Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0604055D8Z / *Operational Energy Capability Improvement (OECI)*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	62.686	15.413	108.482	180.170	-	180.170	170.703	175.181	177.330	186.051	-	-
455: *Operational Energy Capability Improvement*	62.686	15.413	108.482	180.170	0.000	180.170	170.703	175.181	177.330	186.051	-	-

Note

New Start (Y/N): N

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force Defense Ecosystem.

The Operational Energy Capability Improvement (OECI) program matures and demonstrates advanced technologies in operational energy across warfighting platforms and domains.

In FY 2023, OECI will continue, and complete projects started in FY 2022, and support Congressionally directed projects in the DoD Science and Technology Energy Strategy Focus in the following areas: 1) Powering the Force, 2) Electrifying the Battlespace, and 3) Commanding Energy. Competitively awarded projects will continue to focus on multi-year technology maturation efforts. In addition, focused Science and Technology (S&T) efforts will be initiated to specially address operational energy challenges faced by ground vehicles and aviation systems. All these investments address high priority joint operational energy requirements to ensure best-use of operational energy on the battlefield informed, when and where possible. Projects will increase the joint force's lethality and agility and reduce logistical burdens. These new capabilities are required to address threats from near peer enemies across the globe.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	16.000	74.300	0.000	-	0.000
Current President's Budget	15.413	108.482	180.170	-	180.170
Total Adjustments	-0.587	34.182	180.170	-	180.170
• Congressional General Reductions	-	-0.418			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	34.600			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.584	-			
• Adjustments to Budget Year	-	-	180.170	-	180.170
• Other Reprogramming	-0.003	-	-	-	-

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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 455: *Operational Energy Capability Improvement*		
Congressional Add: *Operational Energy Capability Improvement Program Increase*	15.413	-
Congressional Add Subtotals for Project: 455	15.413	-
Congressional Add Totals for all Projects	15.413	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0604055D8Z / *Operational Energy Capability Improvement (OECI)*	Project (Number/Name) 455 / *Operational Energy Capability Improvement*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
455: *Operational Energy Capability Improvement*	62.686	15.413	108.482	180.170	0.000	180.170	170.703	175.181	177.330	186.051	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission of the OECI is to fund innovation that will improve DOD operational effectiveness via targeted S&T investments. As Defense-Wide funding, it incentivizes S&T to promote long term change in DOD capabilities, so they are better aligned with the Operational Energy Strategy. The OECI fosters innovation to improve operational energy performance and has two key mission aspects. First, to develop, demonstrate and transition into use operational energy technologies and practices that will improve DOD military capabilities and/or reduce costs. Second, to establish within the military Services sustainable, institutional capability to continue to research, develop and adopt operational energy innovations. The OECI funds serve as “seed money” to start or consolidate promising operational energy programs to be sustained by the Services; accordingly, the OECI generally emphasizes supporting or establishing programs, rather than one-off projects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Operational Energy Capability Improvement (OECI)	-	108.482	180.170

FY 2022 Plans:

Operational Energy Capability Improvement will develop and demonstrate the most promising, innovative, and cost-effective technologies and methods that address joint high priority operational energy requirements. OECI funding efforts will identify and mitigate energy-related risks and increase warfighting capabilities and resilience.

OECI will invest in three focus areas:
• Powering the Force: Support the deployment of mobile and distributed operations with resilient and agile energy logistics in contested environments. Reduce the risks, vulnerability, and climate impacts of DOD’s dependence on fuel.
• Electrifying the Battlespace: Enable the electrification of weapons, platforms, unmanned systems, and soldiers to field new weapon, sensing, active defense, and other technologies. Meet the growing demands of power across the battlespace.
• Commanding Energy: Capture and understand energy profiles to transform the Joint Force from reactive to predictive energy management and control. Achieve real-time energy awareness and command and control at all levels.

Projects in the three priority areas include:
Powering the Force Investment focus:
• Integrate hybrid-electric platform power into standardized tactical micro-grids; ruggedize portable renewables and energy harvesting technology alongside distributed battery energy storage; decrease the detectable signature and value of fuel movers and storage.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0604055D8Z / *Operational Energy Capability Improvement (OECI)*	**Project (Number/Name)** 455 / *Operational Energy Capability Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Benefits to the Department of these investments include more mobile and distributed operations with decreased logistics requirements and reduced the risk to personnel and equipment of carrying fuel into the fight, especially through contested environments. Electrifying the Battlespace Investment focus: • Improve ruggedized battery performance, to include standardization and safety; develop hybrid systems that include electrical propulsion; reduce the weight of personally carried batteries; improve the efficiency, reliability, and performance of wireless power beaming receivers and integrated systems. • Develop advance power and thermal management technologies to meet the growing demands of high-power systems. Benefits to the Department of these investments include further enabling the electrification of weapons, platforms, unmanned systems, soldiers, sensors, and other systems used by maneuver forces. This drastically reduces energy resupply risks, costs, and signatures to enable persistent unmanned systems and unattended sensors used for ISR. Commanding Energy Investment focus: • Integrate operational energy into mission planning, execution and modeling tools; war-gaming, and personnel development. Benefits to the Department of these investments include analytic products used by operational planners to develop better mission and campaign pre-position, force flow and battlespace distribution plans; and by field commanders to better understand the energy profile of enemy forces and conduct real-time contingency planning to enable the joint force to manage and control battlespace energy in a more predictive and less reactive mode. The tools can provide field commanders options in response to enemy action not otherwise available, enabling actions that might be less predictable by enemy forces. ***FY 2023 Plans:*** In FY 2023, OECI will continue, and complete projects started in FY 2022 and support new projects in DOD Science and Technology Energy Strategy Focus areas of 1) Powering the Force, 2) Electrifying the Battlespace, and 3) Commanding Energy. One third of the FY 2022 projects will continue their multi-year development. In addition, focused S&T efforts will be initiated to specially address operational energy challenges faced by ground vehicles and aviation systems. Technology development to support electrified/hybridized power architectures for existing crewed/uncrewed vehicles will be started and enhanced efficiency power/energy architectures for crewed/uncrewed air vehicles will be developed. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** OECIF competitively awards joint service-nominated projects that best provide operational advantage to combat forces with an emphasis on 1) the deployment of more mobile and distributed operations systems, 2) reduced and more agile logistics, and 3) reduced risk especially within contested environments. The increase in FY 2023 funding is required to continue the baseline			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
program ($73.670) and initiate focused operational energy investments in ground vehicle issues ($34.500) and aviation system issues ($72.000).			
Accomplishments/Planned Programs Subtotals	-	108.482	180.170

	FY 2021	FY 2022
Congressional Add: Operational Energy Capability Improvement Program Increase	15.413	-
FY 2021 Accomplishments: Congressional Adds directed for nuclear fuel core development to support the PELE reactor maturation and also funding to support power and thermal management maturation for directed energy weapons. The Tri-structural Isotropic (TRISO) fuel line is a collaboration between DoD, NASA, and DOE. The first phase in the process is to establish the viability of a commercial TRISO fuel line that could be used by these agencies for any program, and to produce enough TRISO fuel to demonstrate throughput and quality control. The second phase is to purchase a nuclear reactor core for the PELE program. The Congressional Add for TRISO fuel production builds a nuclear fuel fabrication line, in support of DOD's Project Pele for modular nuclear reactors as well as supporting activities for NASA. This funding includes the purchasing of equipment, installation, and additional testing, which will lead to production of demonstration nuclear fuel beginning in FY 2022. Payoff will ensure a commercial TRISO fuel line is available for the PELE Nuclear Micro-Reactor to procure the nuclear reactor core when the Record of Decision for the program is complete. The Congressional Add for thermal and power technology develops thermal energy storage technologies that are more efficient, effective; and size, weight, and power superior. Demonstrations are planned for relevant (hundreds of kW magnitude) power levels, indicative of directed energy weapon engagement and load profiles. This work will demonstrate core technologies associated with the materials, interfaces, controls, and overall system integration, and then apply those lessons to larger scale prototypes that support laser scaling initiatives with higher lethality.		
Congressional Adds Subtotals	15.413	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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D. Acquisition Strategy

N/A