Real Property Asset Condition: April 1, 2016, FIMS Ad Hoc Historical Report for FY 2015 with the following parameters – DOE-Owned Assets Only; all Laboratories and Sites; Buildings, Trailers and OSFs; Programs EE, EM, FE, NE, NNSA, and SC; excludes assets with Excess "Y" Indicators; percentage calculation of total RPV of those assets assessed.

Figure 4. Deferred Maintenance: Actuals from April 1, 2016, FIMS Ad Hoc Historical Reports for FY 2011-FY 2015 with the following parameters – DOE-Owned Assets Only; all Laboratories and Sites; Buildings, Trailers, and OSFs; programs included are EE, EM, FE, NE, NNSA, and SC; includes operating facilities only. Projected data provided by program offices.

Figure 5. Not Utilized Space: September 1, 2016, FIMS Ad Hoc Historical Report for FY 2015 with the following parameters – DOE-Owned Assets Only; all Laboratories and Sites; Buildings,

Trailers and OSFs; Programs EE, EM, FE, NE, NNSA, and SC; excludes assets with Excess "Y" Indicators.

Figure 6. Excess Facility Inventory: Data from ECFWG assessment efforts; total as of March 2016. Data includes excess and non-operational facilities. Non-operational facilities status in FIMS includes the following: D&D in Progress; Deactivation; Operating Pending D&D; Shutdown Pending D&D; and Shutdown Pending Disposal.

Figure 7. Investments in General Purpose Infrastructure: Prior Year Enacted Appropriations and Integrated Facilities and Infrastructure Crosscut submissions for Congressional Requests; data as provided by the programs.

Figure 8. Direct-Funded General Purpose Infrastructure Investments: Prior year enacted appropriations and FY 2017 Congressional Request Submissions; data provided by the programs.

Figure 9. Requested and Enacted Direct-Funded General Purpose Infrastructure Investments: prior year Congressional Request Submissions, prior year Enacted Appropriations, and FY 2017 Congressional Request Submissions; data provided by the programs.

Figure 10. Indirect-Funded General Purpose Infrastructure Investments: Prior year IFI Crosscut submissions for Congressional Requests; data provided by the programs.