FY 2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Feb 2004
Exhibit R-2

BA: 04 PROGRAM ELEMENT: 0603724N
PROGRAM ELEMENT TITLE: Navy Energy Program

COST: (Dollars in Thousands)

Project Number & Title	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
Total PE	14,712	4,636	1,494	1,624	1,613	1,558	1,704
0829 ENERGY CONSERVATION (ADV)	2,779	0	0	0	0	0	0
0838 MOBILITY FUELS (ADV)	2,132	1,694	1,494	1,624	1,613	1,558	1,704
2868 Proton Exchange Membrane (PEM) Fuel Cells	4,302	2,942	0	0	0	0	0
9206 Plasma Energy Pyrolysis	3,824	0	0	0	0	0	0
9207 Thermally Activiated Chiller/Heater	1,675	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports projects to evaluate, adapt, and demonstrate energy related technologies for Navy ships and aircraft operations to: (a) increase fuel-related weapons systems capabilities such as range and time on station; (b) reduce energy costs; (c) apply energy technologies that improve environmental compliance; (d) relax unnecessarily restrictive fuel specification requirements to reduce cost and increase availability worldwide; (e) provide guidance to fleet operators for the safe use of commercial grade or off-specification fuels when military specification fuels are unavailable or in short supply; and (f) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems. This program, and the companion PE 0604710N, Navy Energy Program (ENG) support the achievement of legislated, White House, Department of Defense and Navy Energy Management Goals. It also responds to direction from the Office of the Secretary of Defense, the Secretary of the Navy and the Chief of Naval Operations to make up-front investment in technologies that reduce future cost of operation and ownership of the fleet and supporting infrastructure.

BA: 04 PROGRAM ELEMENT: 0603724N
PROGRAM ELEMENT TITLE: Navy Energy Program

PROGRAM CHANGE SUMMARY:

	FY 2003	FY 2004	FY 2005
FY 2004-2005 President's Budget Submission	14,975	1,713	1,880
Cong. Rescissions/Adjustments/Undist.Reductions	0	-52	0
Congressional Actions	0	2,975	0
Misc. Adjustments	-263	0	-14
Technical Adjustments	0	0	-400
FY 2005 President's Budget Submission	14,712	4,636	1,494

PROGRAM CHANGE SUMMARY EXPLANATION:

Technical: Not applicable.
Schedule: Not applicable.

BA: 04 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program
PROJECT NUMBER: 0829 PROJECT TITLE: ENERGY CONSERVATION (ADV)

COST: (Dollars in Thousands)

Project Number & Title	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
0829 ENERGY CONSERVATION (ADV)	2,779	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project improved the energy efficiency of Navy ships and aircraft, and thereby contributed to reduced operating costs and improved fleet sustainability and performance. Major efforts included work to increase the efficiency of aircraft engines; and develop improved hull drag reducing technologies and more efficient energy conversion systems for ships.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2003	FY 2004	FY 2005
Shipboard Energy Conservation	2,779	0	0

This effort improved the energy efficiency of Navy ships by developing more efficient shipboard machinery and electrical systems and improved hull drag reducing technologies.

FY 2003 Accomplishments:

• Completed full scale ship trials of self-polishing copper/cobiocide hull coatings.
• Completed development and testing of fuel consumption optimization algorithms for digital gas turbine engine control systems.
• Completed development and testing of variable speed drives for 2000 gallon per minute five pumps and LM2500 gas turbine engine cooling module fans.

FY 2004 Plans:

Not applicable

BA: 04 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program
PROJECT NUMBER: 0829 PROJECT TITLE: ENERGY CONSERVATION (ADV)

FY 2005 Plans:

Not applicable

C. OTHER PROGRAM FUNDING SUMMARY:

NAVY RELATED RDT&E:
PE 0601153N (Defense Research Sciences)
PE 0602236N (Warfighter Sustainment Applied Research)
PE 0603236N (Warfighter Sustainment Advanced Technology)
PE 0603513N (Shipboard Systems Component Development)
PE 0603573N (Advanced Surface Machinery Systems)
PE 0603721N (Environmental Protection)
PE 0604710N (Navy Energy Program (ENG))

NON-NAVY RELATED RDT&E: Not applicable

D. ACQUISITION STRATEGY:

Not applicable

FY 2005 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: Feb 2004
Exhibit R-3

BA: 04 PROGRAM ELEMENT: 0603724N
PROJECT ELEMENT TITLE: NAVY ENERGY PROGRAM

Project Number: R0829
Project Title: ENERGY CONSERVATION (ADV)

A. PROJECT COST BREAKDOWN: ($ in thousands)

Project Cost Categories	FY 2003	FY 2004	FY 2005
a. System Development and Integration	2,779	-	-

B. BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: Not applicable.

FY 2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Feb 2004
Exhibit R-2a

BA: 04 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program
PROJECT NUMBER: 0838 PROJECT TITLE: MOBILITY FUELS (ADV)

Project Number & Title	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
0838 MOBILITY FUELS (ADV)	2,132	1,694	1,494	1,624	1,613	1,558	1,704

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFCATION:

This project provides data through engine and fuel system tests which relate the effects of changes in Navy fuel procurement specification properties to the performance and reliability of Naval ship and aircraft engines and fuel systems. This information is required to: (a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; (b) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military specification fuels are unavailable or in short supply; and (c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry. Recent problems with fuel quality have adversely affected ship and aircraft system performance and reliability and resulted in degradation of fuel in storage. The resulting readiness impacts, additional maintenance costs, and the cost of lost equipment, although difficult to quantify, are many times the cost of this project. Over the next decade, the potential for fuel quality related problems will increase because of changing industry practices required to comply with new environmental regulations. This project represents the only investment designed to maintain the Navy's ability to operate as a "smart" customer for fuels that cost over $2B per year to procure, transport, store and consume and are essential to fleet operations.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2003	FY 2004	FY 2005
Ship Fuels	1,100	980	794

Performs development, test and evaluation work for Navy ship 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 to fleet operators for the safe use of off-specification or commercial grade fuels when military specification fuels are unavailable or in short supply; and (c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating

evolutionary changes in the fuel supply industry.

FY 2003 Accomplishments:

• Completed testing of Navy gas turbine, high-and medium-speed diesel engine fuel injection systems, and shipboard fuel handling systems with low-lubricity ship diesel fuels. Use results to specify minimum lubricity levels and test methods to be used for fuel acceptance.
• Continued assessment of the feasibility of specifying JP-5 as the single fuel for use by all Naval Systems (ships, aircraft and ground equipment).
• Completed the evaluation of lubricity enhancing additives for use with Naval distillate fuels.
• Initiated review of F-76 Naval ship fuel specification and test requirements to determine and remove any unnecessary requirements to increase availability.
• Continued development and acceptance of a commercial fuel specification.

FY 2004 Plans:

• Complete assessment of the feasibility of specifying JP-5 as the single fuel for use by all Naval Systems (ships, aircraft and ground equipment).
• Complete F-76 specification and test requirements evaluation to determine and remove any unnecessary requirements to increase availability.
• Complete development and acceptance of commercial fuel specification.
• Initiate development of an equipment/fuel qualification procedure to evaluate utilization of synthetic and ultra clean, low sulfur fuels.

FY 2005 Plans:

• Continue development of a qualification procedure to evaluate and approve utilization of synthetic and ultra clean, low sulfur fuels.
• Initiate development of sensors and instruments to determine composition of blended marine gas oils, diesel fuels and jet fuels.
• Conduct field trial of JP-5 single fuel initiative.

BA: 04 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program
PROJECT NUMBER: 0838 PROJECT TITLE: MOBILITY FUELS (ADV)

	FY 2003	FY 2004	FY 2005
Aircraft Fuels	1,032	714	700

Performs development, test and evaluation work on Navy aircraft 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 to fleet operators for the safe use of military aircraft fuels that include new additives or are from new sources including synthetics; and (c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry.

FY 2003 Accomplishments:

• Continued development and evaluation of fuel copper contamination removal system.
• Completed JP-5 specification and test method review.
• Completed JP-5 +100 high thermal stability fuel T45 field evaluation.
• Conducted shipboard trial of in-line automated fuel contamination and free water detection equipment.
• Evaluated impact of +100 additive on reducing aircraft emissions.

FY 2004 Plans:

• Field trial fuel copper contamination removal system.
• Initiate development of an equipment/fuel qualification procedure to evaluate and approve utilization of synthetic aircraft fuels.

FY 2005 Plans:

• Continue the development of a qualification procedure to evaluate and approve utilization of synthetic fuels.
• Initiate the development and evaluation of shipboard compatible stability and performance improving additives.

BA: 04 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program
PROJECT NUMBER: 0838 PROJECT TITLE: MOBILITY FUELS (ADV)

C. OTHER PROGRAM FUNDING SUMMARY:

NAVY RELATED RDT&E:
PE 0601152N (In-House Laboratory Independent Research)
PE 0205633N (Aviation Improvements)

NON-NAVY RELATED RDT&E: Not applicable

D. ACQUISITION STRATEGY:

Not applicable

BA: 04 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program
PROJECT NUMBER: Various PROJECT TITLE: Congressional Plus-Ups

CONGRESSIONAL PLUS-UPS:

2868	FY 2003	FY 2004
PROTON EXCHANGE MEMBRANE (PEM) FUEL CELLS	4,302	2,942

Demonstrate PEM fuel cells from domestic manufacturers at Department of the Navy installations.

9206	FY 2003	FY 2004
PLASMA ENERGY PYROLYSIS (PEPS)	3,824	0

Demonstrate plasma energy pyrolysis technology to destroy waste aboard Navy ships.

9207	FY 2003	FY 2004
THERMALLY ACTIVATED CHILLER/HEATER	1,675	0

Assess the suitability of thermally activated chiller/heater units for use at the Department of the Navy shore installations.

FY 2005 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: Feb 2004
Exhibit R-3

BA: 04 PROGRAM ELEMENT: 0603724N
PROJECT ELEMENT TITLE: NAVY ENERGY PROGRAM

Project Number: R0838
Project Title: Mobility Fuels (ADV)

A. PROJECT COST BREAKDOWN: ($ in thousands)

Project Cost Categories	FY 2003	FY 2004	FY 2005
a. Reliability, Maintainability and Availability	2,132	1,694	1,494

B. BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: Not applicable.