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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 1: <i>Basic Research</i>					R-1 Program Element (Number/Name) PE 0601108F / <i>High Energy Laser Research Initiatives</i>							
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	13.736	15.057	0.000	0.000	0.000	-	-	-	-	-	-
615097: <i>Joint Directed Energy Basic Research</i>	-	13.736	15.057	0.000	0.000	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense Directed Energy Weapon systems through the Joint Directed Energy Transition Office. This program funds multi-disciplinary research institutes to conduct research on laser, laser beam control and high power microwave technologies. In addition, this program supports educational grants to stimulate student interest in directed energy and encourage graduate research in topics related to high energy lasers and high power microwaves. These educational grants are used for educational tools, scholarships, and summer intern employees in military laboratories. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

In FY 2021, Project 615097 is renamed from High Energy Research Initiatives to Joint Directed Energy Basic Research. This project name change reflects the direction in the 2017 and 2018 National Defense Authorization Acts.

For FY 2022 this effort is moving to OSD PE 601108D8Z.

This program is in Budget Activity 1, Basic Research because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	14.795	15.085	15.397	0.000	15.397
Current President's Budget	13.736	15.057	0.000	0.000	0.000
Total Adjustments	-1.059	-0.028	-15.397	0.000	-15.397
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-0.028			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.541	0.000			
• Other Adjustments	-0.518	0.000	-15.397	0.000	-15.397

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Change Summary Explanation Activities supporting Joint Directed Energy Basic Research decreased in FY 2022 from 15.057 million to zero. Planned activities transferred to the Office of the Secretary of Defense Program Element 0601108D8Z.				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
Title: Directed Energy Sources and Devices		6.236	6.910	0.000
Description: Improve the fundamental understanding and modeling of high energy laser and high power microwave sources and devices.				
FY 2021 Plans: Continue investigations into innovative laser technologies, in diode-pumped lasers, fiber, and solid state laser technologies. Continue investigations into innovative microwave technologies, in microwave sources, antennas, and related microwave component technologies. Continue overseas efforts to leverage international technology advancements. Continue investigations into innovative high power laser and high power microwave technologies.				
FY 2022 Plans: FY 2022 effort is moving to OSD PE 601108D8Z.				
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 effort is moving to OSD PE 601108D8Z				
Title: Directed Energy Propagation Technologies		6.250	6.897	0.000
Description: Improve the fundamental understanding and modeling of beam control technologies as they relate to high energy laser applications and high power microwaves. Conduct research in atmospheric characterization, metrology, control systems, algorithms, waveguides, antennas and beam control component technology.				
FY 2021 Plans: Conduct research of innovative high energy laser and high power microwave beam control architectures. Continue to leverage international research developments and technology advancements.				
FY 2022 Plans: FY 2022 effort is moving to OSD PE 601108D8Z.				
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 effort is moving to OSD PE 601108D8Z.				
Title: Directed Energy Education		1.250	1.250	0.000
Description: Fund educational grants to stimulate student interest in directed energy.				

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p><i>FY 2021 Plans:</i> Continue to provide scholarships and internships to support college students studying in fields related to high energy lasers and high power microwaves. Continue to provide grants to the United States Service Academies to stimulate studies related to high energy lasers and high power microwaves among military cadets. Continue to fund publication of journals and support continuing education for professionals in the high energy laser and high power microwave fields.</p> <p><i>FY 2022 Plans:</i> FY 2022 effort is moving to OSD PE 601108D8Z.</p> <p><i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> FY 2022 effort is moving to OSD PE 601108D8Z.</p>			
Accomplishments/Planned Programs Subtotals	13.736	15.057	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A