Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											Date: May 2017	
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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	270.885	54.911	27.479	50.623	-	50.623	51.385	51.945	53.722	54.722	Continuing	Continuing
0829: *ENERGY CONSERVATION (ADV)*	59.467	8.216	5.065	10.080	-	10.080	11.281	11.485	12.644	12.894	Continuing	Continuing
0838: *Mobility Fuels (ADV)*	66.862	12.191	8.100	12.801	-	12.801	12.243	12.400	12.653	12.905	Continuing	Continuing
0928: *Shore Energy Technology*	48.733	1.519	1.025	2.732	-	2.732	2.884	2.922	2.961	2.951	Continuing	Continuing
0996: *Aircraft Energy Conservation*	95.823	20.916	13.289	25.010	-	25.010	24.977	25.138	25.464	25.972	Continuing	Continuing
9999: *Congressional Adds*	0.000	12.069	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.069

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	56.391	52.479	50.613	-	50.613
Current President's Budget	54.911	27.479	50.623	-	50.623
Total Adjustments	-1.480	-25.000	0.010	-	0.010
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.480	0.000			
• Program Adjustments	0.000	-25.000	0.063	-	0.063
• Rate/Misc Adjustments	0.000	0.000	-0.053	-	-0.053

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy	Date: May 2017
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*

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2016	FY 2017
Project: 9999: *Congressional Adds*		
Congressional Add: *Navy Energy Increase*	12.069	0.000
Congressional Add Subtotals for Project: 9999	12.069	0.000
Congressional Add Totals for all Projects	12.069	0.000

Change Summary Explanation

Schedule:

0838 - Fuel Quality/Develop Operational and Laboratory Techniques was added from 1Q FY18 through 4Q FY22 to improve/reduce cost of Naval tactical fuel quality analysis.

0838 - FY 2017 by $4.873M. Due to reduction Generation 4 Protocol was removed from schedule and Alternative Fuel Evaluations will complete at the end of FY17. Advanced BioFuel Testing ended 2nd QTR of FY17. Evaluate and Maintain compatibility with commercial aviation fuel specs was added as the program continues to support commercial compatibility.

0996 - FY 2017 by $14.586M. Due to reduction Mission Planning Upgrade was ended QTR2 of FY17.

The FY 2018 funding request was reduced by $0.937 million to account for the availability of prior year execution balances.

Technical: Not applicable.

Financial: $25.000 million reduction due to a shift in Department of the Navy (DoN) priorities and an urgent requirement to address emergent, critical unfunded requirements in FY17 . The reduction aligns Energy program funding to the previous amounts executed prior to FY2011.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy											Date: May 2017	
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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
0829: *ENERGY CONSERVATION (ADV)*	59.467	8.216	5.065	10.080	-	10.080	11.281	11.485	12.644	12.894	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 and increase operational capability (i.e., increase time on station). Potential technology target areas will include: Power Generation and Storage systems, Hull Hydrodynamics, Underwater Hull Husbandry, Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management, Main 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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Title: Hull Hydrodynamic Sub Project	0.406	0.114	1.144	0.000	1.144
Articles:	-	-	-	-	-
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.					
FY 2016 Accomplishments: Post availability performance trial (powering and maneuvering) to evaluate performance of bow bulb installation on KIDD was delayed until FY18 due to changing the installation from DDG 100 to DDG 103. Completed bow bulb fabrication and performed laser scan to validate fabrication within drawing tolerances. Conducted layup and storage of bow bulb for installation on DDG 103 in FY17. Worked with stakeholders to identify alternate ship for installation and ultimately chose DDG 103. Continue to identify additional energy saving/capability improvement technologies in Hull Hydrodynamic systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption.					
FY 2017 Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Due to FY 17 program reduction of $4.609M bow bulb installation on DDG 103 was cancelled. Planning was reduced to minimum effort in the event other funding is identified for installation. Task to investigate optimum trim for various classes on ships as an energy savings measure was stopped. ***FY 2018 Base Plans:*** Conduct post installation acoustic, and performance sea trial of bow bulb to assess performance. Provide interim and final bow bulb trial report. Continue to identify additional energy saving/capability improvement technologies in Hull Hydrodynamic domain to reduce drag and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2018 OCO Plans:*** N/A					
Title: Heating , Ventilation and Air Conditioning (HVAC) Sub Project ***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. ***FY 2016 Accomplishments:*** Completed LHD Thermal Management Control System (TMCS) laboratory testing of system and in process of installing on board LHD 2 for test and evaluation. Providing oversight of installation on LHD 2 during FY 16 availability scheduled to end Nov 2016. Continue to identify additional energy saving/capability improvement technologies in HVAC Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 Plans:*** Post installation testing of TMCS on LHD 2 is in progress and Subject Matter Expert will prepare report with recommendations for class-wide implementation. Continuing to identify additional energy saving/capability improvement technologies in HVAC Systems and preparing proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:***	2.258 -	0.240 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Thermal Management Sub Project	0.000	0.000	0.850	0.000	0.850
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 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Investigate exploration of waste heat technologies and methods for shipboard application. Expand scope of effort to include thermo-electric generation integration with shipboard systems and develop potential design applications and test requirements. Provide report of findings with recommendations. Continue to identify additional energy saving/capability improvement 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 2018 OCO Plans:*** N/A					
Title: Propulsion Systems Sub Project	0.000	0.114	0.386	0.000	0.386
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 2016 Accomplishments:*** N/A ***FY 2017 Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Podded propulsion study is only partially funded due to program reduction with only minimum effort limited to compiling feasible pod configurations. ***FY 2018 Base Plans:*** Continue efforts begun in FY17 and, as feasible, develop design requirements and identify potential ship class applications for Navy ships and plan going forward. Continue to identify additional energy saving/capability improvement technologies in Propulsion Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2018 OCO Plans:*** N/A					
Title: Electrical Systems SubProject ***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 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Investigate Micro-Grid technology for shipboard application and its potential to assist in managing the shipboard energy magazine and its impact for improving support of mission capability. Investigate other technologies that impact shipboard energy profile or assist in managing shipboard electrical distribution systems such as Non-Intrusive Load Monitoring (NILM). Continue to identify additional energy saving/capability improvement technologies in Electrical Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2018 OCO Plans:*** N/A	0.000 -	0.000 -	0.579 -	0.000 -	0.579 -
Title: Auxiliary Systems Sub Project ***Articles:***	0.250 -	0.209 -	0.556 -	0.000 -	0.556 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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 2016 Accomplishments:*** Installation of Advanced Reverse Osmosis (ARO) system in USS COMSTOCK (LSD 45) scheduled in February 2016 had to be rescheduled due to a change in the ship schedule and an alternate ship, USS CARTER HALL (LSD 50), has been selected. All ARO equipment qualification testing has been completed and ship installation drawings are being updated to reflect alternate ship. Conduct installation and testing of ARO in LSD 50 and provide performance evaluation report. Continue to identify additional energy saving/capability improvement technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 Plans:*** Installation of ARO in LSD 50 originally scheduled to begin Nov 16 was delayed until Jan 2017due to the ship schedule. Funding supports the testing and reporting of results for ARO and for the partial completion of a Variable Speed Drive study that has to be stopped due to the FMB withhold. ***FY 2018 Base Plans:*** Based on prior year installation and evaluation of ARO on LSD class ship develop design, testing and installation plans for extending this technology to LPD 17 Class ship for evaluation. Effort will include design, material procurement, land-based testing as required, drawing development and selection of ship for installation and test. Continue to identify additional energy saving/capability improvement technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2018 OCO Plans:*** N/A					
Title: Underwater Hull Husbandry Sub Project	0.000	0.000	0.139	0.000	0.139
Articles:	-	-	-	-	-
Description: Hull Husbandry Sub Project - Project funds will be utilized to identify and evaluate new underwater hull/propeller coating systems and underwater hull cleaning and maintenance techniques to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency.					
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Investigate Navy Bio-Fouling initiatives aimed at developing maintenance strategies and anti-fouling coatings for the hulls and propellers of Navy ships as part of a comprehensive bio-fouling program. Continue to identify additional energy saving/capability improvement technologies in Underwater Hull Husbandry domain to reduce drag and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2018 OCO Plans:*** N/A					
Title: Energy Monitoring & Assessment	5.302	4.388	6.426	0.000	6.426
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. ***FY 2016 Accomplishments:*** Continued Global Energy Information System (GENISYS) development efforts and establishment as Program of Record for Fleet Energy Conservation Dashboard (FECD), Vessel Fuel Utilization Tool (VFUT), Shipboard Energy Assessment System (SEAS), and Electronic Logbooks (eLogBook) aimed at supporting a CY 16 GGF demonstration and initial integration of energy monitoring capability for fleet assets. Completed installation and conducting post installation evaluation of the TRITON Hull Assessment Tool installed in DDG 102 and monitoring performance. Monitoring performance of Shipboard Energy Dashboard (SED) installed in LPD 25 and finalizing Energy Summary Report format for stakeholder review. Reviewing eRM requirements as they relate to energy as the program transitions to a Program of Record as the next generation of the Integrated Condition Assessment System (ICAS). Providing engineering, technical and programmatic support of energy initiatives that put in place shore and shipboard monitoring and assessment tools aimed at optimizing ships' energy profiles and increasing operational capabilities. Continue to identify additional energy saving/capability					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
improvement technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 Plans:*** Provide engineering, technical and programmatic support of energy initiatives that put in place shore and shipboard monitoring and assessment tools aimed at optimizing ships' energy profiles and increasing operational capabilities. Continue GENISYS development efforts and shipboard evaluation of FECD, VFUT, SEAS, and eLogBooks to support future fleet-wide implementation. Continue monitoring shipboard installation of TRITON and provide final report with recommendations for implementation. Continue to identify additional energy saving/ capability improvement technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2018 Base Plans:*** Provide engineering, technical and programmatic support of energy initiatives that put in place shore and shipboard monitoring and assessment tools aimed at optimizing ships' energy profiles and increasing operational capabilities. Continue GENISYS development efforts and shipboard evaluation including integration of enterprise Remote Monitoring (eRM) capabilities to support future fleet-wide implementation. Based on successful evaluation of TRITON prototype installation, complete qualification testing of equipment for fleet wide implementation. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.216	5.065	10.080	0.000	10.080

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDT&E Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.000	Jan 2016	0.245	Jan 2017	0.440	Jan 2018	-		0.440	0.000	0.685	-
Systems Engineering	WR	NSWC DD : Dahlgren, MD	0.000	0.000		0.000	Nov 2016	0.000		-		0.000	0.000	0.000	-
Systems Engineering	WR	NSWC PHila : Philadelphia, PA	0.000	0.821	Jan 2016	0.132	Nov 2016	1.806	Nov 2017	-		1.806	0.000	2.759	-
Primary Hardware Development	WR	NSWC Carderock : Bethesda, MD	8.983	0.000	Jan 2016	0.410	Nov 2016	0.000		-		0.000	0.000	9.393	-
Systems Engineering	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Systems Engineering	C/CPAF	NSWC Carderock : Bethesda, MD	6.635	0.000		0.000		0.000		-		0.000	0.000	6.635	-
Engineering Development	WR	NSWC Carderock : Bethesda, MD	7.848	0.000		0.000		0.681	Dec 2017	-		0.681	0.000	8.529	-
Demonstration & Evaluation	WR	NSWC Carderock : Bethesda, MD	7.383	0.766	Jan 2016	0.000		0.000		-		0.000	0.000	8.149	-
System Development	C/BOA	NAWC-AD : Lakehurst, NJ	0.000	0.000		1.300	Jan 2017	2.317	Jan 2018	-		2.317	0.000	3.617	-
		Subtotal	30.849	1.587		2.087		5.244		-		5.244	0.000	39.767	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC Carderock : Bethesda, MD	2.700	0.143	Jan 2016	0.000		0.413	Jan 2018	-		0.413	Continuing	Continuing	Continuing
Software Support	WR	NSWC Carderock : Bethesda, MD	0.450	0.072	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NSWC Carderock : Bethesda, MD	1.200	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Study Anaylsis	WR	NSWC Carderock : Bethesda, MD	1.174	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0829 / *ENERGY CONSERVATION (ADV)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	C/CPAF	NSWC SSES : Philadelphia, PA	0.000	0.878	Jan 2016	0.000		0.220	Jan 2018	-		0.220	0.000	1.098	-
Development Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.100	Jan 2016	0.867	Oct 2017	0.677	Feb 2018	-		0.677	0.000	1.644	-
Software Support	C/CPAF	NSWC SSES : Philadelphia, PA	0.000	0.281	Jan 2016	0.000		0.000		-		0.000	0.000	0.281	-
Software Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	1.200	Jan 2016	0.000		0.000		-		0.000	0.000	1.200	-
Development Support	WR	NSWC PHila : Philadelphia, PA	0.000	0.000		0.124	Nov 2016	0.781	Dec 2017	-		0.781	0.000	0.905	-
		Subtotal	5.524	2.674		0.991		2.091		-		2.091	-	-	-

Remarks

FY16 majority Development and Software support will move to NAVSEA/NSWC SSES from NSWC Carderock.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	9.961	0.000	Feb 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	6.678	1.697	Feb 2016	0.179	Nov 2016	0.682	Nov 2017	-		0.682	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	C/CPAF	NSWC SSES : Philadelphia, PA	0.000	0.383	Feb 2016	0.000		0.000		-		0.000	0.000	0.383	-
Operational Test & Evaluation	WR	NSWC Caderock : Bethesda, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Developmental Test & Evaluation	WR	NSWC Phila : Philadelphia, PA	0.000	0.000		0.445	Nov 2016	0.198	Feb 2018	-		0.198	0.000	0.643	-
		Subtotal	17.021	2.080		0.624		0.880		-		0.880	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC PHila : Philadelphia, PA	5.552	0.628	Oct 2015	0.317	Nov 2016	0.610	Nov 2017	-		0.610	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA HQ : Washington, DC	0.169	0.007	Sep 2016	0.013	Nov 2016	0.013	Dec 2017	-		0.013	Continuing	Continuing	Continuing
Total Assets	WR	NSWC Carderock : Bethesda, MD	0.352	0.000		0.000		0.000		-		0.000	0.000	0.352	-
Program Management Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.890	Jan 2016	0.757	Jan 2017	0.847	Jan 2018	-		0.847	0.000	2.494	-
Program Management Support	WR	NSWC Caderock : Bethesda, MD	0.000	0.350	Oct 2015	0.276	Nov 2016	0.395	Nov 2017	-		0.395	0.000	1.021	-
		Subtotal	6.073	1.875		1.363		1.865		-		1.865	-	-	-

Remarks

FY 18 includes Financial Management function and increased contractor support for GENISYS.

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	59.467	8.216		5.065		10.080		-		10.080	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

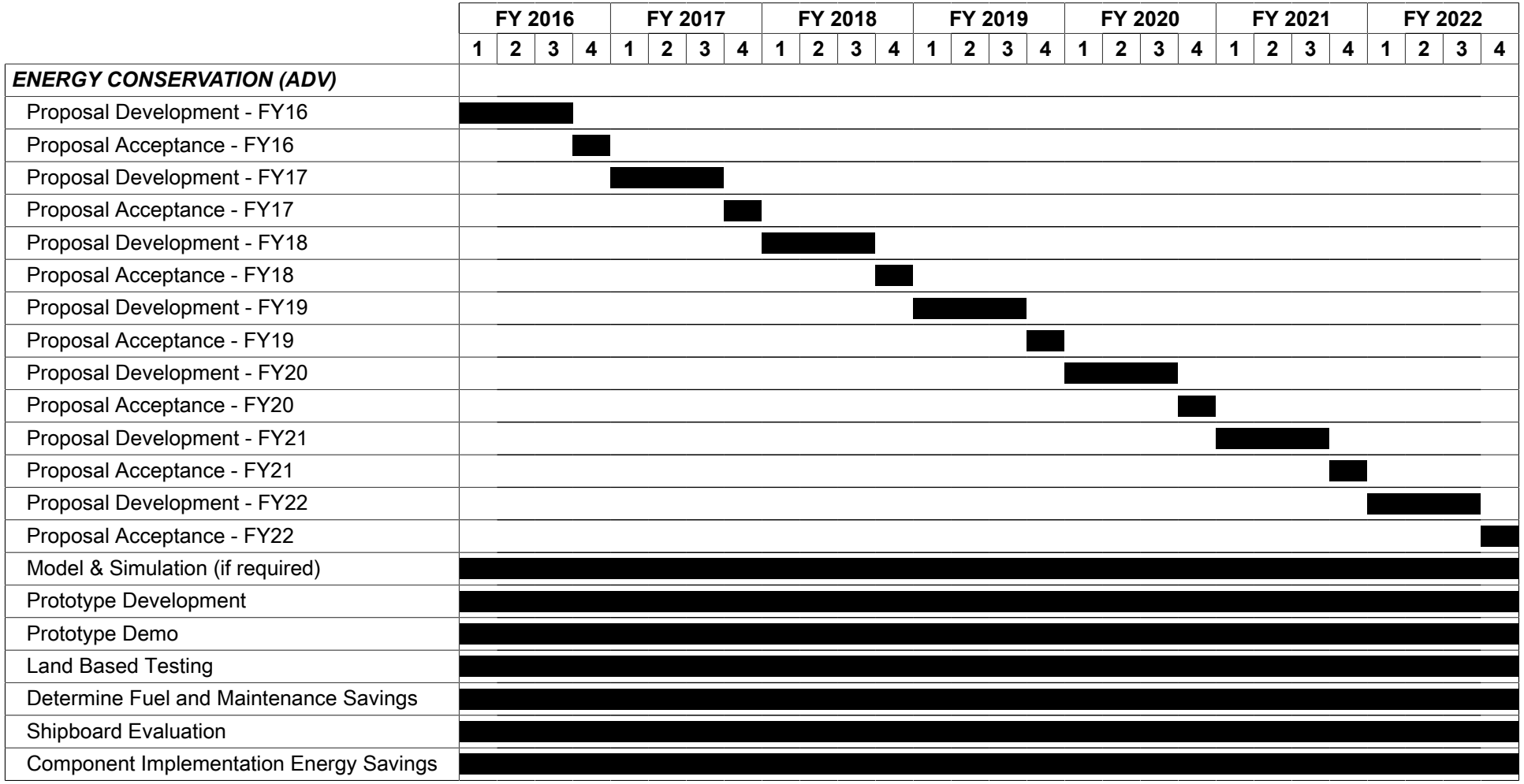


Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ENERGY CONSERVATION (ADV)				
Proposal Development - FY16	1	2016	3	2016
Proposal Acceptance - FY16	4	2016	4	2016
Proposal Development - FY17	1	2017	3	2017
Proposal Acceptance - FY17	4	2017	4	2017
Proposal Development - FY18	1	2018	3	2018
Proposal Acceptance - FY18	4	2018	4	2018
Proposal Development - FY19	1	2019	3	2019
Proposal Acceptance - FY19	4	2019	4	2019
Proposal Development - FY20	1	2020	3	2020
Proposal Acceptance - FY20	4	2020	4	2020
Proposal Development - FY21	1	2021	3	2021
Proposal Acceptance - FY21	4	2021	4	2021
Proposal Development - FY22	1	2022	3	2022
Proposal Acceptance - FY22	4	2022	4	2022
Model & Simulation (if required)	1	2016	4	2022
Prototype Development	1	2016	4	2022
Prototype Demo	1	2016	4	2022
Land Based Testing	1	2016	4	2022
Determine Fuel and Maintenance Savings	1	2016	4	2022
Shipboard Evaluation	1	2016	4	2022
Component Implementation Energy Savings	1	2016	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0838: *Mobility Fuels (ADV)*	66.862	12.191	8.100	12.801	-	12.801	12.243	12.400	12.653	12.905	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) ensure interoperability with commercial specifications, (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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Naval Tactical Fuels	12.191	8.100	12.801	0.000	12.801
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 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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 2017 Plans:*** Evaluate production pathways that are being proposed for inclusion into commercial aviation fuel specification to determine compatibility with naval aircraft. Conduct research, development, and test and evaluation to mitigate field identified aviation and ship propulsion fuel deficiencies. Initiate testing to support fleet driven request to evaluate hardware impact of single fuel operations. ***FY 2018 Base Plans:*** Expand availability of Naval tactical fuels by qualifying non-petroleum sources/production pathways for inclusion into the JP-5 and JP-8 specifications. Conduct research, development, test, and evaluation to mitigate field-identified aviation and ship propulsion fuel deficiencies. Conduct research, development, test, and evaluation to improve/reduce cost of Naval tactical fuel quality surveillance and analysis. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	12.191	8.100	12.801	0.000	12.801

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Testing efforts will be competitively contracted, and performed under Cost Plus Fixed Fee and Firm Fixed Price contracts.

E. Performance Metrics

Program will assess changes and develop data, test methods and hardware performance analysis for all Naval aircraft and ships. Program will evaluate fuel chemistry and properties.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NRL : Washington, D.C.	3.457	0.745	Feb 2016	0.850	Nov 2016	0.800	Dec 2017	-		0.800	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	12.163	2.255	Nov 2015	2.400	Nov 2016	2.297	Dec 2017	-		2.297	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Philadelphia, PA	3.076	0.432	Jan 2016	0.270	Jan 2017	0.500	Jan 2018	-		0.500	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Bethesda, MD	0.278	0.034	Dec 2015	0.000		0.200	Feb 2018	-		0.200	Continuing	Continuing	Continuing
Systems Engineering	C/FFP	Various : Various	0.000	0.000		0.960	Mar 2017	1.300	Mar 2018	-		1.300	0.000	2.260	2.260
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	0.161	0.000		0.000		0.000		-		0.000	0.000	0.161	-
		Subtotal	19.135	3.466		4.480		5.097		-		5.097	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Fuel	C/FFP	Various : Various	2.000	0.000		0.000		1.000	May 2018	-		1.000	0.000	3.000	3.000
Test Fuel	C/FFP	Applied Research Associates : Albuquerque, NM	0.000	3.858	Dec 2015	0.000		0.000		-		0.000	0.000	3.858	3.858
Hardware Testing	WR	NAWCAD : Patuxent River, MD	3.149	1.200	Feb 2016	0.100	Nov 2016	1.043	Dec 2017	-		1.043	Continuing	Continuing	Continuing
Hardware Testing	C/CPFF	Life Cycle Engineering : Charleston, SC	7.688	2.342	Feb 2016	2.950	Apr 2017	2.000	Dec 2017	-		2.000	0.000	14.980	14.980
Hardware Testing	SS/CPFF	Rolls Royce : Indianapolis, IN	2.450	0.462	Feb 2016	0.000		0.000		-		0.000	0.000	2.912	2.912
Hardware Testing	C/CPFF	Univ of Dayton Research Inst : Dayton, OH	0.434	0.255	May 2016	0.200	Apr 2017	0.000		-		0.000	0.000	0.889	0.889
Hardware Testing	WR	US Naval Academy : Annapolis, MD	0.098	0.000		0.000		0.050	May 2018	-		0.050	0.000	0.148	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Testing	C/CPFF	General Electric : Lynn, MA	1.237	0.000		0.000		0.000		-		0.000	0.000	1.237	1.237
Hardware Testing	WR	NSWC : Philadelphia, PA	0.080	0.000		0.000		0.000		-		0.000	0.000	0.080	-
Hardware Testing	C/FFP	Various : Various	1.509	0.000		0.000		3.200	Mar 2018	-		3.200	0.000	4.709	4.709
Hardware Testing	WR	NSWC : Port Hueneme, CA	0.000	0.200	May 2016	0.000		0.000		-		0.000	0.000	0.200	-
Hardware Testing	C/CPFF	DL Mgmt Services JT Venture : Plainfield, IL	0.000	0.004	Mar 2016	0.000		0.000		-		0.000	0.000	0.004	0.004
Fuel Delivery	MIPR	DLA-Energy : Ft. Belvoir, VA	0.195	0.302	Dec 2015	0.150	Dec 2016	0.000		-		0.000	0.000	0.647	-
Fuel Blend Testing	WR	Naval Medical Research Unit : Dayton, OH	0.042	0.000		0.000		0.000		-		0.000	0.000	0.042	-
Prior year T & E no longer funded in the FYDP	Various	Various : Various	21.212	0.000		0.000		0.000		-		0.000	0.000	21.212	-
		Subtotal	40.094	8.623		3.400		7.293		-		7.293	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	1.003	0.085	Nov 2015	0.203	May 2017	0.393	Dec 2017	-		0.393	Continuing	Continuing	Continuing
Program Management Support	WR	NAVSUP : San Diego, CA	0.017	0.005	Nov 2015	0.005	Nov 2017	0.006	Nov 2017	-		0.006	Continuing	Continuing	Continuing
Program Management Support	C/FFP	Coord Research Council : Alpharetta, GA	0.030	0.010	Dec 2015	0.010	Dec 2017	0.010	Nov 2017	-		0.010	0.000	0.060	0.060
Program Management Support	WR	NAVSEA : Washington, DC	0.000	0.002	Jan 2016	0.002	Apr 2017	0.002	Nov 2017	-		0.002	0.000	0.006	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

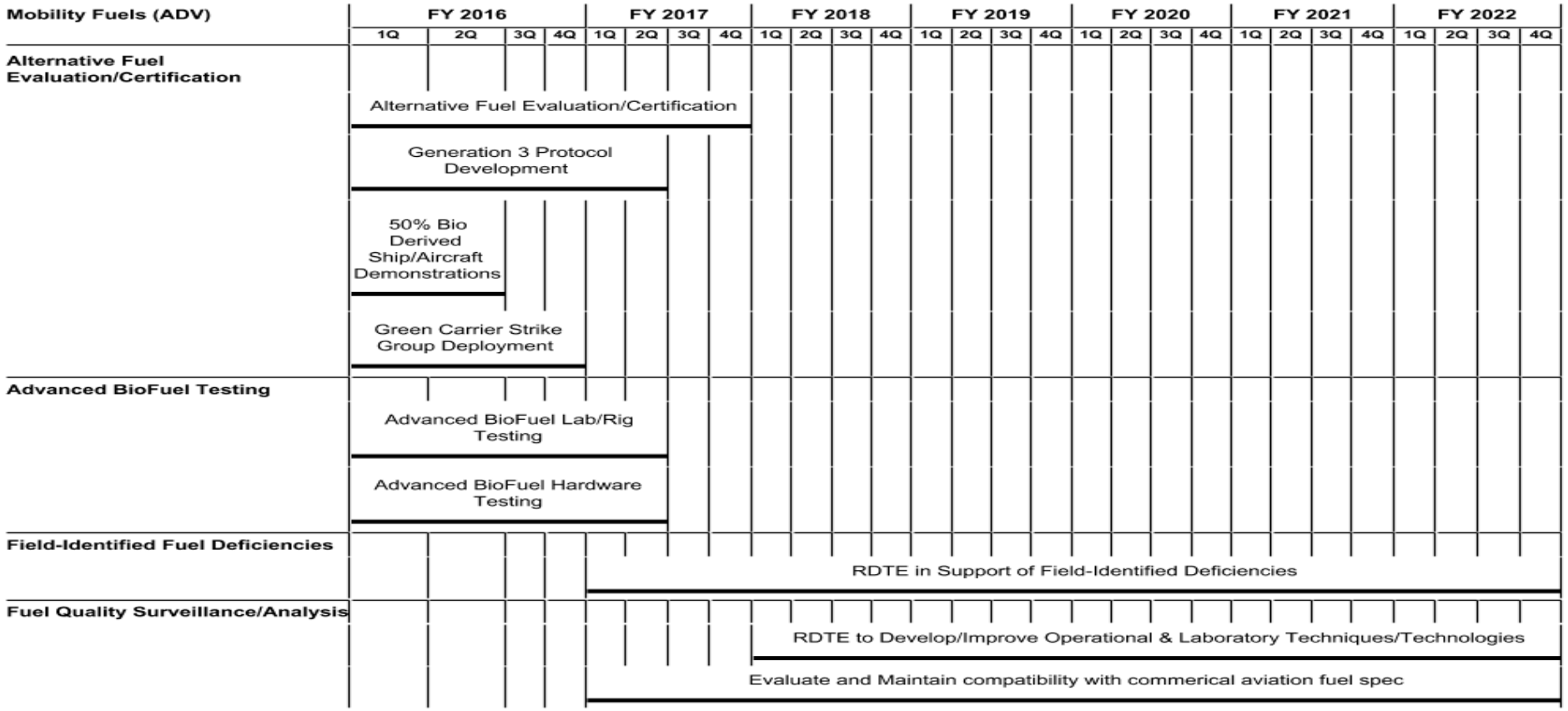
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Mgmt Supp no longer funded in the FYDP	Various	Various : Various	6.583	0.000		0.000		0.000		-		0.000	0.000	6.583	-
		Subtotal	7.633	0.102		0.220		0.411		-		0.411	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	66.862	12.191		8.100		12.801		-		12.801	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0838 / *Mobility Fuels (ADV)*



2018OSD - 0603724N - 0838

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
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: Alternative Fuel Evaluation/Certification	1	2016	4	2017
Alternative Fuel Evaluation/Certification: Generation 3 Protocol Development	1	2016	2	2017
Alternative Fuel Evaluation/Certification: 50% Bio Derived Ship/Aircraft Demonstrations	1	2016	2	2016
Alternative Fuel Evaluation/Certification: Green Carrier Strike Group Deployment	1	2016	4	2016
Advanced BioFuel Testing: Advanced BioFuel Lab/Rig Testing	1	2016	2	2017
Advanced BioFuel Testing: Advanced BioFuel Hardware Testing	1	2016	2	2017
Field-Identified Fuel Deficiencies: RDTE in Support of Field-Identified Fuel Deficiencies	1	2017	4	2022
Fuel Quality Surveillance/Analysis: RDTE to Develop/Improve Operational & Laboratory Techniques/Technologies	1	2018	4	2022
Fuel Quality Surveillance/Analysis: Evaluate and Maintain compatibility with commerical aviation fuel spec	1	2017	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0928 / *Shore Energy Technology*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0928: *Shore Energy Technology*	48.733	1.519	1.025	2.732	-	2.732	2.884	2.922	2.961	2.951	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 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Directed Energy Research	1.519	1.025	2.732	0.000	2.732
Articles:	-	-	-	-	-
FY 2016 Accomplishments: FY16 completed projects initiated in FY14 and FY15. - Completed evaluation of environmental impacts of ocean renewable energy generation systems. - Completed evaluating and testing Wave Energy Systems.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Shore Energy Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Completed evaluation for ocean compressed air storage technologies and SWAC optimization. - Initiated 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 included: - Completed demonstration, testing, deployment, and evaluation of smart energy and micro-grid management technology; and begin development of technical specifications. - Completed 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 has reduced 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 2017 Plans: FY17 will focus on completing or continuing projects initiated in FY15 and FY16. - Continue evaluating and testing Wave Energy Systems to include power generation, to grid integration and monitoring of environmental effects of these systems. - Continue demonstration, testing, and evaluation of improved and low cost smart and micro grid energy management technologies. -Initiate demonstration and validation of new energy storage, energy efficiency, and renewables technologies. -Defer demonstration of new alternative vehicle technologies and CYBER secure technologies to FY18. OCO: N/A.					
FY 2018 Base Plans: FY18 will focus on completing or continuing projects initiated in FY16 and FY17. - Continue demonstration, testing, and evaluation of improved and low cost smart and micro grid energy management technologies. - Continue demonstration and validation of new energy storage, energy efficiency, and renewable technologies.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Shore Energy Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Initiate demonstration of cyber secure technologies utilizing cyber testbed. - Continue to support Energy Program effort for Smart Grid Analytics, Shore Energy Research, Energy Restoration and Modernization. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.519	1.025	2.732	0.000	2.732

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 25% Renewable Energy Increase by 2025.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0996: *Aircraft Energy Conservation*	95.823	20.916	13.289	25.010	-	25.010	24.977	25.138	25.464	25.972	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Aircraft Energy Conservation	20.916	13.289	25.010	0.000	25.010
Articles:	-	-	-	-	-
FY 2016 Accomplishments: 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 2017 Plans: Complete analysis of F135 fuel burn reduction engine demonstration. Conduct flight testing of F-18 trim optimization algorithms. Continue identification, validation, and implementation of fleet best practices and metrics. Evaluate advanced engine efficiency technologies for F-18, MQ-8C and H-53.					
FY 2018 Base Plans: Continue identification, validation, and implementation of energy conservation/efficiency concepts. Conduct evaluation, development, and validation of energy efficiency aircraft subsystem technologies. Core efforts such as identification, development and validation of fleet best practices and validation of an advanced algorithm to optimize the trim/ reduce the drag of the F-18 during flight will continue. Projects still in consideration for FY17 down select and continuance into FY-18 include advance fuel efficient engine technologies for multiple platforms, advanced mission planning technologies, utilization of the trim optimization algorithm in other platforms and the use of a recuperative technology to improve the engine efficiency of the MQ-8C.					
FY 2018 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Accomplishments/Planned Programs Subtotals	20.916	13.289	25.010	0.000	25.010

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: FY 2018 Navy			Date: May 2017
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 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Patuxent River, MD	3.849	0.841	Dec 2015	0.955	Nov 2016	1.590	Nov 2017	-		1.590	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Lockheed Martin : Fort Worth, TX	0.684	0.000		0.000		0.000		-		0.000	0.000	0.684	0.684
Systems Engineering	C/FFP	The Boeing Co. : St. Louis, MO	0.400	0.000		0.000		1.200	Jan 2018	-		1.200	0.000	1.600	1.600
Systems Engineering	C/CPFF	TBD : TBD	0.064	0.000		0.000		0.000		-		0.000	0.000	0.064	0.064
Systems Engineering	C/CPFF	The Boeing Company : Seattle, WA	0.000	0.000		1.150	Jan 2017	0.000		-		0.000	0.000	1.150	1.150
Systems Engineering	C/CPFF	Various : Various	0.000	0.000		3.669	Jan 2017	12.645	Mar 2018	-		12.645	0.000	16.314	16.314
Prior year Sys Eng no longer funded in the FYDP	Various	Various : Various	2.464	0.000		0.000		0.000		-		0.000	0.000	2.464	-
Systems Engineering	C/FFP	General Electric : Lynn, MA	0.000	0.000		0.000		1.500	Dec 2017	-		1.500	0.000	1.500	1.500
Systems Engineering	C/BA	Deloitte Consulting : Alexandria, VA	0.000	0.000		0.700	Jul 2017	0.900	Jan 2018	-		0.900	0.000	1.600	1.600
		Subtotal	7.461	0.841		6.474		17.835		-		17.835	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Testing	C/CPFF	PWA : Hartford, CT	78.598	17.113	Nov 2015	4.140	Oct 2016	0.000		-		0.000	0.000	99.851	99.851
Hardware Testing	WR	NAWCAD : Patuxent River, MD	1.807	0.378	Dec 2015	2.400	Nov 2016	0.733	Nov 2017	-		0.733	Continuing	Continuing	Continuing
Hardware Testing	C/CPFF	Lockheed : Fort Worth, TX	3.134	0.000		0.000		0.000		-		0.000	0.000	3.134	3.134
Prior year T&E no longer funded in the FYDP	Various	Various : Various	0.100	0.000		0.000		6.000	Feb 2018	-		6.000	0.000	6.100	-
Test and Evaluation	C/CPFF	The Boeing Company : Seattle, WA	0.000	1.500	Aug 2016	0.000		0.000		-		0.000	0.000	1.500	1.500

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0996 / *Aircraft Energy Conservation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	83.639	18.991		6.540		6.733		-		6.733	-	-	-

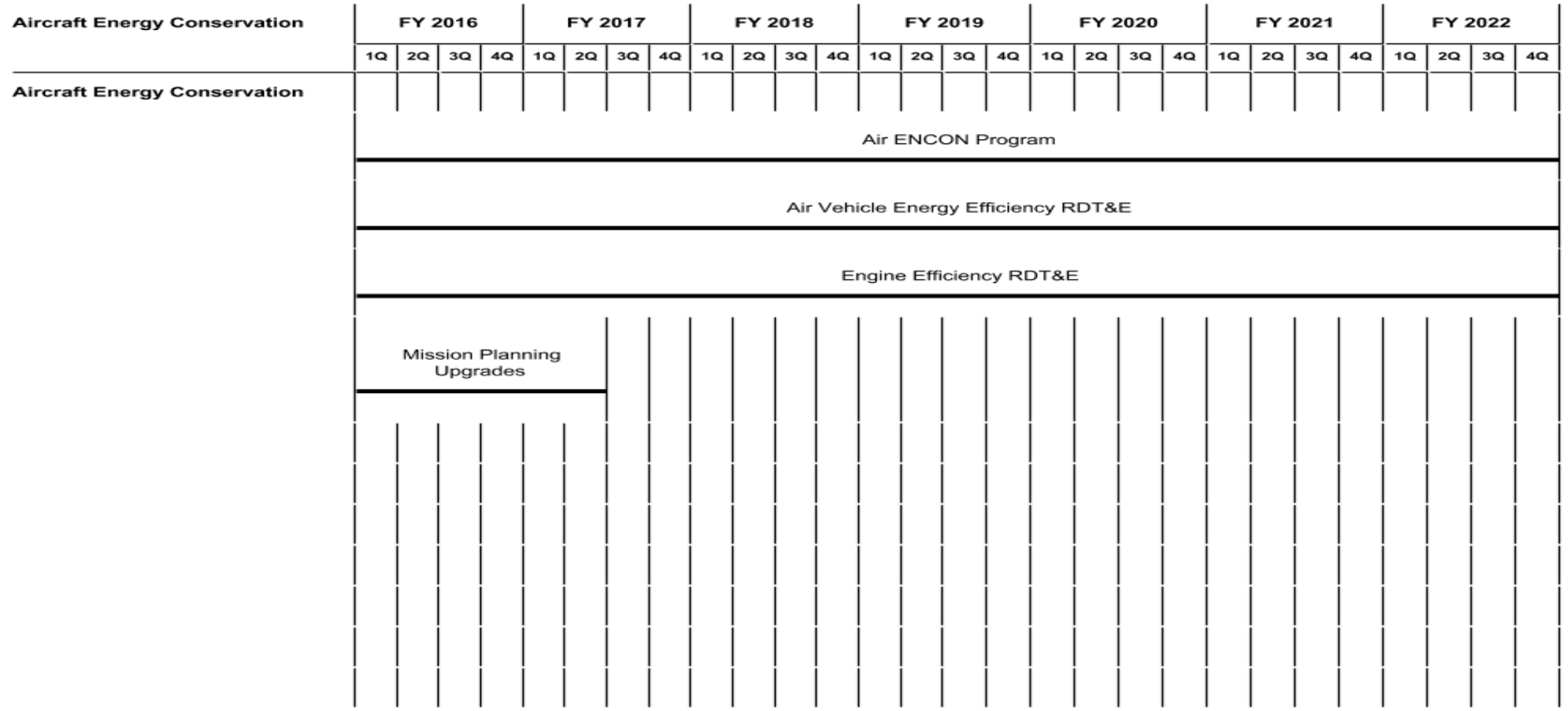
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	1.095	0.200	Nov 2015	0.275	Nov 2016	0.442	Nov 2017	-		0.442	Continuing	Continuing	Continuing
Program Management Support	C/FFP	Deloitte Consulting : Alexandria, VA	1.531	0.884	Nov 2015	0.000		0.000		-		0.000	0.000	2.415	2.415
Program Management Support	WR	NAWCWD : China Lake, CA	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	-
Prog Mgnt no longer funded in the FYDP	Various	Various : Various	2.087	0.000		0.000		0.000		-		0.000	0.000	2.087	-
		Subtotal	4.723	1.084		0.275		0.442		-		0.442	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	95.823	20.916		13.289		25.010		-		25.010	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*



2018OSD - 0603724N - 0996

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
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**
Aircraft Energy Conservation				
Aircraft Energy Conservation: Air ENCON Program	1	2016	4	2022
Aircraft Energy Conservation: Air Vehicle Energy Efficiency RDT&E	1	2016	4	2022
Aircraft Energy Conservation: Engine Efficiency RDT&E	1	2016	4	2022
Aircraft Energy Conservation: Mission Planning Upgrades	1	2016	2	2017

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	12.069	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.069
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add for Hydrokinetic Energy Research

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017
Congressional Add: Navy Energy Increase	12.069	0.000
FY 2016 Accomplishments: N/A		
FY 2017 Plans: N/A		
Congressional Adds Subtotals	12.069	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDTEN Contracts are Competitive Procurements

E. Performance Metrics

Quarterly Program Reviews