''(A) promotes energy security and resilience; and

''(B) provides economic value and environmental benefits for diverse applications across multiple sectors of the economy; and

''(3) hydrogen can be produced from a variety of domestically available clean energy sources, including—

''(A) renewable energy resources, including biomass;

''(B) fossil fuels with carbon capture, utilization, and storage; and

''(C) nuclear power.

''(b) PURPOSE.—The purpose of this subtitle [subtitle B (§§ 40311–40315) of title III of div. D of Pub. L. 117–58, see Tables for classification] is to accelerate research, development, demonstration, and deployment of hydrogen from clean energy sources by—

''(1) providing a statutory definition for the term 'clean hydrogen';

''(2) establishing a clean hydrogen strategy and roadmap for the United States;

''(3) establishing a clearing house for clean hydrogen program information at the National Energy Technology Laboratory;

''(4) developing a robust clean hydrogen supply chain and workforce by prioritizing clean hydrogen demonstration projects in major shale gas regions;

''(5) establishing regional clean hydrogen hubs; and

''(6) authorizing appropriations to carry out the Department of Energy Hydrogen Program Plan, dated November 2020, developed pursuant to title VIII of the Energy Policy Act of 2005 (42 U.S.C. 16151 et seq.).''

[For provisions relating to rates of wages to be paid to laborers and mechanics on projects for construction, alteration, or repair work funded under div. D or an amendment by div. D of Pub. L. 117–58, including authority of Secretary of Labor, see section 18851 of this title.]

§ 16152. Definitions

In this subchapter:

(1) Clean hydrogen; hydrogen

The terms ''clean hydrogen'' and ''hydrogen'' mean hydrogen produced in compliance with the greenhouse gas emissions standard established under section 16166(a) of this title, including production from any fuel source.

(2) Fuel cell

The term ''fuel cell'' means a device that directly converts the chemical energy of a fuel, which is supplied from an external source, and an oxidant into electricity by electrochemical processes occurring at separate electrodes in the device.

(3) Heavy-duty vehicle

The term ''heavy-duty vehicle'' means a motor vehicle that—

(A) is rated at more than 8,500 pounds gross vehicle weight;

(B) has a curb weight of more than 6,000 pounds; or

(C) has a basic vehicle frontal area in excess of 45 square feet.

(4) Infrastructure

The term ''infrastructure'' means the equipment, systems, or facilities used to produce, distribute, deliver, or store hydrogen (except for onboard storage).

(5) Light-duty vehicle

The term ''light-duty vehicle'' means a motor vehicle that is rated at 8,500 or less pounds gross vehicle weight.

(6) Portable; storage

The terms ''portable'' and ''storage'', when used in reference to a fuel cell, include—

(A) continuous electric power; and

(B) backup electric power.

(7) Task Force

The term ''Task Force'' means the Hydrogen and Fuel Cell Technical Task Force established under section 16155 of this title.

(8) Technical Advisory Committee

The term ''Technical Advisory Committee'' means the independent Technical Advisory Committee established under section 16156 of this title.

(Pub. L. 109–58, title VIII, § 803, Aug. 8, 2005, 119 Stat. 844; Pub. L. 117–58, div. D, title III, § 40312, Nov. 15, 2021, 135 Stat. 1006.)

Editorial Notes

AMENDMENTS

2021—Pars. (1) to (4). Pub. L. 117–58, § 40312(2), (3), added par. (1) and redesignated former pars. (1) to (3) as (2) to (4), respectively. Former par. (4) redesignated (5).

Par. (5). Pub. L. 117–58, § 40312(2), redesignated par. (4) as (5). Former par. (5) redesignated (6).

Pub. L. 117–58, § 40312(1), substituted ''Portable; storage'' for ''Stationary; portable'' in heading and ''The terms 'portable' and 'storage', when'' for ''The terms 'stationary' and 'portable', when'' in introductory provisions.

Pars. (6) to (8). Pub. L. 117–58, § 40312(2), redesignated pars. (5) to (7) as (6) to (8), respectively.

Statutory Notes and Related Subsidiaries

WAGE RATE REQUIREMENTS

For provisions relating to rates of wages to be paid to laborers and mechanics on projects for construction, alteration, or repair work funded under div. D or an amendment by div. D of Pub. L. 117–58, including authority of Secretary of Labor, see section 18851 of this title.

§ 16153. Plan

Not later than 6 months after August 8, 2005, the Secretary shall transmit to Congress a coordinated plan for the programs described in this subchapter and any other programs of the Department that are directly related to fuel cells or hydrogen. The plan shall describe, at a minimum—

(1) the agenda for the next 5 years for the programs authorized under this subchapter, including the agenda for each activity enumerated in section 16154(e) of this title;

(2) the types of entities that will carry out the activities under this subchapter and what role each entity is expected to play;

(3) the milestones that will be used to evaluate the programs for the next 5 years;

(4) the most significant technical and nontechnical hurdles that stand in the way of achieving the goals described in section 16154 of this title, and how the programs will address those hurdles; and

(5) the policy assumptions that are implicit in the plan, including any assumptions that would affect the sources of hydrogen or the marketability of hydrogen-related products.

(Pub. L. 109–58, title VIII, § 804, Aug. 8, 2005, 119 Stat. 845.)

§ 16154. Clean hydrogen research and development program

(a) In general

The Secretary, in consultation with other Federal agencies and the private sector, shall conduct a crosscutting research and development program (referred to in this section as the ''program'') on technologies relating to the production, processing, purification, distribution, storage, and use of hydrogen energy, fuel cells, and related infrastructure.

(b) Goals

The goals of the program shall be—

(1) to advance research and development to demonstrate and commercialize the use of clean hydrogen in the transportation, utility, industrial, commercial, and residential sectors; and

(2) to demonstrate a standard of clean hydrogen production in the transportation, utility, industrial, commercial, and residential sectors by 2040.

(c) Focus

In carrying out activities under this section, the Secretary shall focus on factors that are common to the development of hydrogen infrastructure and the supply of vehicle and electric power for critical consumer and commercial applications, and that achieve continuous technical evolution and cost reduction, particularly for hydrogen production, the supply of hydrogen, storage of hydrogen, and end uses of hydrogen that—

(1) steadily increase production, distribution, and end use efficiency and reduce lifecycle emissions;

(2) resolve critical problems relating to catalysts, membranes, storage, lightweight materials, electronic controls, manufacturability, and other problems that emerge from the program;

(3) enhance sources of fossil fuels with carbon capture, utilization, and sequestration, renewable fuels, biofuels, and nuclear energy for hydrogen production; and

(4) enable widespread use of distributed electricity generation and storage.

(d) Public education and research

In carrying out this section, the Secretary shall support enhanced public education and research conducted at institutions of higher education in fundamental sciences, application design, and systems concepts (including education and research relating to materials, subsystems, manufacturability, maintenance, and safety) relating to hydrogen and fuel cells.

(e) Activities

In carrying out the program, the Secretary, in partnership with the private sector, shall conduct activities to advance and support—

(1) the establishment of a series of technology cost goals oriented toward achieving the standard of clean hydrogen production developed under section 16166(a) of this title;

(2) the production of clean hydrogen from diverse energy sources, including—

(A) fossil fuels with carbon capture, utilization, and sequestration;

(B) hydrogen-carrier fuels (including ethanol and methanol);

(C) renewable energy resources, including biomass;

(D) nuclear energy; and

(E) any other methods the Secretary determines to be appropriate;

(3) the use of clean hydrogen for commercial, industrial, and residential electric power generation;

(4) the use of clean hydrogen in industrial applications, including steelmaking, cement, chemical feedstocks, and process heat;

(5) the use of clean hydrogen for use as a fuel source for both residential and commercial comfort heating and hot water requirements;

(6) the safe and efficient delivery of hydrogen or hydrogen-carrier fuels, including—

(A) transmission by pipelines, including retrofitting the existing natural gas transportation infrastructure system to enable a transition to transport and deliver increasing levels of clean hydrogen, clean hydrogen blends, or clean hydrogen carriers;

(B) tanks and other distribution methods; and

(C) convenient and economic refueling of vehicles, locomotives, maritime vessels, or planes—

(i) at central refueling stations; or

(ii) through distributed onsite generation;

(7) advanced vehicle, locomotive, maritime vessel, or plane technologies, including—

(A) engine and emission control systems;

(B) energy storage, electric propulsion, and hybrid systems;

(C) automotive, locomotive, maritime vessel, or plane materials; and

(D) other advanced vehicle, locomotive, maritime vessel, or plane technologies;

(8) storage of hydrogen or hydrogen-carrier fuels, including the development of materials for safe and economic storage in gaseous, liquid, or solid form;

(9) the development of safe, durable, affordable, and efficient fuel cells, including fuel-flexible fuel cell power systems, improved manufacturing processes, high-temperature membranes, cost-effective fuel processing for natural gas, fuel cell stack and system reliability, low-temperature operation, and cold start capability;

(10) the ability of domestic clean hydrogen equipment manufacturers to manufacture commercially available competitive technologies in the United States;

(11) the use of clean hydrogen in the transportation sector, including in light-, medium-, and heavy-duty vehicles, rail transport, aviation, and maritime applications; and

(12) in coordination with relevant agencies, the development of appropriate, uniform codes and standards for the safe and consistent deployment and commercialization of clean hydrogen production, processing, delivery, and end-use technologies.

(f) Program goals

(1) Vehicles

For vehicles, the goals of the program are—