| Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy | | | | | | | | | | | DATE: April 2013 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | | | | | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | | | | | | | |
| **COST ($ in Millions)** | **All Prior Years** | **FY 2012** | **FY 2013#** | **FY 2014 Base** | **FY 2014 OCO ##** | **FY 2014 Total** | **FY 2015** | **FY 2016** | **FY 2017** | **FY 2018** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 53.241 | 69.844 | 55.324 | 45.618 | - | 45.618 | 93.836 | 60.857 | 53.013 | 53.913 | Continuing | Continuing |
| 0829.: *ENERGY CONSERVATION (ADV)* | 14.108 | 17.069 | 8.770 | 7.695 | - | 7.695 | 14.011 | 14.831 | 13.795 | 14.043 | Continuing | Continuing |
| 0838: *Mobility Fuels (ADV)* | 25.729 | 15.749 | 11.071 | 7.649 | - | 7.649 | 18.975 | 14.956 | 12.219 | 12.427 | Continuing | Continuing |
| 0928: *Directed Energy Research* | 13.404 | 13.404 | 16.243 | 1.870 | - | 1.870 | 8.627 | 3.603 | 2.860 | 2.892 | Continuing | Continuing |
| 0996: *Aircraft Energy Conservation* | 0.000 | 23.622 | 19.240 | 28.404 | - | 28.404 | 52.223 | 27.467 | 24.139 | 24.551 | Continuing | Continuing |

# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

## The FY 2014 OCO Request will be submitted at a later date

**A. Mission Description and Budget Item Justification**

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

This program supports projects to evaluate, adapt, and demonstrate energy related technologies for Navy aircraft and ship operations to: (a) increase fuel-related weapons systems capabilities such as range and time on station; (b) reduce energy costs; (c) apply energy technologies that improve environmental compliance; (d) relax restrictive fuel specification requirements to reduce cost and increase availability worldwide; (e) provide guidance to fleet operators for the safe use of commercial grade or off-specification fuels when military specification fuels are unavailable or in short supply; and (f) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems. This program supports the achievement of legislated, White House, Department of Defense, and Navy Energy Management Goals. It also responds to direction from the Office of the Secretary of Defense, the Secretary of the Navy, and the Chief of Naval Operations to make up-front investment in technologies that reduce future cost of operation and ownership of the fleet and supporting infrastructure.

Project 0996 funding and efforts were realigned from project 0929 in FY 2012.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy | | | | | DATE: April 2013 |
|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | | | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2012** | **FY 2013** | **FY 2014 Base** | **FY 2014 OCO** | **FY 2014 Total** |
| Previous President's Budget | 70.538 | 55.324 | 80.467 | - | 80.467 |
| Current President's Budget | 69.844 | 55.324 | 45.618 | - | 45.618 |
| Total Adjustments | -0.694 | 0.000 | -34.849 | - | -34.849 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.694 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -12.523 | - | -12.523 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -22.326 | - | -22.326 |

**Change Summary Explanation**

Technical: Not applicable.

Schedule:

0829 - Land Based Testing, Determine Fuel and Maintenance Saving, Shipboard Evaluation and Component Implementation schedules have all been delayed due to prototype development.

0838 - Generation 3 Protocol Development added to ensure incorporation of efforts on Office of Naval Research fuels science and technology program, for which a deliverable is development of advance tools to improve the alternative fuels test and certification process. Access to technology transition dates was unavailable during the last budget cycle. 50% Bio Derived Lab/Hardware Testing and 50% Bio Derived Ship/Aircraft Demonstrations will be extended because of FY14 budget cut. Hardware testing will be delayed into early FY15, and ship/aircraft demonstrations will be funded in FY15 and FY16.

0929- Air ENCON Program realigned to 0996 starting 1Qtr 2012- 4Qtr 2018. Air Vehicle Energy Efficiency realigned to 0996 starting 1Qtr 2012 - 4Qtr 2018. Engine Efficiency realigned to 0996 starting in 1Qtr 2012 - 4Qtr 2018. Mission Planning Module Upgrades realigned to 0996 starting in 1Qtr 2012 - 4Qtr 2016.

0996 - Aircraft Energy Conservation item deleted; it was over-arching and not representative of individual efforts. Aircraft Drag Reducing item deleted; testing completed in FY12. Completed microsmooth aircraft coating wind tunnel performance evaluations showed that, despite predictions and commercial data presented prior to testing, there was only a minimal benefit to reducing fuel burn and therefore the project will be terminated in FY12. F/A-18 Bring-Back Weight Study item deleted; additional analysis showed that this effort would not meet fuel reduction goals as previously projected during project inception and was therefore not cost-effective to continue.

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | | DATE: April 2013 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* | |

| COST ($ in Millions) | All Prior Years | FY 2012 | FY 2013# | FY 2014 Base | FY 2014 OCO ## | FY 2014 Total | FY 2015 | FY 2016 | FY 2017 | FY 2018 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0829.: *ENERGY CONSERVATION (ADV)* | 14.108 | 17.069 | 8.770 | 7.695 | - | 7.695 | 14.011 | 14.831 | 13.795 | 14.043 | Continuing | Continuing |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | |

# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

## The FY 2014 OCO Request will be submitted at a later date

**A. Mission Description and Budget Item Justification**

The Energy Conservation Advanced Project is designed to develop and implement energy and maintenance saving improvements into existing Fleet assets. The aircraft energy conservation project identifies, evaluates, and implements energy savings initiatives for potential implementation into Naval aircraft. The objective of the project is to engage technical experts from across Naval aviation, industry, and academia to identify mature potential energy saving opportunities and determine the technical and fiscal viability of implementing them in existing aircraft platforms.

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Energy Conversation Advanced Project is designed to develop and implement energy and maintenance saving improvements into existing Fleet assets. This Fleet driven project, managed through NAVSEA 05Z, will identify mature potential energy saving and maintenance improvement areas, by involvement with Life-Cycle Managers (LCMs), NAVSEA Technical Warrant Holders, In-Service Engineering Agents (ISEAs), PEOs, TMA/TMI, Industry, and Academia. Potential technology target areas will include: Hull Hydrodynamics, Hull Husbandry, Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management, Propulsion Systems, Electrical Systems, and Power Generation and Storage systems. The project directly supports Fleet requirements to reduce energy consumption and lower maintenance costs. The project will focus on research and development across the following major areas: (U) Hull Hydrodynamic Sub Project - This project area will accomplish prototype development, modeling, laboratory and Fleet testing of ship modifications to propellers and/or hull appendages to determine overall mission and cost effectiveness of these improvements. (U) Hull Husbandry Sub Project - Project funds will be utilized to identify and evaluate new underwater hull coating systems and underwater hull cleaning and maintenance techniques both landbased and shipboard to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency. (U) HVAC Sub Projects - Project funds will be utilized to accomplish prototype development, land and shipboard testing to determine overall mission and cost effectiveness of these improvements. (U) Thermal Management Sub Project - Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation and reduce the overall need for HVAC. (U) Propulsion Systems Sub Project - Project funds will be utilized to identify requirements and perform landbased and ship board testing of ship propulsion system improvements, on Gas Turbine, Steam, and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs and to develop a ship-wide monitoring system capable of conveying the power usage and operating conditions of numerous systems on the ship (U) Electrical Systems Project - Project funds will be utilized to identify requirements and perform landbased and ship board testing of ship electrical system improvements, to reduce overall fuel consumption and lower maintenance costs. (U) Power Generation & Storage System Project - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall effectiveness of these improvements. (U) Smart Voyage Planning (SVPDA)/ Fleet Scheduler - Analytic software tools for shore-side planning (1) to design ship voyage routes that minimize fuel usage using ship fuel curves, local weather, and ocean-current data, and (2) allow Fleet schedulers to develop mission plans for movement of Ships using minimized fuel usage as a primary focus, while (3) accounting for personnel and ship safety.

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***Title:*** Power Generation and Storage Project | 2.119 | 1.854 | 0.925 |
| ***Articles:*** | 0 | 0 | 0 |
| ***Description:*** Power Generation & Storage System Sub Project - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements.<br><br>***FY 2012 Accomplishments:***<br>Commenced Land Based testing of Energy Storage Module (ESM), developed test specs and procedures for shipboard installation of a 600KW Energy Storage Module (ESM) on a DDG 51 ship (hull to be determined (1-6 month evaluation)) to demonstrate Single Generator Operations. Continuing to identify new fuel saving technologies in Power Generation & Storage including technical assessment of more efficient operation of Ship Service Diesel Engine Generators (SSDGs).<br><br>***FY 2013 Plans:***<br>Continue land based testing and install ESM Proof of Concept on ship for demonstration. Remove shipboard ESM test unit from ship, analyze performance data, continue any additional land based testing required and prepare reports.. Continue to identify new fuel saving technologies in Power Generation & Storage for Gas Turbine, Diesel and Steam ships. Prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption.<br><br>***FY 2014 Plans:***<br>Continue to identify new fuel saving technologies in Power Generation & Storage for Gas Turbine, Diesel and Steam ships. Prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption. | | | |
| ***Title:*** Hull Hydrodynamic Sub Project | 2.800 | 1.000 | 1.725 |
| ***Articles:*** | 0 | 0 | 0 |
| ***Description:*** (U) Hull Hydrodynamic Sub Project - This project area will accomplish prototype development, modeling, laboratory and Fleet testing of ship modifications to propellers and/or hull appendages to determine overall mission and cost effectiveness of these improvements.<br><br>***FY 2012 Accomplishments:***<br>Continued advance planning efforts for installation of fins on LHD 1 Class ship during Dry-docking availability, initiated material procurement and fabrication, install fins during scheduled availability (SEPT 2012). Initiated engineering development efforts to install a bow bulb on DDG 51 class ship for evaluation to reduce fuel consumption. Conducted model testing of bow bulb design and reviewing existing data available based on earlier designs. Identified additional fuel saving technologies in Hull Hydrodynamic | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| systems for all ship classes and prepared proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption.<br>***FY 2013 Plans:***<br>Complete model testing on bow bulb design; identify ship, prepare drawings and Ship Change documents as required for installation of Proof of concept on a DDG Hull. Continue to identify additional fuel saving technologies in Hull Hydrodynamic systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption.<br>***FY 2014 Plans:***<br>Install bow bulb on selected DDG 51 class ship for test and evaluation, conduct pre and post sea trials to capture baseline and post performance data, prepare report of trial results. Continue to identify additional fuel saving technologies in Hull Hydrodynamic systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption. | | | |
| ***Title:*** Hull Husbandry Sub Project<br>***Articles:***<br><br>***Description:*** (U) Hull Husbandry Sub Project - Project funds will be utilized to identify and evaluate new underwater hull coating systems and underwater hull cleaning and maintenance techniques both land based and shipboard to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency.<br>***FY 2012 Accomplishments:***<br>Continued to utilize Ship Powering Condition Monitor (SPCM) to evaluate coating performance and energy savings. Develop Business Case Analysis for easy release hull coating based on test results of coating applications and continue development, test and evaluation of new fuel savings initiatives identified. Continue to identify new fuel saving initiatives in Hull Husbandry.<br>***FY 2013 Plans:***<br>Develop approaches to monitor performance of hull and propeller coatings with focus on determining when ships are operating in a fuel penalty condition due to hull or propeller roughness conditions. Continue to identify new fuel saving initiatives in Hull Husbandry and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption.<br>***FY 2014 Plans:*** | 0.625<br>0 | 0.504<br>0 | 0.994<br>0 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| Conduct model testing as required and ship installation for test and evaluation of identified hull/propeller modifications or monitoring approaches with objective to measure fuel savings. Continue to identify new fuel saving initiatives in Hull Husbandry and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption. | | | |
| ***Title:*** Heating , Ventilation and Air Conditioning (HVAC) Sub Project | 1.350 | 1.605 | 0.791 |
| ***Articles:*** | 0 | 0 | 0 |
| ***Description:*** (U) HVAC Sub Project - Project funds will be utilized to accomplish prototype development, land and shipboard testing to determine overall mission and cost effectiveness of these improvements.<br><br>***FY 2012 Accomplishments:***<br>IAW NAVSEA PPD 802-8417916, continued design and fabrication of the HES-C prototype chiller. The fabrication of major compressor and motor castings was completed. Design and fabrication of the compressor impellers and variable geometry diffusers was completed. Chiller Operator Interface Terminal and Programmable Logic Controller were developed and testing/ debugging commenced. Commenced component level testing of the permanent magnet motor and magnetic bearings. Technical challenges with rotor position sensor laminations were successfully resolved but resulted in an 8-week project delay. Technology implementation on DDG51FLT-IIa; DDG51FLT-III; LPD-26/27 and OHIO Replacement continued. HES-C is the baseline for the DDG51FLT-III. Performance & acoustic testing as well as Electro-magnetic Interference (EMI) testing commenced. Continuing efforts to install centrally controlled HVAC system utilizing programmable digital thermostats on a DDG Class hull and preparing proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel.<br><br>***FY 2013 Plans:***<br>Continue installation, test and evaluation of new HVAC system on a DDG CI hull, monitor performance and prepare report of savings. Evaluate Heating Ventilation and Air Conditioning systems of other classes of ships for efficiencies and installation of new digital thermostats for test and evaluation aimed at reducing ships energy consumption. Continue to identify additional fuel saving technologies in HVAC Systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel.<br><br>***FY 2014 Plans:***<br>Based on evaluation of other classes of ships in FY13 perform technical assessment to develop test and installation plan for appropriate ship classes for improvement to shipboard HVAC systems. Review Business Case Analyses and develop test and installation plans as appropriate to perform land based and shipboard evaluation. Continue to identify additional fuel saving technologies in HVAC Systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel. | | | |
| ***Title:*** Thermal Management Sub Project | 0.100 | 0.100 | 0.100 |
| ***Articles:*** | 0 | 0 | 0 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***Description:*** (U) Thermal Management Sub Project - Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation and reduce the overall need for HVAC.<br><br>***FY 2012 Accomplishments:***<br>Performed engineering analyses to identify potential Thermal Management energy saving technologies applicable to navy ships.<br><br>***FY 2013 Plans:***<br>Continue to identify additional fuel saving technologies in Thermal Management that may be applicable to navy ships. Examine potential improvements to thermal properties of topside and non-skid coatings with aim of increasing heat reflective properties and reducing ships internal space temperatures. Prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption.<br><br>***FY 2014 Plans:***<br>Pursue lab and shipboard testing of identified thermal management technologies. Continue to identify additional fuel saving technologies in Thermal Management that may be applicable to navy ships. Prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel consumption. | | | |
| ***Title:*** Propulsion Systems Sub Project | 4.500 | 3.070 | 1.400 |
| ***Articles:*** | 0 | 0 | 0 |
| ***Description:*** (U) Propulsion Systems Sub Project - Project funds will be utilized to identify requirements and perform land based and ship board testing of ship propulsion system improvements, on Gas Turbine, Steam, and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs and to develop a ship-wide monitoring system capable of conveying the fuel usage and operating conditions of numerous systems on the ship.<br><br>***FY 2012 Accomplishments:***<br>Continued to assess technical merits of improvements to Gas Turbine, Steam and Diesel engine systems and development of Shipboard Energy Dashboard (SED) that captures existing shipboard equipment information related to fuel and electric power consumption for viewing on-board ship. SED is installed on 6 DDG 51 Class hulls for test and evaluation and is capturing fuel consumption data for man engines with monthly energy reports prepared for each ship.<br><br>***FY 2013 Plans:***<br>Evaluate performance of SED for main engines and modify/expand information being captured and displayed based on feedback from ships and other stakeholders. Expand SED development to other classes of ships based on their configuration and examination of information available. Determine actions necessary to deploy an energy dashboard for these classes of ships based on data available or needed and prepare necessary documentation to conduct shipboard test and evaluation. Continue | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| to identify additional fuel saving technologies in Propulsion Systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel.<br>***FY 2014 Plans:***<br>Based on engineering analyses in FY13 of SED and determination of actions for other classes of ships develop plan of action to test and evaluate SED on at least one ship of each identified class of ships. Develop necessary documentation for installation and test of SED based on ships' availability. Monitor performance and prepare reports to evaluate effectiveness in providing ships force with actionable data to operate ships in energy efficient manner based on mission requirements. | | | |
| ***Title:*** Electrical Systems SubProject<br>***Articles:***<br><br>***Description:*** Electrical Systems Sub Project - Project funds will be utilized to identify and perform landbased and shipboard testing of ship electrical system improvements to reduce energy.<br><br>***FY 2012 Accomplishments:***<br>Procured material and replaced legacy incandescent and fluorescent lighting with Solid State Light Emitting Diode (LED) technology for evaluation on a DDG-51 Class hull. Conducting engineering analysis and design for using Variable Speed Drive (VSD) technology in the Collective Protection System (CPS) of a DDG Class hull for test and evaluation. Developed the electric plant portion of the Shipboard Energy Dashboard installed on 6 DDG 51 Class hulls for test and evaluation to capture and display for ship's force the ship's energy posture of electric plant use. Continued to identify new fuel saving technologies in Electrical Systems.<br>***FY 2013 Plans:***<br>Prepare necessary documentation for land and shipboard testing and evaluation of FY12 initiatives (VSD/CPS, SED). Install VSD/CPS on a DDG 51 class hull and monitor performance. Evaluate performance of SED for ship's electric plant data and modify/expand information being captured and displayed based on feedback from ships force and other stakeholders. Expand SED development to other classes of ships based on their configuration and examination of information available. As with propulsion data, determine actions necessary for to deploy an energy dashboard for these classes of ships based on electric plant data available or needed and prepare necessary documentation to conduct shipboard test and evaluation. Continue to identify additional fuel saving technologies in Electrical Systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel.<br>***FY 2014 Plans:***<br>Monitor performance of installed electric plant initiatives, analyze data and prepare reports. Continue SED efforts to monitor and display energy consumption data to ship's force personnel for fossil fuel ships, identify additional fuel saving technologies in | 2.175<br>0 | 0.637<br>0 | 1.760<br>0 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| Electrical Systems and prepare proposals and Business Case Analyses for promising technologies with potential to reduce fossil fuel. | | | |
| ***Title:*** Smart Voyage Planning Decision (SVPDA)<br>***Articles:***<br><br>***Description:*** Provide tools to allow ship voyage planning.<br><br>***FY 2012 Accomplishments:***<br>Awarded contract for development of additional capability to shore-side ship routing process (1) develop and design ship voyage routes that maximize fuel efficiency by incorporating ship configuration and performance data, local weather, and ocean-current data, and (2) allow Fleet Weather Center ship routers to develop mission plans for movement of Ships adding fuel efficiency as a primary focus, while (3) accounting for ship, crew and navigational safety (including weather avoidance). System deployed during Fleet RIMPAC (Rim of the Pacific)exercises in July 12 for evaluation. | 3.400<br>0 | 0.000 | 0.000 |
| **Accomplishments/Planned Programs Subtotals** | 17.069 | 8.770 | 7.695 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

This is a non-acquisition program that develops, evaluates, and validates mature technologies in support of Fleet fuel and maintenance savings.
RDT&E Contracts are Competitive Procurements.

**E. Performance Metrics**

Actual performance of energy conservation initiatives are measured against initially projected fuel savings measured in barrels of fuel saved based on aircraft and ship demonstration testing.
Quarterly Program Reviews

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development | WR | NSWC Carderock:Bethesda, MD | 1.887 | 2.507 | Oct 2011 | 1.200 | Nov 2012 | 0.600 | Nov 2013 | - | | 0.600 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | NSWC Carderock:Bethesda, MD | 1.439 | 1.756 | Oct 2011 | 1.070 | Nov 2012 | 0.896 | Nov 2013 | - | | 0.896 | Continuing | Continuing | Continuing |
| Engineering Development | WR | NSWC Carderock:Bethesda, MD | 2.404 | 1.955 | Nov 2011 | 1.200 | Nov 2012 | 0.600 | Nov 2013 | - | | 0.600 | Continuing | Continuing | Continuing |
| Demonstration & Evaluation | WR | NSWC Carderock:Bethesda, MD | 2.575 | 2.198 | May 2012 | 0.900 | May 2013 | 0.510 | May 2014 | - | | 0.510 | Continuing | Continuing | Continuing |
| Primary Hardware Development-SVPDA | WR | NSWC Carderock:Bethesda, MD | 0.000 | 1.200 | Oct 2011 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.200 | |
| Systems Engineering-SVPDA | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.600 | Oct 2011 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.600 | |
| Engineering Development-SVPDA | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.110 | Nov 2011 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.110 | |
| Demonstration & Evaluation-SVPDA | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.870 | May 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.870 | |
| | | **Subtotal** | 8.305 | 11.196 | | 4.370 | | 2.606 | | 0.000 | | 2.606 | | | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.200 | Dec 2011 | 0.200 | Nov 2012 | 0.300 | Nov 2013 | - | | 0.300 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Support | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.200 | Dec 2011 | 0.100 | Dec 2012 | 0.150 | Dec 2013 | - | | 0.150 | Continuing | Continuing | Continuing |
| Integrated Logistics Support | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.300 | Dec 2011 | 0.200 | May 2013 | 0.200 | May 2014 | - | | 0.200 | Continuing | Continuing | Continuing |
| Study Anaylsis | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.200 | Apr 2012 | 0.200 | Dec 2012 | 0.300 | Dec 2013 | - | | 0.300 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.900 | | 0.700 | | 0.950 | | 0.000 | | 0.950 | | | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | NSWC Carderock:Bethesda, MD | 2.728 | 1.698 | Nov 2011 | 1.450 | Jan 2013 | 2.140 | Dec 2013 | - | | 2.140 | Continuing | Continuing | Continuing |
| Operational Test & Evaluation | WR | NSWC Carderock:Bethesda, MD | 1.280 | 1.748 | Jan 2012 | 0.950 | May 2013 | 0.800 | Mar 2014 | - | | 0.800 | Continuing | Continuing | Continuing |
| Live Fire Test & Evaluation | WR | NSWC Carderock:Bethesda, MD | 0.382 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.382 | |
| Developmental Test & Evaluation-SVPDA | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.060 | Nov 2011 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.060 | |
| | | **Subtotal** | 4.390 | 3.506 | | 2.400 | | 2.940 | | 0.000 | | 2.940 | | | |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

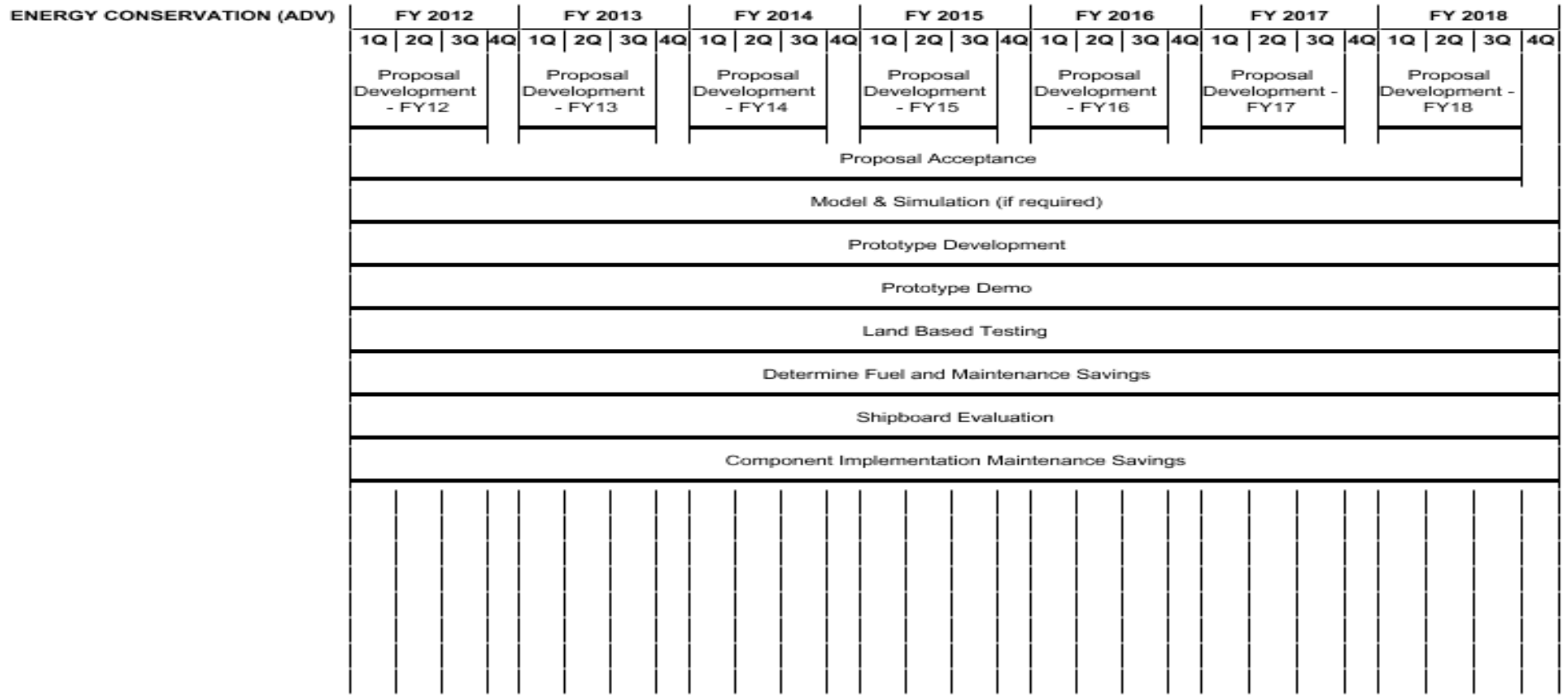
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | WR | NSWC Carderock:Bethesda, MD | 1.042 | 0.900 | Oct 2011 | 1.280 | Oct 2012 | 1.194 | Oct 2013 | - | | 1.194 | Continuing | Continuing | Continuing |
| Travel | Allot | NAVSEA HQ:Washington, DC | 0.119 | 0.015 | Sep 2012 | 0.020 | Nov 2012 | 0.005 | Oct 2013 | - | | 0.005 | Continuing | Continuing | Continuing |
| Total Assets | WR | NSWC Carderock:Bethesda, MD | 0.252 | 0.100 | Mar 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.352 | |
| Program Management Support-SVPDA | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.452 | Oct 2011 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.452 | |
| | | **Subtotal** | 1.413 | 1.467 | | 1.300 | | 1.199 | | 0.000 | | 1.199 | | | |

| | All Prior Years | FY 2012 | | FY 2013 | | FY 2014 Base | | FY 2014 OCO | | FY 2014 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 14.108 | 17.069 | | 8.770 | | 7.695 | | 0.000 | | 7.695 | | | |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |




*2014OSD - 0603724N - 0829.S24*

| Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0829.: *ENERGY CONSERVATION (ADV)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***ENERGY CONSERVATION (ADV)*** | | | | |
| Proposal Development - FY12 | 1 | 2012 | 3 | 2012 |
| Proposal Development - FY13 | 1 | 2013 | 3 | 2013 |
| Proposal Development - FY14 | 1 | 2014 | 3 | 2014 |
| Proposal Development - FY15 | 1 | 2015 | 3 | 2015 |
| Proposal Development - FY16 | 1 | 2016 | 3 | 2016 |
| Proposal Development - FY17 | 1 | 2017 | 3 | 2017 |
| Proposal Development - FY18 | 1 | 2018 | 3 | 2018 |
| Proposal Acceptance | 1 | 2012 | 3 | 2018 |
| Model & Simulation (if required) | 1 | 2012 | 4 | 2018 |
| Prototype Development | 1 | 2012 | 4 | 2018 |
| Prototype Demo | 1 | 2012 | 4 | 2018 |
| Land Based Testing | 1 | 2012 | 4 | 2018 |
| Determine Fuel and Maintenance Savings | 1 | 2012 | 4 | 2018 |
| Shipboard Evaluation | 1 | 2012 | 4 | 2018 |
| Component Implementation Maintenance Savings | 1 | 2012 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | | DATE: April 2013 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* | |

| COST ($ in Millions) | All Prior Years | FY 2012 | FY 2013# | FY 2014 Base | FY 2014 OCO ## | FY 2014 Total | FY 2015 | FY 2016 | FY 2017 | FY 2018 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0838: *Mobility Fuels (ADV)* | 25.729 | 15.749 | 11.071 | 7.649 | - | 7.649 | 18.975 | 14.956 | 12.219 | 12.427 | Continuing | Continuing |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | |

# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

## The FY 2014 OCO Request will be submitted at a later date

**A. Mission Description and Budget Item Justification**

This project provides data through laboratory, component, engine, fuel system, and weapon system tests, which relate the effects of changes in the Navy fuel procurement specification properties and chemistries to the performance and reliability of Naval ship, aircraft, and fuel distribution systems. The information is required to: (a) develop, validate, and execute the test protocols necessary to approve fuels from non-petroleum feedstocks, (b) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide, (c) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military specifications are unavailable or in short supply, (d) technically justify changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in fuel supply, and (e) improve capability to provide fuel quality surveillance in the field. Continued volatility and rapid escalation of the cost of fuel have placed additional pressures on Navy budgets responsible for maintaining and sustaining the Navy tactical fleet both now and in the future. These pressures have placed an added emphasis on the potential use of lower cost commercial fuels and/or fuels derived from non-petroleum sources as a potential means of stabilizing the current and anticipated price volatility. Recent problems with petroleum-based fuel quality have demonstrated the adverse effects that fuel-related problems can have on ship and aircraft system performance, reliability, and readiness. While the program impacts on readiness, additional maintenance costs, and the cost of lost equipment are often difficult to fully quantify, they are often many times the cost of this program. The potential risk of fuel-related problems over the next decade, given the unknown supply, feedstocks, environmental regulations, and the introduction of new theaters of operation, will continue to increase.

This project represents the Navy's only investment designed to maintain its capability to operate as a "smart" customer for fuels that cost over $4.0B per year for procurement, transport, storage, and consumption, and are essential to fleet operations. Additionally, it is the Navy's only investment in the approval of alternative fuels for tactical applications and directly supports the Navy's energy goals of increased energy security and environmental stewardship.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***Title:*** Naval Tactical Fuels | 15.749 | 11.071 | 7.649 |
| ***Articles:*** | 0 | 0 | 0 |
| ***Description:*** Perform development, test and evaluation work on Naval tactical fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance and approval to fleet operators for the safe use of military aircraft that include new additives or are derived from non-petroleum sources; c) make needed periodic changes to the fuel specifications to ensure fuel quality and avoid fleet operating | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| problems while accommodating evolutionary changes in the fuel supply industry and d) improve fleet methods to ensure fuel quality.<br><br>***FY 2012 Accomplishments:***<br>Complete propulsion and system testing of 50/50 bio-blend JP-5 and 50/50 bio-blend F-76. Initiate rig, laboratory and component testing on JP-5 and F-76 containing greater than 50% of bio-derived components. Revise aircraft, ship, and infrastructure alternative fuels protocols.<br><br>***FY 2013 Plans:***<br>Continue rig and propulsion system testing on aircraft and ship biofuels blends containing greater than 50% bio-derived components. Initiate ship and aircraft trials on biofuel blends containing greater than 50% bio-derived components. Initiate laboratory and rig testing on promising advanced biofuel production pathway fuels.<br><br>***FY 2014 Plans:***<br>Expand the list of qualified renewable sources/production pathways for inclusion into the JP-5 and F-76 specifications. Complete hardware testing on direct sugar-to-hydrocarbon and biomass-to-alcohol-to-jet production pathways. Continue laboratory and rig testing, and begin component testing on advanced biofuel production pathway. Evaluate impact of increased use of commercial shipboard propulsion fuel. Evaluate impact on Navy operations of government regulations requiring mandatory addition of fatty acid methyl ester into commercial diesel fuel. | | | |
| **Accomplishments/Planned Programs Subtotals** | 15.749 | 11.071 | 7.649 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Alternative Fuel Efforts including testing and fuel procurement efforts will be competitively contracted, and performed under Cost Plus Fixed Fee and Firm Fixed Price contracts.

**E. Performance Metrics**

Program will develop Alternate Fuel test and certification protocols for 100% of all Naval aircraft and ships. Program will evaluate biofuels, biofuel chemistry and components tests as defined in test and certification protocols.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | | DATE: April 2013 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering | WR | NRL:Washington, D.C. | 1.025 | 0.481 | Nov 2011 | 0.500 | Nov 2012 | 0.350 | Dec 2013 | - | | 0.350 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | NAWCAD:Patuxent River, MD | 5.182 | 2.500 | Nov 2011 | 1.019 | Nov 2012 | 0.400 | Nov 2013 | - | | 0.400 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | DLA-Energy:Ft. Belvoir, VA | 0.000 | 0.010 | Nov 2011 | 0.100 | Nov 2012 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | NAVSEA:Philadelphia, PA | 0.000 | 0.425 | Jan 2012 | 0.100 | Nov 2012 | 0.100 | Dec 2013 | - | | 0.100 | Continuing | Continuing | Continuing |
| Systems Engineering | C/FFP | L-3 Communications:Marlton, NJ | 0.000 | 0.039 | Jan 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.039 | 0.039 |
| Systems Engineering | C/FFP | FEV, Inc.:Auburn Hills, MI | 0.000 | 2.785 | Aug 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.785 | 2.785 |
| Engineering Development | C/CPFF | Various:Various | 2.201 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.201 | 2.201 |
| | | **Subtotal** | 8.408 | 6.240 | | 1.719 | | 0.850 | | 0.000 | | 0.850 | | | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | C/CPFF | Various:Various | 7.511 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.511 | 7.511 |
| Developmental Test & Evaluation | MIPR | Army Tank/ Arm:Warren, MN | 0.228 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.228 | 0.228 |
| Developmental Test & Evaluation | C/CPFF | Life Cycle Engineering:Charleston, SC | 3.000 | 2.926 | Nov 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.926 | 5.926 |
| Test Fuel | C/FFP | TBD:TBD | 0.000 | 2.255 | Aug 2012 | 1.720 | Jan 2013 | 1.000 | Mar 2014 | - | | 1.000 | 0.000 | 4.975 | 4.975 |
| Hardware Testing | WR | NSWC:Panama City, FL | 0.000 | 0.040 | Nov 2011 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.040 | |
| Hardware Testing | SS/CPFF | General Electric:Lynn, MA | 0.000 | 2.200 | Aug 2012 | 0.700 | Mar 2013 | 0.700 | Apr 2014 | - | | 0.700 | 0.000 | 3.600 | 3.600 |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardware Testing | SS/CPFF | Rolls Royce:Indianapolis, IN | 0.000 | 0.000 | | 0.700 | Mar 2013 | 0.700 | Mar 2014 | - | | 0.700 | 0.000 | 1.400 | 1.400 |
| Hardware Testing | C/CPFF | TBD:TBD | 0.000 | 0.159 | Aug 2012 | 2.000 | May 2013 | 1.850 | Mar 2014 | - | | 1.850 | 0.000 | 4.009 | 4.009 |
| Hardware Testing | WR | NAWCAD:Patuxent River, MD | 0.000 | 1.000 | Nov 2011 | 2.000 | Jan 2013 | 1.000 | Dec 2013 | - | | 1.000 | Continuing | Continuing | Continuing |
| Hardware Testing | C/CPFF | Life Cycle Engineering:Charleston, SC | 0.000 | 0.000 | | 1.552 | Jan 2013 | 1.200 | Mar 2014 | - | | 1.200 | 0.000 | 2.752 | 2.752 |
| Hardware Testing | C/FFP | Hughes Associates:Baltimore, MD | 0.000 | 0.040 | Mar 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.040 | 0.040 |
| Hardware Testing | WR | NSWC Carderock:Bethesda, MD | 0.000 | 0.104 | Mar 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.104 | |
| Hardware Testing | WR | Naval Shipyard:Puget Sound, WA | 0.000 | 0.011 | Mar 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.011 | |
| Hardware Testing | C/FFP | AMSEC, LLC:Virginia Beach, VA | 0.000 | 0.147 | Apr 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.147 | 0.147 |
| Hardware Testing | WR | NSWC:Philadelphia, PA | 0.000 | 0.080 | Aug 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.080 | |
| | | **Subtotal** | 10.739 | 8.962 | | 8.672 | | 6.450 | | 0.000 | | 6.450 | | | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | WR | Various:Various | 5.690 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.690 | |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* |

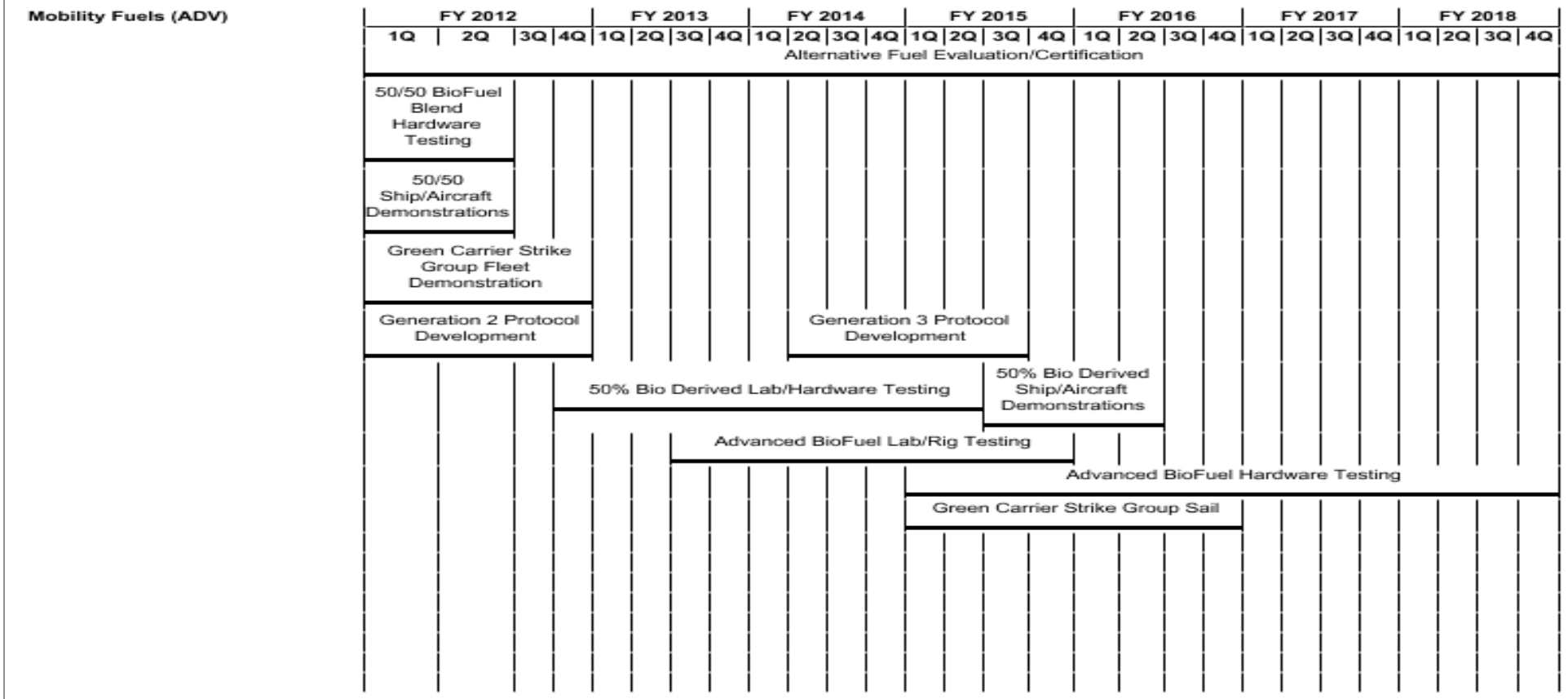
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | MIPR | SRI:San Antonio, TX | 0.696 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.696 | 0.696 |
| Program Management Support | WR | NAVSEA:Washington, DC | 0.100 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.100 | |
| Program Management Support | WR | NSWC:Philadelphia, PA | 0.088 | 0.000 | | 0.000 | | 0.050 | Dec 2013 | - | | 0.050 | 0.000 | 0.138 | |
| Program Management Support | WR | NAWCAD:Patuxent River, MD | 0.000 | 0.539 | Nov 2011 | 0.680 | Nov 2012 | 0.249 | Nov 2013 | - | | 0.249 | Continuing | Continuing | Continuing |
| Program Management Support | WR | NAVSUP:San Diego, CA | 0.000 | 0.008 | Dec 2011 | 0.000 | | 0.050 | Oct 2013 | - | | 0.050 | 0.000 | 0.058 | |
| DAWDF Realignment Issue 74408 | TBD | Not Specified:Not Specified | 0.008 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.008 | |
| | | **Subtotal** | 6.582 | 0.547 | | 0.680 | | 0.349 | | 0.000 | | 0.349 | | | |

| | All Prior Years | FY 2012 | | FY 2013 | | FY 2014 Base | | FY 2014 OCO | | FY 2014 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 25.729 | 15.749 | | 11.071 | | 7.649 | | 0.000 | | 7.649 | | | |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* |




*2014OSD - 0603724N - 0838*

| Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0838: *Mobility Fuels (ADV)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Mobility Fuels (ADV)*** | | | | |
| Alternative Fuel Evaluation/Certification | 1 | 2012 | 4 | 2018 |
| 50/50 BioFuel Blend Hardware Testing | 1 | 2012 | 2 | 2012 |
| 50/50 Ship/Aircraft Demonstrations | 1 | 2012 | 2 | 2012 |
| Green Carrier Strike Group Fleet Demonstration | 1 | 2012 | 4 | 2012 |
| Generation 2 Protocol Development | 1 | 2012 | 4 | 2012 |
| Generation 3 Protocol Development | 2 | 2014 | 3 | 2015 |
| 50% Bio Derived Lab/Hardware Testing | 4 | 2012 | 2 | 2015 |
| 50% Bio Derived Ship/Aircraft Demonstrations | 3 | 2015 | 2 | 2016 |
| Advanced BioFuel Lab/Rig Testing | 3 | 2013 | 4 | 2015 |
| Advanced BioFuel Hardware Testing | 1 | 2015 | 4 | 2018 |
| Green Carrier Strike Group Sail | 1 | 2015 | 4 | 2016 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | | DATE: April 2013 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0928: *Directed Energy Research* | |

| COST ($ in Millions) | All Prior Years | FY 2012 | FY 2013# | FY 2014 Base | FY 2014 OCO ## | FY 2014 Total | FY 2015 | FY 2016 | FY 2017 | FY 2018 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0928: *Directed Energy Research* | 13.404 | 13.404 | 16.243 | 1.870 | - | 1.870 | 8.627 | 3.603 | 2.860 | 2.892 | Continuing | Continuing |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | |

# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

## The FY 2014 OCO Request will be submitted at a later date

**A. Mission Description and Budget Item Justification**

Legislation, Executive Orders (EO), and SECNAV Guidance direct DoN to reduce fossil fuel use and increase renewable energy use. This guidance includes the Energy Policy Act of 2005, which directs agencies to reduce energy intensity 30% by 2015, the National Defense Authorization Act of 2010, which directs DOD to source 25% of its energy from renewable sources by 2025, EO13514, which directs DOD to reduce greenhouse gas emissions by 2020, and SECNAV energy goals, which direct that 50% of DoN's energy come from alternative sources by 2020. Further, studies by the Defense Science Board and others have stressed the dangerous reliance of DOD on vulnerable grid power and unreliable imported oil. Currently, the Navy has limited options for producing energy from renewable sources. Private industry and other federal agencies are developing and testing new technologies. Renewable energy from the ocean such as wave, sea water air conditioning, tidal energy, outer continental shelf wind development, ammonia production and utilization, vortex induced vibration marine hydrokinetic, and compressed air storage for ocean energy, among other technologies have potential to alleviate current Navy island installation dependence on fossil fuel, at comparable costs to projected fossil energy sources. Also, advanced energy management systems have potential to increase installation energy security and enable broader use of renewable energy sources. Because of unique mission and aggressive time frames, testing and demonstration under Navy oversight would facilitate deployment throughout the DoN more quickly than a purely passive approach.

This Energy RDT&E Project will test, evaluate, and validate components as well as demonstrate cost-effective and technical viability of energy efficiency and renewable energy prototypes. All efforts will be coordinated across DOD and with other agencies as appropriate. Specifically, this project aims to pursue three areas of development, testing and evaluation: (A) Renewable Energy to support feasibility evaluation, modeling and possible prototype testing of new energy sources for use at Naval installations with potential for widespread applicability to energy security and renewable energy requirements. Other renewable sources for evaluation, modeling and possible prototype testing may include energy storage (dead-ended fuel cell, zinc air battery, etc.), facility level concentrating solar power, next generation solar heat reflective film, plasma lighting for high wattage applications, micro-inverters for photo-voltaic storage, building level micro-grid, new generation waste heat capture, and other technologies; (B) It will support demonstration and validation of advanced electric grid management systems, known as "Smart Grid" technology, for use at Naval installations to enable improved energy security; (C) Demonstration and Validation of Alternative Energy, Energy Efficiency, Sustainable Building Features, Alternative Fuel Vehicles, and Smart Energy Management Technology: This project will support the testing, demonstration, validation, and application of innovative facility energy efficiency and alternative energy technology.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***Title:*** Directed Energy Research | 13.404 | 16.243 | 1.870 |
| ***Articles:*** | 0 | 0 | 0 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0928: *Directed Energy Research* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***FY 2012 Accomplishments:***<br>Initiated component and prototype planning and development for alternative energy and advanced grid management technology at Naval Installations as follows:<br>- Initiated evaluation of environmental impacts of ocean wave, sea water air conditioning and other ocean energy generation prototypes<br>- Initiated planning and development of advanced wave energy generation prototypes<br>- Initiated planning and development of advanced grid management technology at Naval installations<br>- Initiated demonstration, testing, deployment, and evaluation of energy efficient and alternative energy technology innovations | | | |
| ***FY 2013 Plans:***<br>Perform component testing and prototype development and deployment for alternative energy and advanced grid management technology at Naval installations as follows:<br>- Evaluation of environmental impacts of ocean renewable energy generation systems<br>- Developing, evaluating, and begin installation of supporting equipment for validation of ocean renewable energy generation components and prototypes<br>- Evaluation, and planning for outer continental shelf wind, photovoltaic, ocean compressed air storage and other promising technologies<br>- Demonstration, testing, deployment, and evaluation of smart energy management technology,<br>- Demonstration and validation of mature technologies to be transitioned such as advanced, sustainable building technologies, solar PV collection technologies, alternative fuel vehicles, and improved energy storage systems at Naval installations | | | |
| ***FY 2014 Plans:***<br>Perform component testing and prototype development and deployment for alternative energy and advanced lighting grid management technology at Naval installations as follows:<br>- Evaluation of environmental impacts of ocean renewable energy generation systems<br>- Evaluating and testing Wave Energy Systems<br>- Begin development of technical specifications and acquisition strategies for wave energy systems<br>- Evaluation, and planning for outer continental shelf wind, photovoltaic, ocean compressed air storage and other promising technologies<br>- Demonstration, testing, deployment, and evaluation of smart energy management technology, and begin development of technical specifications | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0928: *Directed Energy Research* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| - Demonstration and validation of mature technologies to be transitioned such as advanced lighting, sustainable building technologies, solar PV collection technologies, alternative fuel vehicles, and improved energy storage systems at Naval installations | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.404 | 16.243 | 1.870 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Demonstration and validation are conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.

**E. Performance Metrics**

The program will be coordinated across DOD and with other agencies as appropriate to achieve 30% Energy Intensity Reduction by FY2015 and 25% Renewable Energy Increase by 2025.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0928: *Directed Energy Research* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Renewable Energy | Various | EXWC:Port Hueneme, CA | 11.854 | 11.854 | Sep 2012 | 15.243 | Jul 2013 | 1.215 | Mar 2014 | - | | 1.215 | Continuing | Continuing | Continuing |
| Smart Energy | Various | EXWC:Port Hueneme, CA | 0.550 | 0.550 | Sep 2012 | 0.000 | | 0.468 | Apr 2014 | - | | 0.468 | Continuing | Continuing | Continuing |
| Demonstration/Validation | Various | EXWC:Port Hueneme, CA | 1.000 | 1.000 | Sep 2012 | 1.000 | Apr 2013 | 0.187 | Apr 2014 | - | | 0.187 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 13.404 | 13.404 | | 16.243 | | 1.870 | | 0.000 | | 1.870 | | | |

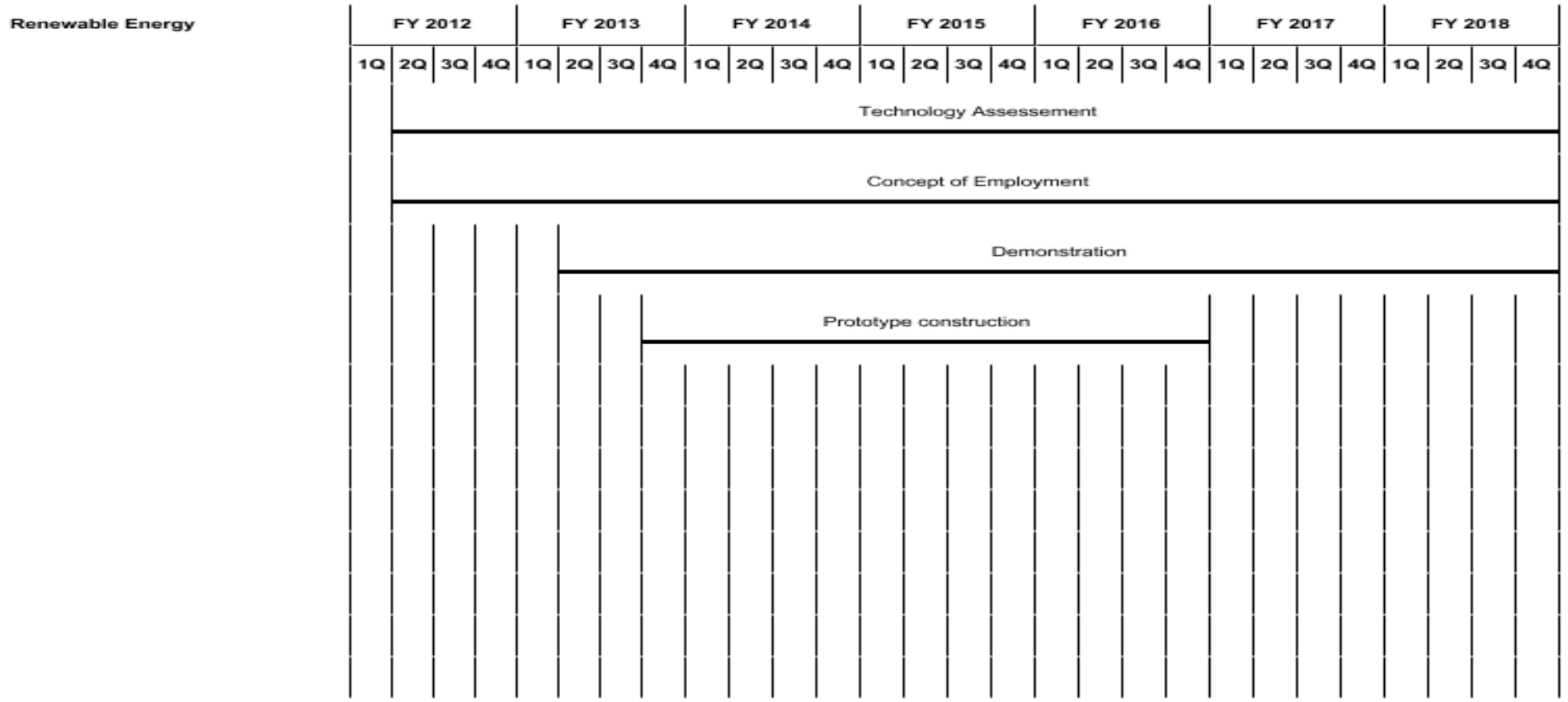
**Remarks**

(FY2014) The Navy Energy Program will be assessing multiple technologies for energy efficiency and energy reduction. This technology assessment continues throughout the program life. As these technologies are assessed, they will be incorporated individually into the shore installation by a variety of acquisition strategies including Energy Savings Performance Contract vehicles, and globally by changes to design and construction criteria coordinated across the services. These, too, will continue throughout the program life. For Smart Energy, and select other technologies, there will be a requirement for component testing and validation. In FY14, wave energy systems will include operation and demonstration through FY15/FY16 timeframe, resulting in development of test and evaluation results and lessons learned by the end of FY16. At the end of the demonstration and evaluation phase, it is expected that feasibility determinations larger, commercial scale plants, including the recommended acquisition strategies to acquire the power, will be provided as part of the final deliverable. This will be followed by criteria development to transition the technical aspects required to acquire a full scale system targeted to support one of several Naval Bases throughout the testing and evaluation period, deliverables will be required at the end of each FY for component test results, validated components, and pilot prototype design and testing.

| | All Prior Years | FY 2012 | | FY 2013 | | FY 2014 Base | | FY 2014 OCO | | FY 2014 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 13.404 | 13.404 | | 16.243 | | 1.870 | | 0.000 | | 1.870 | | | |

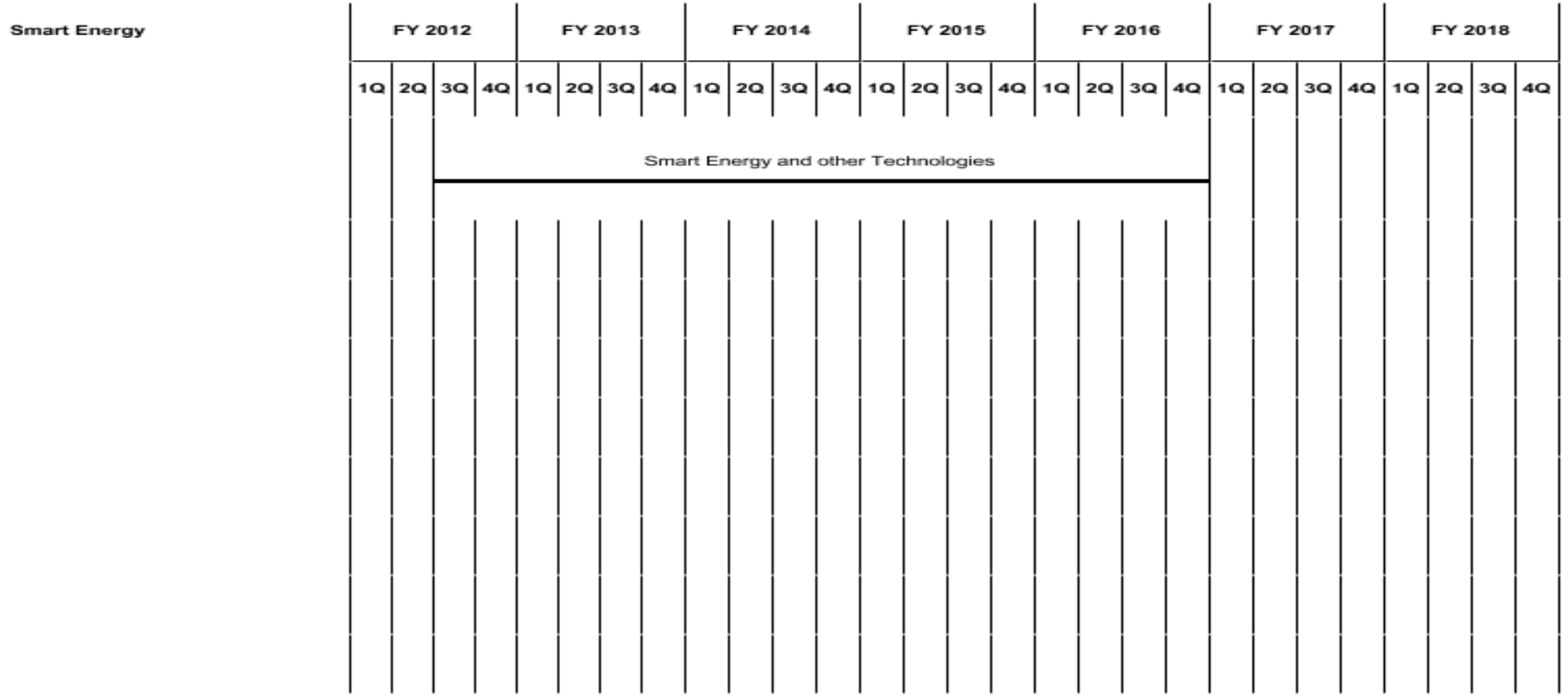
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0928: *Directed Energy Research* |



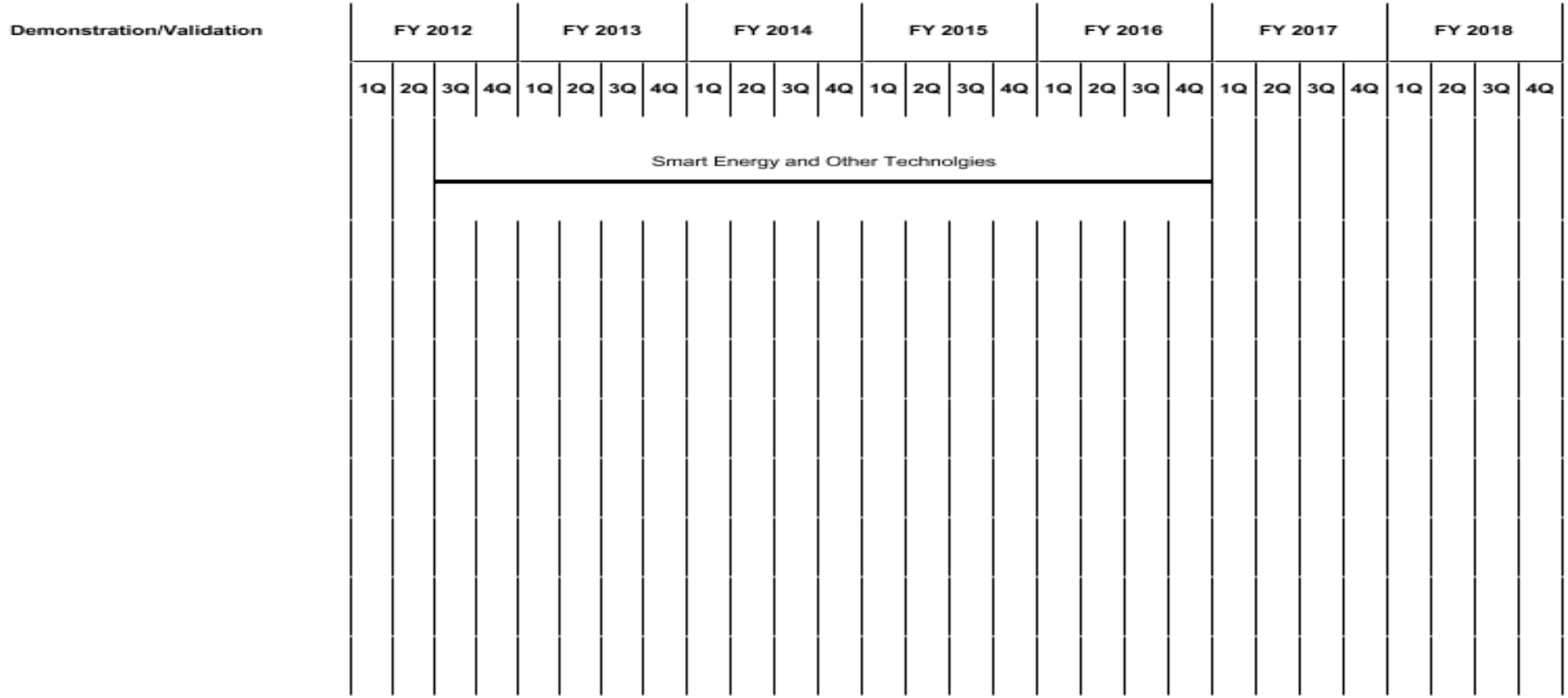

2014OSD - 0603724N - 0928

| Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| **APPROPRIATION/BUDGET ACTIVITY**<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | **R-1 ITEM NOMENCLATURE**<br>PE 0603724N: *Navy Energy Program* | **PROJECT**<br>0928: *Directed Energy Research* |




*2014OSD - 0603724N - 0928*

| Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0928: *Directed Energy Research* |




*2014OSD - 0603724N - 0928*

| Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| **APPROPRIATION/BUDGET ACTIVITY**<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | **R-1 ITEM NOMENCLATURE**<br>PE 0603724N: *Navy Energy Program* | **PROJECT**<br>0928: *Directed Energy Research* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Renewable Energy*** | | | | |
| Technology Assessement | 2 | 2012 | 4 | 2018 |
| Concept of Employment | 2 | 2012 | 4 | 2018 |
| Prototype Construction | 2 | 2013 | 4 | 2018 |
| Demonstration | 4 | 2013 | 4 | 2016 |
| ***Smart Energy*** | | | | |
| Technology Evaluation | 3 | 2012 | 4 | 2016 |
| ***Demonstration/Validation*** | | | | |
| Smart Energy and Other Technologies | 3 | 2012 | 4 | 2016 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | | DATE: April 2013 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0996: *Aircraft Energy Conservation* | |

| COST ($ in Millions) | All Prior Years | FY 2012 | FY 2013# | FY 2014 Base | FY 2014 OCO ## | FY 2014 Total | FY 2015 | FY 2016 | FY 2017 | FY 2018 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0996: *Aircraft Energy Conservation* | 0.000 | 23.622 | 19.240 | 28.404 | - | 28.404 | 52.223 | 27.467 | 24.139 | 24.551 | Continuing | Continuing |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | |

# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

## The FY 2014 OCO Request will be submitted at a later date

**Note**

Project 0996 funding and efforts were realigned from project 0929 in FY 2012.

**A. Mission Description and Budget Item Justification**

The Aircraft Energy Conservation program is designed to develop and implement energy and maintenance saving improvements into existing fleet assets. The program identifies, evaluates, and implements energy savings initiatives for potential implementation into Naval aircraft. The objective of the program is to engage technical experts from across Naval aviation, industry, and academia to identify mature potential energy saving opportunities and determine the technical and fiscal viability of implementing them in existing aircraft platforms.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***Title:*** Aircraft Energy Conservation | 23.622 | 19.240 | 28.404 |
| ***Articles:*** | 0 | 0 | 0 |
| ***FY 2012 Accomplishments:***<br>Complete F/A 18 bring-back weight study. Conduct advanced engine efficiency technology demonstration. Conduct field trial of drag resistant aircraft coatings. Implement fleet i-ENCON (Energy Conservation) program. Complete air vehicle energy savings technology study. | | | |
| ***FY 2013 Plans:***<br>Continue fleet energy conservation program. Continue drag-resistant aircraft coating trial. Develop F135 engine efficiency technology. Initiate F-35 air vehicle energy efficiency technology development program. | | | |
| ***FY 2014 Plans:***<br>Conduct preliminary design for F135 engine fuel burn reduction demonstration. Implement AIR-ENCON full program launch. Conduct evaluation/assessment of advanced mission planning and navigation technologies. Conduct assessment of aircraft subsystem energy efficiency technologies. | | | |
| **Accomplishments/Planned Programs Subtotals** | 23.622 | 19.240 | 28.404 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0996: *Aircraft Energy Conservation* |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

This is a non-acquisition program that develops, evaluates, and validates mature technologies in support of fleet fuel and maintenance savings.

**E. Performance Metrics**

Actual performance of energy conservation initiatives are measured against initially projected fuel savings measured in barrels of fuel saved based on aircraft demonstration testing.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0996: *Aircraft Energy Conservation* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering | WR | NAWCAD:Patuxent River, MD | 0.000 | 2.000 | Feb 2012 | 1.540 | Nov 2012 | 3.000 | Dec 2013 | - | | 3.000 | Continuing | Continuing | Continuing |
| Systems Engineering | C/CPFF | Lockheed Martin:Fort Worth, TX | 0.000 | 0.000 | | 1.000 | Mar 2013 | 2.700 | Feb 2014 | - | | 2.700 | 0.000 | 3.700 | 3.700 |
| Systems Engineering | C/FFP | SAIC:McLean, VA | 0.000 | 0.207 | Apr 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.207 | 0.207 |
| Systems Engineering | C/CPFF | Various:Various | 0.000 | 0.000 | | 1.190 | Mar 2013 | 1.200 | Mar 2014 | - | | 1.200 | 0.000 | 2.390 | 2.390 |
| Systems Engineering | WR | NAWCWD:Point Mugu, CA | 0.000 | 0.091 | Jun 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.091 | 0.091 |
| Systems Engineering | WR | Army Redstone Arsenal:Huntsville, AL | 0.000 | 0.006 | Feb 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.006 | 0.006 |
| | | **Subtotal** | 0.000 | 2.304 | | 3.730 | | 6.900 | | 0.000 | | 6.900 | | | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardware Testing | C/CPFF | PWA:Hartford, CT | 0.000 | 20.025 | Nov 2012 | 13.400 | Mar 2013 | 18.900 | Jan 2014 | - | | 18.900 | 0.000 | 52.325 | 52.325 |
| Hardware Testing | WR | NAWCAD:Patuxent River, MD | 0.000 | 0.000 | | 0.600 | Jan 2013 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Hardware Testing | C/CPFF | Various:Various | 0.000 | 0.000 | | 1.000 | May 2013 | 0.900 | Mar 2014 | - | | 0.900 | 0.000 | 1.900 | 1.900 |
| | | **Subtotal** | 0.000 | 20.025 | | 15.000 | | 19.800 | | 0.000 | | 19.800 | | | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | WR | NAWCAD:Patuxent River, MD | 0.000 | 0.061 | Feb 2012 | 0.510 | Nov 2012 | 0.204 | Dec 2013 | - | | 0.204 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0996: *Aircraft Energy Conservation* |

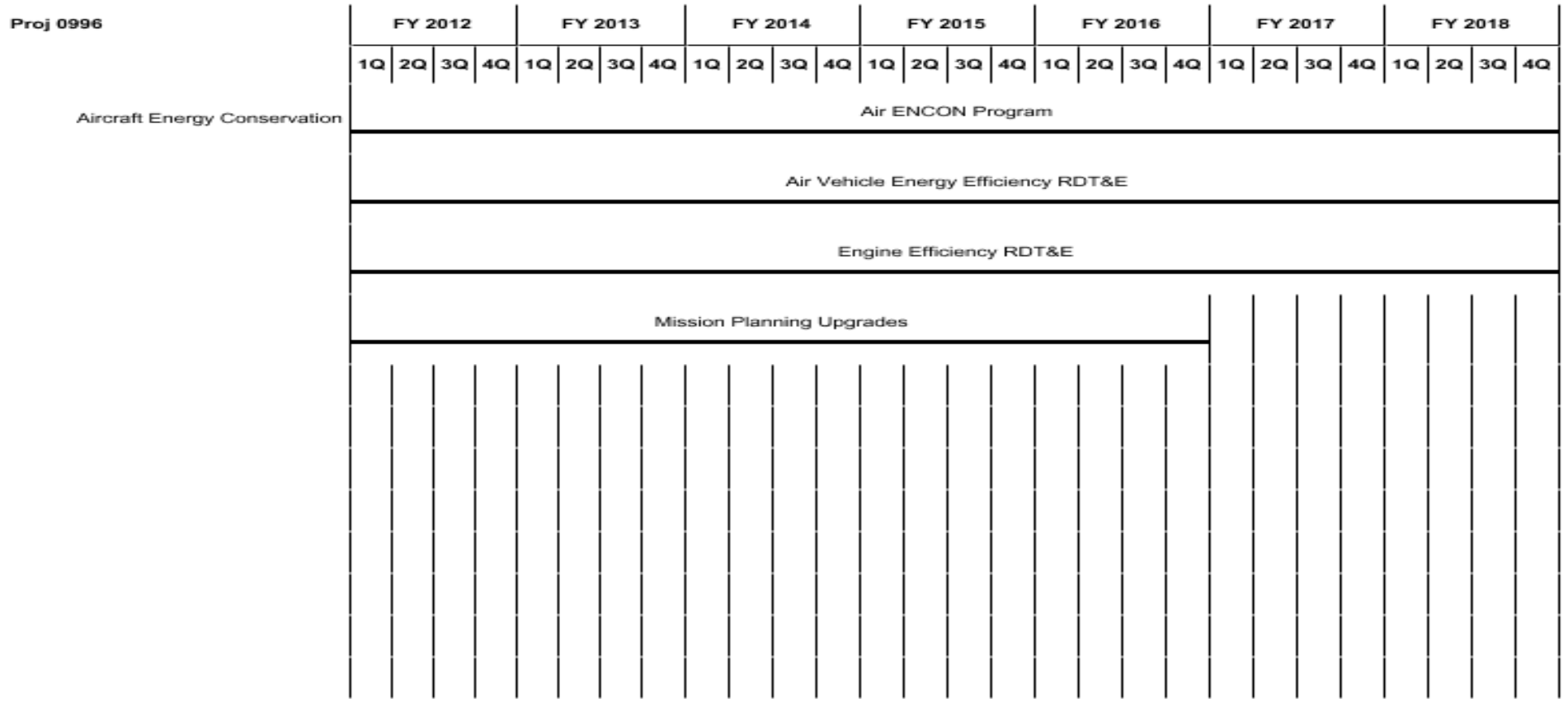
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | All Prior Years | FY 2012 Cost | FY 2012 Award Date | FY 2013 Cost | FY 2013 Award Date | FY 2014 Base Cost | FY 2014 Base Award Date | FY 2014 OCO Cost | FY 2014 OCO Award Date | FY 2014 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | C/FFP | L3 Communications:Marlton, NJ | 0.000 | 1.232 | Jun 2012 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.232 | 1.232 |
| Program Management Support | C/FFP | TBD:TBD | 0.000 | 0.000 | | 0.000 | | 1.500 | Dec 2013 | - | | 1.500 | 0.000 | 1.500 | 1.500 |
| | | **Subtotal** | 0.000 | 1.293 | | 0.510 | | 1.704 | | 0.000 | | 1.704 | | | |

| | All Prior Years | FY 2012 | | FY 2013 | | FY 2014 Base | | FY 2014 OCO | | FY 2014 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 23.622 | | 19.240 | | 28.404 | | 0.000 | | 28.404 | | | |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0996: *Aircraft Energy Conservation* |




*2014OSD - 0603724N - 0996*

| Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 4: *Advanced Component Development & Prototypes (ACD&P)* | R-1 ITEM NOMENCLATURE<br>PE 0603724N: *Navy Energy Program* | PROJECT<br>0996: *Aircraft Energy Conservation* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0996*** | | | | |
| Aircraft Energy Conservation: Air ENCON Program | 1 | 2012 | 4 | 2018 |
| Aircraft Energy Conservation: Air Vehicle Energy Efficiency RDT&E | 1 | 2012 | 4 | 2018 |
| Aircraft Energy Conservation: Engine Efficiency RDT&E | 1 | 2012 | 4 | 2018 |
| Aircraft Energy Conservation: Mission Planning Upgrades | 1 | 2012 | 4 | 2016 |