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FY2019 Funding for CCS and Other DOE Fossil Energy R&D

Carbon Capture and Sequestration Overview

Carbon capture and sequestration (CCS, sometimes called carbon capture and storage) is a process that aims to capture man-made carbon dioxide (CO_2) at its source and store it to prevent its release to the atmosphere. CCS could reduce the amount of CO_2 emitted to the atmosphere from the burning of fossil fuels at power plants and other large, industrial facilities. An integrated CCS system would include three main steps: (1) separating CO_2 from other gases and capturing it; (2) purifying, compressing, and transporting the CO_2 to the sequestration site; and (3) injecting the CO_2 into subsurface geological reservoirs.

Funding Overview

The U.S. Department of Energy (DOE) has supported research and development (R&D) of aspects of the three main steps leading to an integrated CCS system since 1997. From FY2012 to FY2018, Congress has provided more than $4 billion in appropriations for CCS activities at DOE. The American Recovery and Reinvestment Act (P.L. 111-5) provided an additional $3.4 billion to that total.

CCS-focused R&D has come to dominate the coal program area within DOE Fossil Energy Research and Development (FER&D) since 2010. However, the Administration's FY2019 budget request proposes to shift to other priorities, decreasing the overall FER&D budget by nearly $225 million compared to what Congress enacted for FY2018. The FY2019 request cites early-stage research as its focus: "This budget request focuses DOE resources toward early-stage R&D and reflects an increased reliance on the private sector to fund later-stage research." The Administration previously proposed cuts to FER&D in its FY2018 budget request; however, Congress increased funding by nearly $59 million (9%) compared to FY2017.

Table 1 shows funding for DOE CCS programs under FER&D from FY2012 through FY2018 and includes the FY2019 budget request. **Table 1** groups mostly CCS-related programs under the Coal CCS and Power Systems category and the remainder of fossil energy spending under Other Fossil Energy R&D. This grouping follows how Congress has funded these programs.

House-passed FY2019 appropriations legislation would increase overall funding for FER&D by over $58 million compared to FY2018, and $283 million above the Administration budget request. The Senate-passed version of the bill would fund FER&D at the FY2018 level of $727 million, $225 million more than the requested amount.

Coal CCS and Power Systems

Compared to the FY2018 total of $727 million enacted for all FER&D, the FY2019 request of $502 million would be a reduction of approximately 31%. Carbon capture and carbon storage (**Table 1**) would receive $40 million total under the Administration's request, compared to nearly $200 million for FY2018, an 80% reduction.

The FY2019 budget request would prioritize the Advanced Energy Systems (AES) account, requesting $175 million, $63 million above the FY2018-enacted amount, nearly a 44% increase. The budget request indicates that AES would focus on six activities: advanced combustion/gasification, advanced turbines, solid oxide fuel cells, advanced sensors and controls, power generation efficiency, and advanced energy materials. Other accounts under the Coal CCS & Power Systems program area are proposed to be funded slightly above or slightly below FY2018 levels, with the exception of CCS activities. Reductions to CCS-related funding would comprise nearly all of the proposed decreased funding for activities in the Coal CCS & Power Systems program area.

Other Fossil Energy Research & Development

The budget request for FY2019 proposes to decrease funding for programs under Other Fossil Energy R&D by nearly $87 million, a 35% reduction compared to FY2018. Program Direction ($60 million in FY2018) provides DOE headquarters support and federal field and contractor support of the FER&D programs overall. Program Direction and National Energy Technology Laboratory (NETL) Coal R&D together provide support to CCS-related activities directly and indirectly.

The budget request proposes to decrease funding for Natural Gas Technologies and Unconventional Fossil activities compared to what Congress enacted in FY2018, from $90 million to $19.5 million for both programs combined. Congress increased funding for those activities (by $16 million in FY2018 compared to FY2017), which support collaborative research to foster development of shale gas resources, the reduction of methane emissions from natural gas infrastructure, and research on gas hydrates. The budget request proposes to eliminate funding for Transformational Coal Pilot programs (called New Fossil Pilot in FY2017). Congress provided $50 million for the program in FY2017 and $35 million in FY2018.

[Note: In FY2017, Congress rescinded $240 million in unobligated balances from the total FER&D account. The FY2019 Administration request subtracted the rescission from the total FY2017 FER&D enacted amount in its budget justification. **Table 1** does not show that rescission, but it reflects what Congress included in its budget documents for FY2017—$668 million total enacted for FER&D. The congressional Joint Explanatory Statement for FY2017 shows the $240 million rescission offsetting DOE's total appropriations.]

Table 1. Funding for DOE Fossil Energy Research, Development, and Demonstration Program Areas
(FY2012 through FY2018, including the Administration's FY2019 budget request)

FER&D Coal Program Areas	Program/ Activity	FY2012 ($1,000)	FY2013 ($1,000)	FY2014 ($1,000)	FY2015 ($1,000)	FY2016 ($1,000)	FY2017 ($1,000)	FY2018 ($1,000)	FY2019 Request ($1,000)
Coal CCS and Power Systems	Carbon Capture	66,986	63,725	92,000	88,000	101,000	101,000	100,671	20,000
	Carbon Storage[a]	112,208	106,745	108,766	100,000	106,000	95,300	98,096	20,000
	Advanced Energy Systems	97,169	92,438	99,500	103,000	105,000	105,000	112,000	175,000
	Cross-Cutting Research	47,946	45,618	41,925	49,000	50,000	45,500	58,350	53,300
	Supercritical CO_2 Technology	—	—	—	10,000	15,000	24,000	24,000	25,000
	NETL Coal R&D	35,011	33,338	50,011	50,000	53,000	53,000	53,000	50,000
	Transformational Coal Pilots	—	—	—	—	—	—	35,000	0
Subtotal Coal		**359,320**	**341,864**	**392,202**	**400,000**	**430,000**	**423,800**	**481,117**	**343,300**
Other FER&D	Natural Gas Technologies	14,575	13,865	20,600	25,121	43,000	43,000	50,000	5,500
	Unconventional Fossil	4,859	4,621	15,000	4,500	20,321	21,000	40,000	14,000
	Program Direction	119,929	114,201	120,000	119,000	114,202	60,000	60,000	61,070
	Plant and Capital	16,794	15,982	16,032	15,782	15,782	—	—	—
	Environmental Restoration	7,897	7,515	5,897	5,897	7,995	—	—	—
	Special Recruitment	700	667	700	700	700	700	700	200
	NETL Research & Operations	—	—	—	—	—	43,000	50,000	40,000
	NETL Infrastructure	—	—	—	—	—	40,500	45,000	38,000
	New Fossil Pilot	—	—	—	—	—	50,000	—	—
Subtotal Other FER&D		**164,754**	**156,851**	**178,229**	**171,000**	**202,000**	**258,200**	**245,700**	**158,770**
Rescissions/Use of Prior-Year Balances		(187,000)					(14,000)		
Total FER&D		**337,074**	**498,715**	**570,431**	**571,000**	**632,000**	**668,000**	**726,817**	**502,070**
						FY2012-FY2018	**Grand Total**	**$4.004 billion**	

Sources: U.S. Department of Energy annual budget justifications for FY2012 through FY2019; explanatory statement for P.L. 115-141, Division D (Consolidated Appropriations Act, 2018, https://rules.house.gov/bill/115/hr-1625-sa).

Notes: FER&D = Fossil Energy Research and Development; NETL = National Energy Technology Laboratory; Grand total for FY2012-FY2018 subject to rounding. Amounts provided by P.L. 111-5 are not shown in the table or included in the grand total.

a. The FY2019 request is split: $11 million for carbon storage, $9 million for carbon utilization.

Peter Folger, Specialist in Energy Policy

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