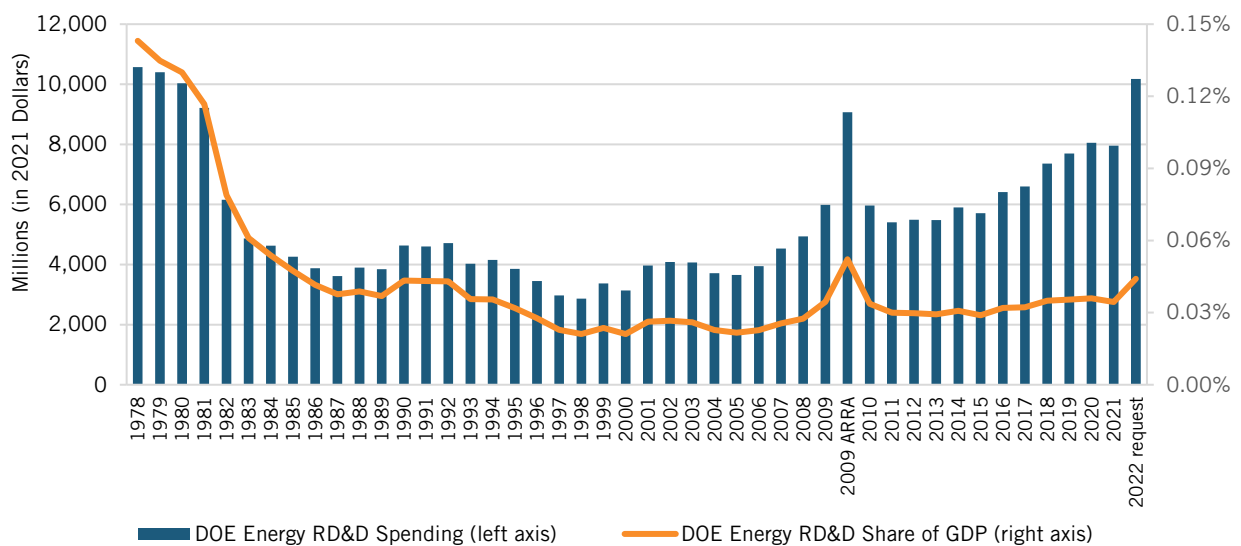


Energizing Innovation: June 2021 Update

BY LINH NGUYEN AND DAVID M. HART | JUNE 2021

In June 2021, the Office of Management and Budget released the President Biden’s full FY 2022 budget request, building on its April outline. The request calls for quadrupling government-wide investment in clean energy innovation over the next four years, which would provide a much-needed boost. This document updates key data in our April 2021 report and provides some highlights from the president’s request.

Figure 1: U.S. DOE Energy RD&D spending, FY 1978 through FY 2022 Request¹



The Biden Administration’s Budget Request for FY 2022

Highlights include:

- A substantial increase in the Department of Energy’s (DOE) energy RD&D funding, surpassing the 2009 total (which includes one-time spending from the American Recovery and Reinvestment Act) and almost reaching 1978 levels in real terms (see figure 7);
- \$46.1 billion for DOE, a \$4.3 billion (10 percent) increase over FY 2021;²
- \$12 billion for DOE energy RD&D programs (see table 1);³
- \$1 billion for a new ARPA-C and the existing ARPA-E, of which \$700 million is funded through DOE;⁴
- Refocusing the Office of Fossil Energy and Carbon Management on carbon reduction and mitigation, and expanding to include industrial carbon capture, hydrogen, and direct air capture;⁵

- \$400 million for a new Office of Clean Energy Demonstration. OCED will use the funding to begin operations and issue an initial competitive solicitation on commercial-scale energy storage demonstrations;⁶
- \$2.3 billion for basic energy sciences RD&D activities, a 2.4 percent increase from FY 2021 enacted levels;⁷
- \$63 million for a new Carbon Dioxide Removal subprogram, within the Office of Fossil Energy and Carbon Management, that focuses on direct air capture, bioenergy with carbon capture and storage, and other mineralization concepts;⁸
- \$550.5 million for the Advanced Manufacturing Office (AMO), a 39 percent boost from FY 2021 enacted levels. AMO subprograms would be completely restructured to address industrial decarbonization and manufacturing innovation;⁹
- \$595 million for the Vehicle Technologies Office, including a 50 percent increase in the Materials Technology R&D subprogram and a 39 percent increase in the Battery and Electrification Technologies subprogram;¹⁰
- \$197.5 million for the Hydrogen & Fuel Cell Technologies Office, a 32 percent boost from FY 2021 enacted levels;¹¹ and
- \$204.87 million for the Wind Energy Technologies Office, including a 59 percent increase for offshore wind and 78 percent increase for distributed wind.¹²

Table 1: DOE budget by program area, FY 2019 enacted through FY 2022 request, in millions of dollars

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 WH Request
DOE Total Budget	35,685	38,657	41,927	46,192
Defense	16,089	17,611	20,652	20,913
Environmental Management	7,175	7,425	7,586	8,012
Basic Science Research	3,755	4,016	4,009	4,465
DOE Energy RD&D Programs*	7,917	8,788	8,931	11,967
ARPA-E**	366	425	427	700
Energy Efficiency & Renewable Energy	2,379	2,790	2,862	3,924
<i>Sustainable Transportation</i>				
Vehicle Technologies	344	396	400	595
Bioenergy Technologies	226	260	255	340
Hydrogen & Fuel Cell Tech	120	150	150	198
<i>Renewable Energy</i>				
Solar Energy	247	280	280	387
Wind Energy	92	104	110	205
Water Power	105	148	150	197
Geothermal Technology	84	110	106	164
<i>Energy Efficiency</i>				
Advanced Manufacturing	320	395	396	551
Building Technologies	226	285	290	382
Fossil Energy R&D	740	750	750	890
CCUS and Advanced Power	486	491	447	532

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 WH Request
Natural Gas Technologies	51	51	57	130
Unconventional Oil Tech	46	46	46	-
NETL Research	51	50	83	83
Nuclear Energy	1,326	1,493	1,508	1,851
Reactor Concepts RD&D	324	267	208	240
Nuclear Energy Enabling Tech	153	113	123	124
Fuel Cycle R&D	264	305	309	369
Advanced Reactor Demos	--	230	250	370
Versatile Test Reactor***	--	--	45	145
Electricity Delivery	156	190	212	327
Cybersecurity (CESER)	120	156	156	201
Science	6,585	7,000	7,026	7,440
Basic Energy Sciences	2,166	2,213	2,245	2,300
Fusion Energy Sciences	564	671	672	675
BER Bioenergy Research	100	100	100	-
Office of Clean Energy Demonstration	--	--	--	400

* Energy programs include some non-RD&D functions, so RD&D funding is less than the sum of office budgets.

** The FY22 budget requests \$1 billion for ARPA-E, with \$700 million through DOE and \$300 million through other agencies. Of the \$700 million, \$200 million will go to a new ARPA-C program.

*** The Versatile Test Reactor was previously funded in FY 2018 and FY 2019 out of the Reactor Concepts RD&D subprogram.

ENDNOTES

1. ITIF adaptation of Kelly Sims Gallagher and Laura Diaz Anadon, "DOE Budget Authority for Energy Research, Development, and Demonstration Database."
2. Office of Management and Budget (OMB), President's FY 2022 Discretionary Request (White House Executive Office of the President, April 9, 2021), <https://www.whitehouse.gov/wp-content/uploads/2021/04/FY2022-Discretionary-Request.pdf>.
3. Ibid.
4. Ibid.
5. DOE, "FY 2022 Congressional Budget Justification" Volume 3.2, (DOE Chief Financial Officer DOE/CF-0174, May 2021), 176-182, <https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-3.2-v3.pdf>.
6. DOE, "FY 2022 Congressional Budget Justification" Volume 3.2, (DOE Chief Financial Officer DOE/CF-0174, May 2021), 373-384.
7. Ibid.
8. DOE, "FY 2022 Congressional Budget Justification" Volume 3.2, (DOE Chief Financial Officer DOE/CF-0174, May 2021), 223-226.
9. DOE, "FY 2022 Congressional Budget Justification" Volume 3.1, (DOE Chief Financial Officer DOE/CF-0173, June 2021), 379-397.
10. Ibid, 203-236.
11. Ibid, 259-278.
12. Ibid, 305-330.