

Argonne National Laboratory

Section 7: Infrastructure

Overview of Site Facilities and Infrastructure

Argonne is a 1,500-acre federally owned site, overseen by the U.S. Department of Energy Office of Science (DOE-SC), in DuPage County, Illinois. The site is located about 25 miles southwest of Chicago and accommodates approximately 4,800 persons (including DOE employees, contractors, and guests). The Laboratory is surrounded by Waterfall Glen Forest Preserve, a 2,470-acre greenbelt. The Argonne site includes 99 buildings having 4.6 million total square feet of floor space. The site includes New Brunswick Laboratory, a DOE-operated facility. In addition, 100,000 ft² of space is leased off-site, of which 73,229 ft² (Building 900) is located approximately 3.5 miles from the site.

The replacement value of existing facilities and other structures at Argonne is estimated to exceed \$1.6 billion. The average age of the facilities is 38 years, with over 60% of the facilities more than 40 years old. Argonne facilities are nearly 97% occupied. The asset utilization index (AUI) values related to use-specific measures exceed the DOE goals for each of the four applicable use types. The overall asset condition index (ACI) is 0.949 ("adequate"). The ACI for buildings is 0.944 ("adequate"). The ACI for other infrastructure, including site utilities (electrical power, water, sewers, and steam) and civil infrastructure (roads, parking, and walks), is 0.967 ("good").

The fiscal year (FY) 2008 Land Use Plan may be accessed in the [Ten-Year Site Plan](#) through the Argonne web site. No real estate actions, including new (or renewal) leases of 10,000 ft² or more or disposals of DOE land via leasing, sale, or gift, are planned for FY 2009 and FY 2010.

SC Infrastructure Data Summary

Replacement Plant Value (\$M)		\$1,642
Total Deferred Maintenance (\$M)		\$84.4
Asset Condition Index (ACI)	Mission Critical	0.947
	Mission Dependent	0.945
	Not Mission Dependent	0.996
Asset Utilization Index (AUI)	Office	0.99
	Warehouse	0.94
	Laboratory	0.97
	Housing	1.00
Prior Year Maintenance (\$M)		\$29.6

Facilities and Infrastructure to Support Laboratory Missions

Argonne's challenge is to revitalize and reshape its existing facilities and infrastructure to meet the current and emerging needs of scientific missions. This challenge includes ensuring compliance with standards of environmental performance and safety and eliminating legacy waste and obsolete facilities, while optimizing operation and maintenance costs. The Argonne physical site has few constraints to expanding the Laboratory's role in 21st century research.

Argonne's mission is executed through six research and development business lines with support from "Laboratory Operations," considered a business line for the purpose of this planning document. The discussion below (1) provides an overview of the conditions evaluation of the existing facilities and infrastructure in the context of each business line and (2) identifies the associated investments needed to

ensure continued mission readiness for those business lines. For brevity, only larger investments are discussed below; smaller investments from the Laboratory's operating funds planned for ongoing upkeep or minor upgrades of facilities and infrastructure are identified in the table in the Strategic Site Investments (SLI) section.

The business line of Controlling Electrons, Atoms and Molecules in Complex Materials currently occupies the majority of programmatic facilities on-site, including the oldest and least adaptable to current research needs — the facilities in the 200 Area. Consolidation and reorganization of research capabilities along investigational lines into cohesive, centrally located, "agile" facilities are the highest priority for SLI line-item funding. The Energy Sciences Building (ESB) will begin the site-wide modernization effort, which will continue with the modernization of Building 223 in support of this business line, with subsequent disposal of obsolete and inefficient assets with funding support from the Environmental Management (EM) program. Continued expansion of the Advanced Photon Source (APS) user facilities includes BES-funded laboratory and office additions, enhanced beamlines, and anticipated major enhancements to the main beamline/ring along the pre-conceptual lines of the recently proposed Energy Recovery Linac (ERL). The ERL proposal is anticipated to be refined to the point of funding by the close of the planning horizon. Closure of the IPNS User Facilities in the 360 Area will result in safe shutdown by the end of FY 2009, with decontamination and decommissioning (D&D) and dispositioning of the core accelerator and target areas and disposal or reprogramming of ancillary and support space as funding and future mission conditions allow. Existing developments related to accelerator design will be consolidated and expanded in the 360 Area, with the modernization of Building 362 starting in FY 2018 and reassignment of high bay capacity subsequent to final dissolution of the IPNS mission.

The business line of Leadership Computing for Grand Challenge Problems in Science and Engineering is well positioned for consolidation of the next phase of peta-scale computing research and support for applications science with leasing of a third-party-financed Theory and Computational Science (TCS) facility on-site. Occupancy of the TCS facility in FY 2009 will end the need for major off-site leased space and enable a nexus of computationally supported development within the allied fields of materials science, biosciences, and physical science research, leading to the consolidation and migration of biosciences from Building 202 and into more specialized settings.

The business line of Metagenomics Driven Protein Structure and Functional Characterization research is currently conducted primarily in two locations: Building 202 and in Laboratory Office Modules (LOMs) 435 and 436 of the APS. To accommodate the need for state-of-the-art experimental space for this business line, the State of Illinois has funded the \$33.5M, 50,000-ft² Advanced Protein Characterization Facility (APCF) adjacent to these LOMs, to be constructed by FY 2012. To accommodate the expected growth in this business line, a 70,000-ft² third-party-financed Systems Biology Building (SBB), planned as a user and research facility, will come online in FY 2012 to support "high-throughput" molecular/cellular screening and associated systems biology research. The addition of the new facilities (TCS, APCF, and SBB) and staged relocations as part of the SLI modernization initiative will achieve the required upgrades and expansion capabilities for continued missions throughout the 10-year target horizon. A second new SLI building in the central 200 Area is planned to consolidate the remaining bioscience groups from Building 202, including terrestrial biology and related elements of the Sustainable Energy Production and Use business line.

For the business line of Forces Shaping Matter and the Universe, enhancements to the target and source beamlines of the ATLAS facility, now being considered for programmatic line-item funding as described in the Twenty Year Outlook (8/07), establish essential future programmatic capabilities for the \$550M Facility for Rare Isotope Beamlines (FRIB). The State of Illinois will fund a \$39M, 71,500-ft² building, the Illinois Science Center (ISC), to provide office, laboratory, and conferencing space for the FRIB facility. The energy and cryogenic requirements will require significant modifications to the site electrical service, including new source capacity and increased service load, as well as significant dedicated cooling capabilities. Such infrastructure needs will be met by dedicated programmatic funding support as part of

the expanded mission role and capabilities. Continued use of Building 203 for base support and reliance on additional adjacent facilities, including the SLI-modernized Building 221 and a greater presence (following modernization) of Building 362, will achieve more complete integration of existing conventional site facilities.

The business line of Sustainable Energy Production and Use will undergo consolidation, locational integration, and synergistic recombination of allied business in all three of the new multiprogram buildings and two of the modernized buildings (223 and 362). Although this business line is matrixed as a minority constituent of the initial (ESB) and second (bioscience) SLI buildings, this business line is the predominant driver in the third new SLI building, to be initiated in FY 2017. The second new building continues to address the removal of aged and poorly adaptable facilities.

The business line of Nonproliferation, Threat Reduction and Critical Infrastructure Assurance will undertake consolidation of various elements as part of planned relocations from off-site (Building 900), in conjunction with occupancy of the TCS facility. Projected mission growth in analysis and planning requires in-depth understanding of threats, conditions, and constraints. Relocation of current personnel to the TCS or Building 221 will consolidate all such personnel on-site but will leave capability gaps related to additional physical space, communications infrastructure, and the advanced analytics needed to evaluate specific security situations.

Support Operations infrastructure suffers from the effects of age. Adequate, reliable utility systems and civil infrastructure must be upgraded to meet the site's needs and reconfigured to serve changed missions and newly consolidated centers of advanced research capabilities. A \$54M SLI infrastructure and utility modernization project is planned to address most of these issues by FY 2019. Additional operations services, including emergency response and management, security, and safety, also require capabilities upgrades. The Laboratory has curtailed its continuing missions in nuclear-facilities-based research and is disposing of legacy and residual nuclear materials and their required storage, with the goal of eliminating these infrastructure requirements at the earliest reasonable dates, presently keyed to end-of-mission operating targets and EM support for D&D and disposal actions.

Controlling Electrons, Atoms and Molecules in Complex Materials Business Line		
Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
200-Area Buildings	The existing 200-Area multi-programmatic research buildings are generally obsolete, only partially capable of supporting Controlling Electrons, Atoms and Molecules in Complex Materials missions because of infrastructural limitations, except for Building 216, the Sub Angstrom Micro-Analysis and Microscopy facility.	<ul style="list-style-type: none"> • Energy Sciences Building (ESB)-140K- ft² multi-programmatic replacement building (SLI, \$95M, FY14) • SLI 221/223 Modernization Project (\$101M, FY16; with 202 disposal) • Phased SLI-linked disposals by EM (200 - \$48M, FY18+; 212 - \$150M, FY15)
300-Area Buildings	300-Area facilities supporting Controlling Electrons, Atoms and Molecules in Complex Materials missions are only partially capable because of infrastructural and age-related limitations. These facilities will be operated until replacement capabilities facilitate mission relocation and disposal.	<ul style="list-style-type: none"> • Building 310 D&D and disposal (EM, \$11.6M, FY12)
360-Area Buildings	The 360-Area office buildings (360 and 362) are mission capable. A plan is under development for the disposition of IPNS facilities. Other area facilities are marginally capable of mission support in Controlling Electrons, Atoms and Molecules in Complex Materials.	<ul style="list-style-type: none"> • Modernize Building 362 (SLI, \$76M, FY18-20).

400-Area Buildings	The 400-Area buildings are broadly capable of supporting Controlling Electrons, Atoms and Molecules in Complex Materials missions. Upgrades to laboratory and storage space, LOM user offices, and improved beamlines are necessary to continue meeting mission requirements. The facility will also be accommodating the APCF location below LOM 435 (see Biosciences, below).	<ul style="list-style-type: none"> • APCF connection in support of Biosciences (third party, \$33.5M, FY12) • (3) LOM office expansions (BES, \$21M-25M, FY10/14/17) • LOM 437 build-out; incorporate long beamline (BES, \$8-10M, FY11) • (3) BES upgrade: extended beamlines (BES, \$7-10M total; FY14/17) • Storage Building - located in APS ring infield near 411 (BES, \$5M, FY13) • 401 Lab wing expansion (BES, \$10M, FY11-15) • APS 2020 (ERL-type) upgrade - potential major programmatic initiative near the end of the planning horizon (BES; TEC TBD as required parameters are more clearly resolved, FY16-18+) <p><u>Note:</u> Actual LOM/beamline upgrade(s) determination will be based on facility utilization; three office expansions and three beamline extensions distributed among LOMs are envisioned over a 10-year planning horizon; \$36-45M.</p>
--------------------	---	--

Leadership Computing for Grand Challenge Problems in Science and Engineering Business Line

Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
Buildings 221 and 369	Building 221 is marginally capable of supporting this business line. Building 369 is capable. Transfer of this business line from 221 and the 369 test bed to TCS will enable mission reassignment of 221 and 369 to other business lines (Forces Shaping Matter and the Universe and Non-proliferation, Threat Reduction and Critical Infrastructure Assurance). New space will be required to accommodate future growth and new capabilities.	<ul style="list-style-type: none"> • Theory and Computing Science (TCS) facility – on-site leased space ready for occupancy in FY09

Metagenomics Driven Protein Structure and Functional Characterization Business Line

Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
Buildings 202, 221, 435, and 436	Building 202 is partially capable of supporting mission objectives but has significant infrastructure issues and is not compatible with Metagenomics Driven Protein Structure and Functional Characterization. New space will be required to accommodate future growth and new capabilities.	<ul style="list-style-type: none"> • Advanced Protein Characterization Facility (APCF) – 50,000-ft² facility focusing on robotic production, storage, and tracking of molecular structures, genes and proteins, and data — near-term needs (third-party financed, \$33.5M, FY12) • Systems Biology Building (SBB) - 70K- ft² to house production robotics and minor staff presence (third-party financed, \$30M, FY12) • SLI Replacement Building #2 - 140K- ft² multi-program building co-locating diverse biological science, ecology, and related Sustainable Energy Production and Use missions (SLI, \$83M, FY15)

Forces Shaping Matter and the Universe Business Line		
Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
Buildings 203, 221, 362, and 366	Buildings in the 200 Area are currently only marginally capable of supporting the mission needs of the Forces Shaping Matter and the Universe business line because of general building conditions and capacity inadequacies within the electrical power and chilled water distribution infrastructures. New space will be required to accommodate future growth and new capabilities.	<ul style="list-style-type: none"> • Facility for Rare Isotope Beams (FRIB), \$550M TPC; programmatic funding (see Facilities for the Future of Science: A Twenty Year Outlook) with new civil construction for accelerator tunnel, support buildings, and experimental halls; capacity and distribution infrastructure improvements necessary to meet the specific beamline and research requirements to be provided within the programmatic line item funding • Illinois Science Center (ISC), to provide office, laboratory, and conferencing space for the FRIB; funded by the State of Illinois (\$39M, 71,500-ft²)
Sustainable Energy Production and Use Business Line		
Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
200-Area Buildings, 300-Area Buildings, and 360-Area Buildings	The 200-Area multi-programmatic research buildings are generally obsolete, only partially capable of supporting required missions because of infrastructural limitations and age. Building 310 is at end of service; 360 Area to be upgraded. New space will be required to accommodate future growth and new capabilities.	<ul style="list-style-type: none"> • Energy Sciences Building (ESB) - 140,000-ft² multi-programmatic replacement building (SLI, \$95M, FY14) • SLI 221/223 Modernization Project (\$101M, FY16; with 202 disposal) • Phased SLI-linked disposals by EM (200 - \$48M, FY18+; 212 - \$150M, FY15) • 310 D&D and disposal (EM, \$11.6M, FY11) • SLI Replacement Building #3 – 140,000-ft² multi-program replacement building consolidating most Sustainable Energy Production and Use capabilities not accommodated in the initial two SLI facilities; to co-locate and consolidate functions and enable continued (future) dispositioning of obsolete 200-Area assets (200, 205) (SLI, \$92M, FY20 completion)
Nonproliferation, Threat Reduction and Critical Infrastructure Assurance Business Line		
Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
200-Area Buildings, 300-Area Buildings, and Building 900	200-Area and 300-Area buildings are in part capable to marginal condition to support this business line. Building 900, an off-site leased facility, will be vacated at the termination of lease in early FY10. New space, including a Sensitive Compartmented Information Facility (SCIF), will be required to accommodate future growth and new capabilities.	<ul style="list-style-type: none"> • Selective rehabilitation, security-related upgrades • SCIF in Building 316 (IGPP, \$5.0M) • 362 modernization (SLI, \$60M, FY18-20); close of Building 900 lease in FY10; relocation to TCS, 221, and 300 Area

Laboratory Operations		
Facility or Infrastructure	Summary Condition Evaluation	Planned Investments
Utilities Electrical (540); Steam (531); Water Systems, Sewers, Natural Gas (525); and Central Heating Plant (108)	Argonne's nearly 60-year-old utility infrastructure supports the mission with adequate capacity and reliability; however, constrained expandability of the distribution systems could severely impact future mission needs. Major improvements to the electrical distribution system are needed. The Central Heating Plant requires upgrades. Steam and natural gas distribution systems remain in good to excellent condition. The Canal Water System requires major rehabilitation. Domestic water is provided by ample "city" supply; however, stand-by wells and water treatment require upgrades to maintain back-up capabilities. The sanitary, laboratory, and storm sewer systems are functional with normal maintenance and minor upgrades. The Central Chilled Water system lacks reliability, redundancy and expansion capability, and major distribution systems upgrades are needed.	<ul style="list-style-type: none"> • Central Heating Plant; potential third-party financing • \$54M SLI infrastructure and utility modernization project planned to address most of these issues by FY19 • Other utility projects to be financed through a combination of funding, including major repairs, deferred maintenance reduction (DMR), and IGPP
Civil Roads, Parking, and Walks	Roads, parking and sidewalks fully support the mission at this time; however, deterioration is accelerating due to age and climate-related failures resulting in increased maintenance and potential safety issues.	<ul style="list-style-type: none"> • Normal maintenance and upgrades to be performed through the use of resources including major repairs, DMR, and IGPP
Other Buildings 46, 201, 213, 214, 233, 460, and 600 series	Generally, the buildings used for administrative, engineering, and other support purposes are evaluated as capable of supporting the mission. The 600 Area is at end-of-life. The Guest House (460) requires additional space to support growth in growth in the Controlling Electrons, Atoms and Molecules in Complex Materials business line.	<ul style="list-style-type: none"> • 600-Area replacement and Guest House expansion being considered for third-party financing
Nuclear Operations Buildings 200 MA/MB Wings, 205-K Wings, 212 (AGHC), 306, 315 (vault 40), and 331	Most of the facilities are ~50 years old; do not meet DOE natural phenomena requirements; some do not meet fire sprinkler system hydraulic design requirements. Most facilities need structural, ventilation and electrical system upgrades. Hot cell manipulator arms, cranes, robots, and shielded windows need repair.	<ul style="list-style-type: none"> • Building 200 MA/MB upgrades; (Source TBD, \$25M) • Building 330 D&D and disposal (EM, \$23.5M, FY11) • Building 331 D&D and disposal (EM, \$15M, FY14) • Buildings: 205-K; 212 (AGHC), 306, 315 (vault 40), inventory, D&D and demolished with EM funding; further discussion under Strategic Site Investments
Communications & Information Technology (IT)	Laboratory communication and IT infrastructure are partially capable. Major investments necessary: (1) replacing obsolete equipment and (2) enhanced enterprise systems, development, and integration.	Total investment of \$23.8M through the use of operating funds
Security Fire Dept. (333), Security and C.I. (316), Visitor Badging (224), and Guard Posts (291)	The Fire Department quarters (333) require upgrades. Buildings 316 and 291 are fully capable but require improvements to support the mission in 5 years.	<ul style="list-style-type: none"> • Post 291- \$2.5M, SC-FS10 GPP

Strategic Site Investments

Argonne has developed a sound, structured modernization plan to meet the targeted goals of providing a productive, safe, secure, and environmentally sound workplace to support its mission efficiently and effectively. Needs identified in the plan were prioritized jointly by the Laboratory and the DOE Argonne Site Office; timing and sequencing of actions optimize the benefits and leverage the limited resources available for execution. The investments are discussed below by program or funding type. The pre-

conceptual locations and extents of the recommended actions are summarized in the attached map titled "Projected 10-Year Status, FY 2008 Annual Laboratory Plan."

Argonne requires immediate and significant recapitalization to replace a substantial portion of the original multi-program scientific facilities and ensure the continued readiness of the facilities and infrastructure to support the business lines. The initial five years require three major SLI-funded projects, in order to move forward with the disposal of the most seriously outmoded and ineffective buildings in the 200 Area.

Concurrently, Argonne is continuing a successful partnership with the State of Illinois to realize specific mission-focused buildings (CNM, APCF, ISC, etc.) and to facilitate more robust leased facilities (TCS and ISSB). This complements more traditional programmatic and major mission initiatives, such as FRIB, directly supported by DOE. The plan relies on DOE-EM funding to disposition the buildings replaced by the SLI projects (and other contaminated facilities) — action essential for obviating the continued high costs of operations and for eliminating the deferred-maintenance backlogs associated with very limited operational lives.

SLI Modernization Initiative. Three initial line-item projects, consistent with the approach identified in April 2007, establish the heart of Argonne's path forward. The most urgently needed project (FY 2010 start) will construct a new, 140,000-ft² Energy Sciences Building (\$95M) to co-locate and consolidate scientific efforts and eliminate excessive costs from the most severely impaired building. The second project (FY 2012) will construct another 140,000-ft² Multiprogram Replacement Building (\$83M) to support the work being performed by the Metagenomics Driven Protein Structure and Functional Characterization and the Sustainable Energy Production and Use business lines. The third project (FY 2012 start also; \$101M) will modernize 180,000 ft² of existing space in Buildings 221 and 223 in support of four business lines: Forces Shaping Matter and the Universe; Non-proliferation, Threat Reduction and Critical Infrastructure Assurance; Controlling Electrons, Atoms and Molecules in Complex Materials; and Sustainable Energy Production and Use.

The scopes of all three projects — consistent with the Infrastructure Modernization Initiative screening and selection criteria — support the core infrastructure, benefiting the overall programmatic mission through co-location, synergy, and space optimization. For all three projects, alternative financing approaches are not economically viable, and costs are beyond the IGPP threshold. These projects directly support the business lines, are critical to the Laboratory and DOE missions, and will enable reduction of deferred maintenance and elimination of excess space while providing a good return on investment (10-15 years). To supplement the SLI investments, the Laboratory will support pre- and post-project implementation costs from its operating funds and is committed to pursuing DOE-EM funding for the removal of the contaminated substandard facilities that will become surplus when these projects are implemented. The proposal for the initial modernization project is sufficiently mature to allow submittal and consideration of the CD-0 package as part of the FY 2010 budget process.

Programmatic Initiatives. Four programmatic facilities funded by DOE-BES are requested in support of the Controlling Electrons, Atoms and Molecules in Complex Materials business line. These include an expansion of APS beamlines (\$3-5M); build-out of the interior of LOM 437 in support of the new beamlines (\$5M); a new APS storage building to house parts currently stored in the area of the future beamlines (\$5M); and an addition to one LOM to house the support staff for the additional planned beamlines (~\$7-8M).

Third-Party Financing. Three facilities will be constructed in the near-term planning period with third-party financing to accommodate anticipated mission growth. The TCS Facility, scheduled for completion in FY 2009, is funded by State of Illinois revenue bonds, to be retired through the lease payments. The TCS Facility will provide the space and facilities support to build on Argonne's strengths in high-performance computing software, advanced hardware architectures, and application expertise in support of the Leadership Computing for Grand Challenge Problems in Science and Engineering and Metagenomics Driven Protein Structure and Functional Characterization business lines and Laboratory

operations. To accommodate the need for state-of-the-art experimental space for the Metagenomics Driven Protein Structure and Functional Characterization business line, the State of Illinois has funded the \$33.5M, 50,000-ft² APCF, to be located adjacent to LOM 435 and constructed by FY 2012. The SBB, planned for completion in FY 2012, will be a third-party-financed facility of ~ 70,000-ft². The SBB will be a user and research laboratory and office facility in support of the Metagenomics Driven Protein Structure and Functional Characterization business line.

Projects Supported by Laboratory Operating Funds. Concurrent with the major construction projects discussed above, the Laboratory will devote Institutional General Plant Projects (IGPP), Major Repairs, and Deferred Maintenance Reduction (DMR) program funding to address pressing rehabilitation, upgrade, or maintenance needs in the other facilities and infrastructure and to support pre- and post-project implementation costs related to the SLI projects. The IGPP funding program will address minor facility upgrades in existing buildings and infrastructure, (e.g., roof replacement, safety, fire protection, and mechanical/electrical systems), rehabilitate utility and site infrastructure, and support energy modification projects.

DOE-Environmental Management (DOE-EM) Funding. The DOE-EM funding is being requested for removal of contaminated facilities that will become inactive, as shown in the table below. Argonne plans to consolidate the nuclear facilities and reduce the inventory of radiological materials, preserving the capability to perform only mission-important experiments. Identification of funding paths is required for expeditious cleanup, material and waste disposition, and the ultimate disposition of these facilities. In conjunction with modernization planning, Argonne has initiated efforts to transfer legacy waste and nuclear material and excess nuclear/radiological facilities to DOE-EM for disposition stewardship.

Projects Required for Safe Disposition of Nuclear Materials, Waste, and Facilities

Facility	\$M*	Declared Excess (FY)	Project Start (FY)	Project Comp. (FY)	Demolition Area (ft ²)	Status
Building 330	23.5	2007	2009	2011	52,743	CD-0 package submitted 1/08
Building 310	11.6	2010	2010	2012	41,434	CD-0 package submitted 1/08
Legacy Waste and Excess Nuclear Material	182.9	2009	2010	2015	N/A	CD-0 package submitted 1/08
Building 331	15	2013	2013	2014	39,381	CD-0 package submitted on 1/08
Building 212, AGHCF	100	2012	2012	2015	20,000	CD-0 package submitted 1/08
Building 212	50	2013	2012	2015	284,572	To be submitted ~ FY09
IPNS (multiple facilities)	TBD	2008	TBD	TBD	TBD	To be submitted ~ FY09

* Project cost estimates for CD-0 submittals are +/- 40%.

The projects identified in the table above provide for the safe, compliant disposition of relatively large quantities of nuclear materials and waste. The result will be a significant reduction in the regulatory controls that apply to the material, equipment, and facilities; elimination of costs associated with operations, surveillance, and maintenance; and securing of long-term safety for the public and the environment.

Removal of legacy facilities is consistent with the DOE-SC goal of achieving an AUI ratio of 1:1 for comparison of utilization-justified assets to current real property assets. The demolition and disposal of these facilities will support responsible stewardship of nuclear material, contaminated equipment, and facilities; improve Argonne's AUI by balancing new construction with elimination of excess space; align infrastructure assets with mission performance; and reduce overhead costs associated with nuclear and radiological facilities.

In the event that sufficient DOE-EM funding is not provided, the Laboratory will work to minimize the ongoing costs associated with these nuclear facilities, but the costs will not go to zero.

Deferred Maintenance Reduction Strategy

The Laboratory is committed to reducing its maintenance backlog and achieving the DOE-established ACI goals for "Mission Critical" and "Mission Essential" facilities. The Laboratory will also participate in the Mission Readiness Initiative, which will more closely align facility maintenance with anticipated facility uses. The successful management of deferred maintenance reduction involves multiple investment strategies. A major component is adequate funding of routine maintenance, Major Repairs, and DMR programs, along with significant contributions from Laboratory operating funds through the IGPP program and SLI programs, as discussed above. The SLI modernization initiative will have a significant impact on removal of the backlog of facility needs through replacement or modernization of maintenance-intensive, substandard existing facilities and infrastructure. Also contributing to the reduction of deferred maintenance is the use of third-party or alternative financing options where economically feasible. Expenditures such as these will be minimized to the extent possible by using a risk-based approach in facilities planned for dispositioning or modernization.

Trends and Metrics

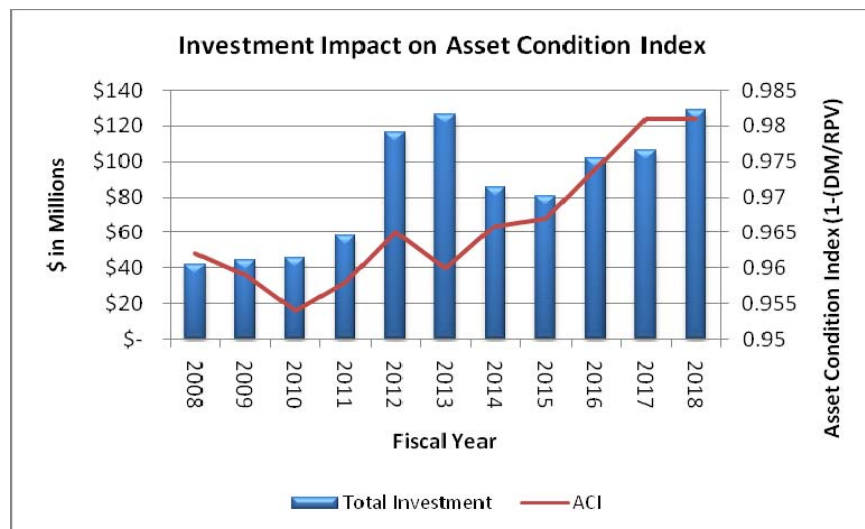
Argonne has consistently achieved the infrastructure goals in the Laboratory's Performance Evaluation and Measurement Plans. The FY 2007 DOE Evaluation of the Laboratory's Performance stated the following:

- "Argonne has continued to lead the SC complex in effective management and stewardship of infrastructure demonstrated by meeting and exceeding the SC FY 2007 Management Investment Index and Deferred Maintenance Reduction targets, as well as continuing to participate effectively in new Departmental and SC infrastructure related initiatives."
- "The Laboratory has developed a long-range vision of the campus and facilities to provide a framework for the replacement/modernization of existing facilities and future campus development. The vision incorporates and builds on the key planning concepts embodied in the Modernization Plan submitted to DOE-SC in April 2007."

As the Modernization Plan is executed, the Laboratory expects immediate benefits in reduced operating costs and improved productivity, accomplished by more efficient facilities and infrastructure (to maintain and operate) and by the reduced footprint achieved with elimination of surplus and substandard facilities. The footprint reduction, in turn, will significantly improve Laboratory performance in meeting AUI, ACI, and energy-related measures.

Facilities and Infrastructure Investments (\$M) — Impact to Asset Condition Index

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Maintenance	34.4	31.4	31.7	31.8	32.7	32.8	32.6	34.8	35.0	46.0	46.0
DMR	2.0	4.6	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Ex. Fac. Disposition (overhead)	0.4	-	-	-	-	-	-	-	-	-	-
IGPP	0.8	8.0	7.0	7.4	8.4	8.4	9.6	9.6	10.1	10.4	10.4
GPP	4.3	-	-	-	-	-	-	-	-	-	-
Line Items	-	-	3.0	15.0	71.3	81.6	39.4	32.4	53.0	46.0	69.0
Total Investment	41.8	44.0	45.5	58.0	116.2	126.6	85.4	80.6	101.9	106.2	129.2
Estimated RPV	1,553.2	1,570.1	1,583.7	1,591.5	1,633	1,640.3	1,629.2	1,741.8	1,749.6	2,299.6	2,302.3
Estimated DM	58.4	64.6	72.6	66.3	57.8	65.3	55.6	57	45.4	43.8	44.9
Site-Wide ACI	96.2	95.9	95.4	95.8	96.5	96	96.6	96.7	97.4	98.1	98.1



Sustainability

The Laboratory currently maintains operational processes and policies to ensure that sustainable materials are acquired and sustainable practices are utilized. The Laboratory uses standardized operations and maintenance and is developing measurement and verification protocols for real-time collection and reporting of energy performance information. Work is under way to measure and validate sustainable practices for energy, water, and related operations.

Laboratory policies, the Office of Project Management's Manual, and procedural documents held within the Engineering Department assure the commissioning of new equipment and retrofitted construction as described in DOE Order 430.2B. Retro-commissioning and energy and water use reduction projects are in the planning stages as part of the Laboratory's in-house energy management program. Increasing the amount of energy obtained from renewable sources continues to be pursued, along with strategies for combined heat and power facilities. Actions have been taken to decrease water use. Improvements to the condensate recovery systems and replacement of water-cooled air conditioning systems with air-cooled technology have been the foundations of these modifications.

Argonne has for many years incorporated alternative-fuel vehicles into the Operations and Transportation fleet through the well-established Fleet Management Program. The program ensures that, to the greatest extent practicable, alternative-fuel vehicles are procured and conventional-fuel vehicles are replaced with alternative-fuel and high-tech vehicles. A plan is being prepared for migration to a vehicle fleet that is totally alternatively fueled.

Requirement	Goal	Funding Source	Cost	Milestone	Comments
Energy Reduction of 30%	18.5%	Shared	-	FY 2007	Percent reduction for FY03-07
	1.5%	ESPC#2	-	FY 2009	Savings from ESPC#2 anticipated by 2009
	10%	IGPP	\$10M	FY 2015	In-house conservation effort
Renewable Energy On-site	2%	ESPC	TBD	FY 2010	
	0.50%	IGPP			
		Overhead			
Renewable Energy Off-Site	5%	Overhead	TBD	FY 2010	Depends on unit price cost effectiveness
Water Reduction	16%	Shared	\$1M	FY 2015	Anticipated performance from condensate recovery and AC cooling water usage reduction projects
Sustainment	15% of space	TBD	TBD	FY 2015	Percentage assessed (to the extent known) and percentage meeting Guiding Principles requirement

In cooperation with the DOE-SC, Argonne participated as a beta test site for the DOE Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings. This participation has established a path forward such that, by the end of FY 2015, 15% of the existing capital asset building inventory will incorporate the sustainable practices in the guiding principles.