

DOE Asset Revitalization: Sustainability and Waste Management Aspects – 12120

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ABSTRACT

In February 2011 Secretary of Energy Steven Chu established a Task Force on Asset Revitalization to facilitate a discussion among the Department of Energy (DOE), communities around DOE sites, nonprofits, tribal governments, the private sector, and other stakeholders to identify reuse approaches as environmental cleanup efforts at DOE sites reach completion. The Task Force was charged with exploring opportunities to reuse DOE site assets for beneficial purposes and making recommendations to the Under Secretaries of Energy, Science, and Nuclear Security on the formation of an Asset Revitalization Initiative (ARI). The ARI is a Department-wide effort to advance the beneficial reuse of the DOE's unique and diverse mix of assets including land, facilities, infrastructure, equipment, technologies, natural resources, and a highly skilled workforce. The ARI will encourage collaboration between the public and private sectors in order to achieve energy and environmental goals as well as to stimulate and diversify regional economies. The recommendations of the ARI Task Force are summarized below, focusing on the sustainability and waste management aspects.

INTRODUCTION

The mission of the Department of Energy (DOE) is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformational science and technology solutions. DOE is a vast organization whose significant resources must be coordinated to meet challenges outlined in the DOE Strategic Plan [1]. Opportunities to reuse assets for beneficial purposes will be created as elements of the DOE cleanup mission are completed. Reutilization of assets is a key management approach for cost-effective achievement of departmental goals.

On February 17, 2011, when Secretary of Energy Chu announced the establishment of the ARI Task Force, he said: "For decades, Department of Energy sites and their surrounding communities have played a vital role in supporting the nation's nuclear weapons defense mission. Thanks to investments through the American Recovery and Reinvestment Act and the hard work of our employees, many sites that were critical to supporting national defense are poised to build a new future." The ARI Task Force will recommend a path forward for working with stakeholders to leverage these resources—including land, industrial structures, electric grid connections, and a highly trained and talented workforce—for future use.

Although DOE has been pursuing asset revitalization for several years, recent drivers and opportunities resulted in the need to look for options to enhance the efforts. In view of the significant benefits; substantial interest among potential participants; and complex mix of assets,

financial incentives, technologies, and opportunities, the ARI Task Force was requested by Secretary Chu to explore opportunities to reuse DOE site assets for beneficial purposes and make recommendations for establishing a path forward on ARI by August 2011.

The major drivers affecting the DOE Complex considered by the Task Force include (1) reductions in DOE's footprint as the Environmental Management program completes significant portions of the cleanup; (2) changes to our nuclear security infrastructure as the National Nuclear Security Administration modernizes the nuclear weapons complex; (3) need for improvements in environmental, energy, and economic performance through implementation of efficiencies in clean energy and water use to meet sustainability and energy security goals; and (4) need to decrease the time required to realize scientific advances from our laboratories to research, pilot, demonstrate, and apply innovative solutions for the nation's most difficult problems. The federal deficit means a tighter fiscal environment and mandates greater efficiency in methods of accomplishing these goals.

This paper summarizes the relevant findings/recommendations of the ARI Task Force and describes how ARI could fit into the DOE sites' waste management and sustainability efforts.

TASK FORCE ACTIVITIES

The Task Force developed the following definition of ARI: ARI is a Department-wide effort to advance the beneficial reuse of DOE's unique and diverse mix of assets, including land, facilities, infrastructure, equipment, technologies, natural resources, and a highly skilled workforce. The ARI will encourage collaboration between the public and private sectors in order to achieve energy and environmental goals as well as to stimulate and diversify regional economies.

The team solicited information from the DOE sites and representatives from the private sector, communities, and stakeholders to identify potential assets that could be available for asset revitalization, assess the interest in and potential for asset revitalization projects, develop lessons learned from previous and ongoing revitalization efforts, and identify potential issues that could impact ARI implementation. Key aspects of lessons learned from previous projects and ongoing site environmental management and sustainability activities are summarized below.

Lessons Learned from Previous Asset Revitalization Efforts

Over the last decade, DOE has made significant progress in cleaning up and closing sites that are no longer needed for future missions. Former weapons facilities, including the Pinellas Plant, Rocky Flats Environmental Technology Site (RFETS), Fernald Closure Project (Fernald), and Miamisburg Closure Project (Mound), have been transformed into wildlife refuges, nature preserves, recreational areas, and industrial parks. DOE is also redeveloping its existing assets for partnerships with other public entities, as well as public-private partnerships, in addition to using renewable resources (energy produced on site or purchased power) that are environmentally sustainable and more energy-efficient.

Previous experience has shown that redevelopment can successfully occur in parallel with cleanup efforts. Examples of lessons learned from previous asset revitalization efforts that could be useful to DOE sites as they proceed with cleanup and revitalization efforts include these.

- Establish redevelopment partnerships early in the revitalization process; maintaining communication and collaboration among partners is critical.
- Develop an understanding of the site and its potential pitfalls early in the planning process.
- Allow adequate time to meet all transition requirements.
- Identify all costs up front and determine how they will be covered.
- Work to have early successes that the program can build on.

Environmental Management

DOE Environmental Management (EM) has made a major commitment to cleaning up former nuclear defense sites in a safe and expeditious manner. Much progress has been made over the last several years, and DOE has plans for completing many site remediations in the near future. In 1989, the legacy cleanup footprint was 3,125 square miles; 20 years later, the footprint had been reduced to 900 square miles. Over the last 10 years, EM has completed cleanup at four major sites: Weldon Spring, Missouri; Fernald, Ohio; Mound, Ohio; and RFETS, Colorado. Over the past two years, EM has made significant progress in accelerating environmental cleanup across the DOE complex. At the end of FY 2011, the acceleration of decontamination and decommissioning of excess facilities and cleanup of contaminated areas will reduce the legacy cleanup footprint by 40 percent (540 square miles will remain), resulting in a footprint reduction of almost 90 percent by 2015 (90 square miles will remain). The shrinking of the legacy footprint will involve the decontamination and decommissioning of more than 2,500 facilities and more than 7,500 completed remediation actions. DOE has also made progress in reducing its footprint through the transfer of uncontaminated properties to other uses. Land has been made available to local government, communities, and other federal agencies for uses ranging from commercialization to wild life habitat.

The DOE–EM efforts for footprint reduction may allow many assets from former nuclear defense sites to become available for future beneficial uses. Potential assets that DOE could consider making available include land; infrastructure such as equipment, structures, roads, rail lines, and electricity transmission facilities; natural resources; energy resources; site environmental characterization data; technology; and highly trained and experienced workers.

Historically, cleanup efforts have been an integral component that has contributed to the stability of local communities and local economies located near former nuclear defense sites. As DOE completes more site remediations, local communities and governments are looking for new ways to diversify their economies. Revitalization of the DOE assets, including transition of these sites for beneficial use, plays a significant role in helping diversify these regional economies as cleanup work is completed.

Sustainability

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, established an integrated sustainability strategy in the federal government and made the reduction of greenhouse gases a priority for federal agencies. To comply with this executive order, DOE completed its first *Strategic Sustainability Performance Plan* in September 2010. This plan sets the path for DOE to execute sustainability efforts throughout the DOE

complex on energy and water conservation; land and paper conservation and use; greenhouse gas emissions reductions; and increased use of renewable energy. To date, DOE has exceeded the renewable energy goal of 7.5 percent of energy use from renewable energy set by the Office of Management and Budget and Council on Environmental Quality three years early by using renewable energy for 9 percent of its energy use in FY 2010.

In addition, several of the DOE sites, particularly those where the energy demand to support mission work is expected to increase over time, are considering large-scale clean energy projects, such as solar, wind, biomass power and steam production plants, and small modular nuclear reactor plants to meet their sustainability goals. Examples of projects being implemented under DOE's Energy Savings Performance Contract (ESPCs) include the following:

- Construction is nearly complete on a 20-megawatt cogeneration facility at the Savannah River Site (SRS)—one of the largest such facilities in the country—to replace an existing old and inefficient coal-fired plant. This cogeneration facility will save approximately 100,000 metric tons of carbon dioxide and about \$34 million annually. Three other biomass steam plants are operating at SRS, replacing fossil-fuel-fired plants and miles of steam piping used to transfer the heat.
- The Oak Ridge National Laboratory (ORNL) is completing a bioenergy generation project to replace four aging natural-gas-fired boilers and reduce carbon dioxide emissions by 55,000 metric tons, along with significant reductions in nitrogen oxides and sulfur dioxide.

TASK FORCE FINDINGS AND RECOMMENDATIONS

The key findings and recommendations of the ARI Task Force included in the August 2011 report [2] to the Under Secretaries of Energy, Science, and Nuclear Security are summarized below.

Accelerate the current shift to multiple site uses and users. Co-locating multiple federal agencies and commercial partners at a site can maximize the use of DOE infrastructure, including site facilities, roads, and security. Additionally, multiple users can then benefit from the trained workforce at the sites, including scientists, engineers, and skilled laborers. Expanding the number and types of site users can enable more effective and efficient pursuit of DOE's mission and goals. Examples of activities that could be undertaken are

- Host dialogues between DOE program offices and sites to showcase assets at DOE sites that could host or support demonstration projects.
- Work with economic development organizations and community reuse organizations (CROs), national laboratories, and the private sector to increase commercial and research and development opportunities. Establish and co-locate technology incubators within site boundaries.
- Authorize site access for early site characterization and expedited land transfer.
- Fund environmental assessment and other activities needed to determine site viability for commercial use.
- Optimize property leasing mechanisms such as enabling enhanced-use leases and lengthening lease authority to spur development at sites.

Inform the workforce of upcoming changes as soon as possible, so they can adapt to meet future site needs. As federal and contractor workers finish overseeing and conducting cleanup

operations, supplying qualitative and quantitative information on projected changes in site missions will help to retain needed expertise for DOE and to help others find new jobs in the public and private sectors.

Strengthen partnerships with other organizations, agencies, and groups. By attracting resources from the private sector and partnering with non-DOE entities—including other federal agencies, local governments, tribal nations, CRO, public utilities, and businesses—DOE can leverage limited federal funding to more effectively revitalize site infrastructure. Examples of activities that could be undertaken include

- Setting up informational meetings with private-sector clean energy and high-tech manufacturing companies, communities, and the sites to introduce possible end uses of DOE properties scheduled for cleanup completion.
- Developing and implementing strategies to increase the attractiveness and marketability of DOE assets.
- Expanding project financing options (e.g., local government bonds, other federal agencies, investment banks, venture capitalists).
- Partnering with local governments, CROs, and the private sector to better use assets (e.g., excess facilities and materials) or privatize services (e.g., wastewater treatment, emergency response).

Promote DOE's national energy security and clean energy goals. Attracting investments in sites and communities with funding from multiple sources can help achieve President Obama's objectives to strengthen America's energy security and to deploy clean energy resources. Examples of activities that could be undertaken are

- Evaluate opportunities to conduct large-scale demonstration projects on DOE sites.
- Support the development of regional energy initiatives.
- Work with other federal agencies to implement joint sustainability projects on DOE sites.
- Continue efforts to extend the life of power purchase agreements to 30 years.

Streamline transfer processes for real and personal property to meet timetables necessary for private-sector investment. By projecting when land or infrastructure will become available at a site and what it can be used for, National Environmental Policy Act (NEPA) work can be conducted in advance. This will enable sites to have transition plans in place and ready to implement once mission work is completed, and it can accelerate the land transfer process. Examples of activities that could be undertaken are

- Review the real property transfer process to determine where improvements can be made.
- Evaluate and remove unnecessary lease and deed restrictions that impede asset revitalization.
- Evaluate broader indemnification for potentially contaminated, transferred property.
- Implement a supportable and efficient NEPA process that establishes parameters for asset uses.

Actively engage stakeholders to generate the best ideas and accelerate positive outcomes. Actively engaging key stakeholders in planning, outreach, and execution will help all parties to better understand the potential for revitalization at any given site.

Create a crosscutting team to implement ARI. A crosscutting team is needed to complete the analysis, drive recommendations, and ensure an integrated DOE-wide approach to asset revitalization.

WASTE MANAGEMENT AND SUSTAINABILITY ASPECTS OF FUTURE ASSET REVITALIZATION PROEJCTS

Based on previous asset revitalization experiences and the task force findings, it would be beneficial for future use plans to be incorporated into environmental management and remediation planning for the DOE sites at as early a stage as possible. Future uses could impact the schedules for cleanup, define the cleanup level requirements, and/or determine the amount and type of characterization data needed. Developing regulatory documents (e.g., NEPA) during the cleanup process with future uses in mind can help facilitate the transition of assets for reuse.

Many potential sustainable energy projects that have been considered for implementation at DOE sites do not meet the ESPC criteria because of factors such as the economies of scale and maturity level of the technology. These projects often need other funding mechanisms and/or larger customer bases to be economical. Asset revitalization efforts, particularly efforts to partner with other entities and development of regional energy initiatives, can potentially play a role in facilitating future sustainability projects at the sites.

SUMMARY

DOE's ongoing completion of cleanup efforts and modernization efforts is creating opportunities to transition underused or excess assets to future beneficial use. The FY 2011 DOE ARI Task Force determined that DOE's assets could be reused for beneficial purposes such as clean energy production, industrial manufacturing, recreational and conversation use, and other economic development initiatives. Asset revitalization has the potential to both help achieve DOE's energy and environmental goals and diversify regional economies where the sites are located, including providing the support needed to implement large-scale projects that achieve green sustainability goals. Asset revitalization efforts could be accelerated by effectively incorporating future use plans into environmental management and remediation efforts.

REFERENCES

1. *U.S. Department of Energy Strategic Plan*, DOE/CF-0067, May 2011.
2. *Asset Revitalization Initiative Phase I Report*, U.S. Department of Energy, August 2011.