

(b) Artificial photosynthesis**(1) In general**

The Secretary shall carry out under the Initiative a program to support research needed to bridge scientific barriers to, and discover knowledge relevant to, artificial photosynthetic systems.

(2) Activities

As part of the program described in paragraph (1)—

(A) the Director of the Office of Basic Energy Sciences shall support basic research to pursue distinct lines of scientific inquiry, including—

(i) photoinduced production of hydrogen and oxygen from water; and

(ii) the sustainable photoinduced reduction of carbon dioxide to fuel products including hydrocarbons, alcohols, carbon monoxide, and natural gas; and

(B) the Assistant Secretary for Energy Efficiency and Renewable Energy shall support translational research, development, and validation of physical concepts developed under the program.

(3) Standard of review

The Secretary shall review activities carried out under the program described in paragraph (1) to determine the achievement of technical milestones.

(4) Funds

Of the funds authorized to be appropriated for basic energy sciences in a fiscal year, there is authorized to be appropriated to the Secretary to carry out activities under this subsection \$50,000,000 for each of fiscal years 2023 through 2027.

(c) Biochemistry, replication of natural photosynthesis, and related processes**(1) In general**

The Secretary shall carry out under the Initiative a program to support research needed to replicate natural photosynthetic processes by use of artificial photosynthetic components and materials.

(2) Activities

As part of the program described in paragraph (1)—

(A) the Director of the Office of Basic Energy Sciences shall support basic research to expand fundamental knowledge to replicate natural synthesis processes, including—

(i) the photoinduced reduction of dinitrogen to ammonia;

(ii) the absorption of carbon dioxide from ambient air;

(iii) molecular-based charge separation and storage;

(iv) photoinitiated electron transfer; and

(v) catalysis in biological or biomimetic systems;

(B) the Associate Director of Biological and Environmental Research shall support systems biology and genomics approaches to understand genetic and physiological pathways connected to photosynthetic mechanisms; and

(C) the Assistant Secretary for Energy Efficiency and Renewable Energy shall support translational research, development, and validation of physical concepts developed under the program.

(3) Standard of review

The Secretary shall review activities carried out under the program described in paragraph (1) to determine the achievement of technical milestones.

(4) Funds

Of the funds authorized to be appropriated for basic energy sciences in a fiscal year, there is authorized to be appropriated to the Secretary to carry out activities under this subsection \$50,000,000 for each of fiscal years 2023 through 2027.

(Pub. L. 109–58, title IX, §973, Aug. 8, 2005, 119 Stat. 902; Pub. L. 115–246, title III, §303(f)(1), formerly §303(d)(1), Sept. 28, 2018, 132 Stat. 3141, renumbered §303(f)(1), Pub. L. 117–167, div. B, title I, §10102(a)(1), Aug. 9, 2022, 136 Stat. 1409; Pub. L. 117–167, div. B, title I, §10102(b), Aug. 9, 2022, 136 Stat. 1414.)

Editorial Notes

AMENDMENTS

2022—Subsec. (b)(4). Pub. L. 117–167, §10102(b)(1), added par. (4) and struck out former par. (4). Prior to amendment, text read as follows: “No funds allocated to the program described in paragraph (1) may be obligated or expended for commercial application of energy technology.”

Subsec. (c)(4). Pub. L. 117–167, §10102(b)(2), added par. (4) and struck out former par. (4). Prior to amendment, text read as follows: “No funds allocated to the program described in paragraph (1) may be obligated or expended for commercial application of energy technology.”

2018—Pub. L. 115–246 amended section generally. Prior to amendment, section related to catalysis research program.

§ 16314. Hydrogen**(a) In general**

The Secretary shall conduct a program of fundamental research and development in support of programs authorized under subchapter VIII.

(b) Methods

The program shall include support for methods of generating hydrogen without the use of natural gas.

(Pub. L. 109–58, title IX, §974, Aug. 8, 2005, 119 Stat. 903.)

§ 16315. Electricity Storage Research Initiative**(a) Initiative****(1) In general**

The Secretary shall carry out a research initiative, to be known as the “Electricity Storage Research Initiative” (referred to in this section as the “Initiative”)—

(A) to expand theoretical and fundamental knowledge to control, store, and convert—

(i) electrical energy to chemical energy; and

(ii) chemical energy to electrical energy;