

WRI Summary of S.1462, the American Clean Energy Leadership Act

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This summary provides a concise overview of the American Clean Energy Leadership Act (here in referred to as the ACELA) as reported by the Senate Committee on Energy and Natural Resources on June 17, 2009 and includes amendments agreed to by the committee on May 6, 2010. The ACELA is an energy bill consisting of six titles:

- Title I, Clean Energy Technology Deployment
- Title II, Enhanced Energy Efficiency
- Title III, Improved Energy Security
- Title IV, Energy Innovation and Workforce Development
- Title V, Energy markets
- Title VI, Policy Studies and reports

This summary roughly follows the structure of the bill. In some cases this summary deviates from this structure and groups together related components to facilitate understanding. For more information on specific components of the ACELA, please refer to the actual legislative language as referenced by section and page number in this document.³

PROVISIONS FOR PETROLEUM AND NATURAL GAS

- **Strategic Petroleum Reserve:** The rules governing the U.S. Strategic Petroleum Reserve are revised in several ways:
 - Requires minimum amounts of refined products to be stored in the reserve: Sets a minimum requirement of 30 million barrels of refined petroleum products that must be stored in the 1 billion barrel petroleum reserve. Previously there was no mandatory storage requirement for refined products. DOE is also directed to devise and implement a plan to meet this requirement (Sec. 321, pg. 340-342).
 - Restricts DOE authority to draw down the reserve: Petroleum and petroleum products may only be drawn down from the reserve if the Secretary of Energy determines that there is a severe market disruption or to meet certain other obligations (Sec. 321, pg. 342).
- **Oil and Natural Gas Production:**
 - Lifts moratorium on oil and gas leases in large areas of the Gulf of Mexico: Outer continental shelf (OCS) areas greater than 45 miles off the coast of Florida are made available for leasing as well as certain other specified areas closer to the coast. The previous moratorium prohibited leasing up to 125 miles off the coast of Florida (Sec. 343, pg. 356).
 - Repeal of royalty relief: Removes financial incentives for deep water OCS natural gas drilling (Sec. 344, pg.359).
 - Geothermal leasing: Allows for geothermal energy production leasing where oil and natural gas leases are in effect (Sec.332, pg. 347).
 - Expands requirements for OCS resource inventories: Expedites the reporting reschedule and expands requirements for the types of data and techniques used to conduct oil and gas resource inventories in the North Atlantic, Gulf of Mexico and Alaska OCS regions (Sec. 341, pg. 348).

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³ Section and page references apply to S. 1462 as reported by the Senate Committee on Energy and Natural Resources on June 17th, 2009. Bill text and other supporting documents may be found at <http://energy.senate.gov/public/>. Provisions marked "New" passed by amendment through the Senate Committee on Energy and Natural Resources on May 6, 2010.

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- **Provisions for Alaska:**
 - Expands natural gas pipeline loan guarantees: Increases limits on Federal loan guarantees for construction of a transcontinental pipeline for Alaskan natural gas from \$18 billion to \$30 billion (Sec. 353, pg. 360).
 - **New:** Federal loan guarantees will cover no less than 80% of capital costs (Amendment 10470, pg. 3).
 - Alaska OCS permitting office: Establishes a field office to process Alaska OCS lease permits (Sec. 342, pg. 353).
 - Trans-Alaska Pipeline exemptions: Exempts the Trans-Alaska oil pipeline from certain requirements of the National Historic Preservation Act (Sec. 355, pg. 364).
- **Miscellaneous:**
 - Funding for data and core sample preservation programs: Extends funding for the preservation of geological and geophysical data through 2020 (Sec. 352, pg. 360) and provides grants to States and other organizations for the storage and preservation of geologic core samples (Sec. 357, pg. 367).
 - Makes exceptions to GHG standard on Federal procurement of alternative fuels: Amends the Energy Independence and Security Act of 2007 to allow Federal agencies to procure generally available fuels that are entirely produced from high carbon, unconventional petroleum sources (e.g., oil sands) as long as the contract is not overtly seeking to promote such fuels (Sec. 356, pg. 365).
 - Makes the Director of the Mineral Management Service a position that requires Senate confirmation (Sec. 351, pg. 359).

ENERGY MARKET INFORMATION AND REGULATORY OVERSIGHT

- **Energy Information:** The Department of Energy (DOE) is required to expand its energy market information capabilities and facilitate the adoption of standardized retail electricity rate data.
 - Information on energy markets and energy supplies: DOE's Energy Information Administration (EIA) is required to collect data on inventories of U.S. oil and natural gas storage capacity and of all petroleum products owned by the 50 largest oil traders (Sec. 501, pg. 482-484).
 - Analysis of financial aspects of energy markets: Creates a Financial Market Analysis Office within the EIA tasked with improving EIA's ability to integrate financial information and instruments into energy forecasts and reviewing reports required by other parts of the act (Sec. 501, pg. 484-486).
 - Standard formats and access to retail electric rate information: DOE in coordination with FERC shall expand the Tariff Analysis Project database to make it publicly accessible and to facilitate standard data reporting of electricity rate information to the database (Sec. 504, pg. 490-492).
- **Expansion of Energy Market Regulatory Powers:** Expands authority of FERC to regulate certain electricity and natural gas markets and creates an interagency working group to explore options for additional regulatory reform.
 - Creates an interagency Working Group on Energy Markets: The workgroup – consisting of the heads of DOE, Treasury, Commodity Futures Trading Commission, Securities and Exchange Commission, EIA, FERC and the Federal Trade Commission – will investigate the role of increased investment in energy markets and derivatives on energy prices. They will make recommendations to Congress on how to ensure increased transparency in petroleum markets through additional information, coordination and statutory authority (Sec. 502-503, pg. 486-490).
 - New regulatory powers for wholesale electricity markets: Grants FERC emergency powers to intervene in electricity markets it oversees when service reliability is or could be disrupted or when excessive price fluctuations take place. FERC is also granted the power to impose temporary permanent cease-and-desist orders on entities found to be manipulating wholesale electricity markets (Sec. 505 and 506, pg. 429-498).
 - New regulatory powers for natural gas markets: Grants FERC authority to impose cease-and-desist orders on entities found to be manipulating the market for natural gas. Civil penalty processes administered by FERC on any entity that violates any permits or regulations it puts in place are revised to be identical to those already in place for electric power markets (Sec. 507 and 508, pg. 498-502).

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PROVISIONS FOR RENEWABLE ENERGY PRODUCTION

- **Federal Renewable Energy Standard:**
 - Standard: Combined efficiency and renewable electricity standard: 15% renewables by 2021. Eligible resources are wind, solar, geothermal, biomass or landfill gas, qualified (incremental) hydropower, qualified waste-to-energy, marine and hydrokinetic renewable energy. Hydro (including pump storage hydro), new nuclear, incinerated waste-to-energy, and CCS generation are not included in base sales. Up to 26.7% of compliance obligation can be met through efficiency (Sec. 132, 92-124).
 - Exceptions: Does not apply to electric utilities that sold less than 4,000 GWhs of electric energy during the previous year. Alternative compliance payments are 2.1 cents per kWh. Double credits are provided for generation on Indian Land and triple credits are provided for renewable, distributed generators less than 1MW. Up to 1.5 credits are provided for the more efficient generation of thermal and electric energy from biomass-fueled facilities. Utilities may petition to waive all or part of the standard to limit the incremental cost of compliance to no more than 4% per retail customer per year. State Public Utility Commissions may apply to the Secretary for a “variance” from all or part of the standard due to electric transmission constraints (Sec. 132, pg. 92-124).
- **Renewable Energy Production on Public Lands:** The Department of Interior (DOI) and the Department of Agriculture (USDA) are required to undertake several measures to facilitate production of renewable energy on Federal lands.
 - Establish field offices to coordinate geothermal, solar and wind energy permitting: DOI is required to open offices in several western States (Sec. 361, pg. 369).
 - Requires environmental impact Statements (EIS) and amendments to land use plans for wind and solar development: Within one year of enactment DOI and USDA must conduct programmatic EISs and amend existing land use plans to account for programs to develop wind and solar energy on Federal lands (Sec. 363, pg. 374).
 - Requires the National Academies of Science to study renewable energy development on public lands: The report will make recommendations to DOI and USDA on effective options for leasing, optimal ways to ensure a fair return to the public, and necessary changes in laws to meet these goals (Sec. 363, pg. 376).
 - Leasing of Federal lands for renewable energy development: DOI is required to conduct a pilot program for leasing Federal lands for renewable energy development. No later than 30 months after enactment the DOI must determine whether or not a comprehensive leasing program is in the public interest. Upon a positive determination, DOI shall collect royalty payments and make other requirements of lease holders. Five percent of lease revenues are to be shared with the State where a project takes place (Sec. 366, pg. 382).
 - Extends funding through 2020 for administration of public land leasing programs for geothermal energy production (Sec. 362, pg. 373).
- **Miscellaneous provisions for renewable energy production:**
 - Creates a program to facilitate renewable energy development on brownfield sites: DOE and EPA are required to identify and prioritize opportunities for development of renewables at brownfield sites and provide technical assistance to State, local governments and others who pursue development of such sites (Sec. 365, pg. 380).
 - Amends biomass definition for Federal government renewable energy purchasing requirement: Renewable energy sources include biomass and the biomass definition is expanded from the Sec. 203 of the Energy Policy Act of 2005 to include animal waste, food waste, algae and any vegetation harvested sustainably (Sec. 133, pg. 124).
 - Federal purchase requirement: Limits contracts for renewable energy purchases to 30 years (Sec. 271, pg. 273).
 - Updates DOE’s assessment of renewable energy resources, with guidance on biomass and renewable energy market penetration (Sec. 607, pg. 520).
 - **New:** Establishes at least one offshore wind center and demonstration projects: for both offshore and onshore innovative designs to be built in different wind class regimes. Results will be published in a database about offshore wind environmental impacts and benefits, zoning issues, and transmission needs (Amendment 10489, pg. 2 & 6).
 - **New:** Establishes a renewable energy grant program (Amendment 10475, pg. 2).

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ELECTRIC GRID AND TRANSMISSION ISSUES

- **High Voltage Electric Transmission:**
 - Federal Policy: A national inter-state transmission policy is established to support a range of goals, including renewable energy development, reliability, efficiency and fuel diversity. High Priority National Transmission Projects (HPNTP) are defined as high voltage (>345 kV AC, or >300 kV DC) transmission lines or renewable feeder lines (>100 kV) that are identified through regional planning (Sec. 121, pg. 58).
 - Regional Planning: Establishes a regional planning process – coordinated by FERC to ensure integrated interconnection-wide plans to achieve the Federal policy and facilitate HPNTP construction. Plans must be submitted within 2 years of bill enactment. Multiple individual plans may be submitted, although FERC will encourage interconnect-wide plans and may alter submitted plans to reconcile inconsistencies (Sec. 121, pg 63).
 - Siting: Developers must first seek authorization to construct an HPNTP under applicable State laws. If any State refuses or fails to authorize HPNTP construction within 1 year, then the developer could apply to FERC for a certificate of public convenience and necessity, which carries eminent domain authority. The Secretary of Interior would be the lead agency to coordinate any Federal authorization and environmental reviews for the siting of HPNTPs on Federal land. With some exceptions, if an agency denies an application or fails to act within 1 year, then a State or applicant may file an appeal to the President, who must approve or deny the application within 90 days. State or Indian Tribe recommendations for resource protection would have to be accepted unless FERC publicly finds them to be infeasible, inconsistent with Federal policy or not cost-effective (Sec. 121, pg. 68).
 - Cost Allocation: FERC is directed to establish by rule a methodology for allocating the cost of HPNTP, which may be distributed broadly across a region to electricity consumers, in proportion to measurable economic or reliability benefits, and to electricity generators. Allocation proposals offered by affected States should be given due deference (Sec. 121, pg. 87).
- **National Peak Demand Reduction Goal:**
 - Goal: Establishes a non-binding goal to improve efficiency by 1.5% annually through the “system load factor”, which is the ratio that the kilowatt hours consumed on a system bear to the highest level of demand in kilowatts on the system in a given year. The goal may be met through improved efficiency, reducing the frequency of peak demand periods, using smart-grid, energy storage and demand response technologies and practices (Sec. 295, pg. 307).
 - Action Plan: The Secretary of Energy is to work with FERC, Regional Transmission Organizations, National Association of Regulatory Utility Commissioners and other Federal agencies to develop, and update every 3 years, an action plan for policies, funding and regulations needed to achieve the peak demand reduction goals (Sec. 295, pg. 309).
- **Uniform National Standards for the Interconnection of Small Electric Generators:**
 - National Standard: Sets national standards requiring all utilities to provide interconnection service available to customers generating electric power from small generators (<15 kW). The new standard is enforceable by FERC. However, FERC could enter into a conditional agreement with a State to discontinue enforcement if the State has adopted and is enforcing a standard that is consistent with the Federal standard. After 3 years, FERC may expand the Standard to 50 kW, after reporting to Congress and subject to Congressional disapproval within 90 days (Sec. 296, pg. 313).
 - Model Standard: FERC is required to establish a model standard for interconnection of facilities between 15 kW and 20 MW for States to consider adopting (Sec. 296, pg. 315).
- **Cyber Security of the Electric Transmission Grid:**
 - Gives authority to FERC and the Secretary of Energy to issue additional rules – including through expedited procedures and without prior notice – for electric utility owners and operators to take actions that will protect critical electric infrastructure and related information from cyber security threats. In the case of emergency rules or orders, such authorities expire after 90 days. Otherwise, rules or orders expire when a reliability standard is approved to address identified threats, pursuant to existing Federal authorities (Sec. 301, pg. 319).

ENERGY EFFICIENCY

- **Manufacturing Efficiency and Industrial Competitiveness:**

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- A Federal-State partnership revolving loan program is established at DOE to accelerate the implementation of industrial and commercial applications of more efficient technologies and processes (Sec. 201, pg. 173).
- Greater coordination is required among the DOE departments and offices to leverage R&D program efforts and expertise to promote early stage efficiency technologies through the Industrial Technologies Program (ITP) (Sec. 202, pg. 178).
- DOE national assessments to list commercially available energy efficiency technologies that are not widely used by manufacturing industries in the U.S., including industry-specific reports and roadmaps for achieving cost, energy and GHG emissions savings (Sec. 203, pg 179; Sec. 204, pg 180).
- Centers for Excellence are authorized to be established by DOE at not less than 10 institutes of higher education, to support region-specific research and assessment of opportunities for small- and medium-sized manufacturers to reduce GHG emissions, promote sustainable practices, conduct workforce training, provide small-business loans and coordinate with related efforts by local utilities, State and Federal governments (Sec. 204, pg. 182).
- An initiative assessing opportunities for manufacturers to maximize efficiency, prevent pollution, reduce water use and conserve natural resources is established for the ITP to carry-out in public-private partnerships (Sec. 205, pg. 187).
- DOE will pay a Federal share to State-industry partnerships to develop, demonstrate and commercialize new technologies and processes that reduce the use of energy and energy-intensive feedstocks, reduce GHG emissions and industrial waste and improve U.S. industrial competitiveness (Sec. 206, pg. 189).
- National Academy of Sciences study: The NAS will assess the capabilities of advanced U.S. manufacturing of established and emerging energy technologies, analyze trends in the energy intensity of supply chain segments, including the sections most critical for U.S. competitiveness, and recommend areas for improvement (Sec. 207, pg 191).
- **Energy Information for Homes and Buildings:**
 - Building energy performance information program: Requires EPA to establish energy performance management specifications for certain building types as well as a voluntary energy performance information program to provide comparative information and raise public awareness of building energy efficiency. Within 3 years of enactment Federal agencies must implement the information program in 30% of pre-existent buildings and 90% of buildings built after establishment of the program. Any newly constructed Federally-funded State and local buildings must use energy information certificates created under the program (Sec. 281, pg. 285).
 - Evaluation, measurement and verification of energy savings: Requires DOE to promulgate rules within 2 years of enactment to measure energy savings and avoided emissions of energy efficiency projects that are publicly-funded, require specific levels of energy reduction, and are eligible for allowances or allowance proceeds (Sec. 282, pg. 296).
 - Residential High-Performance Zero-Net Buildings Initiative: Requires DOE to establish this initiative to reduce residential energy consumed, increase the quantity of renewable energy generated in residential buildings, and promote development of zero-net-energy buildings. The Director of the Initiative shall enter into at least one agreement with consortia to carry out the Initiative every 5-year period. Includes appropriations of \$40 million for 2010, \$60 million for 2011 and 2012, and \$100 million annually between 2013 and 2020 (Sec. 291, pg. 299).
- **Energy Efficiency for Buildings:**
 - National model building efficiency codes: Requires the DOE to develop national model building codes for energy efficiency of new and renovated residential and commercial buildings. Annual targets are to achieve 30% improved energy savings in 2010 and 50% improvements in 2016. Requires States to update building energy codes within 2 years of updated national codes and sets compliance guidelines. Authorizes \$100 million each year (for FY 2009-2013) for States to adopt and enforce the codes. DOE would be responsible in States that do not implement the national model into their State building codes. Also requires DOE to establish, and update every 3 years, voluntary advanced model codes and standards for buildings that achieve 30% more energy savings than the national model building codes and standards (Sec. 241, pg. 228).

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- Multifamily and manufactured housing energy efficiency grant program: Establishes a DOE grant program for States, local governments and non-profits to develop energy efficiency programs for multifamily and manufactured housing (Sec. 242, pg. 246).
- Building training and assessment centers: Establishes a DOE grant programs for institutions of higher education to create training and assessment centers to train building professionals in energy-efficient technologies and to promote R&D for alternative energy sources (Sec. 243, pg. 249).
- Weatherization assistance for low-income persons: Amends Energy Conservation and Production Act, Section 422 (42 U.S.C. 6872) by allocating \$1.7 billion for each year between 2011 and 2015 for weatherization activities (Sec. 251, pg. 251).
- State energy efficiency grants program: Requires DOE to apply performance based criteria in awarding States grants for energy efficiency retrofit programs. Funds can be used for home energy efficiency retrofits (45%) and commercial building efficiency retrofits (45%) (Sec. 262, pg. 255, Sec. 265, pg. 267). Includes provisions for administrative and technical support by the Secretary to States for these programs (10% of funds) (Sec. 263, pg. 267, Sec. 265, pg. 267) and requires regulations to be promulgated no later than 180 days after the date of enactment (Sec. 264, pg. 267). Authorizes sufficient appropriations sums to carry out program for years between 2010-2015 (Sec. 265, pg. 267)
- Home energy retrofit finance program: Requires DOE to provide grants to States to establish or expand revolving financing fund to qualified entities for energy efficiency measures and renewable energy improvements in existing homes and residential buildings. Includes provisions for funding mechanisms, eligibility, allocations, use of funds, coordination with other programs, appropriations and program evaluation (Sec. 266, pg. 268).
- **Efficiency Standards for Consumer Products and Appliances:**
 - Test requirements: Requires the DOE to establish a petition process to prescribe or amend a test procedure for a covered product. Requires the Secretary to publish amended test methods or determinations no later than 18 months after granting a petition, with some exceptions (Sec. 221, pg. 193).
 - Energy Star program: Requires the Secretary of Energy and the Administrator of EPA to develop an agreement on division of responsibility for the program. Requires each product category to be reviewed at least once every 3 years or when market share for an Energy Star Product reaches 35%. Requires a demonstration of compliance through an approved testing approach and authorizes annual appropriations. Includes provisions to petition for amended standards (Sec. 222, pg. 199, Sec.223, pg. 203).
 - Establishes mandatory efficiency standards for lighting: including portable light fixtures, LED lights, art work light fixtures, GU-24 base lamps, incandescent reflector and reflector lamps (Sec. 224, pg. 204; Sec. 225, pg. 213; Sec. 226, pg. 215).
 - Mandatory efficiency standards for commercial furnaces: (Sec. 227, pg. 216).
 - **New**: Requires weatherized furnaces manufactured after January 1, 2015 to reach 81% efficiency and non-weatherized furnaces manufactured after May 1, 2013 to meet the following standard levels: gas-fired units: minimum combustion efficiency of 80%, oil-fired units: minimum thermal efficiency of 83% (Amendment 10474, pg. 13).
 - Motor efficiency rebate program: By Jan. 2010, directs DOE to establish a rebate program for purchase and installation of new electric motors that have nominal full load efficiency not less than as defined in applicable National Electrical Manufacturers Association standards. Includes application, eligibility and appropriations requirements (Sec. 228, pg. 217).
 - **New**: Mandatory efficiency standards for residential air conditioning, heating, pool heaters, water dispensers, spas, food heaters, outdoor lighting (Amendment 10474, pg. 9-60); as well as electric motors, fire pumps, and lighting (Amendment 10474, pg. 99).
 - **New**: Products that have an expected useful life that is less than four years will now have a lower multiplier when considering the cost-benefit analysis used for updating efficiency criteria, thereby making it easier to pass higher standards (Amendment 10474, pg. 75).
 - **New**: Secretary of Energy may strengthen efficiency standards after conducting a cost-benefit analysis that assesses the economic hardships and energy saved, so long as new standards do not lead to product unavailability (Amendment 10474, pg. 94).
- **Analysis and Assessment:**

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- DOE Studies: Calls for DOE study of compliance with energy standards for appliances within 18 months of enactment (Sec. 229, pg. 220). Requires DOE to conduct a cost benefit analysis of direct current electricity supply in certain buildings (Sec. 230, pg. 221). Requires DOE electric motor market assessment and establishment of commercial awareness program (Sec. 231, pg. 222). Calls for DOE study examining the feasibility and advantages of establishing an Energy Superstar rating to the existing Energy Star program (Sec. 232, pg. 225).
- **Miscellaneous Provisions:**
 - Competition requirements for task or delivery orders under energy savings performance contracts: Amends National Energy Conservation Policy Act (42 U.S.C. 8287a) by adding ways the heads of Federal agencies may issue a task or delivery order under an energy savings performance contract (Sec. 272, pg. 274).
 - Funding flexibility: Allows Federal agencies to carry out contracts under the Enhanced Energy Efficiency title with appropriated funds or private financing of energy savings measures (Sec. 273, pg. 277).
 - National energy efficiency improvement goals: Establishes U.S. goals to improve overall energy productivity - measured in GDP per unit of energy input - by at least 2.5% per year in 2012 and continuing annually through 2030. Requires the Secretary to develop a strategic plan for achieving this national goal, with provisions for public input, biennial updates and reporting (Sec. 275, pg. 278).
 - Energy sustainability and efficiency grants and loans for institutions: Amends Energy Policy and Conservation Act (42 U.S.C. 6371h-1) by adding non-profit health care facilities as institutional entities, increasing the grant amounts for efficiency improvement and energy sustainability to \$2.5 million and uncapping appropriated funds for grants from 2010 to 2015.
 - Federal implementation strategy for energy efficient information and communication technologies: Requires Federal agencies to collaborate with Office of Management and Budget to create an implementation strategy for energy-reducing and efficient information and communication practices (Sec. 277, pg. 281).
 - Report on electric generation facility efficiency and emissions, directing the DOE to review, report and identify beneficial technologies for deployment (Sec. 608, pg. 521-5).

TRANSPORTATION

- **Clean Transportation in General:**
 - Clean transportation deployment: Set near, medium and long term goals (Sec. 104, pg. 18).
 - Roadmap Study: Assess energy use and reducing emissions and oil use (Sec. 151, p.156).
 - Lightweight materials: Increases funding to study reduced vehicle weights (Sec. 423, pg. 421).
 - Report on alternative transportation fuels: Report on the effects of alternative fuels on emissions and public health (Sec. 609, pg. 525).
- **Electric Drive Vehicles (EDVs):**
 - Financial assistance: Establishes grants under the plug-in hybrid program for multiple regions to demonstrate the viability of a transportation system that reduces oil use and emissions, explore coordinated investments and demonstrate protocols for integration (Sec. 152, pg. 162).
 - Alternative compliance payments: Use grants to promote deployment (Sec. 610, pg. 111).
 - Infrastructure: Assess 10/20/50% EDV penetration in city and U.S. fleets (Sec. 152, pg. 158).
 - Recharging infrastructure: Grants to State or local governments based on report in subsection (e) or alternate method of analysis (Sec. 152, pg. 168).
 - Information clearinghouse: Technical data on deployment and integration (Sec. 152, pg. 169).
 - Electric drive transportation: Report on establishing standards (Sec. 153, pg. 169).
 - Pilot program: Grants for pre-commercial EDVs and infrastructure (Sec. 154, pg. 171).
 - Battery disposal: Report recommendations for storage and recyclability (Sec. 155, pg. 172).
 - Domestic manufacturing: Research EDV batteries and battery systems (Sec. 422, pg. 419).
- **Energy Efficiency and Oil Savings:**
 - Energy water nexus study: Report on water used for fuel by type (Sec. 141, pg. 134).
 - Residential energy buildings initiative: Assess energy benefits of land and transportation planning to maximize use of existing infrastructure (Sec. 291, pg. 299).
 - State energy efficiency grants: Energy efficiency measure includes installations that reduce

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- fuel use in cost-effective, low-water use, and job-creating paths (Sec. 262, pg. 255).
- Oil savings report: Requires agency action to reduce 10 million barrels daily by 2030 and report on quantity actually saved from measures implemented each year (Sec. 610, pg. 527).
- Foreign fuel subsidies: Report on consequences of subsidies on global energy supply, demand and global economy and recommendations on reducing impacts (Sec. 606, pg. 529).

CARBON DIOXIDE CAPTURE AND STORAGE (Title III, Subtitle F, pg. 392)

- **Establishes a Large-scale Carbon Storage Program**: Through amendment of the Energy Policy Act of 2005, establishes a program to “demonstrate the commercial application of integrated systems for the capture, injection, monitoring, and long-term geological storage of carbon dioxide from industrial sources” (Sec. 371, pg. 392).
 - Authorizes financial and technical assistance for 10 large-scale demonstration projects (>1,000,000 tons of CO₂ per year from industrial sources) (pg. 393).
 - Requires demonstration projects to provide sufficient geological site information to establish safe, long-term storage potential, including: reservoir characteristics; potential leakage pathways; and a measurement, monitoring, and verification plan (pg. 394).
 - Requires possession of necessary land or land interests prior to selection (pg. 395).
 - Provides terms and conditions for operating a CCS demonstration project, including: compliance with environmental and water protection laws, measurement, monitoring, verification, financial assurances, and prompt remediation (pg. 395-7).
 - Clarifies post injection closure and monitoring requirements, including 10 years of compliance and monitoring after plume stabilization (pg. 397-8).
 - Offers indemnification from liability except in cases of gross negligence and intentional misconduct (pg. 398-2).
 - Includes provisions and requirements for projects to be sited on Federal land (pg. 402-3).
 - Provides long-term monitoring and remediation for closed sites (pg. 403-4).
- **Provides Employee Training Grants**: for State Agencies involved in “permitting, management, inspection, and oversight of carbon capture, transportation, and storage projects” (Sec. 372, pg. 405-6).
- **New: Establishes ‘Carbon Dioxide Capture Technology Advisory Board’**: Nine members represent science and business stakeholders appointed by the President (Amendment 10473, pg. 6).
- **New: Authorizes DOE to Offer Prize for Separating CO₂ from Dilute Sources**: Prize recipients’ progress towards achieving carbon capture demonstration will be annually reported (Amendment 10473, pg. 5).

ENERGY AND WATER INTEGRATION

- **Commissions Studies on Integrating Energy and Water Issues**, including:
 - Energy development and production impacts on U.S. water resources (Sec. 141, pg. 133-9).
 - Alternatives to optimize water and energy efficiency in electricity production (Sec. 142, pg. 139-41).
 - Energy consumed for water storage and delivery by major Bureau of Reclamation projects (Sec. 143, pg. 141-3).
 - To determine the interrelated nature of water and energy use and promote efficiency (Sec. 149, pg. 152-5).
- **Guides Efforts to Address Energy-Water Challenges**:
 - DOE will develop an Energy-Water Research and Development Roadmap (Sec. 146, pg. 147-8).
 - Outlines objectives for the Brackish Groundwater National Desalination Research Facility (Sec. 144, pg. 143-6).
 - EIA will collect information on energy use associated with water procurement, treatment, and delivery (Sec. 145, pg. 146-7).
 - Establishes programs to demonstrate and deploy water and energy conservation technologies (Sec. 147, pg. 148-51) and provide relevant technical assistance to rural communities’ water utilities (Sec. 148, pg. 151-2).

NUCLEAR ENERGY

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- **Establishes a National Commission on Nuclear Waste**, to study and report on alternative means of and financing for safe management, reuse, and disposal of nuclear waste (Sec. 311, pg. 323-34).
- **Supports Nuclear Energy's Role**: Conveys the government's obligation to safely manage and/or dispose of nuclear waste and supports reprocessing and recycling (Sec. 312, pg. 334-6).
- **Promotes Development of an Advanced Fuel Recycling Process**: Directs DOE to research, develop, evaluate, and report on the environmental and financial aspects of recycling and waste treatment processes. DOE will also prepare to carry out Said processes (Sec. 313, pg. 336-40).

ENERGY RESEARCH AND DEVELOPMENT

- **Establishes the Grand Energy Challenges Research Initiative**: Directs DOE to support large-scale, multidisciplinary consortiums that blend approaches and disciplines to address energy challenges (Sec. 411, pg. 414-7).
- **Updates ARPA-E⁴**: Slightly broadens ARPA-E's goals and administrative independence and extends reporting, evaluation, and appropriation timelines (Sec. 421, pg. 417).
- **Supports Motor Vehicle Research and Development**: Supports battery manufacturing (Sec. 422, pg. 419) and lightweight materials research and development (Sec. 423, pg. 421).
- **Supports and Updates Other Programs**: Covering methane hydrates (Sec. 424, pg. 421-5), low-BTU gas and helium resources (Sec. 425, pg. 425-7), arctic energy (Sec. 426, pg. 427-9), and unconventional petroleum resources (Sec. 427, pg. 429-31).

ENERGY WORKFORCE DEVELOPMENT

- **Encourages Development of the U.S. Energy Workforce** by:
 - Supporting 'Energy Career Academies' (Sec. 431-2, pg. 431-7) and community college programs (Sec. 433 & 439 pg. 437-9 & 446-8) and promoting student awareness (Sec. 434, pg. 440-1).
 - Studying energy workforce training program coordination in the Federal strategy and budgeting (Sec. 435, pg. 442).
- **Expands DOE Authority to Recruit and Hire Necessary Expertise** (Sec. 436-8, pg. 442-6).
- **Establishes Support for Higher Education Programs in Subsurface Geosciences and Engineering**. To support the human capital needed for the security of clean energy, ground water, and mineral resources, directs the DOI to:
 - Provide funding, establish scholarships and fellowships, and support technical and community college education in relevant fields (Sec. 451-5, pg. 448-60).
 - Require public availability of generated information (Sec. 456, pg. 462).
 - Establish an advisory committee on geosciences and geoengineering education (Sec. 457, pg. 463-9).
 - Study of skilled worker availability, through amendment to the Energy Policy Act of 2005 (Sec. 460, pg. 469-71).
- **Amends the National Energy Policy Plan**: Amends the DOE Organization Act to incorporate more participation, report quadrennially, and better integrate climate and energy policy (Sec. 603, pg. 505-8).
- **Establishes an Interagency Taskforce to Report on China and India's Climate Change and Energy Policy**: The cabinet-level taskforce will evaluate and report back to Congress on energy use and greenhouse gas emissions in China and India. Report will include estimates, reduction measures, best and current technologies, and recommendations for technology transfer and capacity building (Sec. 604, pg. 508-14).
- **New: Annual Reporting of Utility Workforce and Training Trends** (Amendment 10243, pg.6 & 10).

⁴ The Advanced Research Projects Agency-Energy (ARPA-E) was authorized by Congress in 2007 to promote and fund research and development of advanced energy technologies.

