THE UNITED STATES

ENERGY EFFICIENCY GOALS

1. GOVERNMENT POLICY ON ENERGY EFFICIENCY

Federal government energy efficiency policies are determined by legislation and subsequent rulemaking. Landmark energy efficiency legislation enacted over the past twenty-five years includes the National Appliance Energy Conservation Acts of 1987 and 1988 (NAECA); the Energy Policy Act of 1992 (EPAct 1992); the Energy Policy Act of 2005 (EPAct 2005); and the Energy Independence and Security Act of 2007 (EISA 2007). Taken together, this package of legislation provides the basis for most federal government energy efficiency policies, including vehicle fuel economy standards, appliance and equipment energy performance standards, federal support to the adoption of building energy codes, and obligatory energy-saving targets for federal agencies and facilities.

Apart from federal policies, 20 states have established mandatory state-wide energy efficiency resource standards, and an additional eight states have established goals. Under a new Administration as of 2017, past national goals - including doubling energy productivity (economic output per unit of energy consumed) between 2010 and 2030 - are under review.

2. ENERGY EFFICIENCY STRATEGY

The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy published its "2016-2020 Strategic Plan" in November 2015. Two of its seven strategic goals focus on improving the energy efficiency of vehicles, buildings, and industry. However, these strategies are currently under review by the new Administration.

FUNDING

The U.S. Congress funds the Department of Energy and its constituent offices through annual appropriations.

LINKS

"2016-2020 Strategic Plan" U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, November 2015: https://www.energy.gov/sites/prod/files/2015/12/f27/EERE_Strategic_Plan_12.16.15.pdf

3. ENERGY EFFICIENCY ACTION PLAN

The Department of Energy's Building Technologies Office published its “Multi-Year Programme Plan for Fiscal Years 2016-2020” in February 2016. The Department's Advanced Manufacturing Office issued its draft “Multi-Year Programme Plan for Fiscal Years 2017-2021” in December 2016; the plan is currently under review. The Department's Vehicle Technologies Office released its "2016 Annual Merit Review Report" in December 2016.

FUNDING

The U.S. Congress funds the Department of Energy and its constituent offices through annual appropriations.

LINKS

"Multi-Year Programme Plan for Fiscal Years 2016-2020", U.S. Department of Energy, Building Technologies Office, February 2016:

https://energy.gov/sites/prod/files/2016/02/f29/BTO%20Multi-Year%20Program%20Plan%20-%20Final.pdf

"Multi-Year Programme Plan for Fiscal Years 2017-2021 – Draft", U.S. Department of Energy, Advanced Manufacturing Office, December 2016:

https://energy.gov/sites/prod/files/2017/01/f34/Draft%20Advanced%20Manufacturing%20Office%20MYPP_1.pdf

"2016 Annual Merit Review Report" U.S. Department of Energy, Vehicle Technologies Office, December 2016:

https://energy.gov/sites/prod/files/2016/12/f34/2016%20Annual%20Merit%20Review%2C%20Vehicle%20Technologies%20Office%20FINAL_0.pdf

4. ENERGY EFFICIENCY, INTENSITY OR EMISSIONS REDUCTION TARGETS

Energy efficiency and greenhouse gas emissions policies and targets are under review by the new Administration.

LINKS

Not available.

5. SECTORAL ENERGY EFFICIENCY TARGETS

The National Highway Traffic Safety Administration has established corporate average fuel economy standards for new passenger cars and light trucks sold in the U.S. for model years 2017 through 2025. These standards project a corporate average fuel economy of 41 miles per gallon in 2021 and 54.5 miles per gallon in 2025. The National Highway Traffic Safety Administration is required to conduct a mid-term review of proposed corporate average fuel economy standards for model years 2022-2025 by April 2018.

The Department of Energy's Building Technologies Office set a goal to reduce the U.S. building sector's energy use per square foot by 30% by 2030, relative to a 2010 baseline, with a long-term goal of a 50% reduction. These goals are under review by the new Administration.

LINKS

"Final Rule, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards", National Highway Traffic Safety Administration and Environmental Protection Agency, October 15, 2012:

https://www.gpo.gov/fdsys/pkg/FR-2012-10-15/pdf/2012-21972.pdf

"Multi-Year Programme Plan for Fiscal Years 2016-2020," U.S. Department of Energy, Building Technologies Office, February 2016:

https://energy.gov/sites/prod/files/2016/02/f29/BTO%20Multi-Year%20Program%20Plan%20-%20Final.pdf

6. LEAD ENERGY EFFICIENCY INSTITUTIONS

The U.S. Congress establishes federal energy efficiency policies, and multiple Executive Branch agencies implement policies and programmes, including the Department of Energy, the Department of Transportation, and the Environmental Protection Agency. States, local governments, and utilities also establish their own energy efficiency programmes. For example, twenty states have established mandatory state-wide energy efficiency resource standards, and an additional eight states have established efficiency goals.

INSTITUTIONAL SETTINGS AND RESPONSIBILITIES

The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy has primary responsibility for R&D and programmes to improve the energy efficiency of buildings, vehicles, and industry, and for setting minimum efficiency standards for key appliances and equipment.

STAFF AND BUDGET

The Office of Energy Efficiency and Renewable Energy's budget for efficiency in fiscal year 2016 was approximately $720 million. The office employed approximately 170 staff in its efficiency programmes, not including contractors and Department of Energy National Laboratory staff.

BUDGET USE

The Office of Energy Efficiency and Renewable Energy's budget for energy efficiency supports a comprehensive portfolio of programmes to improve the energy efficiency of homes, buildings, and industries. The office supports development of compelling new energy-efficiency options for businesses and consumers, including products that perform at higher efficiency and with improved performance, new ways to design homes and buildings, and new approaches to improve the vast stock of existing buildings.

More specifically, the energy efficiency budget supports:

- Emerging technologies R&D in areas such as lighting, heating and cooling, and building envelope.
- Development of model building codes.
- Establishment of minimum efficiency standards for key appliances and equipment.
- R&D on advanced combustion engines, electric vehicle batteries and drivetrains, and vehicle light weighting.
- Enables the research, development, demonstration, and deployment of industrial efficiency and crosscutting clean energy manufacturing technologies.
- Provides access to home weatherisation services for low-income households across the economy.
- Provides formula and competitive grants to state energy offices and assists federal government agencies to meet energy-related goals and provide energy leadership to the economy.

LINKS

U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy:

https://energy.gov/eere/office-energy-efficiency-renewable-energy

7. OTHER ENERGY EFFICIENCY AGENCIES

The U.S. Environmental Protection Agency and the Department of Energy jointly administer the ENERGY STAR programme, a voluntary energy efficiency labelling programme for appliances and consumer electronics.

The Department of Transportation's National Highway Traffic Safety Administration and the Environmental Protection Agency set standards for, respectively, vehicle fuel economy standards and vehicle greenhouse gas emissions standards.

LINKS

ENERGY STAR programme: https://www.energystar.gov/

Corporate Average Fuel Economy standards: https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy

Department of Transportation's National Highway Traffic Safety Administration: https://www.nhtsa.gov/

Environmental Protection Agency: https://www.epa.gov/

8. ENERGY EFFICIENCY INFORMATION DISSEMINATION

Within the U.S. Department of Energy, the Energy Information Administration collects, analyses, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment.

The Database of State Incentives for Renewables & Efficiency (DSIRE) is a comprehensive source of information on federal, state, local, and utility incentives that support renewable energy and energy efficiency.

LINKS

U.S. Energy Information Administration: https://www.eia.gov/

Database of State Incentives for Renewables & Efficiency: http://www.dsireusa.org/

9. ENERGY EFFICIENCY AWARENESS RAISING

The ENERGY STAR voluntary labelling programme began in 1992 and has approximately 85% brand recognition in the United States. It began as a labelling programme for efficient appliances and consumer electronics and has expanded to cover homes, buildings, and industrial plants. When consumers buy a product with the ENERGY STAR label, they are getting a product whose energy efficiency is in approximately the top 25% of similar products available on the market.

The U.S. Department of Energy established the Better Buildings initiative in 2011. Through its Better Buildings Alliance, building owners and operators share information and best practices on improving the efficiency of

their buildings. The Better Buildings Challenge has attracted 345 partners to commit to making their buildings 20% more efficient over 10 years. The Better Buildings initiative has expanded to a Better Plants programme, in which 2,600 participating manufacturing facilities have committed under the Better Plants Challenge to set an efficiency goal, report progress, and share best practices. The Department of Energy's Superior Energy Performance programme supports and recognises industrial facilities that implement the ISO 50001 energy management system, plus set and achieve a publicised goal for efficiency improvement.

The Environmental Protection Agency administers a mandatory fuel economy labelling (or window sticker) programme for all new passenger cars and light trucks. The Environmental Protection Agency conducts the testing and provides the official fuel economy number for each vehicle model.

LINKS

ENERGY STAR programme: https://www.energystar.gov/

Better Buildings Alliance: https://betterbuildingsinitiative.energy.gov/

Better Plants programme: https://energy.gov/eere/amo/better-plants

Superior Energy Performance programme: https://energy.gov/eere/amo/superior-energy-performance

Vehicle fuel economy labelling programme: https://www.epa.gov/fueleconomy/basic-information-fuel-economy-labeling

10.GOVERNMENT SUPPORTED ENERGY EFFICIENCY TRAINING

The U.S. Department of Energy's Better Buildings and Better Plants programmes offer a variety of training resources (primarily recorded and live webinars) focused on improving efficiency in buildings and industrial facilities. The Department of Energy's Federal Energy Management Programme produces a variety of training (primarily webinars and on-demand short courses) on improving efficiency and incorporating renewable energy into federal government facilities, but these training are applicable to, and used by, people from many different sectors of the economy.

LINKS

Better Buildings training: https://betterbuildingssolutioncenter.energy.gov/webinars-list

Better Plants training: https://betterbuildingssolutioncenter.energy.gov/better-plants/tools-and-trainings

Federal Energy Management Programme training: https://energy.gov/eere/femp/federal-energy-management-program-training

11. PRIVATELY OPERATED TRAINING

The Department of Energy's Office of Energy Efficiency and Renewable Energy maintains a webpage listing many training opportunities offered by public and private providers.

LINKS

Training listing: https://www.energy.gov/eere/education/find-trainings

12. GOVERNMENT SUPPORTED RESEARCH & DEVELOPMENT

The Department of Energy's Building Technologies Office offers an emerging technologies programme that supports R&D in areas such as lighting, heating and cooling, and building envelope. The Department's Advanced Manufacturing Office supports R&D, as well as demonstration and deployment of industrial efficiency and crosscutting clean energy manufacturing technologies, including next-generation machines, materials, and manufacturing processes. The Department's Vehicle Technologies Office supports R&D on advanced combustion engines, electric vehicle batteries and drivetrains, and vehicle light weighting. These offices support R&D at Department of Energy National Laboratories and through funding opportunities for universities and companies.

LINKS

Building Technologies Office emerging technologies initiatives:

https://www.energy.gov/eere/buildings/emerging-technologies-0

Advanced Manufacturing Office R&D initiatives: https://www.energy.gov/eere/amo/research-development

Vehicle Technologies Office R&D initiatives: https://www.energy.gov/eere/vehicles/technology-areas

ENERGY EFFICIENCY MEASURES

13. COLLECTION AND MONITORING OF ENERGY EFFICIENCY OUTCOMES

The Department of Energy's Energy Information Administration collects and analyses energy consumption information with high frequency from all sectors of the economy. The Department of Transportation's National Highway Traffic Safety Administration is responsible for calculating achieved corporate average fuel economy each year and assessing vehicle manufacturers' performance against the corporate average fuel economy requirements.

The Department of Energy obtains information on energy consumption and efficiency from its voluntary partners in the Better Buildings and Better Plants initiatives; this information is not shared with other parties by the Department of Energy.

LEGAL POWER

EIA surveys are conducted under the authority of the Federal Energy Administration Act of 1974 (Public Law 93-275), Sec. 13(b), 5(a), 5(b), 52.

LINKS

Energy Information Administration: https://www.eia.gov/

National Highway Traffic Safety Administration, corporate average fuel economy standards: https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy

14. EVALUATION OF ENERGY EFFICIENCY PROGRESS OR POTENTIAL

The Energy Information Administration publishes energy consumption data in its Monthly Energy Review. Evolving energy efficiency potential is accounted for in periodic revisions of model energy codes for buildings by the Department of Energy. Minimum efficiency standards for appliances and equipment are reassessed periodically by the Department of Energy. Efficiency thresholds for products covered under the voluntary ENERGY STAR labelling programme are reassessed periodically by the joint programme administrators, the Department of Energy and the Environmental Protection Agency.

LINKS

Energy Information Administration: https://www.eia.gov/totalenergy/data/monthly/

Department of Energy's Building Energy Codes Programme: https://www.energy.gov/eere/buildings/building-energy-codes-program

Department of Energy's Appliance and Equipment Standards Programme: https://www.energy.gov/eere/buildings/appliance-and-equipment-standards-program

ENERGY STAR programme: https://www.energystar.gov/

15. SELF-EVALUATION OF ENERGY EFFICIENCY PROGRAMMES

The Department of Energy's Office of Energy Efficiency and Renewable Energy undertakes periodic reviews of each programme's progress. One focus of these activities is to assess whether planned technical goals were met and commercialisation and market results achieved. Another focus is to identify opportunities to make continuous improvements in programmes in order to effectively and efficiently manage public investments. See https://energy.gov/eere/analysis/program-evaluation.

16. CROSS-SECTOR ENERGY EFFICIENCY INITIATIVES

Energy efficiency initiatives (regulatory schemes, tax or price incentives, etc.) are primarily administered by states, local governments, and utilities. Twenty states have established mandatory state-wide energy efficiency resource standards, and an additional eight states have established efficiency goals. The Database of State Incentives for Renewables & Efficiency (DSIRE) is a comprehensive source of information on federal, state, local, and utility incentives that support renewable energy and energy efficiency.

17. INDUSTRY ENERGY EFFICIENCY INITIATIVES

Better Plants Programme

OBJECTIVE

The Better Plants Programme is part of the Department of Energy's Better Buildings initiative and supports leading manufacturers to set a goal to improve their energy intensity, usually by 25& over ten years, develop energy management plans, and track and report their annual progress.

OUTLINE

The Department of Energy helps Better Plants partner companies establish key energy performance metrics, evaluate energy- saving opportunities, and organise plant-level training events. Technical assistance is delivered through technical account managers who help companies develop energy management plans, identify energy-saving opportunities, and track energy performance metrics. Better Plants partners can also participate in or host in-plant training sessions. The Department provides national recognition and technical assistance to help partners meet their energy efficiency goals. Recognition comes in the form of profiles on the Department's web sites, letters from Department leadership, invitations to special events, and articles in the Better Plants newsletter. Better Plants partners consist of nearly 200 industrial companies encompassing close to 2,600 facilities. To date they have saved $3.1 billion in energy costs.

The Better Plants Challenge is a more select group of manufacturers that take on additional commitments to openly share their energy performance data and market-leading energy efficiency strategies. The Department provides additional recognition to Challenge partners for their willingness to share best practices and solutions.

LINKS

Better Plants programme: https://energy.gov/eere/amo/better-plants

Superior Energy Performance Programme

OBJECTIVE

The Department of Energy's Superior Energy Performance programme certifies industrial facilities that implement an energy management system that meets the ISO 50001 global energy management system standard and that achieve verified, improved energy performance.

OUTLINE

To become certified for Superior Energy Performance, facilities must implement an energy management system that meets the ISO 50001 standard and demonstrate improved energy performance. An independent third party audits each facility to verify achievements and qualify it for recognition at the Silver, Gold, or Platinum level, based on energy performance improvement. This certification emphasises measureable savings through a transparent process. Certified Superior Energy Performance facilities receive recognition from the Department of Energy.

LINKS

Superior Energy Performance programme: https://energy.gov/eere/amo/superior-energy-performance

18. TRANSPORT ENERGY EFFICIENCY INITIATIVES

Corporate Average Fuel Economy Standards

OBJECTIVE

The Department of Transportation's National Highway Traffic Safety Administration sets corporate average fuel economy standards for vehicles to encourage manufacturers to continually improve the fuel economy of the vehicles they sell in the United States.

OUTLINE

The National Highway Traffic Safety Administration has established corporate average fuel economy standards for new passenger cars and light trucks sold in the U.S. for model years 2017 through 2025. These standards project a corporate average fuel economy of 41 miles per gallon in 2021 and 54.5 miles per gallon in 2025. The National Highway Traffic Safety Administration is required to conduct a mid-term review of proposed corporate average fuel economy standards for model years 2022-2025 by April 2018. The National Highway Traffic Safety Administration is responsible for calculating achieved corporate average fuel economy each year and assessing vehicle manufacturers' performance against the corporate average fuel economy requirements.

In concert with the National Highway Traffic Safety Administration's establishment of fuel economy standards, the Environmental Protection Agency sets corresponding greenhouse gas emission standards for new vehicles. In addition, the Environmental Protection Agency administers a mandatory fuel economy labelling (or window sticker) programme for all new passenger cars and light trucks. The Environmental Protection Agency conducts the testing and provides the official fuel economy and greenhouse gas emissions numbers for each vehicle model.

Fuel efficiency standards for medium- and heavy-duty vehicles were established for 2014-2018 by the National Highway Traffic Safety Administration and the Environmental Protection Agency. In 2016, the two agencies issued fuel efficiency standards for medium- and heavy-duty vehicles through 2027.

LINKS

National Highway Traffic Safety Administration, corporate average fuel economy standards:

https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy

Vehicle fuel economy labelling programme: https://www.epa.gov/fueleconomy/basic-information-fuel-economy-labeling

SuperTruck Programme

OBJECTIVE

The Department of Energy launched the SuperTruck programme in 2009 to develop and demonstrate a 50% improvement in overall freight efficiency (expressed in a ton-mile per gallon metric) for a heavy-duty Class 8 tractor-trailer truck.

OUTLINE

Class 8 trucks in the United States haul 80% of goods and use about 28 billion gallons of fuel per year, or around 22% of total transportation energy usage. The Department of Energy's SuperTruck partners are the major truck manufacturers providing Class 8 over-the-road trucks in North America and represent over 99% of the U.S.

market share for these trucks. Multiple partners exceeded the 50% improvement goal, with one achieving a 115% improvement in freight efficiency. Approximately 21 technologies demonstrated through the SuperTruck programme have been successfully commercialised.

LINKS

Department of Energy's SuperTruck Programme:

https://energy.gov/eere/articles/supertruck-leading-way-efficiency-heavy-duty-long-haul-vehicles

19. BUILDING ENERGY EFFICIENCY INITIATIVES

Better Buildings

OBJECTIVE

Better Buildings aims to help operators of commercial, public, industrial, and residential buildings make their buildings 20% more energy efficient over the next decade.

OUTLINE

The Department of Energy established the Better Buildings initiative in 2011. Through its Better Buildings Alliance, building owners and operators share information and best practices on improving the efficiency of their buildings. The initiative challenges market leaders to accelerate the pace of energy efficiency adoption, highlights partner success stories and industry best practices, and encourages the latest technological innovation. Better Buildings efforts maintain a focus on four key strategic areas: 1) developing innovative, replicable solutions with market leaders, 2) making energy efficiency investment easier, 3) developing a skilled clean energy workforce and 4) leading by example in the federal government. Among the component programmes are the Better Buildings Alliance, the Better Buildings Challenge, Better Buildings Accelerators, Performance Contracting, a Better Buildings Solution Centre, and a Financing Navigator. The Better Buildings Challenge has attracted 345 partners to commit to making their buildings 20% more efficient over 10 years. These Challenge partners have saved $1.9 billion in energy costs. The Better Buildings initiative is administered by the Department of Energy's Building Technologies Office.

LINKS

Department of Energy's Better Buildings initiative: https://energy.gov/eere/better-buildings

ENERGY STAR Programme

OBJECTIVE

ENERGY STAR is a voluntary labelling programme jointly administered by the U.S. Environmental Protection Agency and the Department of Energy to identify and promote energy-efficient products and buildings in order to reduce energy consumption, improve energy security, and reduce pollution.

OUTLINE

The ENERGY STAR voluntary labelling programme began in 1992 and has approximately 85% brand recognition in the United States. It began as a labelling programme for efficient appliances and consumer electronics and

has expanded to cover homes, buildings, and industrial plants. To maintain consumer trust and improve the oversight of ENERGY STAR certified products, homes, and commercial facilities, EPA has implemented third-party certification requirements and testing. ENERGY STAR is used on products in more than 70 different categories, with more than 4.8 billion sold since 1992. More than 1.5 million new homes and more than 22,000 facilities carry the ENERGY STAR certification.

LINKS

ENERGY STAR programme: https://www.energystar.gov

Appliance and Equipment Standards Programme

OBJECTIVE

The Department of Energy, through its Building Technologies Office, sets minimum energy efficiency standards for approximately 60 categories of appliances and equipment used in homes, businesses, and other applications, as required by existing law.

OUTLINE

The appliances and equipment covered provide services that are used by consumers and businesses each day, such as space heating and cooling, refrigeration, cooking, clothes washing, and lighting. The products regulated by the programme represent about 90% of home energy use, 60% of commercial building energy use, and 30% of industrial energy use. The programme has issued 21 new or updated standards since 2013. All standards together are projected to result in utility bill savings of $1 trillion by 2020 and $2 trillion by 2030.

LINKS

Department of Energy's Appliance and Equipment Standards Programme:

https://www.energy.gov/eere/buildings/appliance-and-equipment-standards-program

20.ENERGY EFFICIENCY COOPERATION

COOPERATION AGREEMENTS WITH OTHER ECONOMIES OR ORGANISATIONS

Many non-governmental organisations are prominent in promoting energy efficiency in the United States. Examples include the Alliance to Save Energy; the American Council for an Energy Efficient Economy; the American Society for Heating, Refrigeration and Air Conditioning Engineering; and various trade associations. These organisations sometimes partner with the federal government to perform specific tasks.

BILATERAL, REGIONAL OR MULTILATERAL COOPERATION AGREEMENTS

The United States participates in a variety of the International Energy Agency's Technology Cooperation Programmes (TCPs). Many of the TCPs are mechanisms for pooling international resources to facilitate joint energy research, development, and deployment of energy efficiency technologies. The United States actively participates in the International Partnership for Energy Efficiency Cooperation (IPEEC), which provides a forum for dialogue - and action - to promote energy efficiency improvements among its seventeen member economies. The United States participates in the Clean Energy Ministerial, which includes multiple initiatives for improving energy efficiency. The United States participates in APEC, and particularly the APEC Energy Working

Group. The Department of Energy's Office of Energy Efficiency and Renewable Energy has efficiency-focused projects with countries including China, India, Brazil, and Saudi Arabia.

LINKS

Department of Energy: https://www.energy.gov/ia/international-affairs-initiatives

21. OTHER ENERGY EFFICIENCY EFFORTS

Not available.