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RADM Fred Lewis (U.S. Navy Ret.), President

National Training Systems Association

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Department of Energy Training 2015

“The Department of Energy’s overarching mission is to advance the national, economic, and energy security of the United States; to promote scientific and technological innovation in support of that mission; and to ensure the environmental cleanup of the national nuclear weapons complex.”
(<http://www.energy.gov>).

1.0 Introduction

Energy security of the United States ensures and supports national stability, economic security, and quality of life for citizens. These principles drive missions and responsibilities of the U.S. Department of Energy (DOE). DOE coordinates and administers the energy functions of the federal government. It engages in long-term, high-risk research and development of energy technology to bring about innovations in science and technology. Department endeavors include encouraging nonproliferation and security of nuclear materials, maintaining the safety and reliability of the nation’s nuclear stockpile, and spearheading environmental clean-up efforts. It also operates a central energy data collection and analysis program (<http://www.energy.gov>).

1.1 Department of Energy Organization Overview

The DOE is organized into Program Offices, Staff and Support Offices, Operation Offices, and Transportation Offices. The Department’s missions are managed by the following DOE Program Offices:

1. Office of Civilian Radioactive Waste Management (OCRWM)
2. Office of Electricity Delivery and Energy Reliability (OE)
3. Office of Energy Efficiency & Renewable Energy (EERE)
4. Office of Environmental Management (EM)
5. Office of Fossil Energy (FE)
6. Office of Legacy Management (LM)
7. Office of Nuclear Energy (NE)
8. Office of Science (OS)

Staff and Support Offices provide administrative, management, and oversight support to the various headquarters programs and offices. They include the following offices:

- The Office of the Chief Financial Officer—comprised of the Office of Financial Management, the Office of Budget, the Office of Program Liaison and Financial Analysis, the Office of Program Analysis and Evaluation, and the I-MANAGE functions.
- The Office of the Chief Human Capital Officer— consists of the Office of Strategic Planning and Policy; the Office of Learning and Workforce Development; and the Office of Human Resources Services. It strategically aligns the agency’s workforce to its missions through effective management of human capital policies and programs.

- The Office of the Chief Information Officer—responsible for the design, implementation, and continuing successful operation of Information Technology programs and initiatives throughout the Department and its offices.
- The Office of Health, Safety and Security (HSS)—provides the corporate-level leadership and strategic vision necessary to better coordinate and integrate health, safety, environment, security, enforcement, and independent oversight programs.
- The Office of Management—comprised of the Offices of Administration, Engineering and Construction Management, Procurement and Assistance Management, Aviation Management, Scheduling and Advance, Competitive Sourcing, and the Executive Secretariat.

Other Staff and Support Offices include: Office of Economic Impact and Diversity; Office of General Counsel; Office of Hearings and Appeals; Office of Inspector General; Office of Intelligence and Counterintelligence; Office of Public Affairs; Office of Congressional and Intergovernmental Affairs; Office of Policy and International Affairs (<http://www.energy.gov/organization/index.htm>).

Operation Offices are DOE offices located outside of Washington, DC, throughout the U.S. They oversee activities in support of two or more of the four missions assigned to the Department (<http://www.energy.gov/organization/ops-offices.htm>)

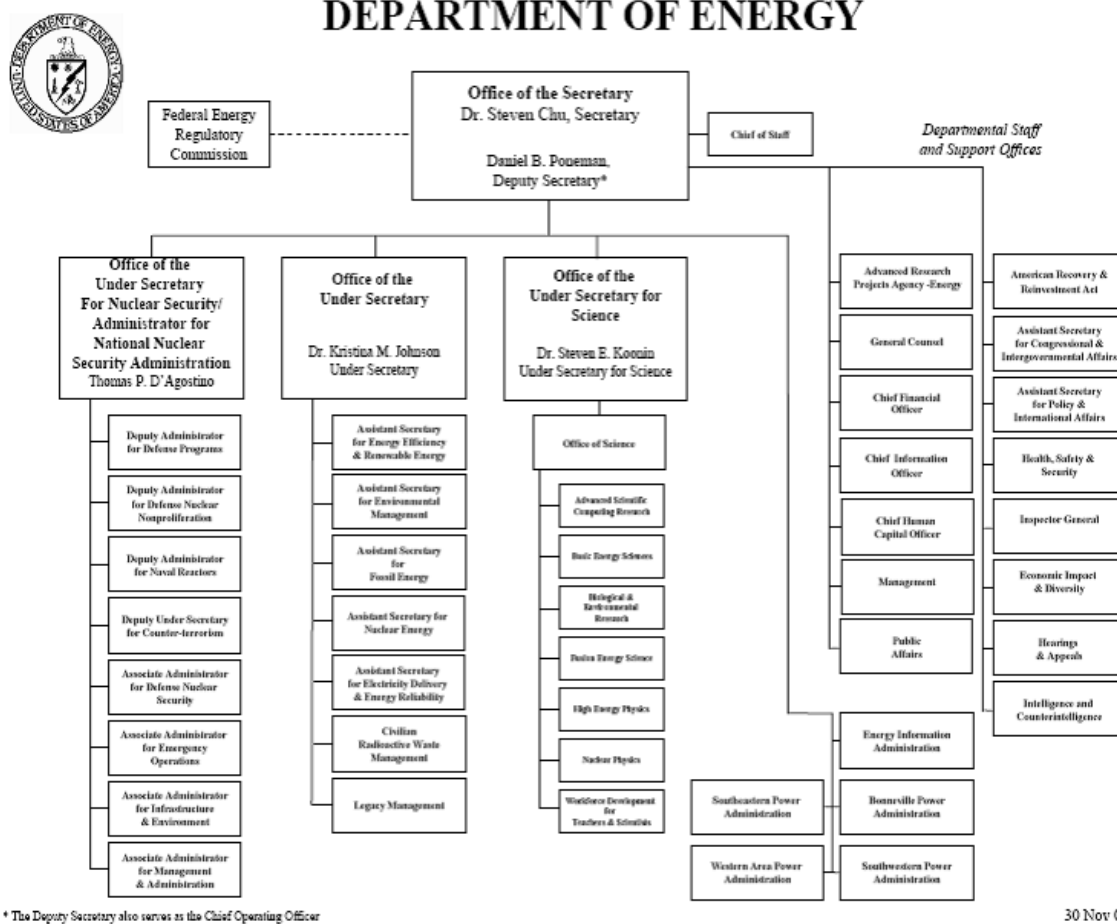
The Office of Packaging and Transportation provides policy, budget, and program direction to the DOE complex on transportation and packaging activities (<http://www.energy.gov/safetyhealth/wastetransportation.htm>).

In addition to various offices, other administrations and facilities fall under the DOE umbrella. More than 30,000 scientists and engineers perform research in 21 DOE National Laboratories and Technology centers. The facilities, along with their, report to DOE Program offices (<http://www.energy.gov/organization/labs-techcenters.htm>).

The U.S. Energy Information Administration (EIA) is an independent statistical agency of the DOE. It provides neutral data and analyses to DOE and Congress used to direct energy policy.

The National Nuclear Security Administration (NNSA) operates as a semiautonomous agency within the DOE. It is responsible for the nation's nuclear weapons, nonproliferation, and naval reactors programs, and was established in 2000 to correct management and security issues within the DOE (GAO, 2000). DOE performs its nuclear weapons and nuclear materials and technology security mission through the NNSA. The NNSA Office of Secure Transportation manages transportation activities associated with shipments of radioactive materials (<http://www.energy.gov/safetyhealth/wastetransportation.htm>).

Power Marketing Administrations market power produced at Federal water projects. Each of the four power marketing administrations is a distinct and self-contained entity within the DOE, much like a wholly owned subsidiary of a corporation (<http://www.energy.gov/organization/powermarketingadmin.htm>).



Source: <http://www.energy.gov/media/DOECHART-NONAMES-113009.pdf>

Figure 1-1: Department of Energy Organization Overview

1.2 DOE Organizations Responsible for Education and Training

Education and training programs and activities are administered by various DOE components.

The HSS Office of the National Training Center (NTC) provides the Nuclear Security Administration (NNSA) Safety and Security personnel with training in support of professional development. Located in Albuquerque, New Mexico on Kirtland AFB, the NTC develops, delivers, and evaluates DOE Safety and Security training. NTC identifies, develops, and delivers training courses for both federal and contractor personnel, maintaining a full range of training delivery capabilities to assure use of current technologies and cost-effective training delivery options. It also provides training and services to other government agencies charged with protecting national security and critical assets as requested consistent with HSS and Departmental priorities (<http://www.hss.doe.gov/NTC/>).

The Office of the Chief Human Capital Officer offers career development and mission critical programs to DOE employees. Career development programs link training activities, research and team projects, coaching and mentoring, and developmental work assignments in a set of activities designed to build mission critical competencies (<http://humancapital.doe.gov/training-06-career-dev.htm>). Programs include:

- [Federal Technical Capability Program](#)
- [Facility Representative Program](#)
- [Acquisition Career Development Program](#)
- [Aviation Safety Program](#)
- [DOE Security and Safety Training Courses](#)
- [National Security Professional Development Program](#)

NNSA provides training to emergency managers and responders through the [Emergency Operations Training Academy](#) (EOTA). The EOTA creates and provides online training, classroom and hands-on training solutions (<http://www.nnsa.energy.gov/aboutus/our/programs/emergencyoperationscounterterrorism/training>).

Through the Office of the Chief Information Officer, the Office of Cyber Security provides a Cyber Security Training Warehouse (CSTW). The CSTW provides a central location where for updates on cyber security training communication, workshops, and resources for professional development, training, and education (<http://www.cio.energy.gov/cybersecurity/training.htm>).

The Department's National Laboratories host mentored experiences for teachers to increase the skills and knowledge of the scientific and technical workforce <http://www.energy.gov/science/tech/workforcedev.htm>).

The Office of Science Workforce Development for Teachers and Scientists program supports subprograms designed to expand the pipeline of students who can enter the STEM workforce (<http://www.energy.gov/sciencetech/education.htm>).

The Office of Nuclear Energy (NE) works to ensure an adequate supply of trained nuclear scientists and engineers. NE assists universities in the operation of research reactors and in the performance of educational activities through the University Nuclear Infrastructure (UNI) program (<http://www.energy.gov/sciencetech/education.htm>). NE also conducts a grants program allowing nuclear engineering faculty and students to conduct innovative research (<http://www.energy.gov/sciencetech/grants.htm>).

2.0 Market Description

Ongoing concerns about climate change, environmental sustainability, and national security and the geopolitical environment direct U.S. energy policy decisions (USEIA, 2010). In an attempt to maintain economic productivity, competitiveness, and a U.S. leadership position, policy directs heavy investment in science and technology. Other factors including tax incentives, rebates, and product acceptance and uptake impact the DOE's ability to achieve policy driven missions. Fuel prices affect the rate of transfer from the laboratory to the marketplace, regardless of the merit of the technological advancement. Natural disasters impact supply and concerns about

domestic security drive infrastructure, technology and security upgrades (DOE, 2006). These factors drive DOE activities and influence the energy market.

The EIA cites economic factors including economic recovery pace, impacts on capital-intensive energy projects from financial market turmoil, and rising fossil fuel prices as a result of an end to fossil fuel subsidies as current and immediate future energy market drivers (USEIA, 2010 and Kopp, 2009).

The EIA [Annual Energy Outlook 2010](#) presents projection and analysis of energy supply, demand, and prices through 2035. The report summarizes the following energy market developments:

- moderate growth in energy consumption
- increased use of renewable fuels, particularly those used to generate electricity and to produce liquid fuels for the transportation sector
- declining reliance on imported liquid fuels
- strong growth in shale gas production
- projected slow growth in energy-related carbon dioxide (CO₂) emissions in the absence of new policies designed to mitigate greenhouse gas (GHG) emission

Source: <http://www.eia.doe.gov/oiaf/aeo/execsummary.html>

2.1 Budget

The following tables present FY09-FY11 DOE budget information.

Table 2-1: Department of Energy Discretionary Funding FY 2009-11 (dollars in thousands)

DOE Total, Discretionary Funding	FY 2009	FY 2009 Recovery	FY 2010 Current Appropriations	FY 2011 Congressional Request	FY 2011 vs. FY 2010 \$	FY 2011 vs. FY 2010 %
	33,856,453	36,725,000	26,596,552	28,404,359	1,807,807	6.80%

Table 2-2: DOE Budget - Energy and Environment

Energy and Environment	FY 2009	FY 2009 Recovery	FY 2010 Current Appropriations	FY 2011 Congressional Request	FY 2011 vs. FY 2010 \$	FY 2011 vs. FY 2010 %
Energy						
Energy Efficiency and Renewable Energy	2,156,865	16,771,907	2,242,500	2,355,473	112,973	5.00%
Electricity Delivery and Energy Reliability	134,629	4,495,712	171,982	185,930	13,948	8.10%
Fossil Energy	1,097,003	3,398,607	951,133	760,358	-190,775	-20.10%

Energy and Environment	FY 2009	FY 2009 Recovery	FY 2010 Current Appropriations	FY 2011 Congressional Request	FY 2011 vs. FY 2010 \$	FY 2011 vs. FY 2010 %
Nuclear Energy	1,357,263	0	869,995	912,252	42,257	4.90%
Total, Energy	4,745,760	24,666,226	4,235,610	4,214,013	-21,597	-0.50%
Environment						
Environmental Management	5,990,667	6,000,000	6,007,854	6,047,000	39,146	0.70%
Civilian	288,390	0	196,800	0	-196,800	-100.00%
Office of Legacy Management	185,981	0	190,802	188,626	-2,176	-1.10%
Total, Environment	6,465,038	6,000,000	6,395,456	6,235,626	-159,830	-2.50%
Total, Energy and Environment	11,210,798	30,666,226	10,631,066	10,449,639	-181,427	-1.70%

Table 2-3: DOE Budget - National Security

National Security	FY 2009	FY 2009 Recovery	FY 2010 Current Appropriations	FY 2011 Congressional Request	FY 2011 vs. FY 2010 \$	FY 2011 vs. FY 2010 %
Weapons Activities	6,410,000	0	6,384,431	7,008,835	624,404	9.80%
Defense Nuclear Nonproliferation	1,545,071	0	2,136,709	2,687,167	550,458	25.80%
Naval Reactors	828,054	0	945,133	1,070,486	125,353	13.30%
Office of the Administrator	439,190	0	410,754	448,267	37,513	9.10%
Total, National Nuclear Security Administration	9,222,315	0	9,877,027	11,214,755	1,337,728	13.50%

Table 2-4: Office of Science

Office of Science	FY 2009	FY 2009 Recovery	FY 2010 Current Appropriations	FY 2011 Congressional Request	FY 2011 vs. FY 2010 \$	FY 2011 vs. FY 2010 %
Advanced Scientific Computing Research	358,772	161,795	394,000	426,000	32,000	8.12%
Basic Energy Sciences	1,535,765	555,406	1,636,500	1,835,000	198,500	12.13%
Biological and Environmental Research	585,176	165,653	604,182	626,900	22,718	3.76%
Fusion Energy Sciences	394,518	91,023	426,000	380,000	-46,000	-10.80%
High Energy Physics	775,868	232,390	810,483	829,000	18,517	2.28%

Office of Science	FY 2009	FY 2009 Recovery	FY 2010 Current Appropriations	FY 2011 Congressional Request	FY 2011 vs. FY 2010 \$	FY 2011 vs. FY 2010 %
Nuclear Physics	500,307	154,800	535,000	562,000	27,000	5.05%
Workforce Development for Teachers and Scientists	13,583	12,500	20,678	35,600	14,922	72.16%
Science Laboratories Infrastructure	145,380	198,114	127,600	126,000	-1,600	-1.25%
Safeguards and Security	80,603	0	83,000	86,500	3,500	4.22%
Science Program Direction	186,695	5,600	189,377	214,437	25,060	13.23%
Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) (SC funding)	104,905b	18,719	0	0	0	0.00%
Subtotal, Office of Science	4,681,572	+1,596,000 ^c	4,826,820	5,121,437	294,617	6.10%
Congressionally-directed projects	91,064	0	76,890	0	-76,890	-100.00%
SBIR/STTR (Other DOE funding)	49,534d	+36,918d	0	0	0	
Subtotal, Office of Science	4,822,170	1,632,918	4,903,710	5,121,437	217,727	4.44%
Use of prior year balances	-15,000	0	0	0	0	
Total, Office of Science	4,807,170	1,632,918	4,903,710	5,121,437	217,727	4.44%
Advanced Research Projects Agency-Energy (ARPA-E)	6,300e	0	0	0	0	0.00%
Total, Science Appropriation	4,813,470	1,632,918	4,903,710	5,121,437	217,727	4.44%

Sources: Aggregate totals, Energy, Environment, and National Security Budgets
<http://www.cfo.doe.gov/budget/11budget/Content/Orgsum.pdf>. Office of Science Budget
http://www.science.doe.gov/obp/FY_11_Budget/FY%202011%20CONG%20SC%20Overview.pdf

The Department of Energy's FY 2011 budget request (\$28.4 billion) is a \$1.8B increase from FY 2010. Budget request highlights focus on research and technology development:

- \$40B of innovative energy technology development
- \$55M for RE-ENERGYSE (Regaining our ENERGY Science and Engineering Edge) in support of K-20+ science and engineering education
- \$300M for the Advanced Research Projects Agency – Energy (ARPA-E). ARPA-E is responsible for enabling specific high-risk and high-payoff transformational research and development projects
- \$325M to promote energy efficiency in vehicles technologies
- \$331M in developing and advancing building and industrial technologies
- \$878M in modernizing the Nation's energy infrastructure by investing in renewable sources including solar, wind, water, hydrogen, biomass, and geothermal

- \$144M for research and development to improve reliability, efficiency, flexibility, and security of electricity transmission and distribution networks (e.g., Smart Grid)

Source: DOE FY 2011 Budget Highlights

2.2 Training Product Lines / Training Priorities

According to its FY 2011 budget, DOE will invest nearly \$100M for 54 smart grid workforce training programs that will help prepare the next generation of workers in the utility and electrical manufacturing industries. The programs will focus on training activities that support electricians, line workers, technicians, system operators, power system engineers, cyber security specialists and transmission planners. Projects will leverage more than \$95M in funding for community colleges, universities, utilities and manufacturers to develop and implement training programs. Award selectees estimate that the programs will train approximately 30,000 Americans. These workers will help to modernize the nation's electrical grid and implement smart grid technologies in communities across the country. Workers will receive training on the transmission and distribution systems as well as new intelligent grid systems, such as smart meters, phasor measurement sensors and advanced communication networks. The list of projects is available at http://www.energy.gov/news/documents/04-08-2010_SG_Workforce_Selections.pdf.

DOE will also invest another \$76M for 58 advanced energy-efficient building technologies and commercial building training programs. The programs will make the nation's buildings more energy efficient and cost-effective, and support workforce development programs. Workers will be trained to service and operate new and existing buildings. The programs will establish a green workforce with technical expertise to reduce energy costs for consumers. The list of projects is available at <http://www.energy.gov/9152.htm>.

The DOE also provides programs oriented around STEM Workforce Development, Teaching & Education. Officials within the DOE see the inability to attract high level scientific talent as a significant energy security challenge (<http://www.cfo.doe.gov/strategicplan/scientific.htm>). Therefore, DOE seeks to expand the nation's supply of highly qualified scientists and engineers by providing these grants, internships, and other activities for students and teachers.

In addition, several DOE programs focus on developing a "green" workforce, fostering skills and education in wind, solar, weatherization and alternative energy technology fields. For example, DOE's Wind for Schools project educates college students in wind energy applications and prepares engineers for the growing U.S. wind industry. Toward this end, DOE has awarded nearly \$3.5M in workforce development grants to universities, community and technical colleges, and adult learning programs. Careers in wind are ideal for workers with existing competencies and skills, and new workers with engineering, math, and science backgrounds (http://www1.eere.energy.gov/library/pdfs/wind_green_jobs_fs.pdf).

3.0 Goals & Challenges

To realize future energy goals of ensuring energy security, prompting innovation and discovery, and protecting the environment, DOE will advance energy technology, modernize and systems that transmit and distribute energy, collaborate with other agencies to solve energy issues, and

promote workforce STEM education and teaching to shape the next generation of energy innovators and leaders. DOE will also improve the information technology infrastructure through upgraded networks and technology and strengthened cyber security (<http://www.cfo.doe.gov/strategicplan>).

DOE also faces important, internal department challenges including addressing an impending knowledge and capability gap as a significant portion of DOE workforce becomes eligible for retirement, addressing concerns of the aging DOE infrastructure, and the adoption of new financial and business practices.

3.1 Energy Security

To lessen dependence on foreign fuel sources, DOE will diversify energy sources. Department goals include increasing energy options and reducing oil dependence to achieve energy diversity. Taking steps to reduce the transportation sector's dependence on oil is a critical component of these goals. The transportation sector is the least energy diverse sector of the U.S. economy, with petroleum accounting for more than 95 percent of the fuel consumed.

Over the next six years, energy infrastructure activities will be primarily focused on modernizing the electricity grid. DOE will develop advanced wires and coils, advance real-time visualization and control tools, integrate advanced technologies on distribution utility feeders, and provide technical assistance to state and regional officials on policies and emergency response options (<http://www.cfo.doe.gov/strategicplan/energysecurity.htm>).

3.2 Nuclear Security

DOE seeks to prevent the acquisition of nuclear and radiological materials for use in weapons of mass destruction and in other acts of terrorism. NNSA will provide international leadership in nonproliferation by developing and promoting new technologies to detect and minimize proliferation risks. The Stockpile Stewardship Program (SSP) will ensure the safety, security, and reliability of nuclear weapons without nuclear testing through the use of scientific tools and computer-based simulation techniques

NNSA, through the Naval Reactors Program, provides the U.S. Navy with safe, militarily effective nuclear propulsion plants and ensures the safe operation of reactor plants in operating nuclear-powered submarines and aircraft carriers. DOE will provide operational support and ensure the safety, performance, reliability, and service life for 104 operating reactor plants, and develop new technologies, methods, and materials to support reactor plant design for future generations of reactors for submarines and aircraft carriers (<http://www.cfo.doe.gov/strategicplan/nuclearsecurity.htm>).

3.3 Scientific Discovery and Innovation

Science-driven innovation is a top DOE priority. Innovation plays an important role in driving economic productivity and promoting high standards of living. Incremental changes in technology will not be enough to significantly reduce dependence on foreign oil, decrease

energy use, increase production, or solve long-term environmental problems. To promote transformation and innovation DOE will:

- invest in biological and environmental research, high energy physics, nuclear physics, and plasma and fusion energy science;
- provide training to prepare the next generation of scientists and engineers;
- collaborate with other agencies to recruit the next generation of STEM leaders.

DOE will increase financial support for innovation-enabling research and investments in the U.S. scientific infrastructure and strengthen the ties between the basic research and applied mission programs in its planning, developing strategic partnerships with other Federal research agencies and the public and private sectors to leverage combined resources (<http://www.cfo.doe.gov/strategicplan/scientific.htm>).

3.4 Environmental Responsibility

Over the next six years, DOE will continue to manage its environmental responsibilities of closed contaminated nuclear weapons sites, both those cleaned up by the Office of Environmental Management and those sites remediated by other parties. The challenge will be to do this in a manner that enables the optimal future use and protection of human health. DOE will leverage science and technology to directly address the specific, applied needs for cleanup and closure and utilize project management best practices to improve implementation and performance of clean-up work (<http://www.cfo.doe.gov/strategicplan/environmental.htm>).

4.0 Organizational Acquisition Strategies

DOE utilizes government-wide acquisition contracts (GWACs), multi-agency contracts, Federal Supply Schedule contracts, and other procurement options including Blanket Purchase Agreements (BPAs) against Federal Supply Schedule contracts. GWACs are multiple-award, indefinite delivery, indefinite quantity (MA/IDIQ) contracts that help agencies meet their technology requirements through a customizable, solutions-based approach.

DOE hosts an Acquisition Forecast website (<https://hqlnc.doe.gov/Forecast>) to provide timely information to the public regarding DOE/NNSA's forecast of future prime contracting opportunities and subcontracting opportunities which are available via the Department's major site and facilities management contractors. These opportunities are searchable by various factors, such as NAICS Code and solicitation method, and identify both prime and subcontracting opportunities.

The Department's "e-center" is DOE's web site (<http://www.pr.doe.gov/>) for information on doing business with the Department of Energy, including viewing current business opportunities, registering to submit proposals, and obtaining information and guidance on the acquisition and financial assistance award process. DOE's "Doing Business with the Department of Energy" provides "one-stop shopping" for information on business and financial assistance opportunities, including points of contact at the Department's contracting activities at Headquarters and in the field (http://www.management.energy.gov/business_DOE.htm).

4.1 Major Contract Vehicles

Millennia Lite is a MA ID/IQ GWAC providing information technology solutions. Its scope is worldwide with a base contract period of three years and seven available performance-based extension years through 2010, and a \$20B program ceiling. Customers have the option of issuing fixed price, cost reimbursement, or labor hour/time and material task orders (<http://www.gsa.gov/portal/content/104652>). Functional areas include IT Planning, Studies and Assessment; High-End Information Technology Services; and Mission Support Services.

EIA is in the process of awarding Omnibus Procurement III (EOPIII) Multiple Award IDIQ Contracts to a new group of small and large vendors under Solicitation Number DE-SOL-0000186. Services include project management, survey operations, energy analysis and modeling, and data integration.

The DOE's 8(a) Pilot Program targets 8(a) small, disadvantaged businesses for DOE procurement opportunities at the subcontract level and allows flexibility to DOE's major prime contractors in awarding subcontracts to them. According to DOE information, participants can receive sole-source contracts up to \$3M for goods and services, and \$5M for manufacturing; bid/propose on competitive procurements above \$3M for goods and services, and above \$5M manufacturing that are set-aside for 8(a) participation only. Participants can also partner with its private sector prime contractor in order to obtain future procurement opportunities (http://diversity.doe.gov/business/8a_pilot.htm).

The Applications 'n Support for Widely-diverse End-user Requirements (ANSWER) GWAC covers the full spectrum of IT and provides the flexibility needed to acquire an integrated solution that incorporates equipment, hardware, software, and other direct costs integral and necessary to the IT service requirements (<http://www.gsa.gov/portal/content/104008>).

5.0 Market Trends and Technological Initiatives

The Advanced Research Projects Agency-Energy (ARPA-E) was established within the DOE through the American Recovery and Reinvestment Act (ARRA). ARPA-E's mission is to fund projects—transformative concepts that industry alone cannot realize—that will reduce dependence on foreign energy imports and energy related emissions (including greenhouse gasses), improve energy efficiency, and ensure the development and deployment of advanced energy technologies (<http://arpa-e.energy.gov/About/FAQs/ARPAEOverview.aspx>). DOE has directed 9.5% of these funds toward small businesses.

The American Recovery and Reinvestment Act of 2009 also included funding for the Federal Emergency Management Program (FEMP), which provides project-specific design assistance, energy audits, training, and technical information to help agencies implement energy efficiency, water conservation, and renewable energy technology projects. FEMP helps Federal agencies use Energy Savings Performance Contracts (ESPC) and utility energy savings contracts (UESC) to finance energy saving improvements at no net cost to taxpayers (http://www1.eere.energy.gov/femp/financing/recovery_act.html).

Existing DOE efforts under the Small Business Innovation Research program (SBIR) and the Small Business Technology Transfer program (STTR) focus on developing near-term clean energy technologies. Eleven federal departments participate in the SBIR program; five departments participate in the STTR program awarding \$2B to small high-tech businesses. Reestablished under the Consolidated Appropriations Act of 2010, the FAST program strengthens the technological competitiveness of small business concerns (http://www.sba.gov/aboutsba/sbaprograms/sbir/announce/SBA_FAST_PROGRAM.html).

RE-ENERGYSE (Regaining our Energy Science and Engineering Edge) is a proposal for a federal education initiative focused on the clean energy sector. Pending Congressional approval, RE-ENERGYSE will be coordinated by the DOE and National Science Foundation (NSF). An initial investment of \$74M will fund clean energy-related education for university, college, technical, and K-12 students, furthering science, technology, engineering and mathematics (STEM) education and workforce development in the U.S. This would include a \$50M EERE program and a \$5M NE program. RE-ENERGYSE is a DOE-wide initiative, funding education and training efforts to develop a "green energy" workforce and vocational training programs for advanced energy jobs (<http://leadenergy.org/2010/02/obama-re-energyyse-proposal-2011/>).

5.1 Opportunities & High Priority Needs

DOE technological initiatives are focused on development and deployment of energy efficient technologies for industry and homes. Programs currently run through the Nuclear Energy (NE) office include:

- [Advanced Modeling and Simulation](#) - Supercomputers advancing nuclear energy technologies.
- [Fuel Cycle Research & Development](#) - Solving nuclear waste and proliferation issues.
- [Generation IV Nuclear Energy Systems \(Gen-IV\)](#) - Developing next generation nuclear plants.
- [Global Nuclear Fuel Assurance](#) - Assuring supplies of fuel for nuclear power plants.
- [International Nuclear Energy Policy and Cooperation \(INEPC\)](#) - Supporting the safe, secure and peaceful use of nuclear energy internationally.
- [Laboratory Facilities Management](#) - Managing nuclear research facilities.
- [Light Water Reactor Sustainability](#) - Extending useful lifetimes of existing nuclear power plants.
- [Nuclear Power 2010](#) - Paving the way for new nuclear power plants.
- [Space and Defense Infrastructure](#) - Providing Radioisotope Power Systems to NASA.

DOE technological initiatives will also promote cyber security. DOE's Oak Ridge National Laboratory recently won DOE solicitations worth about \$7M over the next three years and will be developing systems to guard against power outages caused by man or nature. Involved in this effort are a number of technologies, including advanced radio frequency technology and cyber security vulnerability detection of smart grid components and systems (http://www.ornl.gov/info/press_releases/get_press_release.cfm?ReleaseNumber=mr20101007-00).

DOE funds various state and community programs to enable energy efficient technologies.

- The [State Energy Program](#) provides funding to states to design and carry out their own energy efficiency and renewable energy programs. The outcome of this DOE funding is a rapid and inventive deployment of new energy efficiency and renewable energy technologies.
- The [Clean Cities](#) program provides information on how to build the local alternative fuel market which, in turn, improves air quality, stimulates the local economy, and increases public awareness of alternative fuels.
- The [Database of State Incentives for Renewable Energy](#) contains financial and regulatory incentives available from each of the 50 states designed to promote the application of renewable energy technologies.

Source: <http://www.energy.gov/energyefficiency/stateactivities.htm>

While DOE's primary mission does include training, training requirements are frequently embedded within DOE programs. These requirements include the development of training programs and training devices familiar to the training and modeling and simulation community. An example of such a requirement is reflected in the DOE solicitation below.

Solicitation Number: DE-RQ65-10WA00128

The Western Area Power Administration (Western), Electric Power Training Center (EPTC), is seeking information concerning the availability of capable contractors to provide labor, equipment, and software to replace an existing Dispatch Training Simulator (DTS) at the Electric Power Training Center, Golden, Colorado with a mobilization start period anticipated of 10/01/2010 through 09/30/2011. This sources sought is only an attempt to locate experienced businesses and collect pertinent information on those businesses that are experienced in electric power operations, dispatch training simulators.

6.0 Outlook/Summary

"Nations everywhere are racing to develop new ways to produce and use energy and the nation that wins this competition will be the nation that leads the global economy." President Obama, October 2009

In summary, DOE strives to push the envelope of technology innovation in energy related disciplines. It invests heavily in research programs to overcome critical areas of technology barriers could result in paradigm-shifting developments for the energy sector. Again while DOE's primary mission does include training, training requirements are frequently embedded within DOE programs, and training needs can reasonably be expected as these new technologies are deployed across the energy landscape. Technological advances in energy will require new modes of operation, new equipment, etc.; thus, the new energy workforce will require training and training in a technologically advanced capacity.

7.0 Sources

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