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To provide for a program to accelerate the reduction of greenhouse gas emissions in the United States by establishing a market-driven system of greenhouse gas tradeable allowances, to support the deployment of new climate change-related technologies, and to ensure benefits to consumers from the trading in such allowances, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JANUARY 12, 2007

Mr. LIEBERMAN (for himself, Mr. MCCAIN, Mrs. LINCOLN, Ms. SNOWE, Mr. OBAMA, Ms. COLLINS, and Mr. DURBIN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To provide for a program to accelerate the reduction of greenhouse gas emissions in the United States by establishing a market-driven system of greenhouse gas tradeable allowances, to support the deployment of new climate change-related technologies, and to ensure benefits to consumers from the trading in such allowances, 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,*

1 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

2 (a) SHORT TITLE.—This Act may be cited as the
3 "Climate Stewardship and Innovation Act of 2007".

4 (b) TABLE OF CONTENTS.—The table of contents for
5 this Act is as follows:

Sec. 1. Short title; table of contents.
Sec. 2. Purposes.
Sec. 3. Definitions.

TITLE I—A MARKET TO REDUCE GREENHOUSE GAS EMISSIONS

SUBTITLE A—TRACKING EMISSIONS

Sec. 101. National greenhouse gas database and registry established.
Sec. 102. Inventory of greenhouse gas emissions for covered entities.
Sec. 103. Greenhouse gas reduction reporting.
Sec. 104. Measurement and verification.

SUBTITLE B—MANDATING EMISSIONS REDUCTIONS

Sec. 121. Covered entities must submit allowances for emissions.
Sec. 122. Compliance.
Sec. 123. Exemption of source categories.
Sec. 124. Establishment of tradeable allowances.
Sec. 125. Penalties.

SUBTITLE C—CONTROLLING COMPLIANCE COSTS

Sec. 141. Trading.
Sec. 142. Banking.
Sec. 143. Borrowing.
Sec. 144. Domestic offsets.
Sec. 145. International credits plan.

SUBTITLE D—ALLOCATING EMISSIONS ALLOWANCES

Sec. 161. Determination of tradeable allowance allocations.
Sec. 162. Allocation of tradeable allowances.
Sec. 163. Ensuring target adequacy.
Sec. 164. Initial allocations for early participation and accelerated participation.
Sec. 165. Bonus for accelerated participation.

TITLE II—CLIMATE CHANGE CREDIT CORPORATION

SUBTITLE A—ESTABLISHMENT AND FUNCTIONS

Sec. 201. Establishment.
Sec. 202. Purposes and functions.

SUBTITLE B—FINANCING

Sec. 251. Climate Technology Financing Board.
Sec. 252. Responsibilities of the Secretary.

Sec. 253. Limitations.
Sec. 254. Source of funding for programs.
Sec. 255. Definitions.

TITLE III—ADVANCED TECHNOLOGIES FOR A PRODUCTIVE, SECURE, AND CLEAN ENERGY FUTURE

Sec. 301. Findings.

SUBTITLE A—INNOVATION INFRASTRUCTURE

Sec. 311. Technology transfer opportunities.
Sec. 312. Government-sponsored technology investment program.
Sec. 313. Federal technology innovation personnel incentives.
Sec. 314. Interdisciplinary research and commercialization.
Sec. 315. Climate innovation partnerships.
Sec. 316. National Medal of Climate Stewardship Innovation.
Sec. 317. Math and science teachers' enhancement program.
Sec. 318. Patent study.
Sec. 319. Lessons-learned program.
Sec. 320. Research grants.
Sec. 321. Abrupt climate change research.
Sec. 322. Enhanced environmental measurements and standards.
Sec. 323. Climate technology challenge program.

SUBTITLE B—DEPLOYING ADVANCED TECHNOLOGIES AND PRACTICES

Sec. 351. Low- or zero-emissions electricity generation.
Sec. 352. Low- or zero-emissions transportation.
Sec. 353. Measures to increase energy efficiency.
Sec. 354. Geological storage.
Sec. 355. Agricultural sequestration.

TITLE IV—ADAPTING TO CLIMATE CHANGE IMPACTS

Sec. 401. Adaptation technologies.
Sec. 402. Mitigating climate change's impacts on the poor.

SEC. 2. PURPOSES.

The purposes of this Act are—

(1) without weakening the economic position of the United States or otherwise imposing hardship on its citizens, to reduce the Nation's greenhouse gas emissions substantially enough and quickly enough between 2007 and 2050 to preserve the feasibility of forestalling catastrophic, manmade global climate change; and

(2) to accomplish that purpose while—

(A) promoting the rapid and widespread deployment of advanced technologies and practices for reducing greenhouse gas emissions;

(B) promoting the economic well-being of low- and middle-income Americans;

(C) keeping good jobs in the United States;

(D) mitigating climate change's impacts on low- and middle-income Americans;

(E) mitigating climate change's impacts on low-income populations abroad; and

(F) mitigating climate change's impacts on wildlife.

SEC. 3. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of the Environmental Protection Agency.

(2) BASELINE.—The term ''baseline'' means the historic greenhouse gas emission levels of an entity, as adjusted upward by the Administrator to reflect actual reductions that are verified in accordance with—

(A) regulations promulgated under section 101(c)(1); and

(B) relevant standards and methods developed under this title.

(3) CARBON DIOXIDE EQUIVALENTS.—The term ''carbon dioxide equivalents'' means, for each greenhouse gas, the amount of each such greenhouse gas that makes the same contribution to global warming as one metric ton of carbon dioxide, as determined by the Administrator.

(4) COVERED SECTORS.—The term ''covered sectors'' means the electricity, transportation, industry, and commercial sectors, as such terms are used in the Inventory.

(5) COVERED ENTITY.—The term ''covered entity'' means an entity (including a branch, department, agency, or instrumentality of Federal, State, or local government) that—

(A) owns or controls a source of greenhouse gas emissions in the electric power, industrial, or commercial sectors of the United States economy (as defined in the Inventory), refines or imports petroleum products for use in transportation, or produces or imports

hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride; and

(B) emits, from any single facility owned by the entity, over 10,000 metric tons of greenhouse gas per year, measured in units of carbon dioxide equivalents, or produces or imports—

(i) petroleum products that, when combusted, will emit,

(ii) hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride that, when used, will emit, or

(iii) other greenhouse gases that, when used, will emit,

over 10,000 metric tons of greenhouse gas per year, measured in units of carbon dioxide equivalents.

(6) DATABASE.—The term ''database'' means the national greenhouse gas database established under section 101.

(7) DIRECT EMISSIONS.—The term ''direct emissions'' means greenhouse gas emissions by an entity from a facility that is owned or controlled by that entity.

(8) FACILITY.—The term ''facility'' means a building, structure, or installation located on any 1

or more contiguous or adjacent properties of an entity in the United States.

(9) GREENHOUSE GAS.—The term ''greenhouse gas'' means—

(A) carbon dioxide;

(B) methane;

(C) nitrous oxide;

(D) hydrofluorocarbons;

(E) perfluorocarbons; and

(F) sulfur hexafluoride.

(10) INDIRECT EMISSIONS.—The term ''indirect emissions'' means greenhouse gas emissions that are—

(A) a result of the activities of an entity; but

(B) emitted from a facility owned or controlled by another entity.

(11) INVENTORY.—The term ''Inventory'' means the Inventory of U.S. Greenhouse Gas Emissions and Sinks, prepared in compliance with the United Nations Framework Convention on Climate Change Decision 3/CP.5).

(12) LEAKAGE.—The term ''leakage'' means—

(A) an increase in greenhouse gas emissions by one facility or entity caused by a re-

duction in greenhouse gas emissions by another facility or entity; or

(B) a decrease in sequestration that is caused by an increase in sequestration at another location.

(13) PERMANENCE.—The term ''permanence'' means the extent to which greenhouse gases that are sequestered will not later be returned to the atmosphere.

(14) REGISTRY.—The term ''registry'' means the registry of greenhouse gas emission reductions established under section 101(b)(2).

(15) SECRETARY.—The term ''Secretary'' means the Secretary of Commerce.

(16) SEQUESTRATION.—

(A) IN GENERAL.—The term ''sequestration'' means the capture, long-term separation, isolation, or removal of greenhouse gases from the atmosphere.

(B) INCLUSIONS.—The term ''sequestration'' includes—

(i) agricultural and conservation practices;

(ii) reforestation;

(iii) forest preservation; and

(iv) any other appropriate method of capture, long-term separation, isolation, or removal of greenhouse gases from the atmosphere, as determined by the Administrator.

(C) EXCLUSIONS.—The term ''sequestration'' does not include—

(i) any conversion of, or negative impact on, a native ecosystem; or

(ii) any introduction of non-native species.

(17) SOURCE CATEGORY.—The term ''source category'' means a process or activity that leads to direct emissions of greenhouse gases, as listed in the Inventory.

(18) STATIONARY SOURCE.—The term ''stationary source'' means generally any source of greenhouse gases except those emissions resulting directly from an engine for transportation purposes.

TITLE I—A MARKET TO REDUCE GREENHOUSE GAS EMISSIONS

Subtitle A—Tracking Emissions

SEC. 101. NATIONAL GREENHOUSE GAS DATABASE AND REGISTRY ESTABLISHED.

(a) ESTABLISHMENT.—As soon as practicable after the date of enactment of this Act, the Administrator, in coordination with the Secretary, the Secretary of Energy, the Secretary of Agriculture, and private sector and non-governmental organizations, shall establish, operate, and maintain a database, to be known as the ''National Greenhouse Gas Database'', to collect, verify, and analyze information on greenhouse gas emissions by entities.

(b) NATIONAL GREENHOUSE GAS DATABASE COMPONENTS.—The database shall consist of—

(1) an inventory of greenhouse gas emissions; and

(2) a registry of greenhouse gas emission reductions and increases in greenhouse gas sequestrations.

(c) COMPREHENSIVE SYSTEM.—

(1) IN GENERAL.—Not later than 2 years after the date of enactment of this Act, the Administrator shall promulgate regulations to implement a com-

prehensive system for greenhouse gas emissions reporting, inventorying, and reductions registration.

(2) REQUIREMENTS.—The Administrator shall ensure, to the maximum extent practicable, that—

(A) the comprehensive system described in paragraph (1) is designed to—

(i) maximize completeness, transparency, and accuracy of information reported; and

(ii) minimize costs incurred by entities in measuring and reporting greenhouse gas emissions; and

(B) the regulations promulgated under paragraph (1) establish procedures and protocols necessary—

(i) to prevent the double-counting of greenhouse gas emissions or emission reductions reported by more than 1 reporting entity;

(ii) to provide for corrections to errors in data submitted to the database;

(iii) to provide for adjustment to data by reporting entities that have had a significant organizational change (including mergers, acquisitions, and divestiture), in

order to maintain comparability among data in the database over time;

(iv) to provide for adjustments to reflect new technologies or methods for measuring or calculating greenhouse gas emissions;

(v) to account for changes in registration of ownership of emission reductions resulting from a voluntary private transaction between reporting entities; and

(vi) to clarify the responsibility for reporting in the case of any facility owned or controlled by more than 1 entity.

(3) SERIAL NUMBERS.—Through regulations promulgated under paragraph (1), the Administrator shall develop and implement a system that provides—

(A) for the verification of submitted emissions reductions registered under this section;

(B) for the provision of unique serial numbers to identify the registered emission reductions made by an entity relative to the baseline of the entity;

(C) for the tracking of the registered reductions associated with the serial numbers; and

(D) for such action as may be necessary to prevent counterfeiting of the registered reductions.

SEC. 102. INVENTORY OF GREENHOUSE GAS EMISSIONS FOR COVERED ENTITIES.

(a) IN GENERAL.—Not later than July 1st of each calendar year after 2010, each covered entity shall submit to the Administrator a report that states, for the preceding calendar year, the entity-wide greenhouse gas emissions (as reported at the facility level), including—

(1) the total quantity of direct greenhouse gas emissions from stationary sources, expressed in units of carbon dioxide equivalents, except those reported under paragraph (3);

(2) the amount of petroleum products sold or imported by the entity and the amount of greenhouse gases, expressed in units of carbon dioxide equivalents, that would be emitted when these products are used for transportation in the United States, as determined by the Administrator under section 121(b);

(3) the amount of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride, expressed in units of carbon dioxide equivalents, that are sold or imported by the entity and will ultimately be emitted in the United States, as determined by the Administrator under section 121(d); and

(4) such other categories of emissions as the Administrator determines in the regulations promulgated under section 101(c)(1) may be practicable and useful for the purposes of this Act, such as—

(A) indirect emissions from imported electricity, heat, and steam;

(B) process and fugitive emissions; and

(C) production or importation of greenhouse gases.

(b) COLLECTION AND ANALYSIS OF DATA.—The Administrator shall collect and analyze information reported under subsection (a) for use under this title.

SEC. 103. GREENHOUSE GAS REDUCTION REPORTING.

(a) IN GENERAL.—Subject to the requirements described in subsection (b)—

(1) a covered entity may register greenhouse gas emission reductions achieved after 1990 and before 2012 under this section; and

(2) an entity that is not a covered entity may register greenhouse gas emission reductions achieved at any time since 1990 under this section.

(b) REQUIREMENTS.—

(1) IN GENERAL.—The requirements referred to in subsection (a) are that an entity (other than an entity described in paragraph (2)) shall—

(A) establish a baseline; and

(B) submit the report described in subsection (c)(1).

(2) REQUIREMENTS APPLICABLE TO ENTITIES ENTERING INTO CERTAIN AGREEMENTS.—An entity that enters into an agreement with a participant in the registry for the purpose of a carbon sequestration project shall not be required to comply with the requirements specified in paragraph (1) unless that entity is required to comply with the requirements by reason of an activity other than the agreement.

(c) REPORTS.—

(1) REQUIRED REPORT.—Not later than July 1st of the each calendar year beginning more than 2 years after the date of enactment of this Act, but subject to paragraph (3), an entity described in subsection (a) shall submit to the Administrator a report that states, for the preceding calendar year, the

entity-wide greenhouse gas emissions (as reported at the facility level), including—

(A) the total quantity of direct greenhouse gas emissions from stationary sources, expressed in units of carbon dioxide equivalents;

(B) the amount of petroleum products sold or imported by the entity and the amount of greenhouse gases, expressed in units of carbon dioxide equivalents, that would be emitted when these products are used for transportation in the United States, as determined by the Administrator under section 121(b);

(C) the amount of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride, expressed in units of carbon dioxide equivalents, that are sold or imported by the entity and will ultimately be emitted in the United States, as determined by the Administrator under section 121(d); and

(D) such other categories of emissions as the Administrator determines in the regulations promulgated under section 101(c)(1) may be practicable and useful for the purposes of this Act, such as—

(i) indirect emissions from imported electricity, heat, and steam;

(ii) process and fugitive emissions; and

(iii) production or importation of greenhouse gases.

(2) VOLUNTARY REPORTING.—An entity described in subsection (a) may (along with establishing a baseline and reporting emissions under this section)—

(A) submit a report described in paragraph (1) before the date specified in that paragraph for the purposes of achieving and commoditizing greenhouse gas reductions through use of the registry and for other purposes; and

(B) submit to the Administrator, for inclusion in the registry, information that has been verified in accordance with regulations promulgated under section 101(c)(1) and that relates to—

(i) any activity that resulted in the net reduction of the greenhouse gas emissions of the entity or a net increase in sequestration by the entity that were carried

out during or after 1990 and before the establishment of the database, verified in accordance with regulations promulgated under section 101(c)(1), and submitted to the Administrator before the date that is 4 years after the date of enactment of this Act; and

(ii) with respect to the calendar year preceding the calendar year in which the information is submitted, any project or activity that resulted in the net reduction of the greenhouse gas emissions of the entity or a net increase in net sequestration by the entity.

(3) PROVISION OF VERIFICATION INFORMATION BY REPORTING ENTITIES.—Each entity that submits a report under this subsection shall provide information sufficient for the Administrator to verify, in accordance with measurement and verification methods and standards developed under section 104, that the greenhouse gas report of the reporting entity—

(A) has been accurately reported; and

(B) in the case of each voluntary report under paragraph (2), represents—

(i) actual reductions in direct greenhouse gas emissions—

(I) relative to historic emission levels of the entity; and

(II) after accounting for any increases in indirect emissions described in paragraph (1)(C)(i); or

(ii) actual increases in net sequestration.

(4) FAILURE TO SUBMIT REPORT.—An entity that participates or has participated in the registry and that fails to submit a report required under this subsection shall be prohibited from using, or allowing another entity to use, its registered emissions reductions or increases in sequestration to satisfy the requirements of section 121.

(5) INDEPENDENT THIRD-PARTY VERIFICATION.—To meet the requirements of this section, an entity that is required to submit a report under this section may—

(A) obtain independent third-party verification; and

(B) present the results of the third-party verification to the Administrator.

(6) AVAILABILITY OF DATA.—

(A) IN GENERAL.—The Administrator shall ensure that information in the database is—

(i) published; and

(ii) accessible to the public, including in electronic format on the Internet.

(B) EXCEPTION.—Subparagraph (A) shall not apply in any case in which the Administrator determines that publishing or otherwise making available information described in that subparagraph poses a risk to national security or discloses confidential business information that can not be derived from information that is otherwise publicly available and that would cause competitive harm if published.

(7) DATA INFRASTRUCTURE.—The Administrator shall ensure, to the maximum extent practicable, that the database uses, and is integrated with, Federal, State, and regional greenhouse gas data collection and reporting systems in effect as of the date of enactment of this Act.

(8) ADDITIONAL ISSUES TO BE CONSIDERED.—In promulgating the regulations under section 101(c)(1) and implementing the database, the Administrator shall take into consideration a broad

range of issues involved in establishing an effective database, including—

(A) the data and information systems and measures necessary to identify, track, and verify greenhouse gas emissions in a manner that will encourage private sector trading and exchanges;

(B) the greenhouse gas reduction and sequestration measurement and estimation methods and standards applied in other countries, as applicable or relevant;

(C) the extent to which available fossil fuels, greenhouse gas emissions, and greenhouse gas production and importation data are adequate to implement the database; and

(D) the differences in, and potential uniqueness of, the facilities, operations, and business and other relevant practices of persons and entities in the private and public sectors that may be expected to participate in the database.

(d) ANNUAL REPORT.—The Administrator shall publish an annual report that—

(1) describes the total greenhouse gas emissions and emission reductions reported to the database during the year covered by the report;

(2) provides entity-by-entity and sector-by-sector analyses of the emissions and emission reductions reported;

(3) describes the atmospheric concentrations of greenhouse gases;

(4) provides a comparison of current and past atmospheric concentrations of greenhouse gases; and

(5) describes the activity during the year covered by the period in the trading of greenhouse gas emission allowances.

SEC. 104. MEASUREMENT AND VERIFICATION.

(a) STANDARDS.—

(1) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Administrator shall establish by rule, in coordination with the Secretary, the Secretary of Energy, and the Secretary of Agriculture, comprehensive measurement and verification methods and standards to ensure a consistent and technically accurate record of greenhouse gas emissions, emission reductions, sequestration, and atmospheric concentrations for use in the registry.

(2) REQUIREMENTS.—The methods and standards established under paragraph (1) shall include—

(A) a requirement that a covered entity use a continuous emissions monitoring system, or another system of measuring or estimating emissions that is determined by the Administrator, in consultation with the Secretary, to provide information with precision, reliability, accessibility, and timeliness similar to that provided by a continuous emissions monitoring system where technologically feasible;

(B) establishment of standardized measurement and verification practices for reports made by all entities participating in the registry, taking into account—

(i) protocols and standards in use by entities requiring or desiring to participate in the registry as of the date of development of the methods and standards under paragraph (1);

(ii) boundary issues, such as leakage;

(iii) avoidance of double counting of greenhouse gas emissions and emission reductions;

(iv) protocols to prevent a covered entity from avoiding the requirements of this Act by reorganization into multiple entities that are under common control; and

(v) such other factors as the Administrator, in consultation with the Secretary, determines to be appropriate;

(C) establishment of methods of—

(i) estimating greenhouse gas emissions, for those cases in which the Administrator, in consultation with the Secretary, determines that methods of monitoring, measuring or estimating such emissions with precision, reliability, accessibility, and timeliness similar to that provided by a continuous emissions monitoring system are not technologically feasible at present; and

(ii) reporting the accuracy of such estimations;

(D) establishment of measurement and verification standards applicable to actions taken to reduce, avoid, or sequester greenhouse gas emissions;

(E) in coordination with the Secretary of Agriculture, standards to measure the results of the use of carbon sequestration and carbon recapture technologies, including—

(i) soil carbon sequestration practices; and

(ii) forest preservation and reforestation activities that adequately address the issues of permanence, leakage, and verification;

(F) establishment of such other measurement and verification standards as the Administrator, in consultation with the Secretary, the Secretary of Agriculture, and the Secretary of Energy, determines to be appropriate;

(G) establishment of standards for obtaining the Administrator's approval of the suitability of geological storage sites that include evaluation of both the geology of the site and the entity's capacity to manage the site; and

(H) establishment of other features that, as determined by the Administrator, will allow entities to adequately establish a fair and reliable measurement and reporting system.

(b) REVIEW AND REVISION.—The Administrator, in consultation with the Secretary, shall periodically review, and revise as necessary, the methods and standards developed under subsection (a).

(c) PUBLIC PARTICIPATION.—The Administrator shall—

(1) make available to the public for comment, in draft form and for a period of at least 90 days, the methods and standards developed under subsection (a); and

(2) after the 90-day period referred to in paragraph (1), in coordination with the Secretary of Energy, the Secretary of Agriculture, and the Secretary, adopt the methods and standards developed under subsection (a) for use in implementing the database.

(d) EXPERTS AND CONSULTANTS.—

(1) IN GENERAL.—The Administrator may obtain the services of experts and consultants in the private and nonprofit sectors in accordance with section 3109 of title 5, United States Code, in the areas of greenhouse gas measurement, certification, and emission trading.

(2) AVAILABLE ARRANGEMENTS.—In obtaining any service described in paragraph (1), the Adminis-

trator may use any available grant, contract, cooperative agreement, or other arrangement authorized by law.

Subtitle B—Mandating Emissions Reductions

SEC. 121. COVERED ENTITIES MUST SUBMIT ALLOWANCES FOR EMISSIONS.

(a) IN GENERAL.—Beginning with calendar year 2012—

(1) each covered entity in the electric generation, industrial, and commercial sectors shall submit to the Administrator one tradeable allowance for each metric ton of greenhouse gases, measured in units of carbon dioxide equivalents, that it emits from stationary sources, except those described in paragraph (2);

(2) each producer or importer of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride that is a covered entity shall submit to the Administrator one tradeable allowance for each metric ton of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride, measured in units of carbon dioxide equivalents; that it produces or imports and that will ultimately be emitted in the United States,

as determined by the Administrator under subsection (d); and

(3) each petroleum refiner or importer that is a covered entity shall submit one tradeable allowance for each unit of petroleum product it sells that will produce one metric ton of greenhouse gases, measured in units of carbon dioxide equivalents, as determined by the Administrator under subsection (b), when used for transportation.

(b) DETERMINATION OF TRANSPORTATION SECTOR AMOUNT.—For the transportation sector, the Administrator shall determine the amount of greenhouse gases, measured in units of carbon dioxide equivalents, that will be emitted when petroleum products are used for transportation.

(c) EXCEPTION FOR CERTAIN DEPOSITED EMISSIONS.—Notwithstanding subsection (a), a covered entity is not required to submit a tradeable allowance for any amount of greenhouse gas that would otherwise have been emitted from a facility under the ownership or control of that entity if—

(1) the emission is deposited in a geological storage facility approved by the Administrator under section 104(a)(2)(G); and

(2) the entity agrees to submit tradeable allowances for any portion of the deposited emission that is subsequently emitted from that facility.

(d) DETERMINATION OF HYDROFLUOROCARBON, PERFLUOROCARBON, AND SULFUR HEXAFLUORIDE AMOUNT.—The Administrator shall determine the amounts of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride, measured in units of carbon dioxide equivalents, that will be deemed to be emitted for purposes of this Act.

SEC. 122. COMPLIANCE.

(a) SOURCE OF TRADEABLE ALLOWANCES USED.—A covered entity may use a tradeable allowance to meet the requirements of this section without regard to whether the tradeable allowance was allocated to it under subtitle D of this title or acquired from another entity or the Climate Change Credit Corporation established under section 201.

(b) VERIFICATION BY ADMINISTRATOR.—At various times during each year, the Administrator shall determine whether each covered entity has met the requirements of this section. In making that determination, the Administrator shall—

(1) take into account the tradeable allowances submitted by the covered entity to the Administrator; and

(2) retire the serial number assigned to each such tradeable allowance.

SEC. 123. EXEMPTION OF SOURCE CATEGORIES.

(a) IN GENERAL.—The Administrator may grant an exemption from the requirements of this Act to a source category if the Administrator determines, after public notice and comment, that it is not feasible to measure or estimate emissions from that source category, until such time as measurement or estimation becomes feasible.

(b) REDUCTION OF LIMITATIONS.—If the Administrator exempts a source category under subsection (a), the Administrator shall also reduce the total tradeable allowances under section 161(a)(1) by the amount of greenhouse gas emissions that the exempted source category emitted in calendar year 2000, as identified in the 2000 Inventory.

(c) LIMITATION ON EXEMPTION.—The Administrator may not grant an exemption under subsection (a) to carbon dioxide produced from fossil fuel.

SEC. 124. ESTABLISHMENT OF TRADEABLE ALLOWANCES.

(a) IN GENERAL.—The Administrator shall promulgate regulations to establish tradeable allowances, denominated in units of carbon dioxide equivalents, as follows:

(1) For calendar years beginning after 2011, the number of tradeable allowances shall be equal to 6,130 million metric tons, measured in units of carbon dioxide equivalents, reduced by the amount of emissions of greenhouse gases in calendar year 2012 from non-covered entities.

(2) For calendar years beginning after 2019, the number of tradeable allowances shall be equal to 5,239 million metric tons, measured in units of carbon dioxide equivalents, reduced by the amount of emissions of greenhouse gases in calendar year 2020 from non-covered entities.

(3) For calendar years beginning after 2029, the number of tradeable allowances shall be equal to 4,100 million metric tons, measured in units of carbon dioxide equivalents, reduced by the amount of emissions of greenhouse gases in calendar year 2030 from non-covered entities.

(4) For calendar years beginning after 2049, the number of tradeable allowances shall be equal to 2,096 million metric tons, measured in units of carbon dioxide equivalents, reduced by the amount of

emissions of greenhouse gases in each such calendar year from non-covered entities.

(b) SERIAL NUMBERS.—The Administrator shall assign a unique serial number to each tradeable allowance established under subsection (a), and shall take such action as may be necessary to prevent counterfeiting of tradeable allowances.

(c) NATURE OF TRADEABLE ALLOWANCES.—A tradeable allowance is not a property right, and nothing in this title or any other provision of law limits the authority of the United States to terminate or limit a tradeable allowance.

(d) NON-COVERED ENTITY.—

(1) IN GENERAL.—In this section the term ''non-covered entity'' means an entity that—

(A) owns or controls a source of greenhouse gas emissions in the electric power, industrial, or commercial sectors of the United States economy (as defined in the Inventory), refines or imports petroleum products for use in transportation, or produces or imports hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride; and

(B) is not a covered entity.

(2) EXCEPTION.—Notwithstanding paragraph (1), an entity that is a covered entity for any calendar year beginning after 2011 shall not be considered to be a non-covered entity for purposes of subsection (a) only because it emitted, or its products would have emitted, 10,000 metric tons or less of greenhouse gas, measured in units of carbon dioxide equivalents, in the year 2006.

SEC. 125. PENALTIES.

Any covered entity that fails to meet the requirements of section 121 for a year shall be liable for a civil penalty, payable to the Administrator, equal to thrice the market value (determined as of the last day of the year at issue) of the tradeable allowances that would be necessary for that covered entity to meet those requirements on the date of the emission that resulted in the violation.

Subtitle C—Controlling Compliance Costs

SEC. 141. TRADING.

(a) IN GENERAL.—Tradeable allowances may be sold, exchanged, purchased, retired, or used as provided in this section.

(b) INTERSECTOR TRADING.—Covered entities may purchase or otherwise acquire tradeable allowances from

other covered sectors to satisfy the requirements of section 121.

SEC. 142. BANKING.

Notwithstanding the requirements of section 121, a covered entity that has more than a sufficient amount of tradeable allowances to satisfy the requirements of section 121, may refrain from submitting a tradeable allowance to satisfy the requirements in order to sell, exchange, or use the tradeable allowance in the future.

SEC. 143. BORROWING.

(a) IN GENERAL.—The Administrator shall establish a program under which a covered entity may—

(1) borrow credits for use in the current calendar year;

(2) use the credit in lieu of a tradeable allowance to meet the requirements of this Act for the current calendar year, subject to the limitation imposed by section 122(b); and

(3) use those credits to satisfy up to 25 percent of its total allowance submission requirement under section 121 for the current calendar year.

(b) DETERMINATION OF TRADEABLE ALLOWANCE CREDITS.—The Administrator may make credits available under subsection (a) that will be repaid within 5 years after the year in which the credit is used.

(c) CARRYING COST.—If a covered entity uses a borrowed credit under this section to meet the requirements of this Act for a calendar year (referred to as the use year), the tradeable allowance requirement for the year from which the credit was taken (referred to as the source year) shall be increased by an amount equal to—

(1) 10 percent for each credit borrowed from the source year; multiplied by

(2) the number of years beginning after the use year and before the source year.

(d) MAXIMUM BORROWING PERIOD.—A credit from a year beginning more than 5 years after the current year may not be used to meet the requirements of this Act for the current year.

(e) FAILURE TO ACHIEVE REDUCTIONS GENERATING CREDIT.—If a covered entity that uses a borrowed credit under this section fails to repay the credit for the year from which the credit was taken, then—

(1) the covered entity's requirements under this Act for that year shall be increased by the amount of the credit, plus the amount determined under subsection (c);

(2) any tradeable allowances submitted by the covered entity for that year shall be counted first against the increase in those requirements; and

(3) the covered entity may not use credits under this section to meet the increased requirements.

SEC. 144. DOMESTIC OFFSETS.

(a) ALTERNATIVE MEANS OF COMPLIANCE.—Beginning with calendar year 2012, a covered entity may satisfy up to 30 percent of its total allowance submission requirement under section 121 by—

(1) submitting tradeable allowances from another nation's market in greenhouse gas emissions if—

(A) the Administrator determines that the other nation's system for trading in greenhouse gas emissions is complete, accurate, and transparent and reviews that determination at least once every 5 years;

(B) the other nation has adopted enforceable limits on its greenhouse gas emissions which the tradeable allowances were issued to implement; and

(C) the covered entity certifies that the tradeable allowance has been retired unused in the other nation's market;

(2) submitting a registered net increase in sequestration, as registered in the database, adjusted,

if necessary, to comply with the accounting standards and methods established under subsection (c);

(3) submitting a greenhouse gas emissions reduction (other than a registered net increase in sequestration) that was registered in the database by a person that is not a covered entity; or

(4) submitting credits obtained under section 145.

(b) DEDICATED PROGRAM FOR SEQUESTRATION IN AGRICULTURAL SOILS.—If a covered entity chooses to satisfy more than 15 percent of its total allowance submission requirements under the provisions of subsection (a), it shall satisfy at least 1.5 percent of its total allowance submission requirement by submitting registered net increases in sequestration in agricultural soils, as registered in the database, adjusted, if necessary, to comply with the accounting standards and methods established under this section.

(c) SEQUESTRATION ACCOUNTING.—

(1) IN GENERAL.—If a covered entity uses a registered net increase in sequestration to satisfy the requirements of section 121 for any year, that covered entity shall submit information to the Administrator every 5 years thereafter sufficient to allow the Administrator to determine, using the methods and

standards created under section 104, whether that net increase in sequestration still exists. Unless the Administrator determines that the net increase in sequestration continues to exist, the covered entity shall offset any loss of sequestration by submitting additional tradeable allowances of equivalent amount in the calendar year following that determination.

(2) REGULATIONS REQUIRED.—The Administrator, in coordination with the Secretary, the Secretary of Agriculture, and the Secretary of Energy, shall issue regulations establishing the sequestration accounting rules for all classes of sequestration projects.

(3) CRITERIA FOR REGULATIONS.—In issuing regulations under this subsection, the Administrator shall use the following criteria:

(A) If the range of possible amounts of net increase in sequestration for a particular class of sequestration project is not more than 10 percent of the median of that range, the amount of sequestration awarded shall be equal to the median value of that range.

(B) If the range of possible amounts of net increase in sequestration for a particular class of sequestration project is more than 10 percent

of the median of that range, the amount of sequestration awarded shall be equal to the fifth percentile of that range.

(C) The regulations shall include procedures for accounting for potential leakage from sequestration projects and for ensuring that any registered increase in sequestration is in addition that which would have occurred if this Act had not been enacted.

(4) UPDATES.—The Administrator shall update the sequestration accounting rules for every class of sequestration project at least once every 5 years.

SEC. 145. INTERNATIONAL CREDITS PLAN.

(a) ESTABLISHMENT.—The Administrator shall establish a program the purposes of which are—

(1) to assist developing countries in achieving sustainable development and in contributing to the objective of reducing the greenhouse gas emissions; and

(2) to assist covered entities in achieving compliance with the requirements of section 121.

(b) PROGRAM COMPONENTS.—

(1) IN GENERAL.—The program shall provide for the earning of tradable allowances by covered entities from project activities in developing countries

resulting in certified emission reductions. The Administrator shall ensure tradability of emission reductions earned under this program with reductions earned under other similar international programs.

(2) APPROVAL CRITERIA AND REVIEW PROCESS.—By no later than 2011, the Administrator shall—

(A) develop criteria for the approval of projects submitted for review; and

(B) establish a review process for submitted projects that includes a procedure for providing the results of the review, together with an explanation of the reasons for approving or denying approval of a submitted project, to the entity that submitted the project.

(3) FEES.—The Administrator may charge an application fee for the review of project proposals to cover the administrative costs of the program.

(4) CERTIFICATION OF RESULTS REQUIRED.—The Administrator shall require entities participating in this program to obtain independent third-party verification that—

(A) participation by all parties involved in the project is voluntary;

(B) the project produces—

(i) real, measurable, and long-term benefits related to the mitigation of climate change; and

(ii) reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

(c) USE OF ALLOWANCES.—Subject to the limitation in section 144(a), tradable allowances earned under the program may be used to meet the requirements of section 121.

(d) STUDY.—Within 3 years after the date of enactment of this Act, the Administrator, in coordination with the Secretary, shall conduct a study of the impacts of the compliance cost reduction measures of this section and section 144 on achieving the purposes of this Act. The Administrator shall submit the results of the study to the Congress along with any recommendations the Administrator deems appropriate.

Subtitle D—Allocating Emissions Allowances

SEC. 161. DETERMINATION OF TRADEABLE ALLOWANCE ALLOCATIONS.

(a) IN GENERAL.—The Administrator, in consultation with the Secretary, shall determine—

(1) the number of tradeable allowances to be allocated to each covered sector of that sector's allotments; and

(2) the number of tradeable allowances to be allocated to the Climate Change Credit Corporation established under section 201.

(b) ALLOCATION FACTORS.—In making the determination required by subsection (a), the Administrator, in consultation with the Secretary, shall consider—

(1) the distributive effect of the allocations on household income and net worth of individuals;

(2) the impact of the allocations on corporate income, taxes, and asset value;

(3) the impact of the allocations on income levels of consumers and on their energy consumption;

(4) the effects of the allocations in terms of economic efficiency;

(5) the ability of covered entities to pass through compliance costs to their customers;

(6) the degree to which the amount of allocations to the covered sectors should decrease over time;

(7) the need to maintain the international competitiveness of United States manufacturing and

avoid the additional loss of United States manufacturing jobs; and

(8) the necessary funding levels for the initiatives and programs in section 202.

(c) ALLOCATION RECOMMENDATIONS AND IMPLEMENTATION.—Before allocating or providing tradeable allowances under subsection (a) and within 24 months after the date of enactment of this Act, the Administrator shall submit the determinations under subsection (a) to the Senate Committee on Commerce, Science, and Transportation, the Senate Committee on Environment and Public Works, the House of Representatives Committee on Science, and the House of Representatives Committee on Energy and Commerce. The Secretary's determinations under paragraph (1), including the allocations and provision of tradeable allowances pursuant to that determination, are deemed to be a major rule (as defined in section 804(2) of title 5, United States Code), and subject to the provisions of chapter 8 of that title.

SEC. 162. ALLOCATION OF TRADEABLE ALLOWANCES.

(a) IN GENERAL.—Beginning with calendar year 2012 and after taking into account any initial allocations under section 164, the Administrator shall—

(1) allocate to each covered sector that sector's allotments determined by the Administrator under

section 162 (adjusted for any such initial allocations and the allocation to the Climate Change Credit Corporation established under section 201); and

(2) allocate to the Climate Change Credit Corporation established under section 201 the tradeable allowances allocable to that Corporation.

(b) INTRASECTORIAL ALLOTMENTS.—The Administrator shall, by regulation, establish a process for the allocation of tradeable allowances under this section, without cost to covered entities, that will—

(1) encourage investments that increase the efficiency of the processes that produce greenhouse gas emissions;

(2) minimize the costs to the government of allocating the tradeable allowances;

(3) give credit to covered entities for emissions reductions made before 2012 and registered with the database; and

(4) provide sufficient allocation for new entrants into the sector.

(c) POINT SOURCE ALLOCATION.—The Administrator shall allocate the tradeable allowances for the electricity generation, industrial, and commercial sectors to the entities owning or controlling the point sources of greenhouse gas emissions within that sector.

(d) HYDROFLUOROCARBONS, PERFLUOROCARBONS, AND SULFUR HEXAFLUORIDE.—The Administrator shall allocate the tradeable allowances for producers or importers of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride to such producers or importers.

(e) SPECIAL RULE FOR ALLOCATION WITHIN THE TRANSPORTATION SECTOR.—The Administrator shall allocate the tradeable allowances for the transportation sector to petroleum refiners or importers that produce or import petroleum products that will be used as fuel for transportation.

(f) ALLOCATIONS TO RURAL ELECTRIC COOPERATIVES.—For each electric generating unit that is owned or operated by a rural electric cooperative, the Administrator shall allocate each year, at no cost, allowances in an amount equal to the greenhouse gas emissions of each such unit in 2006, plus an amount equal to the average emissions growth expected for all such units. The allocations shall be offset from the allowances allocated to the Climate Change Credit Corporation.

(g) EARLY AUCTION FOR TECHNOLOGY DEPLOYMENT AND DISSEMINATION.—

(1) IN GENERAL.—Within 1 year after the date of enactment of this Act, the Administrator, in consultation with the Secretary of Energy and the Sec-

retary of Commerce, shall allocate tradeable allowances by the Climate Change Credit Corporation for auction before 2012. The Climate Change Credit Corporation shall use the proceeds of the auction, together with any funds received as reimbursements under subsection (c) or (d) of section 351 of this Act, to support the programs established by that section until the secretary of Energy and the Corporation jointly determine that the purposes of those programs have been accomplished. The Corporation shall also use the proceeds of the auction to support the programs established by section 323 of this Act until 2012.

(2) DETERMINATION OF ALLOCATION.—In determining the amount of tradeable allowances to be allocated to the Climate Change Credit Corporation under this subsection, the Administrator shall consider—

(A) the expected market value of tradeable allowances for auction;

(B) the annual funding required for the programs established by subsections (c) and (d) of section 351 of this Act;

(C) the repayment provisions of those programs; and

(D) the allocation factors in section 161(b).

(3) LIMITATION.—In allocating tradeable allowances under paragraph (1) the Administrator shall take into account the purposes of this Act and the impact, if any, the allocation under paragraph (1) may have on achieving those purposes.

(h) ALLOCATION TO COVERED ENTITIES IN STATES ADOPTING MANDATORY GREENHOUSE GAS EMISSIONS REDUCTION PROGRAMS.—For a covered entity operating in any State that has adopted a legally binding and enforceable program to achieve and maintain reductions that are consistent with, or more stringent than, reductions mandated by this Act, and which requirements are effective prior to 2012, the Administrator shall consider such binding state actions in making the final determination of allocation to such covered entities.

SEC. 163. ENSURING TARGET ADEQUACY.

(a) IN GENERAL.—Beginning 2 years after the date of enactment of this Act, the Under Secretary of Commerce for Oceans and Atmosphere shall review the allowances established by section 124 no less frequently than biennially—

(1) to re-evaluate the levels established by that subsection, after taking into account the best avail-

able science and the most currently available data, and

(2) to re-evaluate the environmental and public health impacts of specific concentration levels of greenhouse gases,

to determine whether the allowances established by section 124 continue to be consistent with the purposes of this Act and the objective of the United Nations' Framework Convention on Climate Change of stabilizing levels of greenhouse gas emissions at a level that will prevent dangerous anthropogenic interference with the climate system.

(b) REVIEW OF 2012 LEVELS.—The Under Secretary shall specifically review in 2012 the level established under section 124(a)(1), and transmit a report on his reviews, together with any recommendations, including legislative recommendations, for modification of the levels, to the Senate Committee on Commerce, Science, and Transportation, the Senate Committee on Environment and Public Works, the House of Representatives Committee on Science, and the House of Representatives Committee on Energy and Commerce.

SEC. 164. INITIAL ALLOCATIONS FOR EARLY PARTICIPATION AND ACCELERATED PARTICIPATION.

(a) IN GENERAL.—Before making any allocations under section 162, the Administrator shall allocate—

(1) to any covered entity an amount of tradeable allowances equivalent to the amount of greenhouse gas emissions reductions registered by that covered entity in the national greenhouse gas database if—

(A) the covered entity has requested to use the registered reduction in the year of allocation;

(B) the reduction was registered prior to 2012; and

(C) the Administrator retires the unique serial number assigned to the reduction under section 101(c)(3); and

(2) to any covered entity that has entered into an accelerated participation agreement under section 165, such tradeable allowances as the Administrator has determined to be appropriate under that section.

(b) ELIGIBILITY UNDER STATE PROGRAMS.—Any covered entity that is subject to a State mandatory greenhouse gas emissions reduction program that meets the requirements of subsection (h) of section 162 shall be eligible for the allocation of allowances under this section and section 165 if the requirements of the State mandatory greenhouse gas emission reduction program are consistent

with, or more stringent than, the emission targets established by this Act.

SEC. 165. BONUS FOR ACCELERATED PARTICIPATION.

(a) IN GENERAL.—If a covered entity executes an agreement with the Administrator under which it agrees to reduce its level of greenhouse gas emissions to a level no greater than the level of its greenhouse gas emissions for calendar year 1990 by the year 2012, then, for the 6-year period beginning with calendar year 2012, the Administrator shall—

(1) provide additional tradeable allowances to that entity when allocating allowances under section 163 in order to recognize the additional emissions reductions that will be required of the covered entity; and

(2) allow that entity to satisfy 40 percent of its requirements under section 121 by the means set forth in section 144(a) and 145.

(b) TERMINATION.—An entity that executes an agreement described in subsection (a) may terminate the agreement at any time.

(c) FAILURE TO MEET COMMITMENT.—If an entity that executes an agreement described in subsection (a) fails to achieve the level of emissions to which it committed by calendar year 2012—

(1) its requirements under section 121 shall be increased by the amount of any tradeable allowances provided to it under subsection (a)(1); and

(2) any tradeable allowances submitted thereafter shall be counted first against the increase in those requirements.

TITLE II—CLIMATE CHANGE CREDIT CORPORATION

Subtitle A—Establishment and Functions

SEC. 201. ESTABLISHMENT.

(a) IN GENERAL.—The Climate Change Credit Corporation is established as a nonprofit corporation without stock. The Corporation shall not be considered to be an agency or establishment of the United States Government.

(b) APPLICABLE LAWS.—The Corporation shall be subject to the provisions of this title and, to the extent consistent with this title, to the District of Columbia Business Corporation Act.

(c) BOARD OF DIRECTORS.—The Corporation shall have a board of directors of 5 individuals who are citizens of the United States, of whom 1 shall be elected annually by the board to serve as chairman. No more than 3 members of the board serving at any time may be affiliated with the same political party. The members of the board

shall be appointed by the President of the United States, by and with the advice and consent of the Senate and shall serve for terms of 5 years.

SEC. 202. PURPOSES AND FUNCTIONS.

(a) TRADING.—The Corporation—

(1) shall receive and manage tradeable allowances allocated to it under section 163(a)(2); and

(2) shall buy and sell tradeable allowances, whether allocated to it under that section or obtained by purchase, trade, or donation from other entities; but

(3) may not retire tradeable allowances unused.

(b) USE OF TRADEABLE ALLOWANCES AND PROCEEDS.—

(1) IN GENERAL.—The Corporation shall use the tradeable allowances, and proceeds derived from its trading activities in tradeable allowances, to reduce costs borne by consumers as a result of the greenhouse gas reduction requirements of this Act. The reductions—

(A) may be obtained by buy-down, subsidy, negotiation of discounts, consumer rebates, or otherwise;

(B) shall be, as nearly as possible, equitably distributed across all regions of the United States; and

(C) may include arrangements for preferential treatment to consumers who can least afford any such increased costs.

(2) TRANSITION ASSISTANCE TO DISLOCATED WORKERS AND COMMUNITIES.—The Corporation shall allocate a percentage of the proceeds derived from its trading activities in tradeable allowances to provide transition assistance to dislocated workers and communities. Transition assistance may take the form of—

(A) grants to employers, employer associations, and representatives of employees—

(i) to provide training, adjustment assistance, and employment services to dislocated workers; and

(ii) to make income-maintenance and needs-related payments to dislocated workers; and

(B) grants to State and local governments to assist communities in attracting new employers or providing essential local government services.

(3) PHASE-OUT OF TRANSITION ASSISTANCE.—The percentage allocated by the Corporation under paragraph (2)—

(A) shall be 20 percent for 2012;

(B) shall be reduced by 2 percentage points each year thereafter; and

(C) may not be reduced below zero.

(4) ADAPTATION AND MITIGATION ASSISTANCE FOR LOW-INCOME PERSONS AND COMMUNITIES.—The Corporation shall allocate at least 10 percent of the proceeds derived from its trading activities to funding climate change adaptation and mitigation programs to assist low-income populations identified in the report submitted under section 106(b) as having particular needs in addressing the impact of climate change.

(5) ADAPTATION ASSISTANCE FOR FISH AND WILDLIFE HABITAT.—The Corporation shall fund efforts to strengthen and restore habitat that improves the ability of fish and wildlife to adapt successfully to climate change. The Corporation shall deposit the proceeds from no less than 10 percent of the total allowances allocated to it in the wildlife restoration fund subaccount known as the Wildlife Conservation and Restoration Account established under section 3

of the Pittman-Robertson Wildlife Restoration Act (16 U.S.C. 669b). Amounts deposited in the subaccount under this paragraph shall be available without further appropriation for obligation and expenditure under that Act.

(6) TECHNOLOGY DEPLOYMENT PROGRAMS.—The Corporation shall establish and carry out a program, through direct grants, revolving loan programs, or other financial measures, to provide support for the deployment of technology to assist in compliance with this Act by distributing the proceeds from no less than 50 percent of the total allowances allocated in support of the program established under section 323.

Subtitle B—Financing

SEC. 251. CLIMATE TECHNOLOGY FINANCING BOARD.

(a) PURPOSE.—The Climate Technology Financing Board shall work with the Secretary of Energy to make financial assistance available to joint venture partnerships and promote private sector participation in financing eligible projects under this subtitle.

(b) ESTABLISHMENT.—

(1) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the Secretary of Energy shall establish within the Department of En-

ergy a Climate Technology Financing Board, which shall be responsible for assisting the Secretary in carrying out this subtitle.

(2) MEMBERSHIP.—The Climate Technology Financing Board shall be comprised of—

(A) the Secretary of Energy, who shall serve as chair; and

(B) 6 additional members appointed by the Secretary, including—

(i) the Chief Financial Officer of the Department of Energy;

(ii) at least 1 representative of the Corporation; and

(iii) other members with experience in corporate and project finance in the energy sector as deemed necessary by the Secretary to carry out the functions of the Board.

(3) REPRESENTATION OF FEDERAL INTEREST.—The Climate Technology Financing Board shall represent the Federal government's interest in all negotiations with project developers interested in forming joint venture partnerships and obtaining secured loans or loan guarantees under this subtitle.

(c) REGULATIONS.—

(1) IN GENERAL.—Not later than 12 months after the date of enactment of this Act, the Climate Technology Financing Board, through the Secretary of Energy, shall publish in the Federal Register such final regulations as may be necessary to implement section 252.

(2) PROJECT SELECTION CRITERIA.—In selecting eligible projects for financial assistance under this subtitle, the Board shall consider, among other relevant criteria—

(A) the extent to which the project reduces greenhouse gases, demonstrates new technologies, meets other clean air attainment goals, generates economic benefits, contributes to energy security, contributes to fuel and technology diversity, and maintains price stability, cost effectiveness, and economic competitiveness;

(B) the extent to which assistance under this subtitle would foster innovative public-private partnerships and attract private equity investment;

(C) the likelihood that assistance under this subtitle would enable the project to proceed

at an earlier date than the project would otherwise be able to proceed without such assistance;

(D) the extent to which the project represents the construction of the first generation of facilities that use substantially new technology; and

(E) any other criteria deemed necessary by the Secretary for the promotion of long-term cost effective climate change-related technologies.

(3) MANDATORY REGULATORY PROVISIONS.—The regulations required by paragraph (1) shall include the following:

(A) The general terms and conditions under which non-recourse financial assistance will be provided. Those terms shall include—

(i) a debt-to-equity ratio of up to 80 percent debt from the Corporation, approved by the Secretary, and no less than 20 percent equity from the project developer;

(ii) a pledge of the eligible project's assets to the Secretary and the project developer to secure their respective loan and equity contributions; and

(iii) loan repayment terms generally consistent with financial terms available to project developers in the United States power generation industry.

(B) The general terms and conditions under which loan guarantees will be provided, which shall be consistent with section 253(c).

(C) The procedures by which project owners and project developers may request such financial assistance.

(D) A process under which the Climate Technology Financing Board, the joint venture partnership, and the project developer shall negotiate commercially reasonable terms consistent with terms generally available in the United States power generation industry regarding cost, construction schedule, and other conditions under which the project developer shall acquire the loan from the joint venture partnership and repay the secured loan and acquire an undivided interest in the eligible project when the project achieves commercial operation. Terms prescribed under this subparagraph shall include—

(i) a defined right of the joint venture partnership to terminate the loan agreement upon a date certain for project delays that are not the fault of the project developer; and

(ii) may not refer to the Federal Acquisition Regulations.

(E) Provisions to retain independent third-party engineering assistance, satisfactory to the Climate Technology Financing Board, the project developer, and the joint venture partnership, to verify and validate construction costs and construction schedules, to monitor construction, and authorize draws on financing during construction to ensure that construction is consistent with generally accepted utility practice, and to make recommendations as to the cause of delay or cost increases should such delays or cost increases occur.

(F) Provisions to ensure—

(i) continued project development and construction in the event of a delay to achieving commercial operation caused by an event outside the control of the joint de-

velopment partners and the project developer; and

(ii) continued project operations in the event the sale of the eligible project to the project developer is not executed due to an event outside the control of the project developer.

(G) Any other information necessary for the Secretary of Energy to discharge fully the obligation conferred under this subtitle, including a process for negotiating the terms and conditions of such financial assistance.

(d) COMPREHENSIVE IMPLEMENTATION PLAN.—Not later than 12 months after the date of enactment of this Act, the Climate Technology Financing Board shall prepare and transmit to the President and Congress a comprehensive plan for implementation of this subtitle.

(e) PROGRESS REPORTS.—Not later than 12 months after the comprehensive plan required by subsection (d) and annually thereafter the Secretary shall prepare and transmit to the President and the Congress a report summarizing progress in satisfying the requirements established by the subtitle.

SEC. 252. RESPONSIBILITIES OF THE SECRETARY.

(a) FINANCIAL ASSISTANCE.—Subject to the requirements of the Federal Credit Reform Act of 1990 (2 U.S.C. 661 et seq.), the Secretary, in coordination with the Corporation, may make available to joint venture partnerships for eligible project costs such Federal financial assistance as the Climate Technology Financing Board determines is necessary to enable access to, or to supplement, private sector financing for projects if the Board determines that such projects are needed to reduce greenhouse gas emissions, contribute to energy security, fuel or technology diversity, or clean air attainment goals. The Secretary, in coordination with the Corporation, shall prescribe such terms and conditions for financial assistance as the Secretary deems necessary or appropriate to protect the financial interests of the United States.

(b) REQUIREMENTS.—Approval criteria for financial assistance under subsection (a) shall include—

(1) the creditworthiness of the project;

(2) the extent to which Federal financial assistance would encourage public-private partnerships, attract private-sector investment, and demonstrate safe and secure electric generation or fuel production technology;

(3) the likelihood that Federal financial assistance would hasten commencement of the project;

(4) in the case of a nuclear power plant, whether the project developer provides reasonable assurance to the Secretary that the project developer can successfully manage nuclear power plant operations;

(5) the extent to which the project will demonstrate safe and secure reduced or zero greenhouse gas emitting electric generating or fuel production technology; and

(6) any other criteria the Secretary deems necessary or appropriate.

(c) RESERVE AMOUNT.—Before entering into any agreements under this subtitle, the Secretary, in consultation with the Director of the Office of Management and Budget, shall determine an appropriate capital reserve subsidy amount for any loan or loan guarantee provided by the agreement. The Secretary, in consultation with the project developer, shall determine the appropriate type of Federal financial assistance to be provided for eligible projects.

(d) CONFIDENTIALITY.—The Secretary and the Corporation shall protect the confidentiality of any information that is certified by a project developer to be commercially sensitive.

(e) FULL FAITH AND CREDIT.—All loans or loan guarantees provided by the Secretary under this subtitle

shall be general obligations of the United States backed by the full faith and credit of the United States.

SEC. 253. LIMITATIONS.

(a) SECURED LOANS.—

(1) IN GENERAL.—The financial assistance provided by this subtitle for secured loans or loan guarantees—

(A) shall be available for new low or zero greenhouse gas emitting energy generating or fuel production facilities, including—

(i) no more than 3 integrated gasification combined cycle coal power plants with carbon capture and geological storage of greenhouse gases;

(ii) no more than the first of each of the 3 advanced reactor design projects for which applications for combined construction and operating licenses have been filed on or before December 31, 2015;

(iii) no more than 3 large scale biofuels production facilities that encourage a diversity of pioneer projects relying on different feedstocks in different regions of the country and maximizing the use of cellulosic biomass; and

(iv) no more than 3 large scale solar facilities of greater than 5 megawatts capacity which begin operation after December 31, 2007, and before January 1, 2011; and

(B) may not exceed 80 percent of eligible project costs for each project.

(2) GOVERNMENT-CAUSED DELAYS.—Paragraph (1)(B) of this subsection does not apply if—

(A) with respect to a nuclear power plant—

(i) the conditions specified in the construction and operation license issued by the Nuclear Regulatory Commission change; and

(ii) the changed conditions result in project delays or changes in project scope after the start of construction that are not attributable to private sector project management, construction, or variances from the Nuclear Regulatory Commission's approved design criteria or safety requirements; or

(B) with respect to an advanced coal power plant, biofuels production facility, solar power facility, or other eligible facility—

(i) the conditions specified in the construction permit change; and

(ii) the changed conditions result in project delays or changes in project scope after the start of construction that are not attributable to private sector project management, construction, or variances from the approved design criteria or safety requirements.

(3) ADDITIONAL ASSISTANCE.—If paragraph (1)(B) of this subsection does not apply for reasons described in paragraph (2), then the financial assistance payable to the project developer shall include additional capital costs, costs of project oversight, lost replacement power, and calculated interest, as determined appropriate by the Secretary of Energy.

(b) LOAN REPAYMENT TERMS.—

(1) The repayment terms for non-recourse secured loans made under this subtitle shall be negotiated among the Climate Technology Financing Board, the joint venture partnership, and the project

developer prior to issuance of the loan and commencement of construction.

(2) The project developer shall purchase the joint venture partnership's interest in the project after the start of the eligible project's commercial operation pursuant to the conditions of the loan with the proceeds of refinancing from non-Federal funding sources.

(3) The value of the joint venture partnership's interest in the eligible project shall be determined in negotiations prior to issuance of a secured loan under the subtitle.

(4) The interest rate on loans made under this subtitle shall not be less than the yield on United States Treasury securities of a similar maturity to the maturity of the loan on the date of execution of the loan agreement.

(5) A secured loan for an eligible project under this subtitle shall be non-recourse to the joint venture partnership in the event of bankruptcy, insolvency, liquidation, or failure of the project to start commercial operation when the project is ready for commercial operation.

(c) LOAN GUARANTEES.—

(1) IN GENERAL.—A loan guarantee shall apply only when a project developer defaults on a loan solely as a result of the regulatory actions, directly applied to the project, of a State, Federal or local government.

(2) LIMITATION.—Nothing in this subsection shall obligate the Corporation or Secretary to provide payments in the event of a default that results from a project developer's malfeasance, misfeasance, or mismanagement of the construction or operation of the project, or from conduct or circumstances unrelated to the regulatory actions of any governmental entity.

SEC. 254. SOURCE OF FUNDING FOR PROGRAMS.

Notwithstanding any other provision of law, or any other provision of this Act, authorizing or appropriating funds to carry out the provisions of this Act, no funds may be made available to carry out any activity under this subtitle except proceeds from the auction authorized by section 162(g) of this Act, subject to the limitation in section 162(g)(3).

SEC. 255. DEFINITIONS.

In this subtitle:

(1) ADVANCED REACTOR DESIGN.—The term ''advanced reactor design'' means any reactor design

approved and certified by the Nuclear Regulatory Commission.

(2) CELLULOSIC ETHANOL.—The term ''cellulosic ethanol'' means ethanol produced from fibrous or woody plant materials.

(3) COMMERCIAL OPERATION.—

(A) NUCLEAR POWER FACILITY.—With respect to a nuclear power plant, the term ''commercial operation'' means the date—

(i) on which a new nuclear power plant has received a full power 40-year operating license from the Nuclear Regulatory Commission; and

(ii) by which all Federal, State, and local appeals and legal challenges to such operating license have become final.

(B) ADVANCED COAL POWER PLANTS.—With respect to an advanced coal power plant, the term ''commercial operation'' means the date—

(i) on which a new power plant has received a full power rating; and

(ii) by which all Federal, State, and local appeals and legal challenges to the

operating license for the power plant have become final.

(4) CORPORATION.—The term ''Corporation'' means the Climate Change Credit Corporation.

(5) ELIGIBLE PROJECT.—The term ''eligible project'' means—

(A) any commercial nuclear power facility for the production of electricity that uses one or more advanced reactor designs;

(B) any advanced coal power plant utilizing the integrated gasification combined cycle technology with carbon capture and geological storage of greenhouse gases;

(C) any biofuels production facility which uses cellulosic feedstock; or

(D) any power facility which uses solar energy for the production of more than 75 percent of its annual output, which output capacity shall not be less than 10 megawatts as determined by common engineering practice.

(6) ELIGIBLE PROJECT COSTS.—The term ''eligible project costs'' means all costs related to the development and construction of an eligible project under this subtitle, including, without limitation, the cost of—

(A) development phase activities, including site acquisition and related real property agreements, environmental reviews, licensing and permitting, engineering and design work, off-taker agreements and arrangements, and other preconstruction activities;

(B) fabrication and acquisition of equipment, project construction activities and construction contingencies, project overheads, project management costs, and labor and engineering costs incurred during construction;

(C) capitalized interest necessary to meet market requirements, reasonably required reserve funds, capital issuance expenses, and other carrying costs during construction; and

(D) any other costs that the Climate Technology Financing Board deems reasonable and appropriate as eligible project costs.

(7) FEDERAL FINANCIAL ASSISTANCE.—The term ''Federal financial assistance'' means project construction financing of up to 80 percent of a project's eligible project costs in the form of a non-recourse secured loan or loan guarantee.

(8) FIRST-OF-A-KIND ENGINEERING COSTS.—The term ''first-of-a-kind engineering costs'' means

the extra costs associated with the first units of a design category for engineering work that develops the design details that finish plant standardization up to a complete plant design and that can be re-used for building subsequent units.

(9) JOINT VENTURE PARTNERSHIP.—The term ''joint venture partnership'' means a special purpose entity, including corporations, partnerships, or other legal entities established to develop, construct, and finance an eligible project and to receive financing proceeds in the form of non-recourse secured loans provided by the Secretary and private equity provided by project developers.

(10) LOAN.—The term ''loan'' means a direct non-recourse loan issued to a joint venture partnership engaged in developing an eligible project and funded by the Secretary under this subtitle, which is subject to repayment by the joint venture partnership under terms and conditions to be negotiated among the project developer, joint venture partnership, and the Secretary before the start of construction on the project.

(11) LOAN GUARANTEE.—The term ''loan guarantee'' means any guarantee or other pledge by the Secretary to pay all or part of the principle and in-

terest on a loan or other debt obligation issued by a project developer related to its equity investment and funded by a lender.

(12) PROJECT DEVELOPER.—The term ''project developer'' means a corporation, partnership, or limited liability company that—

(A) provides reasonable assurance to the Secretary that the project developer can successfully manage plant operations;

(B) has the financial capability to contribute 20 percent equity to the development of the project; and

(C) upon commercial operation, will purchase the project from the joint venture partnership.

(13) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

(14) SUBSIDY AMOUNT.—The term ''subsidy amount'' means the amount of budget authority sufficient to cover the estimated long-term cost to the Federal government of a loan, calculated on a net present value basis, excluding administrative costs and any incidental effects on governmental receipts or outlays, in accordance with the provisions of the

Federal Credit Reform Act of 1990 (2 U.S.C. 661 et seq.).

TITLE III—ADVANCED TECHNOLOGIES FOR A PRODUCTIVE, SECURE, AND CLEAN ENERGY FUTURE

SEC. 301. FINDINGS.

The Congress finds the following:

(1) Innovation, the process that ultimately provides new and improved products, manufacturing processes, and services, is the basis for technological progress. This technological advancement is a key element of sustained economic growth.

(2) The innovation economy is fundamentally different from the industrial or even the information economy. It requires a new vision and new approaches.

(3) Changing innovation processes and the evolution of the relative contribution made by the private and public sectors have emphasized the need for strong industry-science linkages.

(4) Patent regimes play an increasingly complex role in encouraging innovation, disseminating scientific and technical knowledge, and enhancing market entry and firm creation.

(5) Increasing participation and maintaining quality standards in tertiary education in science and technology are imperative to meet growing demand for workers with scientific and technological knowledge and skills.

(6) Research, innovation, and human capital are our principal strengths. By sustaining United States investments in research and finding collaborative arrangements to leverage existing resources and funds in a scarce budget environment, we ensure that America remains at the forefront of scientific and technological capability.

(7) Technology transfer of publicly funded research is a critical mechanism for optimizing the return on taxpayer investment, particularly where other benefits are not measurable at all or are very long-term.

(8) Identifying metrics to quantify program effectiveness is of increasing importance because the entire innovation process is continuing to evolve in an arena of increasing global competition. Metrics need to take into account a wide range of steps in a highly complex process, as well as the ultimate product or service, but should not constrain the con-

tinued evolution or development of new technology transfer approaches.

(9) The United States lacks a national innovation strategy and agenda, including an aggressive public policy strategy that energizes the environment for national innovation, and no Federal agency is responsible for developing national innovation policy.

Subtitle A—Innovation Infrastructure

SEC. 311. TECHNOLOGY TRANSFER OPPORTUNITIES.

(a) IN GENERAL.—The Secretary of Commerce shall conduct a study of technology transfer barriers, best practices, and outcomes of technology transfer activities at Federal laboratories related to the licensing and commercialization of energy efficient technologies, and other technologies that, compared to similar technology in commercial use, result in reduced emissions of greenhouse gases, increased ability to adapt to climate change impacts, or increased sequestration of greenhouse gases. The Secretary shall submit a report setting forth the findings and conclusions of the study to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 6 months after the date of enactment of this Act. The Secretary shall

work with the existing interagency working group to address identified barriers to technology transfer.

(b) BUSINESS OPPORTUNITIES STUDY.—The Secretary of Commerce shall perform an analysis of business opportunities, both domestically and internationally, available for climate change technologies. The Secretary shall transmit the Secretary's findings and recommendations from the first such analysis to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 6 months after the date of enactment of this Act, and shall transmit a revised report of such findings and recommendations to those Committees annually thereafter.

(c) AGENCY REPORT TO INCLUDE INFORMATION ON TECHNOLOGY TRANSFER INCOME AND ROYALTIES.—Paragraph (2)(B) of section 11(f) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710(f)) is amended—

(1) by striking ''and'' after the semicolon in clause (vi);

(2) by redesignating clause (vii) as clause (ix); and

(3) by inserting after clause (vi) the following:

''(vii) the number of fully-executed licenses which received royalty income in the

preceding fiscal year for climate-change or energy-efficient technology;

"(viii) the total earned royalty income for climate-change or energy-efficient technology; and".

(d) INCREASED INCENTIVES FOR DEVELOPMENT OF CLIMATE-CHANGE OR ENERGY-EFFICIENT TECHNOLOGY.—Section 14(a) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710c(a)) is amended—

(1) by striking "15 percent," in paragraph (1)(A) and inserting "15 percent (25 percent for climate change-related technologies),"; and

(2) by inserting "($250,000 for climate change-related technologies)" after "$150,000" each place it appears in paragraph (3).

SEC. 312. GOVERNMENT-SPONSORED TECHNOLOGY INVESTMENT PROGRAM.

(a) PURPOSE.—It is the purpose of this section to provide financial support for the development, through private enterprise, of technology that has potential application to climate change adaptation and mitigation.

(b) FINANCIAL SUPPORT.—The Secretary of Commerce may establish a nonprofit government sponsored enterprise for the purpose of providing investment in private

sector technologies that show promise for climate change adaptation and mitigation applications.

(c) TERMS; CONDITIONS; TRANSPARENCY.—The Secretary shall report within 30 days after the end of each calendar quarter to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science on its operations during that preceding calendar quarter.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Commerce for the use of the enterprise established under subsection (b) such sums as may be necessary to carry out the purpose of this section.

SEC. 313. FEDERAL TECHNOLOGY INNOVATION PERSONNEL INCENTIVES.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is amended by adding at the end the following:

"SEC. 24. FEDERAL TECHNOLOGY INNOVATION PERSONNEL INCENTIVES.

"(a) IN GENERAL.—The head of a Federal laboratory may authorize the participation by any employee of the laboratory in an activity described in subsection (b) in order to achieve the purposes of this Act.

"(b) AUTHORIZED ACTIVITIES.—

"(1) COMMERCIAL DEVELOPMENT PARTICIPATION ARRANGEMENTS.—

"(A) IN GENERAL.—The head of a Federal laboratory may, under the authority provided by section 12(b)(5) of this Act, authorize an employee to participate, as an officer or employee, in the creation of an enterprise established to commercially exploit research work realized in carrying out that employee's responsibilities as an employee of that laboratory for a period of up to 24 months. The authority may be renewed for an additional 12-month period.

"(B) LIMITATIONS.—In addition to the requirements set forth in section 12, an employee may not be authorized under subparagraph (A) to participate in such an enterprise if—

"(i) it would be prejudicial to the normal functioning of the laboratory;

"(ii) by its nature, terms and conditions, or the manner in which the authority would be exercised, participation by that employ would reflect adversely on the functions exercised by that employee as an employee of the laboratory, or risk compro-

mising or calling in question the independence or neutrality of the laboratory; or

"(iii) the interests of the enterprise are of such a nature as to be prejudicial to the mission or integrity of the laboratory or employee.

"(C) RELATIONSHIP TO LABORATORY EMPLOYMENT.—

"(i) REPRESENTATION.—The employee may not represent the employee's official position or the laboratory while participating in the creation of the enterprise.

"(ii) FEDERAL EMPLOYMENT STATUS.—Beginning with the effective date of the authorization under subsection (a), an employee shall be placed in a temporary status without duties or pay and shall cease all duties in connection with the laboratory.

"(iii) RETURN TO SERVICE.—At the end of the authorization period, the employee may be restored to his former position in the laboratory upon termination of

any employment or professional relationship with the enterprise.

"(2) SERVICE IN PRIVATE SECTOR ADVISORY CAPACITY.—

"(A) IN GENERAL.—The head of a Federal laboratory may, under the authority provided by section 12(b)(5) of this Act, authorize an employee to serve, as a member of the board of directors of, as a member of an advisory committee to, or in any similar capacity with a corporation, partnership, joint venture, or other business enterprise for a period of not more than 5 years in order to provide advice and counsel on ways to improve the diffusion and use of an invention or other intellectual property of a Federal laboratory.

"(B) QUALIFYING INVESTMENT.—Under the authorization, an employee authorized to serve on the board of directors of a corporation may purchase and hold the number of qualifying shares of stock needed to serve as a member of that board.

"(C) PARTICIPATION IN CERTAIN PROCEEDINGS.—An employee authorized under subparagraph (A) may not participate in any

grant evaluation, contract negotiation, or other proceeding in which the corporation, partnership, joint venture, or other business enterprise has an interest during the authorization period.''.

SEC. 314. INTERDISCIPLINARY RESEARCH AND COMMERCIALIZATION.

(a) IN GENERAL.—The Director of the National Science Foundation shall develop and implement a plan to increase and establish priorities for funding for multidisciplinary and interdisciplinary research at universities in support of the adaptation to and mitigation of climate change. The plan shall—

(1) address the cross-fertilization and fusion of research within and across the biological and physical sciences, the spectrum of engineering disciplines, and entirely new fields of scientific exploration; and

(2) include the area of emerging service sciences.

(b) REPORT TO CONGRESS.—The Director shall transmit a copy of the plan to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 6 months after the date of enactment of this Act.

(c) SERVICE SCIENCE DEFINED.—In this section, the term ''service science'' means the melding together of the fields of computer science, operations research, industrial engineering, mathematics, management science, decision sciences, social sciences, and legal sciences in a manner that may transform entire enterprises and drive innovation at the intersection of business and technology expertise.

SEC. 315. CLIMATE INNOVATION PARTNERSHIPS.

(a) IN GENERAL.—The Secretary of Commerce, in consultation with the Director of the National Science Foundation, shall create a program of public-private partnerships that—

(1) focus on supporting climate change related regional innovation;

(2) bridge the gap between the long-term research and commercialization;

(3) focus on deployment of technologies needed by a particular region in adapting or mitigating the impacts of climate change; and

(4) support activities that are selected from proposals submitted in merit-based competitions.

(b) INSTITUTIONAL DIVERSITY.—In creating the program, the Secretary and the Administrator shall—

(1) encourage institutional diversity; and

(2) provide that universities, research centers, national laboratories, and other non-profit organizations are allowed to partner with private industry in submitting applications.

(c) GRANTS.—The Secretary may make grants under the program to the partnerships, but the Federal share of funding for any project may not exceed 50 percent of the total investment in any fiscal year.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as may be necessary to carry out this section.

SEC. 316. NATIONAL MEDAL OF CLIMATE STEWARDSHIP INNOVATION.

(a) IN GENERAL.—There is established a National Medal of Climate Stewardship Innovation, which shall be of such design and materials, and bear such inscription, as the President may prescribe. The President shall award the medal on the basis of recommendations submitted by the National Science Foundation and the Secretary of Commerce to individuals who, in the judgment of the President, are deserving of special recognition by reason of their outstanding contributions to knowledge in the field of climate change innovation.

(b) CRITERIA.—The medal shall be awarded in accordance with the following criteria:

(1) ANNUAL LIMIT.—No more than 20 individuals may be awarded the medal in any calendar year.

(2) CITIZENSHIP.—No individual may be awarded the medal unless, at the time the award is made, the individual is—

(A) a citizen or other national of the United States; or

(B) an alien lawfully admitted to the United States for permanent residence who—

(i) has filed a petition for naturalization in the manner prescribed by section 334 of the Immigration and Nationality Act (8 U.S.C. 1445); and

(ii) is not permanently ineligible to become a citizen of the United States.

(3) POSTHUMOUS AWARD.—

(A) IN GENERAL.—Notwithstanding paragraph (2), the medal may be awarded posthumously to an individual who, at the time of death, met the conditions set forth in paragraph (2).

(B) 5-YEAR LIMITATION.—Notwithstanding subparagraph (A), the medal may not

be awarded posthumously to an individual after the fifth anniversary of that individual's death.

(c) INSCRIPTION AND CERTIFICATE.—Each medal shall be suitably inscribed. Each individual awarded the medal shall also receive a citation descriptive of the award.

(d) PRESENTATION.—The presentation of the medal shall be made by the President with such ceremonies as the President deems proper, including attendance by appropriate Members of Congress.

SEC. 317. MATH AND SCIENCE TEACHERS' ENHANCEMENT PROGRAM.

(a) IN GENERAL.—The Director of the National Science Foundation shall establish within the Foundation a climate change science and technology enhancement program for teachers.

(b) PURPOSE.—The purpose of the program is to provide for professional development of mathematics and science teachers at elementary, middle, and secondary schools (as defined by the Director), including improving the education and skills of those teachers with respect to—

(1) teaching strategies;

(2) subject-area expertise; and

(3) the understanding of climate change science and technology and the environmental, economic, and social impacts of climate change on commerce.

(c) PROGRAM AREAS.—In carrying out the program under this section, the Director shall focus on the areas of—

(1) scientific measurements;

(2) tests and standards development;

(3) industrial competitiveness and quality;

(4) manufacturing;

(5) technology transfer; and

(6) any other area of expertise that the Director determines to be appropriate.

(d) APPLICATION PROCEDURE.—The Director shall prescribe procedures and selection criteria for participants in the program.

(e) AWARDS.—The Director shall issue awards under the program to participants. In issuing the awards, the Director shall ensure that the maximum number of participants practicable participate in the program. In order to ensure a maximum level of participation of participants, the program under this section shall be conducted on an annual basis during the summer months, when a majority of elementary, middle, and secondary schools are not in classes.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director for carrying out this section—

(1) $2,500,000 for fiscal year 2008; and

(2) $2,500,000 for fiscal year 2009.

SEC. 318. PATENT STUDY.

(a) IN GENERAL.—The Director of the Patent and Trademark Office, in consultation with representatives of interested parties in the private sector, shall conduct a study to determine the extent to which changes to the United States patent system are necessary to increase the flow of climate change-related technologies. The study shall address—

(1) the balance between the protection of the inventor and the disclosure of information;

(2) the role of patents in innovation within the covered sectors;

(3) the extent to which patents facilitate increased investments in climate change research and development;

(4) the international deployment of United States developed climate change related technologies on the United States patent system;

(5) ways to leverage databases as innovation tools;

(6) best practices for collaborative standard setting; and

(7) any other issues the Director deems appropriate.

(b) REPORT.—Within 6 months after the date of enactment of this Act, the Director shall transmit a report setting forth the findings and conclusions of the study to the Congress.

SEC. 319. LESSONS-LEARNED PROGRAM.

(a) IN GENERAL.—Within 180 days after the date of enactment of this Act, the Secretary of Energy shall establish a national lessons-learned and best practices program to ensure that lessons learned and best practices concerning energy efficiency and greenhouse gas emission reductions are available to the public. The program shall contain consumer awareness initiatives including product labeling and campaigns to raise public awareness. The Secretary shall determine the process and frequency by which the information is provided.

(b) PROGRAM CONTENT.—The program—

(1) may include experiences realized outside of the Federal government;

(2) shall include criteria by which entries in the program are determined;

(3) shall use a standardized, user-friendly format for data reports; and

(4) may include any other matters the Secretary deems appropriate.

SEC. 320. RESEARCH GRANTS.

Section 105 of the Global Change Research Act of 1990 (15 U.S.C. 2935) is amended—

(1) by redesignating subsection (c) as subsection (d); and

(2) by inserting after subsection (b) the following:

''(c) RESEARCH GRANTS.—

''(1) COMMITTEE TO DEVELOP LIST OF PRIORITY RESEARCH AREAS.—The Committee shall develop a list of priority areas for research and development on climate change that are not being addressed by Federal agencies.

''(2) DIRECTOR OF OSTP TO TRANSMIT LIST TO NSF.—The Director of the Office of Science and Technology Policy shall transmit the list to the National Science Foundation.

''(3) FUNDING THROUGH NSF.—

''(A) BUDGET REQUEST.—The National Science Foundation shall include, as part of the annual request for appropriations for the

Science and Technology Policy Institute, a request for appropriations to fund research in the priority areas on the list developed under paragraph (1).

"(B) AUTHORIZATION.—For fiscal year 2008 and each fiscal year thereafter, there are authorized to be appropriated to the National Science Foundation not less than $25,000,000, to be made available through the Science and Technology Policy Institute, for research in those priority areas.".

SEC. 321. ABRUPT CLIMATE CHANGE RESEARCH.

(a) IN GENERAL.—The Secretary, through the National Oceanic and Atmospheric Administration, shall carry out a program of scientific research on potential abrupt climate change designed—

(1) to develop a global array of terrestrial and oceanographic indicators of paleoclimate in order sufficiently to identify and describe past instances of abrupt climate change;

(2) to improve understanding of thresholds and nonlinearities in geophysical systems related to the mechanisms of abrupt climate change;

(3) to incorporate these mechanisms into advanced geophysical models of climate change; and

(4) to test the output of these models against an improved global array of records of past abrupt climate changes.

(b) ABRUPT CLIMATE CHANGE DEFINED.—In this section, the term ''abrupt climate change'' means a change in climate that occurs so rapidly or unexpectedly that human or natural systems may have difficulty adapting to it.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for fiscal year 2008 $60,000,000 to carry out this section, such sum to remain available until expended.

SEC. 322. ENHANCED ENVIRONMENTAL MEASUREMENTS AND STANDARDS.

The National Institute of Standards and Technology Act (15 U.S.C. 271 et seq.) is amended—

(1) by redesignating sections 17 through 32 as sections 18 through 33, respectively; and

(2) by inserting after section 16 the following:

''SEC. 17. CLIMATE CHANGE STANDARDS AND PROCESSES.

''(a) IN GENERAL.—The Director shall establish within the Institute a program to perform and support research on global climate change standards and processes, with the goal of providing scientific and technical knowledge applicable to the reduction of greenhouse gases (as

defined in section 3(8) of the Climate Stewardship and Innovation Act of 2007) and of facilitating implementation of section 321 of that Act.

"(b) RESEARCH PROGRAM.—

"(1) IN GENERAL.—The Director is authorized to conduct, directly or through contracts or grants, a global climate change standards and processes research program.

"(2) RESEARCH PROJECTS.—The specific contents and priorities of the research program shall be determined in consultation with appropriate Federal agencies, including the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration. The program generally shall include basic and applied research—

"(A) to develop and provide the enhanced measurements, calibrations, data, models, and reference material standards which will enable the monitoring of greenhouse gases;

"(B) to assist in establishing a baseline reference point for future trading in greenhouse gases and the measurement of progress in emissions reduction;

"(C) that will be exchanged internationally as scientific or technical information which has the stated purpose of developing mutually recognized measurements, standards, and procedures for reducing greenhouse gases; and

"(D) to assist in developing improved industrial processes designed to reduce or eliminate greenhouse gases.

"(c) NATIONAL MEASUREMENT LABORATORIES.—

"(1) IN GENERAL.—In carrying out this section, the Director shall utilize the collective skills of the National Measurement Laboratories of the National Institute of Standards and Technology to improve the accuracy of measurements that will permit better understanding and control of these industrial chemical processes and result in the reduction or elimination of greenhouse gases.

"(2) MATERIAL, PROCESS, AND BUILDING RESEARCH.—The National Measurement Laboratories shall conduct research under this subsection that includes—

"(A) developing material and manufacturing processes which are designed for energy efficiency and reduced greenhouse gas emissions into the environment;

"(B) developing chemical processes to be used by industry that, compared to similar processes in commercial use, result in reduced emissions of greenhouse gases or increased sequestration of greenhouse gases; and

"(C) enhancing building performance with a focus in developing standards or tools which will help incorporate low- or no-emission technologies into building designs.

"(3) STANDARDS AND TOOLS.—The National Measurement Laboratories shall develop standards and tools under this subsection that include software to assist designers in selecting alternate building materials, performance data on materials, artificial intelligence-aided design procedures for building subsystems and 'smart buildings', and improved test methods and rating procedures for evaluating the energy performance of residential and commercial appliances and products.

"(d) NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM.—The Director shall utilize the National Voluntary Laboratory Accreditation Program under this section to establish a program to include specific calibration or test standards and related methods and protocols assembled to satisfy the unique needs for accredita-

tion in measuring the production of greenhouse gases. In carrying out this subsection the Director may cooperate with other departments and agencies of the Federal Government, State and local governments, and private organizations.''.

SEC. 323. CLIMATE TECHNOLOGY CHALLENGE PROGRAM.

(a) IN GENERAL.—The Secretary of Energy, in coordination with the Climate Change Credit Corporation, shall develop and carry out a program in fiscal years 2008 through 2011, to be known as the ''Climate Technology Challenge Program''. The Secretary of Energy shall award funding through the program to stimulate innovation in development, demonstration, and deployment of technologies that have the greatest potential for reducing greenhouse gas emissions. The program shall be conducted as follows:

(1) The Secretary of Energy shall post a request for zero or low greenhouse gas energy services or products along with a suggested level of funding for each competition.

(2) The Secretary of Energy shall award the funding to the lowest bidder in each competition who meets all other qualifications in a form of a production incentive to supply—

(A) the requested services for a specified period of time; or

(B) the requested product within a specified period of time.

(b) FUNDING.—

(1) SOURCE.—Notwithstanding any other provision of law, or any other provision of this Act, authorizing or appropriating funds to carry out the provisions of this Act, no funds may be made available to carry out any activity under this subtitle except proceeds from the auction authorized by section 162(g) of this Act, subject to the limitation in section 162(g)(3).

(2) OPERATING FUNDS.—Beginning with fiscal year 2010, the Climate Change Credit Corporation shall administer the Climate Technology Challenge Program using funds generated under section 202 of this Act.

(c) PROGRAM REQUIREMENTS.—

(1) COMPETITIVE PROCESS.—Recipients of awards under the program shall be selected through competitions conducted by the Secretary of Energy.

(2) ADVERTISEMENT OF COMPETITIONS.—The Secretary of Energy shall widely advertise any competitions conducted under the program.

(3) CATEGORIES OF COMPETITIONS.—The Secretary of Energy shall conduct separate competitions in the following areas of energy and fuel production and services:

(A) Advanced coal (including integrated gasification combined cycle) with carbon capture and storage.

(B) Renewable electricity.

(C) Energy efficiency (including transportation).

(D) Advanced technology vehicles.

(E) Transportation fuels.

(F) Carbon sequestration and storage.

(G) Zero and low emissions technologies.

(H) Adaptation technologies.

(I) The Secretary of Energy may also conduct competition for a general category to stimulate additional, unanticipated advances in technology.

(4) EVALUATIONS AND CRITERIA FOR COMPETITIONS.—

(A) PANEL OF EXPERTS.—The Secretary of Energy shall establish a separate panel of experts to evaluate proposals submitted under each competition.

(B) COMPETITION CRITERIA.—The Secretary of Energy, in consultation with other relevant Federal agency heads, shall set minimum criteria, including performance and safety criteria, for each competition. Proposals shall be evaluated on their ability to reduce, avoid, or sequester greenhouse gas emissions at a given price.

(C) FULL LIFE CYCLE.—All proposals within a competition shall compete on full life cycle avoided greenhouse gas emissions (as weighted by global warming potential) per dollar of incentive.

(5) REPORT OF AWARDS.—In 2011 and every 5 years thereafter the Secretary of Energy shall issue a report on the awards granted by the program, funding provided, and greenhouse gas emissions avoided or sequestered.

(6) PROGRAM EVALUATION.—The Secretary of Energy, in coordination with the National Academies of Science, shall evaluate the continued necessity of the program and future funding needs after fiscal year 2011. The evaluation shall be submitted 3 months before the end of fiscal year 2011 to the

Congress and the Climate Change Credit Corporation.

(7) REVIEW AND REVISION BY CORPORATION.—The Climate Change Credit Corporation shall review and revise the awards program every 5 years starting in 2011, issuing new guidelines for the next 5 years of Climate Technology Challenge Program by the end of the fiscal year in which the evaluation in paragraph (6) is reported. The Climate Change Credit Corporation shall assess and adjust the categories of competitions as described in paragraph (3) to ensure new developing technologies that reduce, avoid, or sequester greenhouse gases and are in need of financial assistance for further development and deployment are the focus of the awards program.

(d) BUDGETING AND AWARDING OF FUNDS.—

(1) AVAILABILITY OF FUNDS.—Any funds appropriated to carry out this section shall remain available until expended, but for not more than 4 fiscal years.

(2) DEPOSIT AND WITHDRAWAL OF FUNDS.—When an award is offered, the Secretary of Energy shall deposit the total amount of funding made available for that award in the Climate Technology

Challenge Trust Fund. If funding expires before an award is granted, the Secretary of Energy shall deposit additional funds in the account to ensure the availability of funding for all awards. If an award competition expires before its goals are met, the Secretary of Energy may redesignate those funds for a new challenge, but any redesignated funds will be considered as newly deposited for the purposes of paragraph (3). All cash awards made under this section shall be paid from that account.

(3) MAXIMUM AWARD.—No competition under the program may result in the award of more than $100,000,000 without the approval of the Secretary of Energy.

(4) POST-2012 FUNDING.—Funding for the competitions after fiscal year 2012 shall be taken from the Climate Change Credit Corporation.

(e) REGISTRATION; ASSUMPTION OF RISK.—

(1) REGISTRATION.—Each potential recipient of an award in a competition under the program under this section shall register for the competition.

(2) ASSUMPTION OF RISK.—In registering for a competition under paragraph (1), a potential recipient of a prize shall assume any and all risks, and waive claims against the United States Government

and its related entities (including contractors and subcontractors at any tier, suppliers, users, customers, cooperating parties, grantees, investigators, and detailees), for any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from participation in the competition, whether such injury, death, damage, or loss arises through negligence or otherwise, except in the case of willful misconduct.

(f) RELATIONSHIP TO OTHER AUTHORITY.—The Secretary of Energy may exercise the authority in this section in conjunction with or in addition to any other authority of the Secretary to acquire, support, or stimulate basic and applied research, technology development, or prototype demonstration projects that promote reduced greenhouse gas emissions.

Subtitle B—Deploying Advanced Technologies and Practices

SEC. 351. LOW- OR ZERO-EMISSIONS ELECTRICITY GENERATION.

(a) ENERGY AUDITS.—

(1) IN GENERAL.—The Secretary of Energy shall establish a program to reduce greenhouse gas emissions through the deployment of energy efficiency measures, including appropriate technologies,

by large commercial customers by providing for energy audits. The program shall provide incentives for large users of electricity or natural gas to obtain an energy audit.

(2) COMPONENTS.—The energy audit shall provide users with an inventory of potential energy efficiency measures, including appropriate technologies, and their cost savings over time, along with financing options to initiate the project.

(3) REIMBURSEMENT OF AUDIT COSTS.—If any of the recommendations of an energy audit implemented by a facility owner result in cost savings greater than 5 times the cost of the original audit, then the facility owner shall reimburse the Secretary for the cost of the audit.

(b) ADVANCED RESEARCH AND DEVELOPMENT FOR SAFETY AND NONPROLIFERATION.—The Secretary of Energy shall establish, operate, and report biannually to Congress the results of—

(1) a program of research and development focused on advanced once-through fuel cycles;

(2) a Nuclear System Modeling project to carry out the analysis, research, simulation, and collection of engineering data needed to evaluate all fuel cycles with respect to cost, inherent safety, waste manage-

ment and proliferation-avoidance and -resistance; and

(3) an Advanced Diversified Waste-Disposal Research Program, to complement the current repository authorized under the Nuclear Waste Policy Act, for deep-bore hole disposal options, alternative geological environments, and improved engineered barriers.

(c) GOVERNMENT-INDUSTRY PARTNERSHIPS FOR FIRST-OF-A-KIND ENGINEERING DESIGN.—

(1) IN GENERAL.—The Corporation may provide funding for a cost-sharing program to address first-of-a-kind engineering costs inherent in building the first facility of a substantially new design that generates electricity with low or no net greenhouse gas emissions or produces transportation fuels that result in low or no net greenhouse gas emissions, including Integrated Gasification Combined Cycle Advanced Coal power generating facilities using carbon capture technology with geological storage of greenhouse gases, advanced reactor designs, large scale biofuels facilities that maximize the use of cellulosic biomass, and large scale solar concentrating power facilities.

(2) PROJECT SELECTION.—The Secretary of Energy in coordination with the Corporation shall select the final designs to be supported, in terms of reducing greenhouse gas emissions, demonstrating a new technology, meeting other clean air attainment goals, generating economic benefits, contributing to energy security, contributing to fuel and technology diversity, maintaining price stability, and attaining cost effectiveness and economic competitiveness.

(3) COST-SHARING LIMITATIONS.—

(A) CORPORATION'S SHARE OF COSTS.—Costs for the program shall be shared equally between the Corporation and the builder of such first facilities.

(B) NUCLEAR REACTORS.—Funding under this section for any nuclear facility—

(i) may not exceed $200,000,000 for an individual project; and

(ii) shall be available for no more than 1 of each of the 3 designs certified by the Nuclear Regulatory Commission.

(4) REIMBURSEMENT OF COSTS.—For any subsequently-built facility that uses a design supported by the cost-sharing program under this section, the Secretary of Energy and the Corporation shall speci-

fy an amount to be paid to the Corporation in order for the Corporation to receive full reimbursement for costs the Corporation incurred in connection with the design, considering the program's objectives, including the costs of promoting the deployment of cost-effective, economically competitive technologies with no or low net greenhouse gas emissions.

(5) REIMBURSEMENT FOR DELAY.—If the construction of such a first facility of a substantially new design is not started within 10 years after the date on which a commitment under the cost-sharing program is made by the Secretary, then the industry partner shall reimburse the Corporation for any costs incurred by the Corporation under the program.

(6) JURISDICTION.—

(A) NUCLEAR REGULATORY COMMISSION.—Nothing in this Act shall affect the jurisdiction of the Nuclear Regulatory Commission over nuclear power plant design approvals or combined construction and operating licenses pursuant to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

(B) REGULATORY AGENCIES.—Nothing in this Act affects the jurisdiction of any Federal, State, or local government regulatory agency.

(d) DEMONSTRATION PROGRAM.—

(1) NUCLEAR REGULATORY COMMISSION LICENSING PROCESS.—Within 24 months after the date of enactment of this Act, the Secretary of Energy shall establish a demonstration program to reduce the first-time regulatory costs of the current Nuclear Regulatory Commission licensing process incurred by the first applicant using an advanced reactor design.

(2) PERMITS; LICENSES; COST-SHARING.—

(A) The demonstration program shall—

(i) address the Early Site Permit applications and the combined construction and operating license applications; and

(ii) be jointly funded by the Department of Energy and the applicant.

(B) The Secretary shall work with the applicant to determine the appropriate percentage of costs that the Department and the applicant shall each provide.

(3) REIMBURSEMENT FOR LICENSE TRANSFER.—If an applicant decides to transfer a permit

granted by the Commission under the program to another entity, the applicant shall reimburse the Department for its costs in obtaining the permit.

SEC. 352. LOW- OR ZERO-EMISSIONS TRANSPORTATION.

(a) IN GENERAL.—The Secretary of Energy, the Administrator of the Environmental Protection Agency, and the Secretary of Transportation shall establish jointly a competitive, merit-based research program to fund proposals that—

(1) develop technologies that aid in reducing fuel use or reduce greenhouse gas emissions associated with any fuel;

(2) further develop existing or new technologies to create renewable fuels created from less carbon or energy-intensive practices than current renewable fuel production;

(3) remove existing barriers for deployment of existing fuels that dramatically reduce greenhouse gas emissions;

(4) support low-carbon transportation fuels, including renewable hydrogen, advanced cellulosic ethanol, and biomass-based diesel substitutes, and the technical hurdles to market entry;

(5) support technologies that facilitate meeting transportation energy requirements with electricity

1 produced by low- or zero-carbon stationary sources
2 of electricity;
3 (6) support short-term and long-term tech-
4 nology improvements for United States cars and
5 light trucks that reduce greenhouse gas emissions,
6 including advanced, high-power hybrid vehicle bat-
7 teries, advanced gasoline engine designs, fuel cells,
8 hydrogen storage, power electronics, and lightweight
9 materials;
10 (7) support advanced heavy-duty truck tech-
11 nologies to reduce greenhouse gas emissions from
12 the existing and new fleets, including aerodynamics,
13 weight reduction, improved tires, anti-idling tech-
14 nology, high-efficiency engines, and hybrid systems;
15 or
16 (8) expand research into the climatological im-
17 pacts of air travel and support advanced tech-
18 nologies to reduce greenhouse gas emissions from
19 aircraft including advanced turbines, aerodynamics,
20 and logistics technology that reduces delays, in-
21 creases load factors and cuts in-air emissions.
22 (b) REAL-WORLD TEST PROCEDURES.—The Admin-
23 istrator of the Environmental Protection Agency, in con-
24 sultation with the Secretary of Transportation, shall—

(1) conduct research and establish a Federal test procedure for certifying fuel economy of heavy duty vehicles; and

(2) update Federal test procedures for certifying fuel economy of automobiles and light duty trucks so the results better reflect real-world operating conditions.

(c) INCORPORATION INTO PROGRAM.—The Secretaries shall ensure that the program established under subsection (a) is incorporated into the United States Climate Technology Challenge Program.

(d) MARKETING STUDY.—The Secretary of Transportation, in coordination with the Secretary of Commerce, shall conduct a study on how the government can accelerate the market for low-carbon vehicles. The results of the study shall be submitted to the Congress within 6 months after the date of enactment of this Act.

(e) RETOOLING OF ADVANCED VEHICLE MANUFACTURING.—

(1) IN GENERAL.—Within 24 months after the date of enactment of this Act, the Secretary of Energy shall establish a program to demonstrate the effectiveness of retooling an existing vehicle or vehicle component manufacturing facility to reduce reduced greenhouse gas emissions from vehicles and

increasing competitiveness of advanced technology vehicle production facilities.

(2) PROGRAM ELEMENTS.—

(A) ACTIVITIES SUPPORTED.—The demonstration program shall be designed—

(i) to re-equip an existing manufacturing facility to produce advanced technology vehicles or components that will result in reduced greenhouse gas emissions; and

(ii) to conduct engineering integration activities of advanced technological vehicles and components.

(B) FUNDING.—The program shall be jointly funded by the private sector and the Department of Energy. The Secretary of Energy shall work with participating entities to determine the appropriate percentage of costs that each shall provide.

(C) ELIGIBLE COMPONENTS AND ACTIVITIES.—The Secretary of Energy, in coordination with the Administrator of the Environmental Protection Agency and the Secretary of Transportation, shall determine what advanced technology components and engineering integra-

tion activities will qualify for support under the program.

(D) ELIGIBLE COSTS.—Costs eligible to be shared under this subsection include the cost of engineering tasks related to—

(i) incorporating qualifying components into the design of advanced technology vehicles; and

(ii) designing new tooling and equipment for production facilities that produce qualifying components or advanced technology vehicles.

(3) LIMITATION.—No more than 2 facilities may receive financial assistance under the program for re-equipment and expansion or for engineering integration.

(4) ADVANCED TECHNOLOGY VEHICLE DEFINED.—In this subsection, the term ''advanced technology vehicle'' means a light duty motor vehicle that is either a hybrid or advanced lean burn technology motor vehicle, and that meets the following additional performance criteria:

(A) The vehicle shall meet the Tier II Bin 5 emission standard established in regulations prescribed by the Administrator under that Act.

(B) The vehicle shall meet any new emission standard for fine particulate matter prescribed by the Administrator under that Act.

(C) The vehicle shall achieve at least 125 percent of the base year city fuel economy for its weight class.

SEC. 353. MEASURES TO INCREASE ENERGY EFFICIENCY.

(a) IN GENERAL.—The Secretary of Energy shall establish a program to reduce greenhouse gas emissions through the deployment of energy efficiency measures, including appropriate technologies, by large commercial customers by providing for energy audits. The program shall provide incentives for large users of electricity or natural gas to obtain an energy audit.

(b) COMPONENTS.—The energy audit shall provide users with an inventory of potential energy efficiency measures, including appropriate technologies, and their cost savings over time, along with financing options to initiate the project.

(c) REIMBURSEMENT OF AUDIT COSTS.—If any of the recommendations of an energy audit implemented by a facility owner result in cost savings greater than 5 times the cost of the original audit, then the facility owner shall reimburse the Secretary for the cost of the audit.

SEC. 354. GEOLOGICAL STORAGE.

(a) IN GENERAL.—The Secretary of Energy, in consultation with the Secretary of Agriculture and the Administrator of the Environmental Protection Agency, shall establish guidelines for setting individual project baselines for reductions of greenhouse gas emissions and greenhouse gas storage in various types of geological formations to serve as the basis for determining the amount of greenhouse gas reductions produced by the project.

(b) SPECIFIC ACTIVITIES.—The Secretary of Energy, in consultation with the Director of the U.S. Geological Survey, shall—

(1) develop local and regional databases on existing practices and technologies for greenhouse gas injection in underground aquifers;

(2) develop methods for computation of additionality discounts for prospective greenhouse gas reductions or offsets due to carbon dioxide injection and storage in underground aquifers;

(3) develop accepted standards for monitoring of carbon dioxide stored in geological subsurface reservoirs by—

(A) developing minimum suitability standards for identifying and monitoring of geological storage sites including oil, gas, and coal bed methane reservoir and deep saline aquifers; and

(B) testing monitoring standards using sites with long term (multi-decade) large injections of carbon dioxide into oil field enhanced recovery projects; and

(4) address non-permanence and risk of release of sequestered greenhouse gas by—

(A) establishing guidelines for risk assessment of inadvertent greenhouse gas release, both long-term and short-term, associated with geological sequestration sites; and

(B) developing insurance instruments to address greenhouse gas release liability in geological sequestration.

(c) NATIONAL GEOLOGICAL CARBON SEQUESTRATION ASSESSMENT.—

(1) FINDINGS.—The Congress finds the following:

(A) One of the most promising options for avoiding emissions of carbon dioxide is through long-term storage by geological sequestration in stable geological formations, which involves—

(i) capturing carbon dioxide from industrial sources; and

(ii) injecting the captured carbon dioxide into geological storage sites, such as

deep saline formations, unmineable coal seams, and depleted gas and oil fields.

(B) As of the date of introduction of this Act, there are only very broad estimates of national geological storage capacity.

(C) The potential to recover additional oil and gas resources through enhanced oil and gas recovery using captured carbon dioxide emissions is an option that could add the equivalent of tens-of-billions of barrels of oil to the national resource base.

(D) An initial geological survey of storage capacity in the subsurface of sedimentary basins in the United States would—

(i) provide estimates of storage capacity based on clearly defined geological parameters with stated ranges of uncertainty;

(ii) allow for an initial determination of whether a basin or 1 or more portions of the basin may be developed into a storage site; and

(iii) provide information on—

(I) a baseline for monitoring injections and post injection phases of storage; and

(II) early opportunities for matching carbon dioxide sources and sinks for early deployment of zero-emissions fossil fuel plants using capture and storage technologies.

(2) NATIONAL GEOLOGICAL CARBON SEQUESTRATION ASSESSMENT.—

(A) DEVELOPMENT AND TESTING OF ASSESSMENT METHODOLOGY.—

(i) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Director of the United States Geological Survey shall develop and test methods for the conduct of a national assessment of geological storage capacity for carbon dioxide.

(ii) OPPORTUNITY FOR REVIEW AND COMMENT.—During the period beginning on the date that is 180 days after the date of enactment of this Act and ending on the date of completion of the development and testing of the methodologies under clause (i), the Director shall provide the Under Secretary for Oceans and Atmosphere of the Department of Commerce, the Sec-

retary of Energy, the Administrator of the Environmental Protection Agency, the Director of the Minerals Management Service, the Director of the Bureau of Land Management, the heads of other Federal land management agencies, the heads of State land management agencies, industry stakeholders, and other interested parties with an opportunity to review and comment on the proposed methodologies.

(B) ASSESSMENT.—

(i) IN GENERAL.—The Director shall conduct the assessment during the period beginning on the date on which the development and testing of the methodologies is completed under subparagraph (A) and ending 4 years after the date of enactment of this Act.

(ii) AVAILABILITY OF INFORMATION.—The Director shall establish an Internet database accessible to the public that provides the results of the assessment, including a detailed description of the data collected under the assessment.

(iii) REPORT.—Not later than 1 year after the date on which the assessment is completed under clause (i), the Director shall submit to the appropriate committees of Congress and the President a report that describes the findings of the assessment.

(3) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated $15,000,000 to carry out this section for fiscal years 2008 through 2011.

SEC. 355. AGRICULTURAL SEQUESTRATION.

(a) IN GENERAL.—The Director of the Office of Science and Technology Policy shall establish an interagency panel of representatives from the United States Forest Service, Agriculture Research Service, Agricultural Experiment Stations and Extension Service, Economic Research Service, Natural Resource Conservation Service, Environmental Protection Agency, the U.S. Geological Survey, and the National Institute of Standards and Technology to establish standards for measurement (and remeasurement) of sequestered carbon, including lab procedures, field sampling methods, and accuracy of sampling statistics.

(b) DUTIES.—The interagency panel shall—

(1) develop discounted default values for the amount of greenhouse gas emission reductions due to carbon sequestration or emissions reductions from improved practices and technologies;

(2) develop technologies for low-cost laboratory and field measurement;

(3) develop procedures to improve the accuracy of equations used to estimate greenhouse gas emissions reductions produced by adoption of improved land management technologies and practices;

(4) develop local and regional databases on carbon sequestration in soils and biomass, greenhouse gas emissions, and adopted land management technologies and practices;

(5) develop computation methods for additionality discounts for prospective greenhouse gas offsets;

(6) develop entitywide reporting requirements to evaluate project-level leakage;

(7) develop commodity-specific greenhouse gas offset discount factors for market-level leakage, and update those factors periodically;

(8) develop guidelines and standards for greenhouse gas offset and reduction project monitoring and verification and uniform qualifications for third

party verifiers, including specification of conflict of interest conditions;

(9) increase landowner accessibility to technologies and practices by—

(A) improving and expanding availability and adoption of best management practices for soils, crop residues, and forests to achieve additional carbon sequestration that meets standards as bona fide greenhouse gas offsets;

(B) improving and expanding availability and adoption of best management practices for soils, crop residues, and forests to achieve reductions in emissions of carbon dioxide, methane, and nitrous oxides that meet standards as bona fide greenhouse gas emissions reductions; and

(C) establishing incentives for land managers to help finance investments in facilities that produce bona fide greenhouse gas offsets or reductions through carbon sequestration or direct greenhouse gas emissions reductions; and

(10) establish best practices to address non-permanence and risk of release of sequestered greenhouse gases by—

(A) assessing and quantifying risks, both advertent and inadvertent, of release of greenhouse gases sequestered in soils and biomass; and

(B) establishing insurance instruments concerning the release, both advertent and inadvertent, of sequestered greenhouse gases.

(c) ADDITIONALITY DEFINED.—In this section the term ''additionality'' means emissions reduction and sequestration activities that result in atmospheric benefits that would not otherwise have occurred.

TITLE IV—ADAPTING TO CLIMATE CHANGE IMPACTS

SEC. 401. ADAPTATION TECHNOLOGIES.

(a) IN GENERAL.—The Director of the Office of Science and Technology Policy shall establish a program on adaptation technologies as part of the Climate Technology Challenge Program. The Director shall perform an assessment of the climate change technological needs of various regions of the country. This assessment shall be provided to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 6 months after the date of enactment of this Act.

(b) REGIONAL ESTIMATES.—The Director of the Office of Science and Technology Policy, in consultation with the Secretaries of Transportation, Homeland Security, Agriculture, Housing and Urban Development, Health and Human Services, Defense, Interior, Energy, and Commerce, the Administrator of the Environmental Protection Agency, the Director of U.S. Geologic Survey, and other such Federal offices as the Director deems necessary, along with relevant State agencies, shall perform 6 regional infrastructure cost assessments covering the United States, and a national cost assessment, to provide estimates of the range of costs that should be anticipated for adaptation to the impacts of climate change. The Director shall develop those estimates for low, medium, and high probabilities of climate change and its potential impacts. The assessments shall be provided to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 1 year after the date of enactment of this Act.

(c) ADAPTATION PLAN.—

(1) IN GENERAL.—Within 6 months after the date of enactment of this Act, the Secretary of Commerce shall submit a climate change adaptation plan for the United States to the Congress. The adaptation plan shall be based upon assessments performed

by the United Nations Intergovernmental Panel on Climate Change, those as required by the 1990 Global Change Research Act, and any other scientific peer-reviewed regional assessments.

(2) REQUIRED COMPONENTS.—The adaptation plan shall include—

(A) a prioritized list of vulnerable systems and regions;

(B) coordination requirements between Federal, State, and local governments to ensure that key public infrastructure, safety, health, and land use planning and control issues are addressed;

(C) coordination requirements among the Federal government, industry, and communities;

(D) an assessment of climate change science research needs including probabilistic assessments as an aid to planning;

(E) an assessment of climate change technology needs; and

(F) regional and national costs assessments for the range of costs that should be anticipated for adapting to the impacts of climate change.

SEC. 402. MITIGATING CLIMATE CHANGE'S IMPACTS ON THE POOR.

(a) IN GENERAL.—The Secretary shall conduct research on the impact of climate change on low-income populations everywhere in the world. The research shall—

(1) include an assessment of the adverse impact of climate change on low-income populations in the United States and on developing countries;

(2) identify appropriate climate change adaptation measures and programs for developing countries and low-income populations and assess the impact of those measures and programs on low-income populations;

(3) identify appropriate climate change mitigation strategies and programs for developing countries and low-income populations and assess the impact of those strategies and programs on developing countries and on low-income populations in the United States; and

(4) include an estimate of the costs of developing and implementing those climate change adaptation and mitigation programs.

(b) REPORT.—Within 1 year after the date of enactment of this Act, the Secretary shall transmit a report on the research conducted under subsection (a) to the Senate Committee on Commerce, Science, and Transpor-

1 tation, the Senate Committee on Environment and Public
2 Works, the House of Representatives Committee on
3 Science, and the House of Representatives Committee on
4 Energy and Commerce.

5 (c) AUTHORIZATION OF APPROPRIATIONS.—There
6 are authorized to be appropriated to the Secretary
7 $2,000,000 to carry out the research required by sub-
8 section (a).

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