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(Original Signature of Member)

111TH CONGRESS
1ST SESSION

H. R. _____

To provide for a program of research, development, demonstration and commercial application in vehicle technologies at the Department of Energy.

IN THE HOUSE OF REPRESENTATIVES

Mr. PETERS (for himself and Mrs. BIGGERT) introduced the following bill; which was referred to the Committee on _____

A BILL

To provide for a program of research, development, demonstration and commercial application in vehicle technologies at the Department of Energy.

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 “Advanced Vehicle
5 Technology Act of 2009”.

6 **SEC. 2. FINDINGS.**

7 Congress finds the following:

1 (1) According to the Energy Information Ad-
2 ministration, the transportation sector accounts for
3 approximately 28 percent of the United States pri-
4 mary energy demand and greenhouse gas emissions,
5 and 24 percent of global oil demand.

6 (2) The United States transportation sector is
7 over 95 percent dependent on petroleum, and over
8 60 percent of petroleum demand is met by imported
9 supplies.

10 (3) United States heavy truck fuel consumption
11 will increase 23 percent by 2030, while overall trans-
12 portation energy use will decline by 1 percent.

13 (4) The domestic automotive and commercial
14 vehicle manufacturing sectors have increasingly lim-
15 ited resources for research and development of ad-
16 vanced technologies.

17 (5) Vehicle, engine, and component manufactur-
18 ers are playing a more important role in vehicle
19 technology development, and should be better inte-
20 grated into Federal research efforts.

21 (6) Priorities for the Department of Energy's
22 vehicle technologies research have shifted drastically
23 in recent years among diesel hybrids, hydrogen fuel
24 cell vehicles, and plug-in electric hybrids, with little
25 continuity among them.

1 (7) The integration of vehicle, communication,
2 and infrastructure technologies has great potential
3 for efficiency gains through better management of
4 the total transportation system.

5 (8) The Federal Government should balance its
6 role in researching longer-term exploratory concepts
7 and developing nearer-term transformational tech-
8 nologies for vehicles.

9 **SEC. 3. OBJECTIVES.**

10 The objectives of this Act are to—

11 (1) develop technologies and practices that—

12 (A) improve the fuel efficiency and emis-
13 sions of all vehicles produced in the United
14 States; and

15 (B) reduce transportation sector reliance
16 on petroleum-based fuels;

17 (2) support domestic research and manufac-
18 turing of advanced vehicles, engines, and compo-
19 nents;

20 (3) enable moving larger volumes of freight and
21 more passengers with less energy and emissions;

22 (4) allow for greater consumer choice of vehicle
23 technologies and fuels;

24 (5) shorten technology development and inte-
25 gration cycles in the vehicle industry;

1 (6) ensure a proper balance and diversity of
2 Federal investment in vehicle technologies; and

3 (7) strengthen partnerships between Federal
4 and State governmental agencies and the private
5 and academic sectors.

6 **SEC. 4. DEFINITIONS.**

7 For the purposes of this Act:

8 (1) DEPARTMENT.—The term “Department”
9 means the Department of Energy.

10 (2) SECRETARY.—The term “Secretary” means
11 the Secretary of Energy.

12 **SEC. 5 AUTHORIZATION OF APPROPRIATIONS.**

13 (a) IN GENERAL.—The following sums are author-
14 ized to be appropriated to the Secretary for research, de-
15 velopment, demonstration, and commercial application of
16 vehicles and related technologies, including activities au-
17 thorized under this Act:

18 (1) \$550,000,000 for fiscal year 2010.

19 (2) \$560,000,000 for fiscal year 2011.

20 (3) \$570,000,000 for fiscal year 2012.

21 (4) \$580,000,000 for fiscal year 2013.

22 (5) \$590,000,000 for fiscal year 2014.

23 (b) MEDIUM AND HEAVY DUTY COMMERCIAL VEHI-
24 CLES.—From the amounts authorized in under subsection

1 (a), there are authorized to be appropriated for carrying
2 out title II—

3 (1) \$200,000,000 for fiscal year 2010;

4 (2) \$210,000,000 for fiscal year 2011;

5 (3) \$220,000,000 for fiscal year 2012;

6 (4) \$230,000,000 for fiscal year 2013; and

7 (5) \$240,000,000 for fiscal year 2014.

8 (c) USER FACILITIES.—From the amounts author-
9 ized in under subsection (a), there are authorized to be
10 appropriated for carrying out section 104—

11 (1) \$35,000,000 for fiscal year 2010;

12 (2) \$30,000,000 for fiscal year 2011;

13 (3) \$20,000,000 for fiscal year 2012;

14 (4) \$15,000,000 for fiscal year 2013; and

15 (5) \$15,000,000 for fiscal year 2014.

16 (d) NON-ROAD PILOT PROGRAM.—From the
17 amounts authorized in under subsection (a), there are au-
18 thorized to be appropriated for carrying out section 214—

19 (1) \$20,000,000 for fiscal year 2010;

20 (2) \$20,000,000 for fiscal year 2011; and

21 (3) \$20,000,000 for fiscal year 2012.

1 **TITLE I—VEHICLE RESEARCH**
2 **AND DEVELOPMENT**

3 **SEC. 101. PROGRAM.**

4 (a) **ACTIVITIES.**—The Secretary shall conduct a pro-
5 gram of basic and applied research, development, dem-
6 onstration, and commercial application activities on mate-
7 rials, technologies, and processes with the potential to sub-
8 stantially reduce or eliminate petroleum use and the re-
9 lated emissions of the Nation’s automotive and commercial
10 vehicle sectors, including activities in the areas of—

11 (1) hybridization or full electrification of vehicle
12 systems;

13 (2) batteries and other energy storage devices;

14 (3) power electronics;

15 (4) vehicle manufacturing technologies and
16 processes;

17 (5) engine efficiency and combustion optimiza-
18 tion;

19 (6) waste heat recovery;

20 (7) transmission and drivetrains;

21 (8) hydrogen fuel cells and internal combustion
22 engines, infrastructure, and related technologies;

23 (9) aerodynamics, rolling resistance, and acces-
24 sory power loads of vehicles and associated equip-
25 ment;

- 1 (10) vehicle weight reduction;
- 2 (11) friction and wear reduction;
- 3 (12) engine and component durability;
- 4 (13) innovative propulsion systems;
- 5 (14) engine compatibility with and optimization
6 for nonpetroleum fuels;
- 7 (15) modeling and simulation of vehicle and
8 transportation systems;
- 9 (16) refueling and charging infrastructure for
10 alternative fueled and electric or plug-in electric hy-
11 brid vehicles;
- 12 (17) sensing, communications, and actuation
13 technologies for vehicle, electrical grid, and infra-
14 structure;
- 15 (18) efficient use and recycling of rare earth
16 materials, and reduction of precious metals and
17 other high-cost materials in vehicles;
- 18 (19) aftertreatment technologies;
- 19 (20) thermal management of battery systems;
- 20 (21) development of common standards, speci-
21 fications, and architectures for both transportation
22 and stationary battery applications;
- 23 (22) consumer education and outreach; and
- 24 (23) other research areas as determined by the
25 Secretary.

1 (b) TRANSFORMATIONAL TECHNOLOGY.—The Sec-
2 retary shall ensure that the Department continues to sup-
3 port activities and maintains competency in mid-to-long-
4 term transformational vehicle technologies with potential
5 to achieve deep reductions in petroleum use and emissions,
6 including activities in the areas of—

7 (1) hydrogen fuel cells, internal combustion en-
8 gines, storage, infrastructure, and technology valida-
9 tion, and development of hydrogen safety codes and
10 standards;

11 (2) multiple battery chemistries and novel en-
12 ergy storage devices;

13 (3) communication and connectivity among ve-
14 hicles, infrastructure, and the electrical grid; and

15 (4) other innovative technologies research and
16 development, as determined by the Secretary.

17 (c) INDUSTRY PARTICIPATION.—To the maximum
18 extent practicable, activities under this Act shall be carried
19 out in partnership or collaboration with automotive manu-
20 facturers, heavy commercial and transit vehicle manufac-
21 turers, vehicle and engine equipment and component man-
22 ufacturers, manufacturing equipment manufacturers, ad-
23 vanced vehicle service providers, fuel producers and energy
24 suppliers, electric utilities, universities, national labora-

1 tories, and independent research laboratories. In carrying
2 out this Act the Secretary shall—

3 (1) determine whether a wide range of domestic
4 manufacturers and suppliers are represented in on-
5 going public-private partnership activities and, where
6 possible, partner with firms that have not tradition-
7 ally participated in federally-sponsored research and
8 development activities;

9 (2) leverage the capabilities and resources of,
10 and formalize partnerships with, industry-led stake-
11 holder organizations, nonprofit organizations, indus-
12 try consortia, and trade associations with expertise
13 in the research and development of, and education
14 and outreach activities in, advanced automotive and
15 commercial vehicle technologies;

16 (3) streamline processes for transferring tech-
17 nologies and research findings to industry and con-
18 sumers;

19 (4) give consideration to conversion of existing
20 or former vehicle technology manufacturing facilities
21 for the purposes of this Act; and

22 (5) make every effort to ensure that tech-
23 nologies developed under this Act are produced in
24 the United States.

1 (d) INTERAGENCY AND INTRAAGENCY COORDINA-
2 TION.—To the maximum extent practicable, the Secretary
3 shall coordinate research, development, demonstration,
4 and commercial application activities among—

5 (1) relevant programs within the Department,
6 including—

7 (A) the Office of Energy Efficiency and
8 Renewable Energy;

9 (B) the Office of Science;

10 (C) the Office of Electricity Delivery and
11 Energy Reliability;

12 (D) the Office of Fossil Energy;

13 (E) the Advanced Research Projects Agen-
14 cy—Energy; and

15 (F) other offices as determined by the Sec-
16 retary; and

17 (2) relevant technology research and develop-
18 ment programs within other Federal agencies, as de-
19 termined by the Secretary or an officer of the Exec-
20 utive Office of the President.

21 (e) FEDERAL DEMONSTRATION OF TECH-
22 NOLOGIES.—The Secretary shall make information avail-
23 able to procurement programs of Federal agencies regard-
24 ing the potential to demonstrate technologies resulting
25 from activities funded through programs under this Act.

1 (f) INTERGOVERNMENTAL COORDINATION.—The
2 Secretary shall seek opportunities to leverage resources
3 and support initiatives of State and local governments in
4 developing and promoting advanced vehicle technologies,
5 manufacturing, and infrastructure.

6 **SEC. 102. SENSING AND COMMUNICATIONS TECH-**
7 **NOLOGIES.**

8 The Secretary, in coordination with the relevant re-
9 search programs of other Federal agencies, shall conduct
10 research, development, and demonstration activities on
11 connectivity of vehicle and transportation systems, includ-
12 ing on sensing, computation, communication, and actu-
13 ation technologies that allow for reduced fuel use, opti-
14 mized traffic flow, improved freight logistics, and vehicle
15 electrification, including technologies for—

16 (1) onboard vehicle, engine, and component
17 sensing and actuation;

18 (2) vehicle-to-vehicle sensing and communica-
19 tion;

20 (3) vehicle-to-infrastructure sensing and com-
21 munication; and

22 (4) vehicle integration with the electrical grid.

23 **SEC. 103. MANUFACTURING.**

24 The Secretary shall carry out a research, develop-
25 ment, demonstration, and commercial application program

1 of advanced vehicle manufacturing technologies and prac-
2 tices, including innovative processes to—

3 (1) increase the production rate and decrease
4 the cost of advanced battery manufacturing;

5 (2) vary manufacturing facility capability to ac-
6 commodate different battery chemistries and con-
7 figurations;

8 (3) reduce waste streams, emissions, and en-
9 ergy-intensity of vehicle, engine, and component
10 manufacturing processes;

11 (4) recycle and remanufacture used batteries
12 and other vehicle components for reuse in vehicles or
13 stationary applications;

14 (5) produce cost-effective lightweight materials
15 such as advanced metal alloys and carbon fiber;

16 (6) design and manufacture purpose-built hy-
17 drogen and fuel cell vehicles and components; and

18 (7) produce permanent magnets for advanced
19 vehicles.

20 **SEC. 104. USER FACILITIES.**

21 Activities under this Act may include construction,
22 expansion, or modification of new and existing vehicle, en-
23 gine, and component research and testing facilities for—

24 (1) testing or simulating interoperability of a
25 variety of vehicle components;

1 (2) subjecting whole or partial vehicle platforms
2 to fully representative duty cycles and operating con-
3 ditions;

4 (3) developing and demonstrating a range of
5 chemistries and configurations for advanced vehicle
6 battery manufacturing; and

7 (4) developing and demonstrating test cycles for
8 new and alternate fuels, and other advanced vehicle
9 technologies.

10 **TITLE II—MEDIUM AND HEAVY**
11 **DUTY COMMERCIAL VEHICLES**

12 **SEC. 201. PROGRAM.**

13 (a) IN GENERAL.—The Secretary, in partnership
14 with relevant research and development programs in other
15 Federal agencies, and diverse industrial stakeholders, shall
16 carry out a program of cooperative research, development,
17 demonstration, and commercial application activities on
18 advanced technologies for medium-to-heavy duty commer-
19 cial and transit vehicles, including activities in the areas
20 of—

21 (1) engine efficiency and combustion research;

22 (2) waste heat recovery and conversion;

23 (3) improved aerodynamics and tire rolling re-
24 sistance;

- 1 (4) energy and space-efficient emissions control
- 2 systems;
- 3 (5) heavy hybrid, hybrid hydraulic, plug-in hy-
- 4 brid, and electric platforms, and energy storage
- 5 technologies;
- 6 (6) drivetrain optimization;
- 7 (7) friction and wear reduction;
- 8 (8) engine idle and parasitic energy loss reduc-
- 9 tion;
- 10 (9) electrification of accessory loads;
- 11 (10) onboard sensing and communications tech-
- 12 nologies;
- 13 (11) advanced lightweight materials and vehicle
- 14 designs;
- 15 (12) increasing freight capacity per vehicle;
- 16 (13) thermal management of battery systems;
- 17 (14) recharging infrastructure;
- 18 (15) complete vehicle modeling and simulation;
- 19 (16) vehicle and driver management systems;
- 20 (17) retrofitting advanced technologies onto ex-
- 21 isting truck fleets; and
- 22 (18) integration of these and other advanced
- 23 systems onto a single truck and trailer platform.
- 24 (b) LEADERSHIP.—The Secretary shall appoint a
- 25 full-time Director to coordinate research, development,

1 demonstration, and commercial application activities in
2 medium-to-heavy duty commercial and transit vehicle
3 technologies. Responsibilities of the Director, reporting to
4 the Program Manager for Vehicle Technologies, include—

5 (1) improving coordination and developing con-
6 sensus between government agency and industry
7 partners, and proposing new processes for program
8 management and priority setting to better align ac-
9 tivities and budgets among partners;

10 (2) frequent convening of workshops, site visits,
11 demonstrations, conferences, investor forums, and
12 other events in which information and research find-
13 ings are shared among program participants and in-
14 terested stakeholders;

15 (3) developing a budget for the Department's
16 activities with regard to the interagency program,
17 and providing consultation and guidance on vehicle
18 technology funding priorities across agencies;

19 (4) determining a process for reviewing pro-
20 gram technical goals, targets, and timetables and,
21 where applicable, aided by life-cycle impact and cost
22 analysis, proposing revisions in light of program
23 progress, available funding, and rate of technology
24 adoption;

1 (5) evaluating ongoing activities of the program
2 and recommending project modifications, including
3 the termination of projects, where applicable; and

4 (6) recruiting new industry participants to the
5 interagency program, including truck, trailer, and
6 component manufacturers who have not traditionally
7 participated in federally-sponsored research and
8 technology development activities.

9 (c) REPORTING.—At the end of each fiscal year the
10 partnership shall submit to the Secretary and relevant
11 Congressional committees of jurisdiction an annual report
12 describing activities undertaken in the previous year, ac-
13 tive industry participants, efforts to recruit new partici-
14 pants, progress of the program in meeting goals and
15 timelines, and a strategic plan for funding of activities
16 across agencies.

17 **SEC. 202. CLASS 8 TRUCK DEMONSTRATION.**

18 The Secretary shall conduct a competitive grant pro-
19 gram to demonstrate the integration of multiple advanced
20 technologies on long-haul Class 8 truck and trailer plat-
21 forms with a goal of improving overall freight efficiency,
22 as measured in ton-miles per gallon, by 50 percent, includ-
23 ing a combination of technologies listed in section 201(a).
24 Applicant teams may be comprised of truck and trailer
25 manufacturers, engine and component manufacturers,

1 fleet customers, university researchers, and other appli-
2 cants as appropriate for the development and demonstra-
3 tion of integrated Class 8 truck and trailer systems.

4 **SEC. 203. TECHNOLOGY TESTING AND METRICS.**

5 The Secretary, in coordination with the partners of
6 the interagency research program described in section
7 201(a)—

8 (1) shall develop standard testing procedures
9 and technologies for evaluating the performance of
10 advanced heavy vehicle technologies under a range of
11 representative duty cycles and operating conditions,
12 including for heavy hybrid propulsion systems;

13 (2) may evaluate heavy vehicle performance
14 using metrics other than those based on miles per
15 gallon, including those based on units of volume or
16 weight transported for freight applications, and ap-
17 propriate metrics based on the work performed by
18 nonroad systems; and

19 (3) may construct heavy duty truck and bus
20 testing facilities.

21 **SEC. 204. NONROAD SYSTEMS PILOT PROGRAM.**

22 The Secretary is authorized to undertake a pilot pro-
23 gram of research, development, demonstration, and com-
24 mercial applications of technologies to improve total ma-
25 chine or system efficiency for heavy duty nonroad equip-

1 ment, and shall seek opportunities to transfer relevant re-
2 search findings and technologies between the nonroad and
3 on-highway equipment and vehicle sectors.