



Department of Defense

American Recovery and Reinvestment Act of 2009

Near Term Energy Efficient Technologies (NTEET) Program Plan

June 2010

NEAR TERM ENERGY EFFICIENT TECHNOLOGIES PROGRAM PLAN

A. Funding Table

Appropriation	Amount (\$000s)
Research, Development, Test and Evaluation - Army	\$75,000
Research, Development, Test and Evaluation - Navy	\$75,000
Research, Development, Test and Evaluation – Air Force	\$75,000
Research, Development, Test and Evaluation - Defense-Wide	\$75,000
Total	\$300,000

Additional details on funding, allocated by project and activity for the Near Term Energy Efficient Technologies Program, are found in Attachment A.

B. Objectives

Program Purpose

The American Recovery and Reinvestment Act of 2009 (Recovery Act) provides \$300 million in funding for the Department of Defense (DoD) Research, Development, Test, and Evaluation (RDT&E) projects within the Near Term Energy Efficient Technologies (NTEET) Program. This program investigates technologies that can satisfy capability gaps, present opportunities for military applications, or spur initiatives within industry. Efforts focus on engine efficiencies; cost-effective solar energy photovoltaics; fuel cells; alternative fuel testing; mobile waste-to-energy; and tactical micro-grids.

Public Benefits

RDT&E provides significant benefits to the general public with emphasis on transitioning military relevant technology from the laboratory to fielded capability. Transition shall occur either directly, through development of capability in industry, or through formal acquisition programs of record.

While looking at the bigger picture, we know DoD energy issues cannot be viewed in isolation - they are a subset of the larger national challenge. Reducing dependence on imported energy is a critical national issue that must be addressed. Energy is essential to military operations. Important missions and programs are at risk today from interruption of energy supplies and increasing cost. Therefore, with these near term efficient energy technologies, the DoD will seek to bridge some of the capability gaps

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and look to proactively respond to the energy challenge. In addition to facility improvements described separately, the Recovery Act funds \$300 million for 55 energy research programs by the Military Services to reduce the Department's energy demand via increasing fuel efficiency or advancing new technologies related to alternative energy sources. This research could directly benefit the Department and the nation by reducing the cost (potential range from 5-25%) and security burden (uninterrupted operations, while putting fewer service members in harm's way) of fueling selected operational forces.

C. Activities:

The NTEET Program will conduct 55 research and development projects. Project titles, locations, and estimated costs were provided in the initial Reports to Congress submitted on March 20, 2009 and April 28, 2009. These projects cover these five topics:

- Fuel Optimization for Mobility Platforms:
 - Testing various materials, like ceramics, in engine and equipment design to lower thermal loads and decrease the need for cooling of component parts that require additional energy to perform the cooling tasks
 - Demonstrating the fuel efficiency of Low Observable subsonic propulsion systems in aircraft and small-scale propulsion systems for Unmanned Aerial Vehicles (UAVs)
 - Developing engine improvements to improve fuel efficiency
 - Developing and testing airframe modifications to demonstrate drag reduction and better aerodynamics
- Facility Energy Initiatives:
 - Developing or reviewing off-the-shelf enterprise energy auditing programs and software that can couple energy security with energy efficiency
 - Reducing power consumption in tactical heating and air conditioning systems and environmental control units
 - Designing whole-building energy modeling and monitoring systems
- Operational Efficiencies/Commercial Practices:
 - Developing or reviewing off-the-shelf enterprise energy auditing and water management programs and software that can couple energy security with energy efficiency
 - Modeling whole-building energy use, monitoring systems capable of identifying, classifying, and quantifying energy and water consumption deviations from design intent or optimal set-point; recommend, prioritize, and implement corrective actions.
- Domestic Energy Supply/Distribution:

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- Researching and demonstrating waste-to-energy and waste-to-fuel technology; landfill gas use; biomass and algae fuel oil production; multi-junction solar photovoltaics for cells and sensors; wave and thermal energy from oceans; wind power and analyzing radar cross sections and noise control on wind turbines.
- Tactical power Systems /Generators:
 - Developing and demonstrating methanol-based portable fuel cells with improved energy densities
 - Developing Long-duration multi-junction photovoltaics for UAVs
 - Developing improved fuel cells
 - Designing and testing scalable micro-grid electrical distribution systems for fixed and tactical installation use

D. Characteristics

Type of Award

Unlike contracts for other services and supplies, most Research and Development (R&D) contracts are directed toward objectives for which the work or method cannot be precisely described in advance. It is difficult to judge the probabilities of success or required effort for technical approaches. Although the Government ordinarily prefers fixed-price arrangements in contracting, this preference applies in R&D contracting only to the extent that goals, objectives, specifications, and cost estimates are sufficient to permit this preference.

Given this disposition, the Department forecasts a smaller percentage of Fixed Price contracts for anticipated Recovery Act NTEET Program projects. DoD total awards will total \$0.3B.

At this time, 54 out of the 55 projects will utilize some type of contract, and 1 project will utilize a competitive grant. The contract types include: Cost-Plus-Fixed-Fee; Task Order; Small-Business Innovative Research (SBIR) Phase II; Small Business Technology Transfer (STTR); Sole Source; and Indefinite Delivery/Indefinite Quantity (IDIQ). There is also one effort utilizing an Alaskan Native Corporation Contract. At least 56% of planned contract dollars for the Recovery Act are anticipated to be awarded on a fixed-price basis; 1.8% for competitive grants; 8.5% for Task Order; 9.1% to Small Business Innovative Research/Small Business Technology Transfer; 16.6% for Cost-Plus-Fixed-Fee; 12% for Sole Source efforts; and 4.5% for Indefinite Delivery/Indefinite Quantity. This projection is based on acquisition plans that have been developed by the Military Services and the Defense Logistics Agency.

Targeted Recipients

In order to obtain a broad base of the best contractor sources from the scientific and industrial community, the Department seeks sources competent to perform R&D work.

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The targeted type of recipients for the program includes federal agencies, small businesses, and profit organizations. The Department is committed to maximizing small business opportunities within DoD acquisitions and recognizes that small businesses play a critical role in stimulating economic growth and creating jobs, which is one of the primary goals of the Recovery Act. The Department adheres to the Federal Acquisition Regulations Part 19, Small Business Programs, which allows agencies to make awards both competitively and noncompetitively to various types of small businesses. The use of these socio-economic programs enables contracting activities to maximize small business participation in Federal contracting. The Department will make every effort to provide maximum practicable opportunities for small businesses to compete for agency contracts and to participate as subcontractors in contracts that are awarded using Recovery Act funds. DoD contracting activities will work with their small business offices and coordinate with the Department's Office of Small Business Programs to maximize small business opportunities that use Recovery Act funds.

Similarly, the targeted beneficiaries include local governments (city/county), minority groups, small businesses, engineer/architect, builder/contractor/developer, and for-profit organizations (other than small businesses).

Methodology for Award Selection

Competition is the preferred methodology for award selection. The DoD continues to promote full and open competition in its acquisition processes and to provide for full and open competition after exclusion of any mandatorily-prohibited sources (such as excluding large businesses from a small business competition). This facilitates awarding the best value to benefit the warfighters and the taxpayers. Given the importance of the Recovery Act dollars in stimulating the economy, the Department has taken extra steps, including frequent communications with Senior Procurement Executives (SPEs), regarding the expectations for contract implementation. SPEs in the Department are communicating more frequently with their respective acquisition workforce, including flash notices and reminders of Recovery Act regulations, specifically the importance of competition.

Consistent with law and the Office of Management and Budget (OMB) guidance, exclusions to full and open competition are allowable. However, competition will be used to the maximum extent practical for Recovery Act funds. When other than full and open competition is utilized the appropriate documentation and reporting will occur to meet the requirements of the Federal Acquisition Regulation and the Recovery Act.

E. Delivery Schedule:

While each project within the NTEET Program is unique in its schedule and size, all of the schedules can be broadly divided into four delivery phases. Completion of individual phases will represent the project milestones from a portfolio delivery perspective.

Planning Phase: The portfolio planning phase commenced when requirements were identified by the Services. Within the construct of the Energy Security Task Force (ESTF), and more specifically the Energy Security Strategic Plan, each Service and Defense-Wide agency submitted multiple energy-related RDT&E candidate projects,

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studies and proposals for review in five broad areas listed above. Candidate projects were submitted to the ESTF, which reviewed and de-conflicted funding to be spent on the same kinds of research. Programs were also assigned a priority based upon near-term demonstration ability.

Procurement Phase: The procurement phase is currently ongoing as Military services are working to obligate Recovery Act funds in a prompt manner. For projects that may be using existing competitively awarded contracts, this phase includes negotiating a nature/price for the work, finalizing the statement of work, and then developing deliverables. For projects completed by new competitive bid, the procurement phase involves advertising for a statement of work, identification of the best offer and award of the work. The bottom line is that DoD will seek to obtain the best value for the funds expended. As of March 31, 2010, 87% of the funding has been obligated. All remaining contracts will be awarded by end of Sep 2010.

Project Execution Phase: Once the procurement phase is complete, the selected team will start work on the project. The execution phase will vary on a project-by-project basis due to the scope and complexity of each individual project. Work typically begins thirty to sixty days after contract award and continues until funds are expended. Execution as of March 31, 2010 is approximately 20% of the \$0.3B.

Project Completion Phase: DoD officials will review and approve each project upon completion of the various research and demonstration phases. The project completion phase will vary on a project-by-project basis due to the scope and complexity of each individual project. RDT&E projects began in May 2009, with estimated completion twenty-four months after project award.

F. Environmental Review

The Recovery Act funds 55 Near Term Energy Efficiency Research, Development, Testing and Evaluation projects valued at \$300 million. In each case, the Department follows the rigorous applicable requirements outlined in the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act of 1966 (NHPA), and all other statutes that involve protecting vital land resources under DoD stewardship.

While the NHPA usually does not apply to research projects within the NTEET Program, the DoD has a long and successful program to comply with NEPA. DoD's policy is in DoD Instruction 4715.9, Environmental Planning and Analysis, which can be found on the internet at <http://www.dtic.mil/whs/directives/corres/pdf/471509p.pdf>. Each of the Military Departments and Defense Agencies was required to demonstrate how they would comply with NEPA prior to selection of each military construction project using ARRA funds.

It was determined that within the NTEET Program, over ninety-five percent (95%) of the projects are expected to be classified as categorically exempt from NEPA. No other environmental compliance issues are expected.

The remaining projects have either had an Environmental Assessment conducted or will be conducted in the near future.

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G. Performance Measures

In meeting the requirements of the Recovery Act, the Department established performance measures for the NTEET Program that were consistent with the intent and goals of the Recovery Act and the OMB Program Assessment Rating Tool. These performance measures are supported by quantifiable outputs and have designated measurement frequencies.

The metric in the original plan pertaining to the percentage of NTEET funding executed at universities was eliminated from this plan, as it did not reflect the broader goals of this program. As of March 31, 2010, 1.7% of the total program funding was executed at universities.

The metric pertaining to the jobs created or retained was eliminated from this plan as this data is collected through <http://www.federalreporting.gov>. DoD totals for jobs created/retained can be viewed at:

<http://www.recovery.gov/Pages/TextView.aspx?data=jobSummaryAgency&topnumber=200&qtr=2010Q1>.

The following performance goals will be used to measure progress in meeting the requirements of the Recovery Act:

- Percent of Total Dollar Value of Recovery Act Projects Awarded

Metric	Target	Results
This indicator will measure the total dollar value of Recovery Act projects awarded divided by total dollar value of Recovery Act projects. This measurement will be sampled monthly and tracks the status of total funding for awards made with the Recovery Act.	Percent of projects awarded: Dec 2009: 50% Jan 2010: 55% Feb 2010: 60% Mar 2010: 65% Apr 2010: 70% May 2010: 75% Jun 2010: 80% Jul 2010: 85% Aug 2010: 90% Sep 2010: 100%	Percent of projects awarded: Dec 2009: 62.4%; Jan 2010: 68.5% Feb 2010: 75.3% Mar 2010: 80.3%

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- Number of New Products entering Commercial Market

Metric	Target	Results
This output measurement will measure the numbers of products that will provide usefulness/employment of new products within DoD and/or industry. This output measurement will be sampled yearly and tracks the status of technologies that may be transitioned further within the Government and/or industry.	FY 2011: 2 new products entering Commercial Market. FY 2012: 2 new products entering Commercial Market FY 2013: 1 new product entering Commercial Market	No data is available at this time to determine the outcome for FY 2010. Projects have not matured enough to take sample, and the majority of testing has not occurred to make a determination if the efforts are viable for transition.

H. Monitoring and Evaluation

Review of the progress and performance of major programs, including risk-mitigation and corrective actions, is guided by the Risk Management Plan developed by the Department in accordance with the OMB Circular A-123, Management’s Responsibility for Internal Control. The Department’s current Management’s Responsibility for Internal Control process has a Senior Assessment Team that is lead by Principal Deputy Under Secretary (Comptroller), who is also the Responsible Officer for the Department’s Recovery Act funding. As part of the Risk Management Plan, each program has been evaluated on a quarterly basis, with a Risk Profile being submitted to the Comptroller (who also serves as the Department’s Chief Financial Officer). The Plan identifies areas of high risk and high and low performance through a Risk Assessment and Gap Analysis. The Plan evaluates the potential for financial, reporting and procurement risks; and is used to analyze Information Technology (IT) systems; and review results from any audits and investigations.

An initial evaluation provided an overview of management capabilities for senior leadership in assessing their people, processes and technology. The risk assessment reviewed internal controls on human capital, performance, and measurement tools. Upon completion of the risk assessments, gap analyses were conducted.

The completion of Risk Profiles, the second step in the Plan, allows for the periodic review of each program’s progress in monitoring and evaluating risk management. These iterative evaluations were conducted on a quarterly basis and submitted to the Comptroller. This process also identified significant uncorrected weaknesses or newly identified gaps for each program and when applicable, required more detailed information related to the questions identified in the Risk Assessment and Gap Analysis. Managers for any program area that required mitigation were required to submit a Risk Management Strategy that included a description of the issue, the pace of corrective action, the methodology to ensure the effectiveness of the corrective action(s), performance measures that were met, and major upcoming milestones. The next submission is due at the end of June, 2010.

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To date, the Department has identified two gaps that could stand in the way of assuring that funds are used only for authorized purposes and that instances of fraud, waste, error, and abuse are mitigated. Those gaps continue to affect funding accounts (known as Treasury Account Fund Symbol (TAFS)). Both were reported in Risk Management Strategies in the 2nd Quarter, FY 2010, by the Business Integration Office of the Office of the Under Secretary of Defense, Comptroller and Chief Financial Officer.

Gap #G-OSDC-02 identified transactions in all the NTEET Program TAFS being submitted which contain coding that does not match the current master project listing. Project listings are run each day. Codes that are unassigned are researched to see if they are new, erroneous or miss assigned. The system queries to research unassigned transactions and to correct problems, if feasible. When the data is not valid enough to process, the appropriation holder is notified to enter corrective transactions in the field level system, which feeds the reporting system. The targeted correction date is 4th Quarter, FY 2010.

Gap #S-OSDC-01 was found to occur in the Army (2041) of the NTEET Program Plan. Transactions reported by the United States Army Corps of Engineers (USACE) Financial Management System (CEFMS) were not being passed from the Defense Corporate Database to the Business Enterprise Information Services for inclusion on all data reports, including the weekly Financial Accounting Reports. Reports are being updated manually using a weekly report from USACE for all their executable appropriations. The resolution is projected for the 3rd Quarter, FY 2010.

I. Transparency:

The Recovery.gov website was established to provide the public with unprecedented visibility. The DoD will be providing financial and contractual information to the Recovery.gov site using existing information systems.

Due to the magnitude of normal budgeting for national defense, the Office of the Under Secretary of Defense (Comptroller) has established a centralized Business Enterprise Integration System (BEIS) for financial review and internal control. The Department will use BEIS to handle financial tracking, particularly obligation and execution data, at a project-level. This ensures compliance with general financial management policies pertaining to the Recovery Act.

The Department will capture contract award information using the Federal Procurement Data System (FPDS), identifying Recovery Act procurement actions in accordance with the guidance provided by the OMB.

J. Accountability:

Accountability for the execution of Recovery Act programs is enforced in all DoD components receiving Recovery Act funds. The DoD will use the existing civilian and military service performance regulations and policies (such as Career and Non-Career Senior Executive Service (SES), General Schedule (GS)) to assess, review, reward and penalize results in carrying out the Recovery Act. Recovery Act activities are

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considered a part of a manager, employee, and Service member's duties; and performance will be reviewed within existing assessment cycles.

Performance success and failures will also be rewarded and enforced respectively for the execution of Recovery Act funds through the Department's Risk Management Plan. This management plan includes setting priorities and performance measures and encourages the workforce to improve the overall performance of the Department for the Recovery Act and beyond. As part of the Risk Management Plan, each program is directed to identify the roles and responsibilities of management and upper level management and the processes that management follows to ensure that program and projects are reviewed on a frequent basis.

Additionally, at the project level, various other techniques will be used. One example is as follows: the Air Force, within AFRL management, will regularly review projects as part of the standard Program Management Review process which includes an in-depth review of financial and technical progress. In addition, major technical milestones will be presented to the Technical Review Boards of both the Propulsion Directorate and Materials & Manufacturing Directorate for review and comment.

K. Barriers to Effective Implementation:

The Department's mission to provide technologies and services necessary to support our military forces in a cost effective, safe, sustainable, and environmentally sound manner is what we attempt to accomplish on a daily basis. It is a complex and costly mission.

The DoD has worked through any barriers that may have occurred during the implementation of the Recovery Act. The Department will also be continuously reviewing execution of its projects to be better prepared to react should resource competition affect implementation of projects funded through the Recovery Act.

L. Federal Infrastructure Investments:

The DoD has issued policy guidance for implementing energy and water efficiency and other sustainability requirements included in the Energy Policy Act of 2005, Executive Orders 13423 and 13514, and Energy Independence and Security Act of 2007. DoD Components have developed subordinate policies for implementing the legislative and Executive Order requirements as well. For example, each of the three (3) Military Departments (i.e. Navy/Marine Corps, Air Force, Army) has a policy that includes using Leadership Energy and Environmental Design (LEED) Silver Certification as a basis for new construction sustainability; a metering implementation plan; an energy professional training program; and awareness and award programs. The Department has developed and implemented Unified Facilities Criteria to ensure new construction and major renovation projects comply with applicable requirements and goals. The DoD Energy Program also includes initiatives for audit programs

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Category	Project Title	(\$ M)	Total Obligations	Total Expenditures	Description
PROPULSION / ELECTRIC DRIVE / ENGINE EFFICIENCY					
Fuel Optimization for Mobility Platforms	Advanced Power Electronics Ground Systems Testbed Equipment	14.580	14.579	0.000	Enhanced laboratory facilities and instrumentation to perform integrated power and thermal management across a spectrum of power regimes (micro power to 100s of kW). Leverages a baseline of advanced high power, high temperature electronics efforts for high density conversion on future Army platforms. State-of-the-art research and development (R&D) for enhanced modeling, simulation, and testing of all military ground vehicles from sub-system components to systems of systems, with focus on hybrid and electric power subsystems.
	High Temperature Silicon Carbide (SiC) Power Semiconductors (Applied Research)	12.150	12.150	0.000	This will enable more electric Army vehicles, heavy commercial vehicles, and mobile, exportable power systems. SiC is currently produced in limited quantity because of material impurities. Significant material advances have been achieved by several companies in the U.S.
	High Temperature Silicon Carbide (SiC) Power Semiconductors (Advanced Development)	12.150	12.140	0.000	This will enable more electric Army vehicles, heavy commercial vehicles, and mobile, exportable power systems. SiC is currently produced in limited quantity because of material impurities. Significant material advances have been achieved by several companies in the U.S.
FACILITY ENERGY					
Facility Energy Initiatives	Ultra Low Energy Community Systems	2.916	2.916	0.000	Develop concept, methodology, technology integrations, and master planning for a specific Army campus to achieve ultra low energy community systems. Most promising concepts will be demonstrated at candidate installations such as Ft Irwin and Ft Carson. The outcome of the work will be readily implementable for all Army ultra low energy applications from installations to deployed bases.
	Energy Security Audit & Islanding Methodology	6.804	6.804	0.000	Develop energy security self audit model to include the development of metrics to describe the energy security state of critical missions, and utilize this with existing Anti Terrorism/Force Protection (AT/FP) processes at the 16 force projection installations. Identify actionable projects for each installation to achieve energy security.
RENEWABLE DEVELOPMENT AND TESTING					
Domestic Energy Supply/ Distribution	Lightweight, Flexible, Cost Effective Solar Energy Photovoltaics	14.580	14.577	0.759	Develop flexible photovoltaic devices and cells for sensor, Soldier, and autonomous systems. Investigate novel approaches, highly integrated advanced materials, electronic devices and structures to enhance weight, space reduction and self powering for emerging flexible and specialized electronics. Program will leverage and accelerate development and demonstration of integrated flexible solar cells, and high-efficiency solar cell film technology for renewable energy sources for the Army which will also have commercial applicability.

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Tactical Power Systems/Generators	SMALL SCALE CO-GENERATION				
	Develop smaller, lighter cogeneration and absorption environmental control systems	6.318	6.315	0.272	The ammonia-water and lithium-bromide absorption cycles hold significant promise for direct waste-heat to cooling cogeneration applications. Both technologies are expensive and require minimization of components to be viable for mobile applications.
	MICRO-GRIDS				
	Micro-Grid Field Scaled Demonstration	3.402	0.000	0.000	We propose a demonstration of a full power architecture suite. Successful completion of this demonstration is a major step toward enabling Army to implement microgrid power architecture for deployed bases too. Will develop software and hardware required for a mini or micro-grid arrangement to support an installation and the NetZero initiative. It needs the capability to handle input energy supplies from Solar, Wind, Biomass, and other.
SBIR/STTR	SBIR/STTR SMALL BUSINESS INNOVATIVE RESEARCH				
	SBIR Innovative Research	1.877	0.570	0.267	The overall objective of this effort is to identify 3 – 4 projects coming out of the Army SBIR program that address energy issues, meet Army requirements, and broaden the small business base. These may be new efforts (Phase I or Phase II) or additional work put on existing efforts to speed transition and/or expand usability of small business products (Enhancements or Commercialization Pilot Program efforts).
	STTR Innovative Research	0.223	0.000	0.000	Augment the Army STTR investment and level of effort in soldier and soldier equipment electric power sources of higher efficiency and higher reliability.

ARMY TOTAL: \$75.000 M

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Category	Project Title	(\$ M)	Total Obligations	Total Expenditures	Description
Fuel Optimization for Mobility Platforms	PROPULSION / ELECTRIC DRIVE / ENGINE EFFICIENCY				
	On-Board Vehicle Power	3.888	0.734	0.000	The overall effort of this program is to improve tactical wheeled vehicle fuel economy while providing exportable electric power. End-state: vehicle that can provide electric power for high mobility missions and applications that require onboard electric power.
	AIRCRAFT FUEL EFFICIENCY				
	F18 Engine Efficiency Improvements	15.552	15.552	9.149	The overall effort of this program is to develop and test technologies to improve fuel efficiency of F-414 engine used in the F-18 E/F/G. Addresses Naval Aviations most significant fuel burner. End-state is a technology demonstration of F-414 SFC technologies in FY10.
	Aircraft Energy Conservation RDTE Program	1.458	0.257	0.118	The overall effort of this program is to pursue T-56 engine energy efficiency study, Performance Based Navigation (PBN) study, and Aircraft Performance module upgrades. In addition, it will seek to institute an aircraft energy conservation program; upgrade air flight performance modules and performance navigation. T56 engines (C130, C2 & E2) and mission planning will also be involved. The T-56 and PBN efforts have shown potential for significant benefits in non-Navy application studies.
	SHIP FUEL EFFICIENCY				
	Hybrid Electric Drive System Development for Surface Combatants	26.244	24.668	10.895	Develop & test (land-based and at-sea) electrical rotating machine, converter power electronics, supervisory control system, and ship integration for hybrid electric drive system. Reduce DDG-51 fuel consumption and increase mission effectiveness through longer time on station. Supports cruising speeds (< 12 kts) without the use of main propulsion. Provides the foundation towards propulsion derived ship service and ultimately energy storage.
Advanced High Efficiency HVAC System	2.624	2.624	0.379	The objective of this project is to improve shipboard cooling efficiency (power, space, weight and cost) required to support near-term needs and future high energy radars and directed energy weapons. Project scope of work is to develop and test a variable speed, two-stage, oil-free refrigerant compressor and associated electronics as an Advanced Demonstration Model (ADM) for common use on CVN, CG(X), DDG83AF, DDG1000, FSC, LHA, LDP17, and submarine platforms. Cooling load is mission critical and a significant power consumer on ships. This project supports increased operational efficiency and reduced overall fuel consumption. End-state will be prototype hardware and electronics ready for test by 2010.	

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	Navy Shipboard Energy Program	1.652	1.652	1.404	The overall effort of this program is to address shipboard energy inefficiencies which present significant operational liabilities, constraint on operations, and force protection challenges. This project sponsors test and evaluation of projects that will reduce surface fleet fossil fuel demand; to include initiatives such as solid state lighting to reduce shipboard electrical loads and improve steering systems on amphibious ships. The funding will accelerate program steered towards Ship Energy Conservation Program (e.g., LED lighting, steering on amphibians) and the immediate impact (existing program).
	OPERATIONAL CHANGES				
Facility Energy Initiatives	Improved Environmental Control Equipment	3.402	3.402	0.364	The overall effort of this program is to improve system efficiency and meet EPA HCFC requirements for the family of USMC Environmental Control Units (ECUs). End State: qualification of USMC ECUs to HCFC compliance, lower input power requirements for 5 models of USMC ECUs.
	RENEWABLE DEVELOPMENT AND TESTING				
	Ocean and Wave Energy Utilization - OTEC	8.554	8.553	5.466	The overall effort of this program is to reduce developmental risk of utilizing thermal energy from oceans to provide renewable energy for shore installations. Final deliverable is a system design to support a full scale project demonstration suitable for Naval Support Facility Diego Garcia (NSFDG) and other Navy locations. Final deliverables will support future system installations and follow-on long term utility Power Purchase Agreements at Navy OTEC locations, including NSFDG, Hawaii and Guam.
	ALTERNATIVE FUELS				
Domestic Energy Supply/ Distribution	Alternative Test Fuel and Certification Protocol Acceleration	5.152	4.897	2.468	The objective of this program is to accelerate the approval of use of fuels derived from alternative feedstocks for use in Naval tactical ships, aircraft, and expeditionary vehicles. Project scope is to: accelerate the development of the requirements necessary to ensure safe alternative fuel utilization in all Navy tactical systems; and to validate the aircraft requirements through the demonstration of a biofuel in the F-18 Super Hornet. This program will accelerate testing of alternative fuels for use in Naval tactical vehicles - ships, aircraft, and USMC combat vehicles to finish by 2010.
	ALTERNATIVE ENERGY SOURCES				
	Plasma Fusion (Polywell)	1.944	1.944	1.753	The overall effort of this program is to lower carbon footprint and reduce reliance on petroleum through the Polywell fusion concept which has the potential to provide a compact, practical, and radiation free fusion power generator for 20-200MW power range for installations and ship applications. End-state: Demonstrated technologies to TRL 2-3. This additional funding will allow continued experimentation to understand the Polywell plasma formation and properties to allow systematic scaling to larger power units.
Tactical	SMALL SCALE CO-GENERATION				

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<p>Power Systems/Generators</p>	<p>Integrated Generator / Environmental Control</p>	<p>2.430</p>	<p>2.185</p>	<p>0.288</p>	<p>The overall effort of this program is to improve system efficiency for power generation and HVAC in tactical environments. End-state: USMC tested and qualified system for fielding to operational forces by 2011. System integration will be performed in CY09 with improved system components for improved efficiency. This effort will include a delivery of 5 prototype units, with System validation testing & operational user testing performed in FY10, and Full-rate production decision in FY11.</p>
<p align="center">SBIR/STTR SMALL BUSINESS INNOVATIVE RESEARCH</p>					
<p>SBIR/STTR</p>	<p>SBIR Innovative Research</p>	<p>1.877</p>	<p>1.771</p>	<p>0.415</p>	<p>The overall objective of this effort is to identify 3 – 4 projects coming out of the Navy SBIR program that address energy issues, meet Navy requirements, and broaden the small business base. These may be new efforts (Phase I or Phase II) or additional work put on existing efforts to speed transition and/or expand usability of small business products (Enhancements or Commercialization Pilot Program efforts). Augment the Navy STTR investment and level of effort in soldier and soldier equipment electric power sources of higher efficiency and higher reliability.</p>
	<p>STTR Innovative Research</p>	<p>0.223</p>	<p>0.223</p>	<p>0.000</p>	<p>Augment the Navy STTR investment and level of effort in soldier and soldier equipment electric power sources of higher efficiency and higher reliability.</p>

NAVY TOTAL: \$75.000 M

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Fuel Optimization for Mobility Platforms	PROPULSION / ELECTRIC DRIVE / ENGINE EFFICIENCY				
	Highly Efficient Embedded Turbine Engine (HEETE)	4.860	4.856	0.995	This technology demonstration program supports subsonic engines for future ISR, UAVs, tankers, and mobility extreme endurance and range requirements. The HEETE program will demonstrate advanced turbine engine technologies that enable a 35% reduction in average fuel consumption when compared to a year 2000 state-of-the-art engine. The HEETE program will also demonstrate technologies enabling reduced emissions and noise relative to previous military engines while achieving reduced fuel consumption. Conduct demonstrations of fuel efficient, LO compatible subsonic propulsion system core engines that support future ISR, UAVs, tankers and mobility extreme endurance and range requirements.
	Adaptive Versatile Engine Technology (ADVENT)	5.832	5.826	5.521	The ADVENT program uses adaptive engine features to reconfigure the basic engine to generate high thrust and to optimize fuel efficiency when needed. ADVENT will leverage current and ongoing propulsion technology investments to address the need for speed, range, and persistence in a cost effective, LO compatible weapon system. The principle focus of turbine engine research has been on increasing engine thrust-to-weight ratio through increased engine hot section temperature capability. Commercial engines have focused on reducing energy cost through high pressure ratio compressors and high-efficiency components. ADVENT will leverage recent technology investments in both the military and civilian arenas and will conduct demonstrations of multi-design point adaptive turbine engines that automatically adjust fan and core airflow and pressures for optimized performance and fuel efficiency at all flight conditions.
	Efficient Small-Scale Propulsion and Power (ESSP)	4.860	4.858	3.529	The contractor shall conduct design activities for innovative technologies of their Versatile Affordable Advanced Turbine Engine (VAATE) program plan. These technologies will be demonstrated in testing planned to be conducted under the VAATE II initiative plan. This program will develop fuel efficient, lightweight, and affordable small scale propulsion that supports future ISR, UAV, and missile extreme endurance and range requirements. The ongoing objectives will be increased loiter time, short take-off and landing, long range, and enhanced thermal management and survivability. Conduct demonstrations of small scale propulsion systems to reduce fuel consumption for Unmanned Air Vehicles (UAV) and power generators; using unconventional configuration that enables high pressure ratios, high bypass ratios, mission adaptive technology features, and distributed vehicle power integration improvements.

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	Materials for Green Propulsion	5.832	5.832	0.665	Define risk reduction projects for advanced materials and manufacturing technologies that will deliver improvement in fuel burn and a reduction in greenhouse gas emissions for both fielded and next generation commercial and military turbine engines. Anticipated that FFP IDIQ contracts will be let to each of the four major DOD engine manufacturer – General Electric, Pratt & Whitney, Rolls Royce and Honeywell utilizing the VAATE BAA. The anticipated amount of each award is \$1.4582M.
	AIRCRAFT FUEL EFFICIENCY				
	Aft-Body Drag Reduction	6.804	5.124	1.450	The overall objective of this Air Force Research Laboratory (AFRL) Air Vehicles Directorate (RB) program is to improve aircraft energy efficiency. In the near term, an opportunity exists to reduce the drag due to aft body flow separation on mobility aircraft using vortex control (VC) finlet technology. This technology has the greatest potential for drag reduction when implemented on the C-130 aircraft due to this specific aircraft's aft body design, which causes a large area of flow separation over the aft body region, resulting in high drag due to separation. For the far term, much more efficient aerodynamic configuration designs must be developed in order to achieve revolutionary levels of energy efficiency for mobility aircraft. This program will investigate both near and far term technologies for the improvement of aircraft energy efficiency.
Operational Efficiencies/ Commercial Practices	MODELING AND SIMULATION				
	Global Solar Prediction Model	0.972	0.966	0.026	Develop a comprehensive solar power design and simulation software tool package that will enable the Air Force and DOD to design the optimum renewable energy strategies for deployed bases worldwide. The tool will include design optimization capabilities for fixed and deployable structures, which will enable the use of solar generated power in existing or future airbases. Components of the package will be capable of integration with other software environments that support the Air Force (e.g. mission planning). The package will build on and extend the solar power object-oriented framework developed for the solar orientation and prediction model. The extended-package framework will enable others in the commercial solar energy field to easily build applications of interest to their studies and goals.
Domestic	RENEWABLE DEVELOPMENT AND TESTING				

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Energy Supply/ Distribution	Ultra-Hi Efficiency Multi-junction Solar Cells	17.496	17.496	4.998	Primary objectives are to increase efficiency of solar cell technologies applicable for space use, and mature technologies to enable the use of these solar cells on both commercial and military satellites. This program will evaluate advanced multijunction solar cells based on 4 and 5 junction inverted metamorphic structures with promise of reaching greater efficiency for space applications, and greater concentration for terrestrial applications.
	Solar Cell Transparent Conductor	0.972	0.972	0.121	Improving the performance of next-generation solar cells (currently being developed in AFRL/RXBN) is dependent on the development of new optically transparent and electrically conducting electrode materials. This effort focuses on developing such materials and will result in the development of thin film electrodes. The payoff will be the demonstration of lightweight, low-cost, and flexible solar cells. Develop and test alternatives to Indium Tin Oxide for the transparent electrodes in solar cells. Alternatives include, but are not limited to, non indium containing conductive oxides, conductive polymer, and carbon nanotube based electrodes.
	Self Sustaining Energy Technology for Basic Expeditionary Airfield Resources (BEAR)	4.860	0.925	0.068	The primary mission of the BEAR is to provide expeditionary basing assets for the use at austere airfields, thereby providing the AEF with global basing capability. BEAR is included in the Force Modules that open, establish, and operate forward operating bases. BEAR supports the full range of DOD missions within our National Military Strategy. The overall objective of this project is to work with the BEAR community to develop and demonstrate a prototype(s) for support, to introduce sustainable power generation systems and a tentatively power management concept smart grid, which will coordinate the production and distribution of power from large numbers of distributed renewable power sources.
	ALTERNATIVE FUELS				
	Nanoscale Additives for Novel Fuels	2.916	2.916	0.464	This Program seeks to create the underpinning science necessary to develop nanoscale additives for novel fuels. The ability to dissolve or suspend nanoparticles in fuels to create new sets of desirable properties for fuels will be investigated. These and other approaches will be pursued to produce new fuels for aircraft, rockets, and satellites.

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	Greenhouse Gas Lifecycle Analysis	1.944	1.944	0.649	The overall purpose of the Alternative Fuels program is to identify and evaluate alternative aviation fuels for potential use in AF aircraft. Per Section 526 of the Energy Security and Independence Act of 2007, all alternative fuels are required to have a lower greenhouse gas footprint than current petroleum fuels. Recovery funding will be used to augment the existing Interagency Working Group program to provide the lifecycle analyses and to conduct studies of ways to reduce the carbon footprint of AF activities. Recovery funding will also be used to identify areas where alternative energy technologies may be used in concert to achieve synergies for larger systems, again on a case study basis. For example, a base might consider replacing a coal-fired steam generation heating system with a combined cycle gasification system with carbon mitigation to generate heat and power (and perhaps liquid fuels) with a much lower greenhouse gas footprint.
	Toxicology Assessment - Biomass Av Fuel	0.972	0.972	0.134	The overall purpose of the Alternative Fuels program is to identify and evaluate alternative aviation fuels for potential use in AF aircraft. All alternative fuels are required to be analyzed for human and environmental toxicity. Recovery funding will be used to augment the existing program to provide toxicology analysis on bio-based alternative fuels, including fuel exposure and combustion emissions.
	ALTERNATIVE ENERGY SOURCES				
	Anaerobic Bioreactor	5.832	0.000	0.000	Seeking to develop and demonstrate a bioreactor that can efficiently and economically utilize organic waste within a high solids inflow from municipal garbage to generate energy and reduce the volume of waste material deposited to a landfill. This project looks to utilize alternative sources of energy using available and renewable resources; and supports AFCEE objectives to reduce the volume of waste generated from an AF installation. The project supports an overall AF vision for creating an installation infrastructure that is both economical and sustainable. Specifically, the AF is interested in demonstrating how biogas from the anaerobic digestion of organic waste can be used to: 1) provide economical and sustainable power to an electricity grid to reduce installation energy costs; 2) produce a marketable by-product (e.g. compost); and 3) significantly reduce the volume of waste deposited to landfills.
Tactical Power Systems/ Generators	FUEL CELLS				
	High Efficiency Portable Fuel Cells	1.944	1.944	1.194	Develop and demonstrate methanol-based portable fuel cells with improved energy densities. Funding will be used to address materials related issues and would result in the demonstration of 20 units of a portable power fuel cell.

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	Hybrid UAV Renewable Propulsion/Power Systems	4.860	4.860	0.708	The INVENT program has identified near term electrical accumulators and battery technologies that could be applied to ISR variants with a shorter operational life - 15 to 30 days continuously aloft. This program shall identify opportunities to utilize INVENT technologies for appropriate AF ISR alternatives. It will highlight the energy storage technologies and show how the performance (payload, altitude, speed) and life of the system is changed by these alternate INVENT energy optimized architectures (four junction photovoltaic power to renew a fuel-cell based power system and high efficient electric propulsion.
	GENERATORS				
	Deployable Multi-Fuels Electric Generators	1.944	1.944	0.082	Design, develop, and demonstrate a 10kW compact and efficient fuel cell electric generator running on multi-fuels including logistic fuels using the compact reformer technology. The developed system will be 40% more efficient than current electric power generation units with a 50% reduction in the footprint. Current power generation systems are inefficient, noisy, bulky, and limited to diesel fuel. These systems are not compatible with Air Force future airbase requirements. The developed technology can be run on several fuels including bio-fuels and can be applied to a multitude of applications from battery charging to large 750kW electric generation units.
SBIR/STTR SMALL BUSINESS INNOVATIVE RESEARCH					
SBIR/STTR	SBIR/STTR Innovative Research	1.877	1.873	0.960	The overall objective of this effort is to identify 3 – 4 projects coming out of the AF SBIR program that address energy issues, meet AF requirements, and broaden the small business base. These may be new efforts (Phase I or Phase II) or additional work put on existing efforts to speed transition and/or expand usability of small business products (Enhancements or Commercialization Pilot Program efforts). Augment the AF STTR investment and level of effort in soldier and soldier equipment electric power sources of higher efficiency and higher reliability.
	STTR Innovative Research	0.223	0.225	0.000	Augment the Air Force STTR investment and level of effort in soldier and soldier equipment electric power sources of higher efficiency and higher reliability.

AIR FORCE TOTAL: \$75.000 M

NEAR TERM ENERGY-EFFICIENT TECHNOLOGIES PROGRAM PLAN – ATTACHMENT A

Category	Project Title	(\$ M)	Total Obligations	Total Expenditures	Description
Fuel Optimization for Mobility Platforms	PROPULSION / ELECTRIC DRIVE / ENGINE EFFICIENCY				
	Materials - Ceramic Matrix Composites	4.860	4.860	0.534	Ceramic matrix composites for turbine engines/lightweight composite to metal joining; CMCs will replace metal coated components resulting in a decrease in specific fuel consumption (SFC) for turbine engines. Some estimate savings for engines with CMCs components vs. metal coated components. Legacy engines will be able to integrate technology downstream in depot.
	Fuel Efficient Ground Vehicle Demonstrator (FED)	8.748	8.748	0.342	This program will design, integrate & build 1 system level demonstrator vehicle, with the system being designed to perform capabilities of a light tactical vehicle while demonstrating a reduction of overall fuel consumption by more than 30%. This program will also leverage the expertise of the Detroit area's automotive industry and demonstrate the art of the possible in fuel efficiency in a light tactical vehicle when approaching problem from the system level. Overall, the program hopes to achieve greater than 30% improvement in overall fuel consumption as compared to an Up-Armored HMMWV M1114; leverage the fuel efficiency expertise of the United States automotive industry; and evaluate modern high power-to-weight ratio (commercial) diesel engines (e.g., GM 2010 4.5L, Ford 2010 4.4L) for application to the demonstrator design.
	MODELING AND SIMULATION				
	Energy Modeling	1.600	1.549	0.516	The overall objective of this program is to institutionalize the fully burdened cost of fuel (FBCF) in analysis and decision making processes regarding investment and resource management. This topic has been continuously identified since the 2001 Defense Science Board Report. This need has been amplified with the rising cost of fuel since 2005. The Office of Secretary Defense – Acquisition, Technology, and Logistics (OSD-ATL) published a policy memorandum in April 2007 directing Services to implement the FBCF to fully value energy in the acquisition process in order to improve energy efficiency and effectiveness. The Sustain the Mission Project (SMP) - Decision Support Tool (DST) provides the Army with the capability to conduct the FBCF analysis in an automated manner for scenario-based operations that will increase the importance of energy in acquisitions and operations.
Operational Efficiencies/ Commercial Practices	OPERATIONAL CHANGES				
	Continuous Building Commissioning	6.804	6.804	0.815	Demonstrate whole-building modeling and monitoring systems capable of 1) identifying, classifying, and quantifying energy and water consumption deviations from design intent or optimal, 2) identify the causes of those deviations, and 3) recommend, prioritize, and implement corrective actions.

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	Energy Enterprise Management	1.944	1.707	0.032	<p>The goal of the program is to improve DoD facility energy management and reduce energy consumption and associated costs. The objectives of the project are to assess, evaluate and prototype an energy enterprise management application that can be used from the building level, all the way up to the OSD level, to manage and aggregate energy data and to affect technology information transfer. A capabilities needs assessment will be conducted to determine desired requirements. An evaluation of existing commercial and government systems will be made followed by the development of a prototype system.</p>
RENEWABLE DEVELOPMENT AND TESTING					
Domestic Energy Supply/ Distribution	Solid Waste Gasification	2.916	2.785	0.621	<p>Solid waste gasification technology will reduce the cost and carbon footprint of DoD facility energy. All DoD installations generate solid wastes that contain biomass from packaging and paper, construction debris, and wood removed for land clearing and maintenance of the forested areas within the installation boundary. The primary objective of this demonstration is to validate a Waste-to-Energy Conversion (WEC) system capable of converting combustible municipal solid waste (refuse-derived fuel) and biomass into electricity and heat on fixed DoD installations. An evaluation of the economics, reliability, and environmental impact will be performed. An assessment of DoD installation waste streams for waste to energy applications will also be conducted. The primary user of these technologies will be DoD fixed installations, but smaller transportable units also have the potential to be applicable for deployed operations, as well as non-DoD applications.</p>
	Anaerobic Digester Technology	1.944	1.905	0.010	<p>The primary demonstration and validation issues for this project include determining: waste types and compositions at DoD installations that can effectively be digested, and digester operating conditions for stable operation and optimal biogas production. This demonstration will focus on digestion of food (both pre- and post-consumer) waste, waste cooking oil, and grease trap waste. The demonstration will also evaluate digestion of these wastes with and without co-digestion of sewage sludge. The demonstration is proposed to be conducted at Ft. Lewis and will leverage work being funded by the Water Environment Research Foundation (WERF).</p>
	Landfill Gas Energy Capture	2.430	2.428	0.000	<p>An ongoing ESTCP project is demonstrating the ability of a unique microturbine to generate electrical power from LFGs with methane concentrations as low as 1.5% at one site. This project will expand that demonstration to additional sites and additional technologies. The objectives of the demonstrations are to establish economics, reliability, and applicability of the technology to a variety of DoD installations. With the high number of landfills on DoD installations, implementation of these technologies can yield enormous cost savings and energy reductions.</p>

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Wind Lift Power Generator	0.972	0.968	0.521	<p>The overall objective of this demonstration R&D project is to provide a renewable power capability to remote villages in Afghanistan. For military forces confronting an insurgency, it is a matter of military necessity to ensure that civic action projects are undertaken to cultivate popular support and increase force protection – also known as “winning hearts and minds.” The WindLift Kite Engine can provide renewable power at an affordable price to communities where access to power does not currently exist or where there is unreliable access to grid-based power or fuel. WindLift produces power using a tethered airfoil and a proprietary base station to harness the force of the wind and convert that force into usable power.</p>
Mobile Waste to Energy	7.311	0.000	0.000	<p>The purpose of the Biomass Waste to Energy effort is to evaluate a new technology using bacteria to convert biomass waste to fuel and upscale it from laboratory applications into a prototype mobile unit. The biomass is any formerly living material that would be sent to a landfill, recycled, or left to decay (yard clippings, wood chips, cardboard, paper, etc). DESC will partner with the Army in a year long demonstration project to evaluate the mobile unit’s capabilities in field operations. The demonstrations sites for these units will be at six Army locations (Ft. Benning GA, Ft. Stewart GA, Ft. Bragg NC, Ft. A.P. Hill VA, Ft. Drum NY and Ft. Lewis WA) and one DLA site (DFSP San Pedro). These locations were chosen to test the unit in various climatic conditions and environments. The Army will provide the site to house the unit and DESC will reimburse the Army for variable costs incurred (e.g. electricity, water and unique installation expenses).</p>
HPCM Maui Energy Improvement Initiative	3.888	3.880	0.170	<p>This effort will make solar power more efficient, affordable, and applicable to military installations. This project provides the key demonstration steps to bring improvement to the Maui High Performance Computing Center (MHPCC) - a DoD Supercomputing Resource Center as a showcase for an energy independent future. The overall objective of this effort is to provide a solar power demonstration, providing a significant power generation capability, and showing the practical economic and technical feasibility of new high efficiency solar cell arrays. Contributing objectives include: (1) showing the feasibility of integration and assembly process for solar cell condenser modules, (2) demonstrating an expedited manufacturing capability allowing the deployment of a prototype installation, (3) deploying an installation suitable for a technology demonstration and testing, and (4) collecting appropriate technical operational data on the installed system, including tracking reliability and expected versus measured efficiency.</p>

ALTERNATIVE FUELS

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	Algal Derived Biofuel Program	5.851	4.093	0.076	The overall objective of this program is to develop and demonstrate pre-commercial production of renewable biofuel on a larger scale. With the aid of this funding, the goal is to increase the production capacity of algal-derived crude oil from approximately 2,000 gallons per year to 30,000 gallons per year to undergo fuel testing and certification for military tactical programs. The desire is to produce a variety of diesel and jet fuels meeting required specifications from that oil. In order to accomplish this objective, the lease for the production facility must be extended, additional fermentation tanks for oil production must be installed, and an agreement with a refiner must be established to meet the volume and specification requirements for testing.
	ALTERNATIVE ENERGY SOURCES				
	Plasma Fusion (Polywell)	1.944	0.000	0.000	The overall effort of this program is to lower carbon footprint and reduce reliance on petroleum through the Polywell fusion concept which has the potential to provide a compact, practical, and radiation free fusion power generator for 20-200MW power range for installations and ship applications. End-state: Demonstrated technologies to TRL 2-3. This additional funding will allow continued experimentation to understand the Polywell plasma formation and properties to allow systematic scaling to larger power units.
	FUEL CELLS				
	Fuel Cells	18.468	17.163	0.707	The goal of this program is to combine the commercial and military sector efforts, along with leveraging a DoE investment, in the development of portable fuel cells (auxiliary power unit - 25-50 250W - 2KW units). This program will result in the completion of the required engineering efforts to bring to the commercial and military markets a small, hand held fuel cell that can be carried on a backpack and a larger one that can be used as a small generator. One of the criteria of the design effort is to provide a product with dual use capabilities so that the commercial and military production is integrated into a single production facility. The effort will also take actions to establish and ongoing a demand for these products, and a domestic production capability to meet these demands. In conjunction with establish this capability; a portion of the funding will be used to install automated production equipment so that the product will be the highest quality at a low unit price.
Tactical Power Systems/ Generators	MICRO-GRIDS				
	Tactical, Deployable Micro-Grid	3.260	1.302	0.000	This project will continue development of multiple control architectures for managing microgrids, demonstrate full power architecture suite at a sub-campus of a DoD installation (Microgrid A) and demonstrate an operational system at a training base located at the National Training Center (NTC) in Ft Irwin California (Microgrid B). The objective of the projects is to evaluate reduction in energy consumption, applicability to DoD installations, and cost. The demonstrations can serve as a future test bed for microgrid control strategies. Plan is to put this on the ground at NTC less than 5 months after funding and to further develop multiple control architectures for managing microgrids in coordination with Army and Air Force installation based micro-grid demonstrations.

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SBIR/STTR SMALL BUSINESS INNOVATIVE RESEARCH					
SBIR/STTR	SBIR/STTR Innovative Research (DW)	1.722	1.720	0.476	<p>The overall objective of this effort is to identify 3 – 4 projects coming out of the DW SBIR program that address energy issues, meet DW requirements, and broaden the small business base. These may be new efforts (Phase I or Phase II) or additional work put on existing efforts to speed transition and/or expand usability of small business products (Enhancements or Commercialization Pilot Program efforts). Augment the DW STTR investment and level of effort in soldier and soldier equipment electric power sources of higher efficiency and higher reliability.</p>
	SBIR Innovative Research (DLA)	0.338	0.338	0.000	<p>The overall objective of this effort is to identify 1 project coming out of the DLA SBIR program that address energy issues, meet DLA requirements, and broaden the small business base. These may be new efforts (Phase I or Phase II) or additional work put on existing efforts to speed transition and/or expand usability of small business products (Enhancements or Commercialization Pilot Program efforts).</p>

DEFENSE-WIDE TOTAL: \$75.000 M