

117TH CONGRESS 2D SESSION

H. R. 8285

To support research, development, and other activities to develop innovative vehicle technologies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

July 5, 2022

Mrs. Dingell (for herself and Ms. Stevens) introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Energy and Commerce, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To support research, development, and other activities to develop innovative vehicle technologies, and for other purposes.

- 1 Be it enacted by the Senate and House of Representa-
- 2 tives of the United States of America in Congress assembled,
- 3 SECTION 1. SHORT TITLE.
- 4 This Act may be cited as the "Vehicle Innovation Act
- 5 of 2022".
- 6 SEC. 2. DEFINITIONS.
- 7 In this Act:

1	(1) Department.—The term "Department"
2	means the Department of Energy.
3	(2) Secretary.—The term "Secretary" means
4	the Secretary of Energy.
5	SEC. 3. OBJECTIVES.
6	The objectives of this Act are—
7	(1) to establish a consistent and consolidated
8	authority for the vehicle technology program at the
9	Department;
10	(2) to develop United States technologies and
11	practices that improve the fuel efficiency and emis-
12	sions of all vehicles produced in the United States
13	(3) to support domestic research, development
14	engineering, demonstration, and commercial applica-
15	tion and manufacturing of advanced vehicles, en-
16	gines, and components;
17	(4) to enable vehicles to move larger volumes of
18	goods and more passengers with less energy and
19	emissions;
20	(5) to develop cost-effective advanced tech-
21	nologies for wide-scale utilization throughout the
22	passenger, commercial, government, and transit ve-
23	hicle sectors;
24	(6) to allow for greater consumer choice of vehi-
25	ele technologies and fuels:

1	(7) shorten technology development and inte-
2	gration cycles in the vehicle industry;
3	(8) to ensure a proper balance and diversity of
4	Federal investment in vehicle technologies; and
5	(9) to strengthen partnerships between Federal
6	and State governmental agencies and the private
7	and academic sectors.
8	SEC. 4. COORDINATION AND NONDUPLICATION.
9	The Secretary shall ensure, to the maximum extent
10	practicable, that the activities authorized by this Act do
11	not duplicate those of other programs within the Depart-
12	ment or other relevant research agencies.
13	SEC. 5. AUTHORIZATION OF APPROPRIATIONS.
14	There are authorized to be appropriated to the Sec-
15	retary for research, development, engineering, demonstra-
16	tion, and commercial application of vehicles and related
17	technologies in the United States, including activities au-
18	thorized under this Act—
19	(1) for fiscal year 2023, \$313,567,000;
20	(2) for fiscal year 2024, \$326,109,000;
21	(3) for fiscal year 2025, \$339,154,000;
22	(4) for fiscal year 2026, \$352,720,000; and
23	(5) for fiscal year 2027 \$366 829 000

SEC. 6. REPORTING.

- 2 (a) Technologies Developed.—Not later than 18
- 3 months after the date of enactment of this Act and annu-
- 4 ally thereafter through 2027, the Secretary shall submit
- 5 to Congress a report regarding the technologies developed
- 6 as a result of the activities authorized by this Act, with
- 7 a particular emphasis on whether the technologies were
- 8 successfully adopted for commercial applications, and if
- 9 so, whether products relying on those technologies are
- 10 manufactured in the United States.
- 11 (b) Additional Matters.—At the end of each fis-
- 12 cal year through 2027, the Secretary shall submit to the
- 13 relevant Congressional committees of jurisdiction an an-
- 14 nual report describing activities undertaken in the pre-
- 15 vious year under this Act, active industry participants, the
- 16 status of public-private partnerships, progress of the pro-
- 17 gram in meeting goals and timelines, and a strategic plan
- 18 for funding of activities across agencies.

19 SEC. 7. VEHICLE RESEARCH AND DEVELOPMENT.

- 20 (a) Program.—
- 21 (1) ACTIVITIES.—The Secretary shall conduct a
- program of basic and applied research, development,
- engineering, demonstration, and commercial applica-
- 24 tion activities on materials, technologies, and proc-
- esses with the potential to substantially reduce pe-
- troleum use and the emissions of the passenger and

1	commercial vehicles of the United States, including
2	activities in the areas of—
3	(A) electrification of vehicle systems;
4	(B) batteries, ultracapacitors, and other
5	energy storage devices;
6	(C) power electronics;
7	(D) vehicle, component, and subsystem
8	manufacturing technologies and processes;
9	(E) engine efficiency and combustion opti-
10	mization;
11	(F) waste heat recovery;
12	(G) transmission and drivetrains;
13	(H) hydrogen vehicle technologies, includ-
14	ing fuel cells and internal combustion engines,
15	and hydrogen infrastructure, including hydro-
16	gen energy storage to enable renewables and
17	provide hydrogen for fuel and power;
18	(I) natural gas vehicle technologies;
19	(J) aerodynamics, rolling resistance (in-
20	cluding tires and wheel assemblies), and acces-
21	sory power loads of vehicles and associated
22	equipment;
23	(K) vehicle weight reduction, including
24	lightweighting materials and the development of

1	manufacturing processes to fabricate, assemble,
2	and use dissimilar materials;
3	(L) friction and wear reduction;
4	(M) engine and component durability;
5	(N) innovative propulsion systems;
6	(O) advanced boosting systems;
7	(P) hydraulic hybrid technologies;
8	(Q) engine compatibility with and optimi-
9	zation for a variety of transportation fuels in-
10	cluding natural gas and other liquid and gas-
11	eous fuels;
12	(R) predictive engineering, modeling, and
13	simulation of vehicle and transportation sys-
14	tems;
15	(S) refueling and charging infrastructure
16	for alternative fueled and electric or plug-in
17	electric hybrid vehicles, including the unique
18	challenges facing rural areas;
19	(T) gaseous fuels storage systems and sys-
20	tem integration and optimization;
21	(U) sensing, communications, and actu-
22	ation technologies for vehicle, electrical grid,
23	and infrastructure;
24	(V) efficient use, substitution, and recy-
25	cling of potentially critical materials in vehicles,

1	including rare earth elements and precious met-
2	als, at risk of supply disruption;
3	(W) aftertreatment technologies;
4	(X) thermal management of battery sys-
5	tems;
6	(Y) retrofitting advanced vehicle tech-
7	nologies to existing vehicles;
8	(Z) development of common standards,
9	specifications, and architectures for both trans-
10	portation and stationary battery applications;
11	(AA) advanced internal combustion en-
12	gines;
13	(BB) mild hybrid;
14	(CC) engine down speeding;
15	(DD) vehicle-to-vehicle, vehicle-to-pedes-
16	trian, and vehicle-to-infrastructure technologies;
17	and
18	(EE) other research areas as determined
19	by the Secretary.
20	(2) Transformational technology.—The
21	Secretary shall ensure that the Department con-
22	tinues to support research, development, engineer-
23	ing, demonstration, and commercial application ac-
24	tivities and maintains competency in mid- to long-
25	term transformational vehicle technologies with po-

1	tential to achieve reductions in emissions, including
2	activities in the areas of—
3	(A) hydrogen vehicle technologies, includ-
4	ing fuel cells, hydrogen storage, infrastructure,
5	and activities in hydrogen technology validation
6	and safety codes and standards;
7	(B) multiple battery chemistries and novel
8	energy storage devices, including nonchemical
9	batteries and electromechanical storage tech-
10	nologies such as hydraulics, flywheels, and com-
11	pressed air storage;
12	(C) communication and connectivity among
13	vehicles, infrastructure, and the electrical grid;
14	and
15	(D) other innovative technologies research
16	and development, as determined by the Sec-
17	retary.
18	(3) Industry participation.—
19	(A) In general.—To the maximum ex-
20	tent practicable, activities under this Act shall
21	be carried out in partnership or collaboration
22	with automotive manufacturers, heavy commer-
23	cial, vocational, and transit vehicle manufactur-
24	ers, qualified plug-in electric vehicle manufac-

turers, compressed natural gas vehicle manufac-

25

turers, vehicle and engine equipment and component manufacturers, manufacturing equipment manufacturers, advanced vehicle service providers, fuel producers and energy suppliers, electric utilities, universities, national laboratories, and independent research laboratories.

- (B) REQUIREMENTS.—In carrying out this Act, the Secretary shall—
 - (i) determine whether a wide range of companies that manufacture or assemble vehicles or components in the United States are represented in ongoing public-private partnership activities, including firms that have not traditionally participated in federally sponsored research and development activities, and where possible, partner with such firms that conduct significant and relevant research and development activities in the United States;
 - (ii) leverage the capabilities and resources of, and formalize partnerships with, industry-led stakeholder organizations, nonprofit organizations, industry consortia, and trade associations with expertise in the research and development of,

1	and education and outreach activities in,
2	advanced automotive and commercial vehi-
3	cle technologies;
4	(iii) develop more effective processes
5	for transferring research findings and tech-
6	nologies to industry;
7	(iv) support public-private partner-
8	ships, dedicated to overcoming barriers in
9	commercial application of transformational
10	vehicle technologies, that use such indus-
11	try-led technology development facilities of
12	entities with demonstrated expertise in
13	successfully designing and engineering pre-
14	commercial generations of such trans-
15	formational technology; and
16	(v) promote efforts to ensure that
17	technology research, development, engi-
18	neering, and commercial application activi-
19	ties funded under this Act are carried out
20	in the United States.
21	(4) Interagency and intraagency coordi-
22	NATION.—To the maximum extent practicable, the
23	Secretary shall coordinate research, development,
24	demonstration, and commercial application activities
25	amone

1	(A) relevant programs within the Depart-
2	ment, including—
3	(i) the Office of Energy Efficiency
4	and Renewable Energy;
5	(ii) the Office of Science;
6	(iii) the Office of Electricity Delivery
7	and Energy Reliability;
8	(iv) the Office of Fossil Energy;
9	(v) the Advanced Research Projects
10	Agency—Energy; and
11	(vi) other offices as determined by the
12	Secretary; and
13	(B) relevant technology research and devel-
14	opment programs within other Federal agen-
15	cies, as determined by the Secretary.
16	(5) Federal demonstration of tech-
17	NOLOGIES.—The Secretary shall make information
18	available to procurement programs of Federal agen-
19	cies regarding the potential to demonstrate tech-
20	nologies resulting from activities funded through
21	programs under this Act.
22	(6) Intergovernmental coordination.—
23	The Secretary shall seek opportunities to leverage
24	resources and support initiatives of State and local
25	governments in developing and promoting advanced

1	vehicle technologies, manufacturing, and infrastruc-
2	ture.
3	(7) Criteria.—In awarding grants under the
4	program under this subsection, the Secretary shall
5	give priority to those technologies (either individually
6	or as part of a system) that—
7	(A) provide the greatest aggregate fuel
8	savings based on the reasonable projected sales
9	volumes of the technology; and
10	(B) provide the greatest increase in United
11	States employment.
12	(8) Secondary use applications.—
13	(A) IN GENERAL.—The Secretary shall
14	carry out a research, development, and dem-
15	onstration program that—
16	(i) builds on any work carried out
17	under section 915 of the Energy Policy Act
18	of 2005 (42 U.S.C. 16195);
19	(ii) identifies possible uses of a vehicle
20	battery after the useful life of the battery
21	in a vehicle has been exhausted;
22	(iii) conducts long-term testing to
23	verify performance and degradation pre-
24	dictions and lifetime valuations for sec-
25	ondary uses;

1	(iv) evaluates innovative approaches to
2	recycling materials from plug-in electric
3	drive vehicles and the batteries used in
4	plug-in electric drive vehicles;
5	(v)(I) assesses the potential for mar-
6	kets for uses described in clause (ii) to de-
7	velop; and
8	(II) identifies any barriers to the de-
9	velopment of those markets; and
10	(vi) identifies the potential uses of a
11	vehicle battery—
12	(I) with the most promise for
13	market development; and
14	(II) for which market develop-
15	ment would be aided by a demonstra-
16	tion project.
17	(B) Report.—Not later than 1 year after
18	the date of enactment of this Act, the Secretary
19	shall submit to the appropriate committees of
20	Congress an initial report on the findings of the
21	program described in subparagraph (A), includ-
22	ing recommendations for stationary energy stor-
23	age and other potential applications for bat-
24	teries used in plug-in electric drive vehicles.
25	(C) Secondary use demonstration.—

1	(i) In general.—Based on the re-
2	sults of the program described in subpara-
3	graph (A), the Secretary shall develop
4	guidelines for projects that demonstrate
5	the secondary uses and innovative recycling
6	of vehicle batteries.
7	(ii) Publication of guidelines.—
8	Not later than 18 months after the date of
9	enactment of this Act, the Secretary
10	shall—
11	(I) publish the guidelines de-
12	scribed in clause (i); and
13	(II) solicit applications for fund-
14	ing for demonstration projects.
15	(iii) Pilot demonstration pro-
16	GRAM.—Not later than 21 months after
17	the date of enactment of this Act, the Sec-
18	retary shall select proposals for grant
19	funding under this subsection, based on an
20	assessment of which proposals are mostly
21	likely to contribute to the development of
22	a secondary market for batteries.
23	(b) Manufacturing.—The Secretary shall carry out
24	a research, development, engineering, demonstration, and
25	commercial application program of advanced vehicle man-

1	ufacturing technologies and practices, including innovative
2	processes—
3	(1) to increase the production rate and decrease
4	the cost of advanced battery and fuel cell manufac-
5	turing;
6	(2) to vary the capability of individual manufac-
7	turing facilities to accommodate different battery
8	chemistries and configurations;
9	(3) to reduce waste streams, emissions, and en-
10	ergy intensity of vehicle, engine, advanced battery
11	and component manufacturing processes;
12	(4) to recycle and remanufacture used batteries
13	and other vehicle components for reuse in vehicles or
14	stationary applications;
15	(5) to develop manufacturing processes to effec-
16	tively fabricate, assemble, and produce cost-effective
17	lightweight materials such as advanced aluminum
18	and other metal alloys, polymeric composites, and
19	carbon fiber for use in vehicles;
20	(6) to produce lightweight high pressure storage
21	systems for gaseous fuels;
22	(7) to design and manufacture purpose-built hy-
23	drogen fuel cell vehicles and components;
24	(8) to improve the calendar life and cycle life of
25	advanced batteries; and

1	(9) to produce permanent magnets for advanced
2	vehicles.
3	SEC. 8. MEDIUM- AND HEAVY-DUTY COMMERCIAL AND
4	TRANSIT VEHICLES PROGRAM.
5	The Secretary, in partnership with relevant research
6	and development programs in other Federal agencies, and
7	a range of appropriate industry stakeholders, shall carry
8	out a program of cooperative research, development, dem-
9	onstration, and commercial application activities on ad-
10	vanced technologies for medium- to heavy-duty commer-
11	cial, vocational, recreational, and transit vehicles, includ-
12	ing activities in the areas of—
13	(1) engine efficiency and combustion research:
14	(2) onboard storage technologies for compressed
15	and liquefied natural gas;
16	(3) development and integration of engine tech-
17	nologies designed for natural gas operation of a vari-
18	ety of vehicle platforms;
19	(4) waste heat recovery and conversion;
20	(5) improved aerodynamics and tire rolling re-
21	sistance;
22	(6) energy and space-efficient emissions control
23	systems;

1	(7) mild hybrid, heavy hybrid, hybrid hydraulic,
2	plug-in hybrid, and electric platforms, and energy
3	storage technologies;
4	(8) drivetrain optimization;
5	(9) friction and wear reduction;
6	(10) engine idle and parasitic energy loss reduc-
7	tion;
8	(11) electrification of accessory loads;
9	(12) onboard sensing and communications tech-
10	nologies;
11	(13) advanced lightweighting materials and ve-
12	hicle designs;
13	(14) increasing load capacity per vehicle;
14	(15) thermal management of battery systems;
15	(16) recharging infrastructure;
16	(17) compressed natural gas infrastructure;
17	(18) advanced internal combustion engines;
18	(19) complete vehicle and power pack modeling,
19	simulation, and testing;
20	(20) hydrogen vehicle technologies, including
21	fuel cells and internal combustion engines, and hy-
22	drogen infrastructure, including hydrogen energy
23	storage to enable renewables and provide hydrogen
24	for fuel and power;

1	(21) retrofitting advanced technologies onto ex-
2	isting truck fleets;
3	(22) advanced boosting systems;
4	(23) engine down speeding; and
5	(24) integration of these and other advanced
6	systems onto a single truck and trailer platform.
7	SEC. 9. CLASS 8 TRUCK AND TRAILER SYSTEMS DEM-
8	ONSTRATION.
9	(a) In General.—The Secretary shall conduct a
10	competitive grant program to demonstrate the integration
11	of multiple advanced technologies on Class 8 truck and
12	trailer platforms, including a combination of technologies
13	listed in section 8.
14	(b) APPLICANT TEAMS.—Applicant teams may be
15	comprised of truck and trailer manufacturers, engine and
16	component manufacturers, fleet customers, university re-
17	searchers, and other applicants as appropriate for the de-
18	velopment and demonstration of integrated Class 8 truck
19	and trailer systems.
20	SEC. 10. TECHNOLOGY TESTING AND METRICS.
21	The Secretary, in coordination with the partners of
22	the interagency research program described in section 8—
23	(1) shall develop standard testing procedures
24	and technologies for evaluating the performance of
25	advanced heavy vehicle technologies under a range of

- 1 representative duty cycles and operating conditions,
- 2 including for heavy hybrid propulsion systems;
- 3 (2) shall evaluate heavy vehicle performance
- 4 using work performance-based metrics other than
- 5 those based on miles per gallon, including those
- 6 based on units of volume and weight transported for
- 7 freight applications, and appropriate metrics based
- 8 on the work performed by nonroad systems; and
- 9 (3) may construct heavy duty truck and bus
- testing facilities.

11 SEC. 11. NONROAD SYSTEMS PILOT PROGRAM.

- The Secretary shall undertake a pilot program of re-
- 13 search, development, demonstration, and commercial ap-
- 14 plications of technologies to improve total machine or sys-
- 15 tem efficiency for nonroad mobile equipment including ag-
- 16 ricultural, construction, air, and sea port equipment, and
- 17 shall seek opportunities to transfer relevant research find-
- 18 ings and technologies between the nonroad and on-high-
- 19 way equipment and vehicle sectors.

20 SEC. 12. REPEAL OF EXISTING AUTHORITIES.

- 21 (a) IN GENERAL.—Sections 706, 711, 712, and 933
- 22 of the Energy Policy Act of 2005 (42 U.S.C. 16051,
- 23 16061, 16062, 16233) are repealed.
- 24 (b) Energy Efficiency.—Section 911 of the En-
- 25 ergy Policy Act of 2005 (42 U.S.C. 16191) is amended—

1	(1) in subsection (a)—
2	(A) in paragraph (1)(A), by striking "vehi-
3	cles, buildings," and inserting "buildings"; and
4	(B) in paragraph (2)—
5	(i) by striking subparagraph (A); and
6	(ii) by redesignating subparagraphs
7	(B) through (E) as subparagraphs (A)
8	through (D), respectively; and
9	(2) in subsection (c)—
10	(A) by striking paragraph (3);
11	(B) by redesignating paragraph (4) as
12	paragraph (3); and
13	(C) in paragraph (3) (as so redesignated),
14	by striking "(a)(2)(D)" and inserting
15	"(a)(2)(C)".

 \bigcirc