Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy											Date: February 2015	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603724N *I Navy Energy Program*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	164.621	43.851	63.804	47.761	-	47.761	62.919	59.123	55.061	55.770	Continuing	Continuing
0829: *ENERGY CONSERVATION (ADV)*	35.868	7.505	16.320	9.278	-	9.278	20.225	19.086	16.442	16.723	Continuing	Continuing
0838: *Mobility Fuels (ADV)*	47.334	8.958	10.745	12.509	-	12.509	12.952	12.705	12.159	12.304	Continuing	Continuing
0928: *Directed Energy Research*	40.630	1.420	6.703	2.019	-	2.019	1.883	1.830	1.734	1.769	Continuing	Continuing
0996: *Aircraft Energy Conservation*	40.789	25.968	30.036	23.955	-	23.955	27.859	25.502	24.726	24.974	Continuing	Continuing

A. Mission Description and Budget Item Justification

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) examine 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; 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.

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.

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	45.618	69.415	57.021	-	57.021
Current President's Budget	43.851	63.804	47.761	-	47.761
Total Adjustments	-1.767	-5.611	-9.260	-	-9.260
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.611			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.767	-			
• Program Adjustments	-	-	3.600	-	3.600
• Rate/Misc Adjustments	-	-	-12.860	-	-12.860

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy	Date: February 2015
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603724N *I Navy Energy Program*

Change Summary Explanation

The FY 2016 funding request was reduced by $12.5 million to account for the availability of prior year execution balances.

Technical: Not applicable.

Schedule:

0838 - Continue Advanced BioFuel Lab/Rig Testing thru 4Qtr 2020. Lab and rig testing is the prerequisite of the qualification program and should continue through 2020. Multiple new production processes have been identified and are in early development; if these processes are successful, they will require initial Navy evaluation in out-years.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0829 / *ENERGY CONSERVATION (ADV)*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
0829: *ENERGY CONSERVATION (ADV)*	35.868	7.505	16.320	9.278	-	9.278	20.225	19.086	16.442	16.723	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 energy conservation project, managed through NAVSEA 05T, will identify mature potential energy saving areas, by involvement with Fleet representatives, Life-Cycle Managers (LCMs), NAVSEA Technical Warrant Holders, In-Service Engineering Agents (ISEAs), PEOs, TMA/TMI, Industry, and Academia. The project directly supports SECNAV and CNO goals to reduce energy consumption. Potential technology target areas will include: Power Generation and Storage systems, Hull Hydrodynamics, Underwater Hull Husbandry, Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management, Man Propulsion Systems, Electrical Systems, Auxiliary Systems, and Energy Monitoring & Assessment. Potential energy saving proposals, Energy Conservation Concepts (ECC), are developed each FY for evaluation by functional category. Based on review of a business case and a technical community review projects are selected for development. Not all proposed ECCs are pursued and changes to planned funding between functional categories or fiscal years can occur based on the technology maturity level, ship schedule changes, or other factors affecting the projected development or testing timeline.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: Power Generation and Storage Project	0.925	1.229	-	-	-
Articles:	-	-	-	-	-
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 energy conservation technologies these improvements.					
FY 2014 Accomplishments: Delivered final report of ESM land based testing. Prepared energy conservation proposals and business case analyses for Electronic Unit Injection of LPD 17 Ship Service Diesel Generators and Improvements to Bleed Air Operations designed to save fuel. Continuing to identify new fuel saving technologies in Power Generation & Storage for Gas Turbine, Diesel and Steam ships.					
FY 2015 Plans: Examine potential Prime Mover (gas turbines an diesel engines) fuel saving initiatives for evaluation. Evaluate Gas Turbine Generator (GTG) Bleed Air proposal and actual ship operational scenarios for possible funding. Continue to identify new fuel saving technologies in Power Generation & Storage for Gas Turbine, Diesel and					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Steam ships. Prepare proposals and business case analyses (BCA) for promising technologies with potential to reduce fossil fuel consumption. ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: Hull Hydrodynamic Sub Project	1.725	1.357	0.879	-	0.879
Articles:	-	-	-	-	-
Description: (U) Hull Hydrodynamic Sub Project - This project area will accomplish prototype development, modeling, laboratory and Fleet testing of ship modifications to propellers such as fouling release coatings and/or hull appendages to determine overall mission and cost effectiveness of these improvements. ***FY 2014 Accomplishments:*** Change in planned installation ship from DDG 91 to DDG 100 impacted schedule. Bow bulb material is under procurement ship installation drawings completed Jul 14 and baseline sea trial was completed 17 Nov 14. Conducted post installation sea trial of improved steering modifications to LHD 2 and completed preliminary report of performance. 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. ***FY 2015 Plans:*** Install bow bulb on selected DDG 100 ship for test and evaluation and install strain gages for long term monitoring of performance. 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. ***FY 2016 Base Plans:*** Conduct sea trial to capture bow bulb post installation performance and acoustic data. Prepare preliminary and final report of Bow Bulb installation on DDG 100 ship and post installation business case analysis to evaluate plan to implement on entire DDG 51 Class. 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. ***FY 2016 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
N/A					
Title: Hull Husbandry Sub Project	0.994	0.300	-	-	-
Articles:	-	-	-	-	-
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 to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency. ***FY 2014 Accomplishments:*** Complete modeling of propeller fouling conditions for use as tool to assess required periodicity of propeller cleaning and quantification of fouled propeller fuel penalty. Prepare final report of findings including recommended propeller monitoring approaches with objective to avoid ships operating in fuel penalty condition due to fouled propellers. Prepared proposal for evaluating coating of DDG51 and CG 47 class propellers using two different types of silicone fouling release coatings. 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. ***FY 2015 Plans:*** Evaluate proposal for coating a DDG 51 or CG 47 set of propellers. Initiate review with all affected stakeholders including NAVSEA, PEO SHIPS and Fleet personnel, prepare appropriate documents supporting paint application and select test ship. 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. ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: Heating , Ventilation and Air Conditioning (HVAC) Sub Project	0.791	2.675	2.360	-	2.360
Articles:	-	-	-	-	-
Description: (U) HVAC Sub Project - Project funds will be utilized to accomplish prototype development, land and shipboard testing to determine cost effectiveness of improvements aimed at more efficient climate control of shipboard spaces.					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
FY 2014 Accomplishments: Conducted technical community review on the merits of installing a prototype Thermal Management Control System (TMCS) on an LHD class ship for test and evaluation. TMCS installs digital thermostats which permits centralized control of space temperatures throughout the ship. Evaluated proposals for improved air conditioning plant performance on DDG 51 Class ships. Continued 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. ***FY 2015 Plans:*** Initiate phase I development of Ship Change Document (SCD) for LHD class TMCS installation, work with Fleet to select appropriate test ship for installation, develop Ship Installation Drawings (SIDs), prepare test documentation and initiate Long Lead Time Material (LLTM) procurement. Initiate tasking for test and evaluation of Air Conditioning (AC) Plant improvements on DDG 51 Class ships. Conduct engineering design, material procurement and laboratory testing of prototype system for ship installations in FY16. 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. ***FY 2016 Base Plans:*** Continue phase II LHD TMCS development for laboratory testing of system and installation on board selected ship for test and evaluation. Prepare SCD for installation of AC plant improvement on selected test ship (s), install improvements, conduct evaluation and provide report. 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. ***FY 2016 OCO Plans:*** N/A					
Title: Thermal Management Sub Project	0.100	0.100	-	-	-
Articles:	-	-	-	-	-
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 shipboard electrical demand on HVAC systems.					
FY 2014 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Reviewed industry approaches to energy recovery that may be applicable for navy use. 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. ***FY 2015 Plans:*** Continue to seek out energy recovery devices that are approaching Technology Readiness Level 6 and may be ready for shipboard application. 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. ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: Propulsion Systems Sub Project	1.210	0.885	-	-	-
Articles:	-	-	-	-	-
Description: (U) Propulsion Systems Sub Project - Project funds will be utilized to identify requirements and perform land based and shipboard testing of ship propulsion system improvements on Gas Turbine, Steam, and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. ***FY 2014 Accomplishments:*** A ship check was completed on LPD 22 in Jan 14 and an Authorized Work Item (AWI) and Ship Change Document for installation of a Shipboard Energy Dashboard SED on LPD 25 is complete. Ship installation drawings have been completed and material has been procured and delivered. Installation is scheduled to commence in Jan 15 vice Nov 14 due to ship schedule change. Development of a TRITON hull fouling assessment tool to detect when a ship is operating in a fuel penalty mode is in progress. Both these projects will move to Energy Monitoring and Assessment functional area in FY15. Continue 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. ***FY 2015 Plans:*** Evaluate Business Case developed for installing variable speed drives for lube oil and fuel oil pumps in LHD class ships. Based on review, develop test plan, perform ship check, create system design and requirements					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
document, procure material and perform preliminary testing. Continue 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. ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: Electrical Systems SubProject	1.760	2.201	-	-	-
Articles:	-	-	-	-	-
Description: Electrical Systems Sub Project - Project funds will be utilized to identify and perform land based and shipboard testing of ship electrical system improvements to reduce energy consumption. ***FY 2014 Accomplishments:*** Draft final report for Collective Protection System Variable Speed Drive (CPS/VSD) ECC was issued in Sep 14 and final testing of Port Use Fan (PUF) was delayed due to change in schedule for USS Wasp and material condition of critical motor. Comments are being incorporated into the CPS/VSD report and interim report on PUF is due Jan 15. Ship check to install SED on DDG 60 is completed and data analysis modeling is in progress. Design, material procurement and SCD development is in process for an advanced Reverse Osmosis (RO) prototype Energy Recovery Device (ERD) installation on USS COMSTOCK in FY15. Electrical Shipboard Energy Dashboard efforts will move to Energy Monitoring and Assessment functional area in FY15 and beyond and RO will move to Auxiliary Systems in FY 15 and beyond. Tasking for installation of hangar bay solid state lighting was initiated for a DDG 51 class ship and material procurement and First Article Testing is in process. ECC proposals for installation of VSDs for the Collective Protection System as well as Main Space Ventilation were prepared and are reviewed. 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. ***FY 2015 Plans:*** Based on review of Business case analysis Proposals initiate tasking to design test and evaluate fuel saving initiatives for electrical systems such as Collective Protection System and Main Space Ventilation Fans for LHD 1 class ships. Tasking will include SCD and SIDs development as well as preparation of test plans and material procurement to support installation in FY16. Investigate additional uses of VSD technology, high efficiency motors and Solid State Lighting for shipboard use. Continue to identify additional fuel saving technologies in					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Electrical Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: Auxiliary Systems Sub Project	-	1.134	-	-	-
Articles:	-	-	-	-	-
Description: Auxiliary Systems Sub Project -- Project funds will be utilized to identify, test and evaluate new technologies for shipboard auxiliary systems aimed at reducing fuel consumption. ***FY 2014 Accomplishments:*** N/A ***FY 2015 Plans:*** Conduct qualification and endurance testing of RO plant ERD, install upgrade kit on USS COMSTOCK, provide on-board-training for ship's force, monitor system performance and provide final report. Based on successful business case analyses of ECCS such as high and low pressure compressed air and other potential ECCs developed tasking will be initiated. Continue to identify additional fuel saving technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: Energy Monitoring & Assessment	-	6.439	6.039	-	6.039
Articles:	-	-	-	-	-
Description: This project area will focus on methods of capturing and displaying energy related data to shipboard personnel as actionable information for ships force to employ energy conservation measures underway and in port as mission requirements permit.					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
FY 2014 Accomplishments: N/A ***FY 2015 Plans:*** Perform overall planning and execution functions related to energy initiatives including monitoring performance of Phase III SED on LPD 25 to monitor performance, develop energy summary report format, and provide monthly energy summary report. Determine requirements for Phase II SED installation on DDG 60 and prepare SCD, procure required material, develop test plan and monitor performance. Investigate steps required to provide bridge display of energy information. Expand Phase I SED efforts to additional ship systems identified by Fleet and other ship classes, LSD, LCS, etc as applicable based on gap analysis data. Initiate Phase I identification of requirements, initial Configuration Data Set (CDS) update, identification of test ship and building general ship knowledge base. Investigate web-enabled capability for capturing and displaying energy data. Investigate methods to capture and display fuel penalty conditions relating to hull and propeller fouling and feed information to SED and other reporting systems to measure ship energy performance. Continue to identify additional fuel saving technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Base Plans:*** Perform overall planning and execution functions related to energy initiatives. Conduct Phase III SED on DDG 60 or other DDG 51 class ship selected, monitor performance, develop energy summary report format, and provide monthly energy summary report to monitor and prepare final report. Initiate Phase II efforts for new ship classes identified in FY15 and initiate Phase I SED efforts for DDG 51 Flt II and IIA classes. Working with Fleet, develop requirements for a Global Energy Information System (GENYSIS). Monitor performance of hull fouling assessment tool, analyze data, provide quarterly quick look and final report. ***FY 2016 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	7.505	16.320	9.278	-	9.278

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDT&E Contracts are Competitive Procurements.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Carderock : Bethesda, MD	5.394	0.600	Nov 2013	3.650	Nov 2014	-		-		-	-	9.644	-
Systems Engineering	WR	NSWC Carderock : Bethesda, MD	4.045	0.896	Nov 2013	1.259	Feb 2015	-		-		-	-	6.200	-
Engineering Development	WR	NSWC Carderock : Bethesda, MD	5.498	0.600	Nov 2013	1.750	Feb 2015	-		-		-	-	7.848	-
Demonstration & Evaluation	WR	NSWC Carderock : Bethesda, MD	5.673	0.510	May 2014	1.200	May 2015	-		-		-	-	7.383	-
		Subtotal	20.610	2.606		7.859		-		-		-	-	31.075	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC Carderock : Bethesda, MD	0.400	0.300	Nov 2013	2.000	Dec 2014	3.178	Sep 2016	-		3.178	Continuing	Continuing	Continuing
Software Support	WR	NSWC Carderock : Bethesda, MD	0.300	0.150	Dec 2013	-		0.500	Jan 2016	-		0.500	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NSWC Carderock : Bethesda, MD	0.500	0.200	May 2014	0.500	May 2015	0.500	Jan 2016	-		0.500	Continuing	Continuing	Continuing
Study Anaylsis	WR	NSWC Carderock : Bethesda, MD	0.400	0.300	Dec 2013	0.474	Dec 2014	0.300	Jan 2016	-		0.300	Continuing	Continuing	Continuing
		Subtotal	1.600	0.950		2.974		4.478		-		4.478	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	5.876	1.950	Dec 2013	2.135	Jun 2015	0.890	Feb 2016	-		0.890	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	3.978	0.800	Mar 2014	1.900	Jun 2015	2.100	Feb 2016	-		2.100	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0829 / *ENERGY CONSERVATION (ADV)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	0.382	-		-		-		-		-	-	0.382	-
		Subtotal	10.236	2.750		4.035		2.990		-		2.990	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC Carderock : Bethesda, MD	2.916	1.194	Oct 2013	1.442	Oct 2014	0.700	Sep 2016	-		0.700	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA HQ : Washington, DC	0.154	0.005	Oct 2013	0.010	Oct 2014	0.010	Sep 2016	-		0.010	Continuing	Continuing	Continuing
Total Assets	WR	NSWC Carderock : Bethesda, MD	0.352	-		-		-		-		-	-	0.352	-
Program Management Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	-		-		1.100	Sep 2016	-		1.100	-	1.100	-
		Subtotal	3.422	1.199		1.452		1.810		-		1.810	-	-	-

	Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.868	7.505		16.320		9.278		-		9.278	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

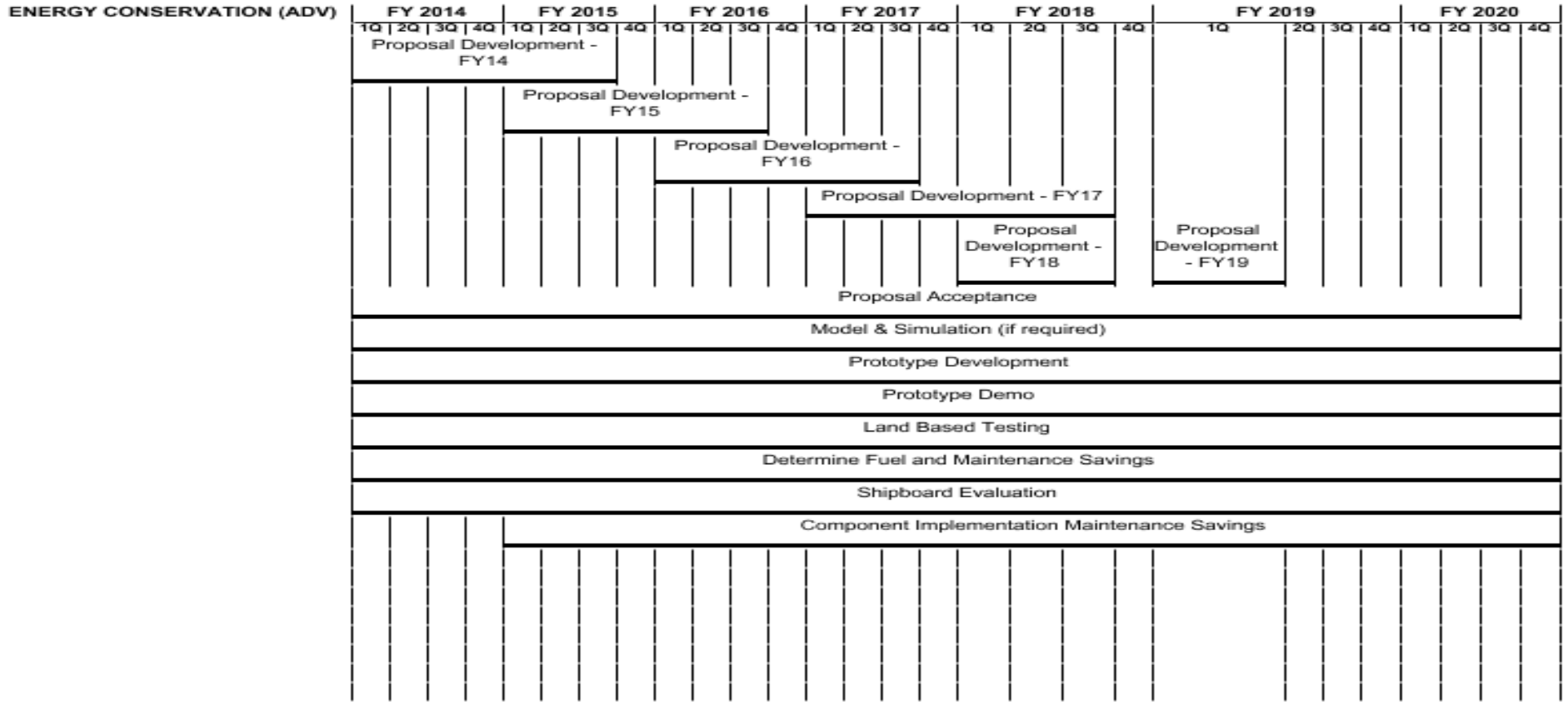

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy		Date: February 2015
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ENERGY CONSERVATION (ADV)				
Proposal Development - FY14	1	2014	3	2015
Proposal Development - FY15	1	2015	3	2016
Proposal Development - FY16	1	2016	3	2017
Proposal Development - FY17	1	2017	3	2018
Proposal Development - FY18	1	2018	3	2018
Proposal Development - FY19	1	2019	1	2019
Proposal Acceptance	1	2014	3	2020
Model & Simulation (if required)	1	2014	4	2020
Prototype Development	1	2014	4	2020
Prototype Demo	1	2014	4	2020
Land Based Testing	1	2014	4	2020
Determine Fuel and Maintenance Savings	1	2014	4	2020
Shipboard Evaluation	1	2014	4	2020
Component Implementation Maintenance Savings	1	2015	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
0838: *Mobility Fuels (ADV)*	47.334	8.958	10.745	12.509	-	12.509	12.952	12.705	12.159	12.304	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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. The program addresses readiness, additional maintenance costs, and the cost of lost equipment. The potential risk of fuel-related problems over the next decade, given the unknown supply, feedstocks, 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 $4.0 billion 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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: Naval Tactical Fuels	8.958	10.745	12.509	-	12.509
Articles:	-	-	-	-	-
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 problems while accommodating evolutionary changes in the fuel supply industry and d) improve fleet methods to ensure fuel quality.					
FY 2014 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0838 / *Mobility Fuels (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
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. ***FY 2015 Plans:*** Continue to expand list of qualified renewable sources/production pathways for inclusion into JP-5 and F-76 specifications. Conduct hardware testing on hydroprocessed depolymerized cellulosic. Continue testing on advanced production pathways. ***FY 2016 Base Plans:*** Continue to expand the list of qualified renewable sources and production pathways for inclusion into the JP-5 and F-76 specifications. Conduct hardware testing on 100% fully synthetic aviation and shipboard fuels. Continue testing on advanced production pathways. ***FY 2016 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.958	10.745	12.509	-	12.509

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 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NRL : Washington, D.C.	2.380	0.487	Nov 2013	0.500	Oct 2014	0.500	Dec 2015	-		0.500	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	8.682	1.731	Nov 2013	1.344	Nov 2014	1.800	Nov 2015	-		1.800	Continuing	Continuing	Continuing
Systems Engineering	WR	DLA-Energy : Ft. Belvoir, VA	0.010	0.150	Mar 2014	-		-		-		-	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Philadelphia, PA	1.501	0.588	Nov 2013	0.510	Nov 2014	0.450	Nov 2015	-		0.450	Continuing	Continuing	Continuing
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	0.001	-		-		-		-		-	-	0.001	0.001
		Subtotal	12.574	2.956		2.354		2.750		-		2.750	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Fuel	C/FFP	Various : Various	0.500	1.500	Oct 2014	2.045	Jan 2015	3.812	Jan 2016	-		3.812	-	7.857	7.857
Hardware Testing	WR	NAWCAD : Patuxent River, MD	1.749	1.250	Nov 2013	1.993	Dec 2014	0.700	Feb 2016	-		0.700	Continuing	Continuing	Continuing
Hardware Testing	C/CPFF	Life Cycle Engineering : Charleston, SC	2.957	1.342	Mar 2014	-		3.000	Jan 2016	-		3.000	-	7.299	7.299
Hardware Testing	WR	NSWC : Philadelphia, PA	0.080	-		0.750	Mar 2015	0.750	Feb 2016	-		0.750	Continuing	Continuing	Continuing
Hardware Testing	WR	Naval Postgraduate School : Monterey, CA	0.200	-		0.100	Dec 2014	-		-		-	-	0.300	-
Hardware Testing	C/FFP	Various : Various	0.000	0.756	Jul 2014	3.000	Mar 2015	0.161	Jun 2016	-		0.161	-	3.917	3.917
Hardware Testing	C/FFP	General Electric : Cincinnati, OH	0.000	0.551	Sep 2014	-		-		-		-	-	0.551	0.551
Hardware Testing	WR	NSWC : Little Creek, VA	0.000	0.042	Apr 2014	-		-		-		-	-	0.042	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Testing	WR	US Naval Academy : Annapolis, MD	0.000	0.046	Apr 2014	-		-		-		-	-	0.046	-
Hardware Testing	C/CPFF	Univ of Dayton Research Inst : Dayton, OH	0.000	0.152	May 2014	-		0.150	Mar 2016	-		0.150	-	0.302	0.302
Hardware Testing	WR	TBD : TBD	0.000	-		-		0.200	Jan 2016	-		0.200	-	0.200	-
Hardware Testing	SS/CPFF	Rolls Royce : Indianapolis, IN	1.850	-		-		0.500	May 2016	-		0.500	-	2.350	2.350
Prior year T & E no longer funded in the FYDP	Various	Various : Various	20.419	-		-		-		-		-	-	20.419	-
		Subtotal	27.755	5.639		7.888		9.273		-		9.273	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.403	0.350	Nov 2013	0.483	Dec 2014	0.481	Nov 2015	-		0.481	Continuing	Continuing	Continuing
Program Management Support	WR	NAVSUP : San Diego, CA	0.009	0.003	Nov 2013	0.010	Nov 2014	0.005	Nov 2015	-		0.005	Continuing	Continuing	Continuing
Program Management Support	C/FFP	Coord Research Council : Alpharetta, GA	0.010	0.010	Jan 2014	0.010	Dec 2014	-		-		-	-	0.030	0.030
Prior year Mgmt Supp no longer funded in the FYDP	Various	Various : Various	6.583	-		-		-		-		-	-	6.583	6.583
		Subtotal	7.005	0.363		0.503		0.486		-		0.486	-	-	-

	Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	47.334	8.958		10.745		12.509		-		12.509	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0838 / *Mobility Fuels (ADV)*

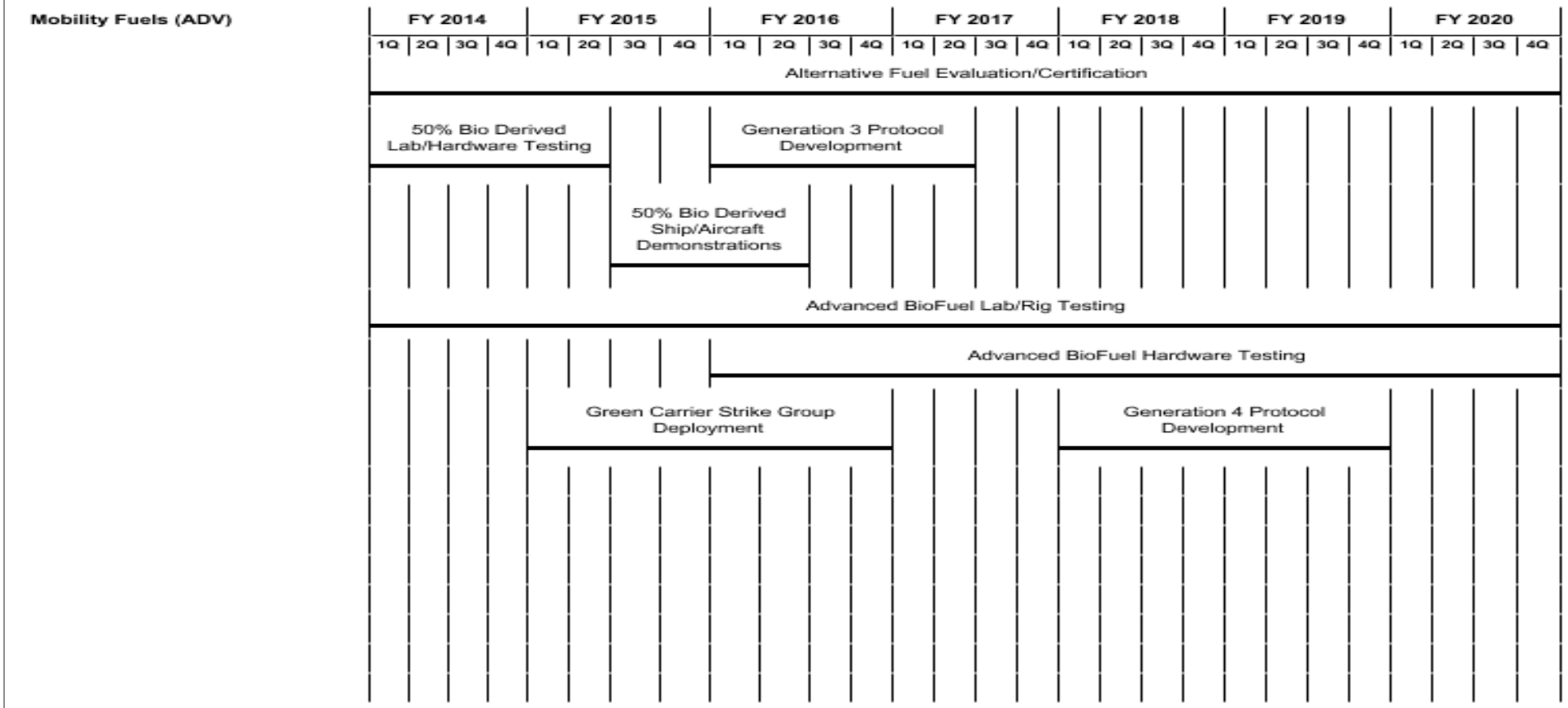

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0838 / *Mobility Fuels (ADV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Mobility Fuels (ADV)				
Alternative Fuel Evaluation/Certification	1	2014	4	2020
Generation 3 Protocol Development	1	2016	2	2017
50% Bio Derived Lab/Hardware Testing	1	2014	2	2015
50% Bio Derived Ship/Aircraft Demonstrations	3	2015	2	2016
Advanced BioFuel Lab/Rig Testing	1	2014	4	2020
Advanced BioFuel Hardware Testing	1	2016	4	2020
Green Carrier Strike Group Deployment	1	2015	4	2016
Generation 4 Protocol Development	1	2018	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy									Date: February 2015			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*				Project (Number/Name) 0928 / *Directed Energy Research*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
0928: *Directed Energy Research*	40.630	1.420	6.703	2.019	-	2.019	1.883	1.830	1.734	1.769	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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.

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, energy storage and Alternative Fuel Vehicle 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" and "Micro 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 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**
Title: Directed Energy Research	1.420	6.703	2.019	-	2.019
Articles:	-	-	-	-	-
FY 2014 Accomplishments: Performed planning, installation prototype development, and component testing deployment for alternative energy, advanced lighting, and grid Smart/micro grid management, and energy efficient technologies at Naval installations as follows:					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Initiated evaluation of environmental impacts of ocean renewable energy generation systems - Completed environmental planning efforts and received approval to begin installation of testing facility/ infrastructure equipment. Began application process for permits to install wave energy devices into the testbed. - Further analysis and implementation of Sea Water Air Conditioning (SWAC) systems at several Naval Bases. Results are being utilized to support future design efforts of potential SWAC systems in Guam. - Demonstration, testing, deployment, and evaluation of advanced lighting, alternative fuel vehicles, and improved energy storage systems at Naval installations. Prototypes are now ready to be tested and evaluated in FY15 and FY16 to determine system capabilities and integration opportunities across the Navy.					
FY 2015 Plans: Perform component testing, prototype development and deployment for alternative energy, advanced lighting, facility cooling, and grid management technology at Naval installations as follows: - Continue evaluation of environmental impacts of ocean renewable energy generation systems. - Evaluate and test Wave Energy Systems - Assess and document performance of multiple wave energy devices at the Wave Energy Test Site. - Evaluation, and planning for multiple energy storage technologies, Sea Water Air Conditioning system optimization, and other promising technologies. - Demonstration, testing, deployment, and evaluation of smart and micro grid energy management technology, and begin development of technical specifications. - 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. The FY15 plan includes: - Continue and expand demonstration, testing, deployment, and evaluation of smart energy and micro-grid management technology; and continue development of technical specifications. - Continue and expand demonstration and validation of mature technologies to be transitioned such as sustainable building technologies, alternative fuel vehicles, and improved energy storage systems and integration at Naval installations. - Initiate planning and development of prototypes for the next set of energy storage, grid management, renewable/alternative energy, and efficiency technologies. This includes innovative technology development and site planning to prepare for FY16/17 testing and evaluation.					
FY 2016 Base Plans: FY16 will focus on completing or continuing projects initiated in FY14 and FY15.					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Continue evaluation of environmental impacts of ocean renewable energy generation systems. - Continue evaluating and testing Wave Energy Systems. - Complete evaluation for ocean compressed air storage technologies and SWAC optimization. - Initiate demonstration, testing, and evaluation of improved and low cost smart and micro grid energy management technologies. - Demonstration and validation of mature low-cost 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. The FY16 plan includes: - Continue demonstration, testing, deployment, and evaluation of smart energy and micro-grid management technology; and begin development of technical specifications. - Continue demonstration and validation of mature technologies to be transitioned such as sustainable building technologies, alternative fuel vehicles, and improved energy storage systems and integration at Naval installations. - The FY16 plan will reduce the number of new technologies evaluated for alternative energy, grid management, efficiency and sustainable building technologies. In addition, the validation will delay development of procurement specifications impacting deployment of these technologies beyond 2020. ***FY 2016 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.420	6.703	2.019	-	2.019

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 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Renewable Energy	Various	EXWC : Port Hueneme, CA	36.530	0.950	Mar 2014	3.928	Mar 2015	0.890	Jan 2016	-		0.890	Continuing	Continuing	Continuing
Smart Energy	Various	EXWC : Port Hueneme, CA	1.100	0.400	Apr 2014	1.982	May 2015	0.890	Jan 2016	-		0.890	Continuing	Continuing	Continuing
Demonstration/Validation	Various	EXWC : Port Hueneme, CA	3.000	0.070	Apr 2014	0.793	Jun 2015	0.239	Jan 2016	-		0.239	Continuing	Continuing	Continuing
		Subtotal	40.630	1.420		6.703		2.019		-		2.019	-	-	-

Remarks

In FY16 the Directed Energy Program will be limited to assessing technologies for renewable energy, 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, Purchase Power Agreements, and globally by changes to design and construction criteria. 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. The wave energy systems will include operation and demonstration throughout the FYDP, resulting in development of test and evaluation results and lessons learned. 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 Fiscal Year for component test results, validated components, and pilot prototype design and testing.

	Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.630	1.420		6.703		2.019		-		2.019	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

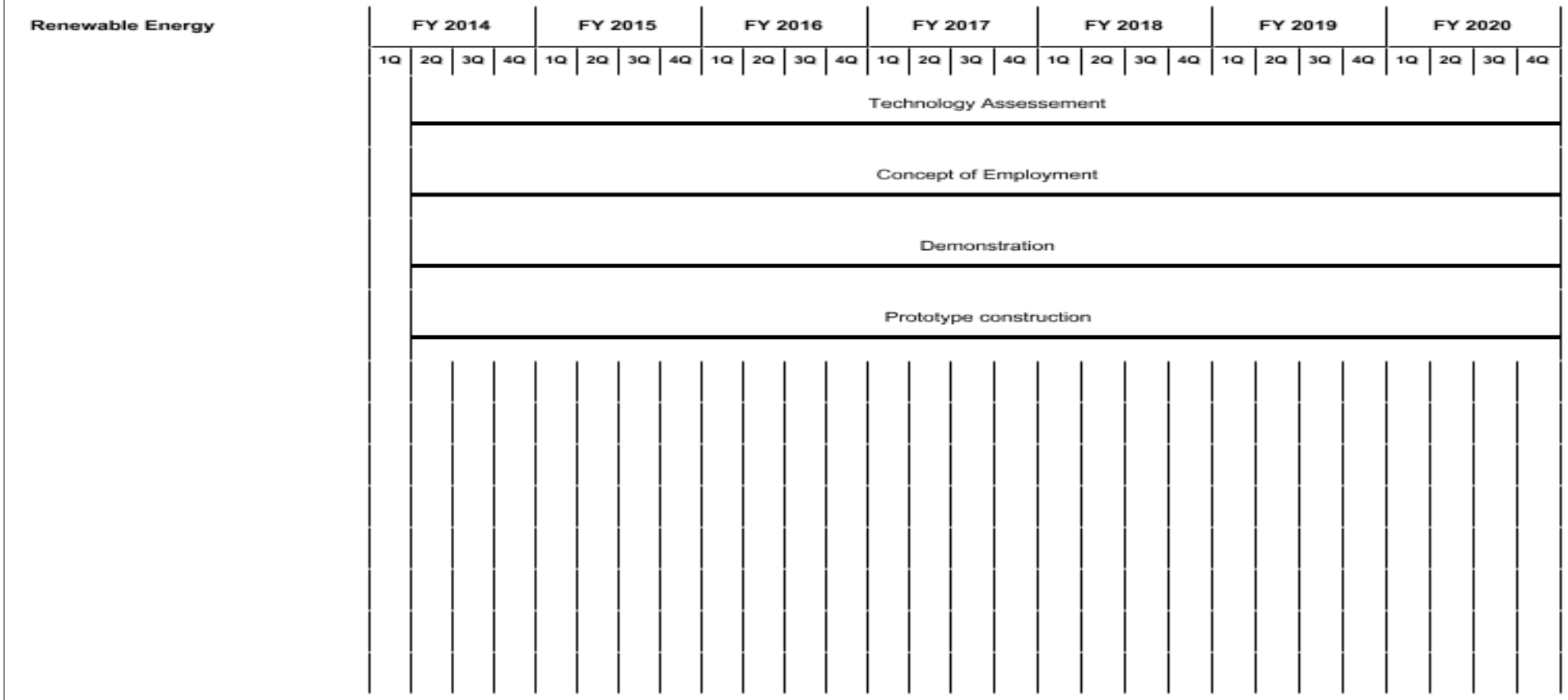

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

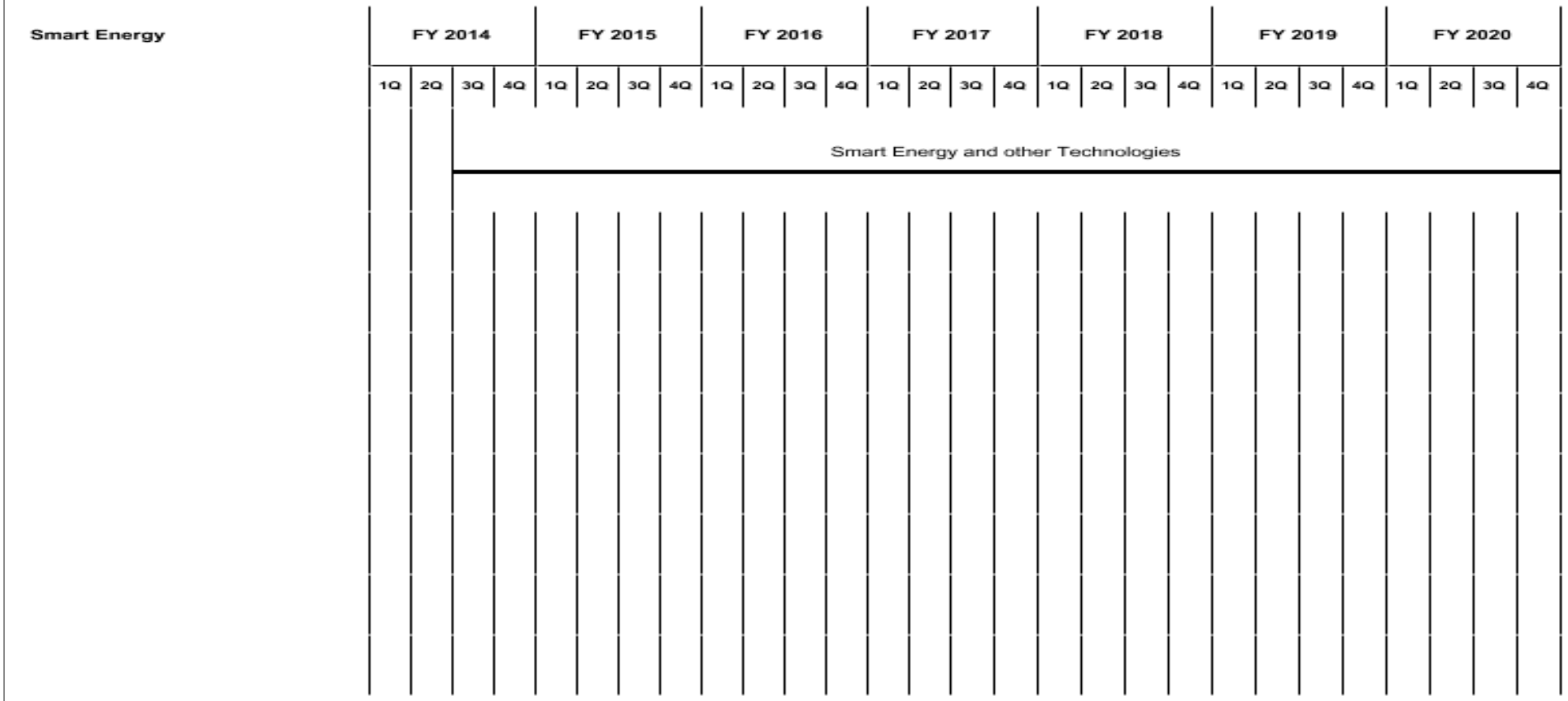

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

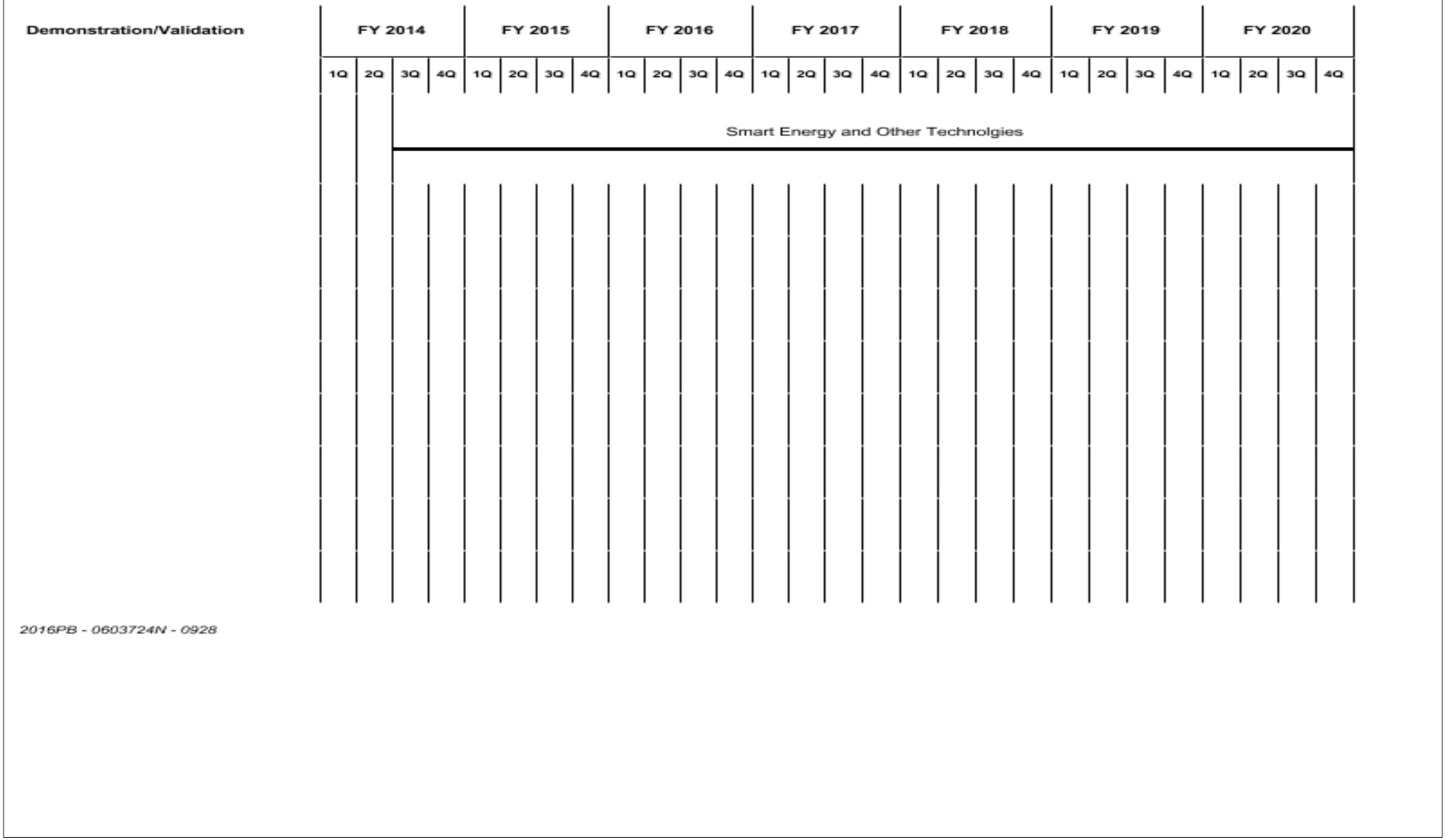

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Renewable Energy				
Technology Assessement	2	2014	4	2020
Concept of Employment	2	2014	4	2020
Prototype Construction	2	2014	4	2020
Demonstration	2	2014	4	2020
Smart Energy				
Technology Evaluation	3	2014	4	2020
Demonstration/Validation				
Smart Energy and Other Technologies	3	2014	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy											Date: February 2015	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*				Project (Number/Name) 0996 / *Aircraft Energy Conservation*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
0996: *Aircraft Energy Conservation*	40.789	25.968	30.036	23.955	-	23.955	27.859	25.502	24.726	24.974	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Energy Conservation (AIR-ENCON) 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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: Aircraft Energy Conservation	25.968	30.036	23.955	-	23.955
Articles:	-	-	-	-	-
FY 2014 Accomplishments: 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.					
FY 2015 Plans: Complete F135 compressor rig test and conduct Critical Design Review in support of F135 engine fuel burn reduction demonstration. Continue to identify, validate, and institutionalize energy conservation/efficiency concepts into the fleet. Continue validation of aircraft subsystem technologies and advance mission planning and navigation technologies for incorporation into legacy and emerging platforms.					
FY 2016 Base Plans: Conduct F135 fuel burn reduction engine demonstration. Continue identification, validation, and implementation of energy conservation/efficiency concepts into the fleet. Conduct validation of energy efficiency aircraft subsystem technologies and advanced planning and mission/navigation technologies.					
FY 2016 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	25.968	30.036	23.955	-	23.955

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 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 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0996 / *Aircraft Energy Conservation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.799	0.950	Nov 2013	1.530	Dec 2014	1.040	Nov 2015	-		1.040	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Lockheed Martin : Fort Worth, TX	0.000	0.505	Apr 2014	3.250	Feb 2015	-		-		-	-	3.755	3.755
Systems Engineering	C/CPFF	General Electric : Evendale, OH	0.475	1.661	Jul 2014	-		-		-		-	-	2.136	2.136
Systems Engineering	C/CPFF	TBD : TBD	0.000	0.064	Oct 2014	-		1.975	Mar 2016	-		1.975	-	2.039	2.039
Prior year Sys Eng no longer funded in the FYDP	Various	Various : Various	0.328	-		-		-		-		-	-	0.328	-
		Subtotal	2.602	3.180		4.780		3.015		-		3.015	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Testing	C/CPFF	PWA : Hartford, CT	35.132	19.373	Feb 2014	18.058	Dec 2014	15.400	Oct 2015	-		15.400	-	87.963	87.963
Hardware Testing	WR	NAWCAD : Patuxent River, MD	0.507	0.700	Nov 2013	0.400	Dec 2014	0.600	Nov 2015	-		0.600	Continuing	Continuing	Continuing
Hardware Testing	C/CPFF	Various : Various	0.000	-		2.800	Jun 2015	-		-		-	-	2.800	2.800
Hardware Testing	C/CPFF	Lockheed : Fort Worth, TX	0.000	1.300	Jul 2014	2.800	Jun 2015	4.554	May 2016	-		4.554	-	8.654	8.654
Prior year T&E no longer funded in the FYDP	Various	Various : Various	0.100	-		-		-		-		-	-	0.100	-
		Subtotal	35.739	21.373		24.058		20.554		-		20.554	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.361	0.500	Nov 2013	0.234	Dec 2014	0.386	Nov 2015	-		0.386	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	Deloitte Consulting : Alexandria, VA	0.000	0.915	Feb 2014	0.964	Apr 2015	-		-		-	-	1.879	1.879
Prog Mgnt no longer funded in the FYDP	Various	Various : Various	2.087	-		-		-		-		-	-	2.087	-
		Subtotal	2.448	1.415		1.198		0.386		-		0.386	-	-	-

	Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.789	25.968		30.036		23.955		-		23.955	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*

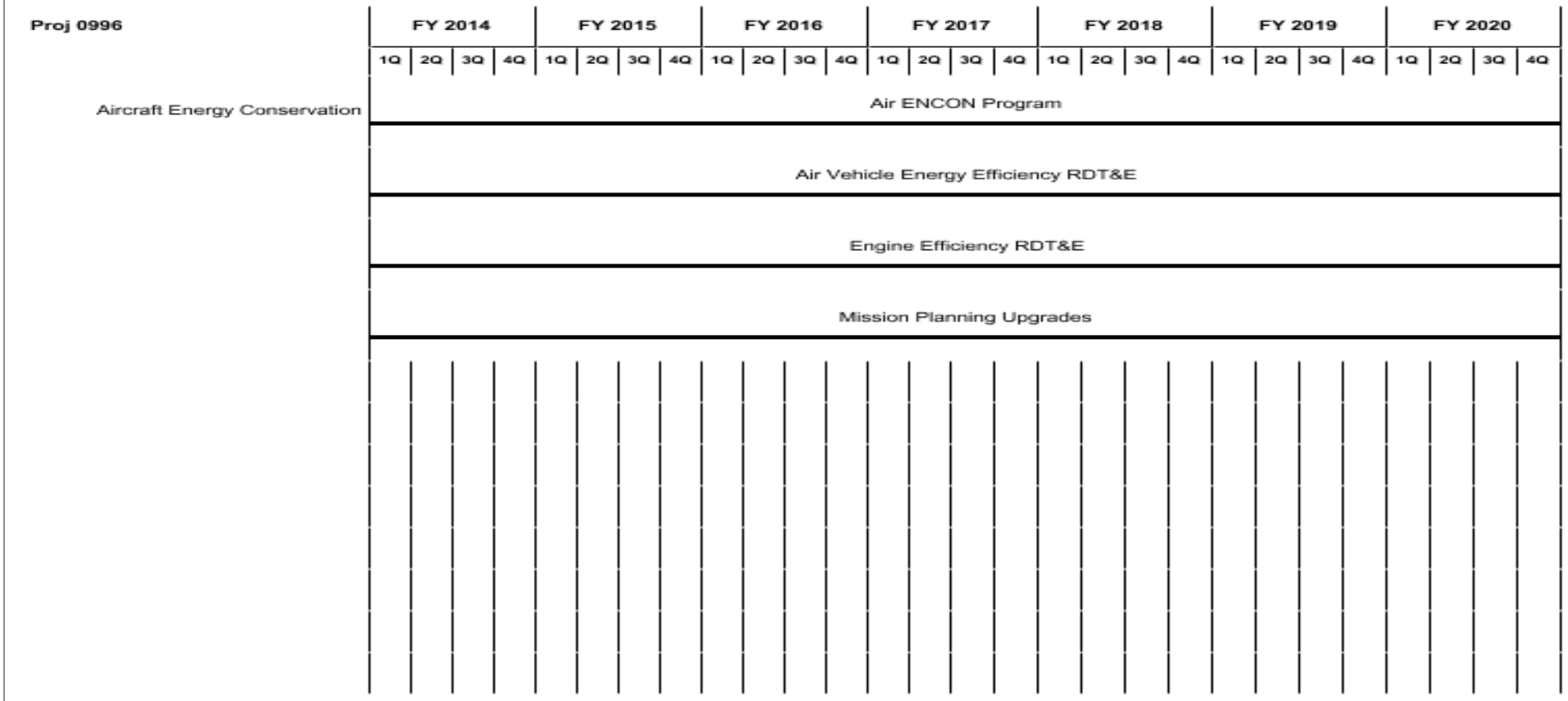

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0996				
Aircraft Energy Conservation: Air ENCON Program	1	2014	4	2020
Aircraft Energy Conservation: Air Vehicle Energy Efficiency RDT&E	1	2014	4	2020
Aircraft Energy Conservation: Engine Efficiency RDT&E	1	2014	4	2020
Aircraft Energy Conservation: Mission Planning Upgrades	1	2014	4	2020