Energy Technology RD&D Budgets

May 2026 Edition

Database documentation

International Energy Agency

INTERNATIONAL ENERGY AGENCY

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This document provides information regarding the 2026 edition of the IEA *Energy Technology RD&D Budgets* database. The data files and documentation are available at: https://www.iea.org/data-and-statistics/data-product/energy-technology-rd-and-d-budget-database-2

For visualization of country-level data through interactive menus, please visit: https://www.iea.org/data-and-statistics/data-tools/energy-technology-rdd-budgets-data-explorer

Please address your comments and inquiries to RDD@iea.org.

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Changes from last edition

Technology classification

Updated in co-operation with governments to reflect technological developments since its last revision in 2011, the IEA's energy technology classification now covers a full range of energy technologies, from those that improve the efficiency of end-uses, to those that improve or change the nature of energy supplies. As of 2025, it covers technologies relating to the extraction and processing of critical minerals and the electrification of industrial processes in addition to technologies previously covered. The logic relating to the allocation of cross-cutting technologies, including batteries, hydrogen, and CO2 capture, has also been clarified. Further details about the classification system and the recent changes, including a breakdown of the new alphanumeric codes for each technology class, can be found in the *IEA Guide to Reporting Energy Technology RD&D Budgets*.

Critical minerals

The new critical minerals category is broken down as follows:

Short name	Long name	Definition
H	Critical minerals	Critical minerals refers to the techniques, processes, materials, equipment and systems to extract, refine and process mineral resources for the development and deployment of energy technologies, such as copper, lithium, nickel, cobalt and rare earth elements.
H1	Critical minerals exploration	Critical minerals exploration refers to the identification, assessment and evaluation of mineral resources for the development and deployment of energy technologies.
H2	Critical minerals extraction	Critical minerals extraction refers to the techniques, processes, materials, equipment and systems for the physical removal and recovery of mineral resources for the development and deployment of energy technologies.
H3	Critical minerals refining and processing	Critical minerals processing and refining refers to the techniques, processes, materials, equipment and systems upgrading extracted raw materials into high purity, market-ready products suitable for use in energy technologies.
H4	Critical minerals recycling	Critical minerals recycling refers to technologies, processes and techniques related to the recovery, processing and reintegration of critical minerals from end-of-life products, industrial waste or scrap materials not included elsewhere.

H9	Critical minerals not elsewhere classified	Critical minerals not elsewhere classified refers to technologies, processes and techniques related to critical minerals not included elsewhere in category H, such as supply chain monitoring.
HUN	Unallocated critical minerals	Unallocated critical minerals refers to technologies, processes, and techniques that do not fall within a single category listed above.

Hydrogen

In the new classification, hydrogen end uses are interwoven with other categories where relevant. For example, technologies related to the use of hydrogen to power vehicles are now contained in category A315 – hydrogen for road transport instead of in the hydrogen-specific category.

Short name	Long name	Definition
A315	Hydrogen for road transport	Hydrogen for road transport refers to the technologies related to the use of hydrogen to power vehicles through fuel cell electric drivetrains or hydrogen combustion engines, covering storage, on-board energy conversion and refuelling infrastructure.
A3151	Hydrogen fuel cell drivetrains for road transport	Hydrogen fuel cell drivetrains for road transport refers to the systems and technologies that use hydrogen to generate electricity on-board via fuel cells for vehicle propulsion.
A3152	Hydrogen applications in combustion engines on board road transport	Hydrogen applications in combustion engines on board road transport refers to the use of hydrogen as a fuel in internal combustion engines to power vehicles, including engine modifications for hydrogen.
A3153	Hydrogen storage on board road transport	Hydrogen storage on board road transport refers to the systems and technologies used to safely store hydrogen as a gas, liquid or in a solid on a vehicle, enabling it to be used as an energy carrier for propulsion independently of the power conversion system, such as fuel cells or combustion engines.
A3154	Hydrogen refuelling station and dispensers for road transport	Hydrogen refuelling stations and dispensers for road transport refers to the equipment and technologies to supply hydrogen fuel to road vehicles.
A3159	Hydrogen for road transport not elsewhere classified	Hydrogen for road transport not elsewhere classified refers to technologies related to hydrogen as a road transport fuel not included elsewhere in the subcategories of A315.
A315UN	Unallocated hydrogen for road transport	Unallocated hydrogen for road transport refers to technologies, processes, and techniques that span multiple subgroups of category A315.

The hydrogen-specific category is now broken down as follows:

Short name	Long name	Definition
E	Hydrogen, hydrogen-based fuels and fuel cells	Hydrogen, hydrogen-based fuels and fuel cells refers to techniques, processes, materials, equipment and systems involved in the production, storage, distribution and conversion of hydrogen, as well as the development and utilisation of hydrogen based synthetic fuels and fuel cells.
E1	Hydrogen production	Hydrogen production refers to techniques, processes, materials, equipment and systems to produce hydrogen and to purify it at levels acceptable for its further use as an energy source or in energy-related applications.
E11	Hydrogen production via electrolysis	Hydrogen production via electrolysis refers to the process of splitting water into hydrogen and oxygen using electrical energy, regardless of the origin of the electricity.
E12	Hydrogen production from fossil fuels without CO2 capture	Hydrogen production from fossil fuels without CO2 capture refers to technologies and processes that generate hydrogen from fossil fuels (natural gas, coal or oil), without integrating CO2 capture.
E13	Hydrogen production from fossil fuels with CO2 capture or via non-oxidative processes	Hydrogen production from fossil fuels with CO2 capture or via non-oxidative processes refers to technologies and processes that generate hydrogen from fossil fuels, primarily natural gas, coal or oil, while mitigating associated CO2 emissions with CO2 capture or by utilising non-oxidative conversion routes that avoid CO2 production.
E14	Hydrogen production from biomass	Hydrogen production from biomass refers to the conversion of organic biomass feedstocks, such as agricultural residues, forestry by-products, dedicated energy crops or organic waste, into hydrogen, with or without CO2 capture.
E15	Geological hydrogen	Geological hydrogen, also called natural hydrogen, refers to technologies related to the extraction of naturally occurring hydrogen directly from underground resources.
E19	Hydrogen production not elsewhere classified	Hydrogen production not elsewhere classified refers to technologies, processes and techniques related to hydrogen production not included elsewhere in the subcategories of E1.
E1UN	Unallocated hydrogen production	Unallocated hydrogen production refers to technologies, processes, and techniques that span multiple subgroups of category E1.
E2	Hydrogen storage	Hydrogen storage refers to techniques, processes, materials, equipment and systems to store small or large volumes of hydrogen for further use.
E3	Transport of hydrogen	Transport of hydrogen refers to techniques, processes, materials, equipment and systems to convey hydrogen from one location to another.
E4	Hydrogen distribution infrastructure and systems	Hydrogen distribution infrastructure and systems refers to techniques, processes, materials, equipment and systems not included elsewhere aimed at facilitating the use of hydrogen as a source of energy, including distribution.

E5	Hydrogen uses	Hydrogen uses refers to techniques, processes, materials, equipment and systems not covered elsewhere needing or consuming hydrogen as a source of energy, including through combustion and excluding fuel cells.
E51	Hydrogen use in oil refining	Hydrogen use in oil refining refers to the use of hydrogen as a critical reagent and process fluid to upgrade crude oil into cleaner, higher-value fuels.
E52	Electricity generation from hydrogen	Electricity generation from hydrogen refers to the production of electrical energy from hydrogen via combustion, for example in turbines.
E59	Hydrogen uses not elsewhere classified	Hydrogen uses not elsewhere classified refers to technologies, processes and techniques related to hydrogen uses not included elsewhere.
E5UN	Unallocated hydrogen uses	Unallocated hydrogen uses refers to technologies, processes, and techniques that span multiple subgroups of category E5.
E6	Hydrogen-based fuels	Hydrogen-based fuels refers to techniques, processes, materials, equipment and systems related to producing, transporting and using fuels (when not covered elsewhere) whose energy content is derived from the chemical energy of hydrogen's diatomic bond.
E7	Fuel cells (excluding transport applications)	Fuel cells (excluding transport applications) refers to techniques, processes, equipment, materials, catalysts, electrolytes, membranes and systems to conceive, design and engineer fuel cells, which are electrochemical devices that convert the energy of a chemical reaction directly into electricity, with heat as a by-product.
E9	Hydrogen, hydrogen-based fuels and fuel cells not elsewhere classified	Hydrogen, hydrogen-based fuels and fuel cells not elsewhere classified refers to technologies, processes and techniques related to hydrogen, hydrogen-based fuels and fuel cells not included elsewhere.
EUN	Unallocated hydrogen, hydrogen-based fuels and fuel cells	Unallocated hydrogen, hydrogen-based fuels and fuel cells refers to technologies, processes, and techniques that span multiple subgroups of category E.

CO2 capture and storage

The new CO2 capture, use, and storage category, which was formerly contained within the fossil fuels category, is broken down as follows:

Short name	Long name	Definition
G	CO2 capture and storage	CO2 capture and storage refers to techniques, processes, materials, equipment and systems to reduce CO2 emissions from large point sources, such as power generation or industrial facilities that use fossil fuels or biomass, or from ambient air or water.
G1	CO2 capture	CO2 capture refers to techniques, processes, materials, equipment and systems to produce a concentrated stream of CO2, from mainly

		large point sources (e.g. fossil fuel power plants or industrial sources) or from ambient air or water, to be transported for use or storage.
G11	CO2 capture from fossil fuels power plants	CO2 capture from fossil fuels power plants refers to techniques, processes, materials, equipment and systems to produce a concentrated stream of CO2 from fossil fuel power plants.
G12	Direct air capture	Direct air capture (DAC) refers to techniques, processes, materials, equipment and systems to extract CO2 directly from ambient air or from water whose CO2 concentration is in equilibrium with the air (and therefore has the purpose of reducing atmospheric CO2 concentrations).
G13	Bioenergy with CO2 capture	Bioenergy with CO2 capture (BECCS) refers to the integrated process of generating energy from biomass, such as agricultural residues, forestry by-products or dedicated energy crops, and capturing the CO2 emissions produced during the conversion process.
G14	CO2 capture from industry	CO2 capture from industry refers to the suite of technologies and processes designed to capture CO2 emissions directly from industrial sources, such as cement and steel production, chemical manufacturing and other heavy industrial operations.
G19	CO2 capture not elsewhere classified	CO2 capture not elsewhere classified refers to technologies, processes and techniques related to CO2 capture not included elsewhere in the subcategories of G1.
G1UN	Unallocated CO2 capture	Unallocated CO2 capture refers to technologies, processes, and techniques that span multiple subgroups of category G1.
G2	CO2 transport	CO2 transport refers to techniques, processes, materials, equipment and systems to convey CO2 between locations regardless of the physical state (gas, liquid) of the CO2.
G3	CO2 storage	CO2 storage refers to techniques, processes, materials, equipment and systems to prevent captured CO2 from reaching the atmosphere.
G9	CO2 capture and storage not elsewhere classified	CO2 capture and storage not elsewhere classified refers to technologies, processes and techniques related to CO2 capture and storage not included elsewhere in category G.
GUN	Unallocated CO2 capture and storage	Unallocated CO2 capture and storage refers to technologies, processes, and techniques that span multiple subgroups within the CO2 capture and storage category..

Database structure

The *Energy Technology RD&D Budgets* database includes annual data for:

Countries: 32 IEA countries; 4 IEA regions; the European Union; Brazil; Chile. For availability of data by country, see section 4: *Geographical coverage and country notes*.

Years: 1974-2026 unless otherwise specified. 2025 and 2026 are provisional and subject to change in future editions.

The database contains the following datasets:

Public energy technology RD&D budgets

- 39 countries/regions: 34 individual countries + European Union + 4 IEA regions
- 3 sectors
- 292 technologies
- 3 types
- 6 units of measure

Private sector energy technology RD&D expenditures

- 4 countries
- 10 technologies
- 5 units of measure

Dimension definitions

The IEA Guide to Reporting Energy Technology RD&D Budgets, which includes the detailed definitions, is available for download here. The classification visualization tool, available online here, is another way to explore the different technologies covered in this dataset.

Major changes from the previous edition include the addition of a critical minerals technology group, as well as a separate category for carbon capture, use, and storage, which was previously under the fossil fuels category. Cross-cutting technologies, including batteries, hydrogen, and CO2 capture, have also been reallocated for improved clarity.

The following tables show the complete set of technologies covered in the questionnaire. The different countries submit at various levels of disaggregation depending on availability at national level.

Technology

Short name	Long name
A	**Energy end uses**
A1	Industry
A11	Energy-efficient industrial management and processes
A12	Energy-efficient industrial equipment
A121	Industrial heat pumps
A129	Energy-efficient industrial equipment not elsewhere classified
A12UN	Unallocated energy-efficient industrial equipment
A13	Direct use of electricity in industrial processes
A14	CO2 utilisation in industry
A15	Hydrogen use in industry
A19	Industry not elsewhere classified

A1UN	Unallocated industry
A2	Residential and commercial buildings, appliances and equipment
A21	Building design and envelope
A211	Building envelope technologies
A212	Building design
A219	Building design and envelope not elsewhere classified
A21UN	Unallocated building design and envelope
A22	Buildings operations and efficient building equipment
A221	Building energy management systems (including smart meters)
A222	Building lighting technologies and control systems
A223	Building heating, cooling and ventilation technologies
A2231	Building heat pumps
A2232	Hydrogen and hydrogen-based fuels applications in building heating and cooling
A2233	Bioenergy applications in building heating and cooling
A2239	Building heating, cooling and ventilation technologies not elsewhere classified
A223UN	Unallocated building heating, cooling and ventilation technologies
A229	Building operations and efficient building equipment not elsewhere classified
A22UN	Unallocated building operations and efficient building equipment
A23	Appliances and equipment (excluding heating and cooling)
A231	Cooking technologies
A232	Energy-efficient information and communication technologies (ICT)
A239	Appliances and equipment not elsewhere classified
A23UN	Unallocated appliances and equipment
A24	Urban and spatial energy planning
A29	Residential and commercial buildings, appliances and equipment not elsewhere classified
A2UN	Unallocated residential and commercial buildings, appliances and equipment

A3	Transport
A31	Road transport
A311	Storage technologies on board road transport (excluding hydrogen)
A3111	Batteries on board road transport
A3119	Storage technologies on board road transport not elsewhere classified
A311UN	Unallocated storage technologies on board road transport
A312	Advanced power electronics, motors and EV/HEV systems on board road transport
A313	Advanced combustion engines and powertrains on board road transport
A3131	Biofuels applications in combustion engines on board road transport
A3139	Advanced combustion engines and powertrains on board road transport not elsewhere classified
A313UN	Unallocated advanced combustion engines and powertrains on board road transport
A314	Electric vehicle charging equipment
A3141	Electric vehicle digital charging infrastructure
A3149	Electric vehicle infrastructure not elsewhere classified
A314UN	Unallocated electric vehicle infrastructure
A315	Hydrogen for road transport
A3151	Hydrogen fuel cell drivetrains for road transport
A3152	Hydrogen applications in combustion engines on board road transport
A3153	Hydrogen storage on board road transport
A3154	Hydrogen refuelling station and dispensers for road transport
A3159	Hydrogen for road transport not elsewhere classified
A315UN	Unallocated hydrogen for road transport
A316	Materials for road transport
A319	Road transport not elsewhere classified
A31UN	Unallocated road transport

A32	Rail
A321	Electricity for rail transport
A322	Hydrogen and hydrogen-based fuels for rail transport
A329	Rail not elsewhere classified
A32UN	Unallocated rail
A33	Aviation
A331	Electricity for aviation
A332	Hydrogen and hydrogen-based fuels for aviation
A339	Aviation not elsewhere classified
A33UN	Unallocated aviation
A34	Shipping
A341	Electricity for shipping
A342	Hydrogen and hydrogen-based fuels for shipping
A349	Shipping not elsewhere classified
A34UN	Unallocated shipping
A35	Other non-road transport
A39	Transport not elsewhere classified
A3UN	Unallocated transport
A4	Agriculture and forestry
A5	Construction and civil engineering
A6	Data centres
A9	Energy end uses not elsewhere classified
AUN	Unallocated energy efficiency
B	**Fossil fuels**
B1	Oil and gas
B11	Conventional oil and gas production

B12	Refining, transport and storage of oil and gas
B13	Non-conventional oil and gas production
B14	Oil and gas combustion
B15	Oil and gas transformation
B19	Oil and gas not elsewhere classified
B1UN	Unallocated oil and gas
B2	Coal
B21	Coal production, preparation and transport
B22	Coal combustion
B23	Coal transformation
B29	Coal not elsewhere classified
B2UN	Unallocated coal
B3	Oil-,gas- and coal-related methane management
B9	Fossil fuels not elsewhere classified
BUN	Unallocated fossil fuels
C	**Renewable energy sources**
C1	Solar energy
C11	Solar heating and cooling
C12	Solar photovoltaics
C121	Solar cell technologies
C122	Solar modules
C123	Integrated photovoltaics
C124	Solar photovoltaics systems
C129	Solar photovoltaics not elsewhere classified
C12UN	Unallocated solar photovoltaics
C13	Solar thermal power and high-temperature applications

C19	Solar energy not elsewhere classified
C1UN	Unallocated solar energy
C2	Wind energy
C21	Onshore wind technologies
C22	Offshore wind technologies
C221	Fixed-bottom offshore wind technologies
C222	Floating offshore wind technologies
C229	Offshore wind technologies not elsewhere classified
C22UN	Unallocated offshore wind technologies
C29	Wind energy not elsewhere classified
C2UN	Unallocated wind energy
C3	Ocean energy
C31	Tidal energy
C32	Wave energy
C33	Salinity gradient power
C34	Ocean thermal power
C39	Ocean energy not elsewhere classified
C3UN	Unallocated ocean energy
C4	Bioenergy
C41	Liquid biofuels production
C411	Biogasoline production
C412	Biodiesel production
C413	Biojet kerosene production
C419	Liquid biofuels production not elsewhere classified
C41UN	Unallocated liquid biofuels production
C42	Solid bioenergy production

C421	Fuelwood, wood residues and by-products production
C422	Charcoal and biochar production
C429	Solid biofuels production not elsewhere classified
C42UN	Unallocated solid biofuels production
C43	Gaseous bioenergy production
C431	Gaseous bioenergy production from thermal processes
C432	Gaseous bioenergy production from anaerobic fermentation
C433	Biomethane production
C439	Gaseous bioenergy production not elsewhere classified
C43UN	Unallocated gaseous bioenergy production
C44	Bioenergy applications for heat and electricity
C45	Biorefining
C49	Bioenergy not elsewhere classified
C4UN	Unallocated bioenergy
C5	Geothermal energy
C51	Geothermal energy from hydrothermal resources
C52	Enhanced geothermal systems
C53	Closed-loop geothermal systems
C54	Drilling and exploration for geothermal energy
C59	Geothermal energy not elsewhere classified
C5UN	Unallocated geothermal energy
C6	Hydroelectricity
C61	Large hydroelectricity (capacity of 10 MW and above)
C62	Small hydroelectricity (capacity of less than 10 MW)
C69	Hydroelectricity not elsewhere classified
C6UN	Unallocated hydroelectricity

C9	Renewable energy sources not elsewhere classified
CUN	Unallocated renewable energy sources
D	**Nuclear fission and fusion**
D1	Nuclear fission
D11	Large nuclear reactors
D111	Large water-cooled reactors
D112	Large liquid metal-cooled fast reactors
D113	Large gas-cooled reactors
D114	Large molten salt-cooled reactors
D119	Large nuclear reactors not elsewhere classified
D11UN	Unallocated large nuclear reactors
D12	Small modular nuclear reactors
D121	Small pressurized water-cooled reactors
D122	Small liquid metal-cooled fast reactors
D123	Small gas-cooled reactors
D124	Small molten salt-cooled reactors
D125	Small heat-pipe-cooled reactors
D129	Small modular nuclear reactors not elsewhere classified
D12UN	Unallocated small modular nuclear reactors
D13	Nuclear fuel cycle and waste management
D131	Front end of the fuel cycle
D132	Back end of the fuel cycle (excluding reprocessing and recycling)
D133	Reprocessing and recycling of nuclear waste products
D139	Nuclear fuel cycle and waste management not elsewhere classified
D13UN	Unallocated nuclear fuel cycle and waste management
D14	Nuclear fission supporting technologies

D141	Nuclear plant safety and integrity
D142	Nuclear environmental assessments, monitoring and protection
D143	Nuclear decommissioning, dismantling and site recovery
D149	Nuclear fission supporting technologies not elsewhere classified
D14UN	Unallocated nuclear fission supporting technologies
D19	Nuclear fission not elsewhere classified
D1UN	Unallocated nuclear fission
D2	Nuclear fusion
D21	Magnetic confinement
D22	Inertial confinement
D23	Hybrid magnetic and electrostatic confinement
D24	Magneto-inertial confinement
D29	Nuclear fusion not elsewhere classified
D2UN	Unallocated nuclear fusion
D3	Hybrid nuclear fission and fusion
D9	Nuclear fission and fusion not elsewhere classified
DUN	Unallocated nuclear fission and fusion
E	**Hydrogen, hydrogen-based fuels and fuel cells**
E1	Hydrogen production
E11	Hydrogen production via electrolysis
E12	Hydrogen production from fossil fuels without CO2 capture
E13	Hydrogen production from fossil fuels with CO2 capture or via non-oxidative processes
E14	Hydrogen production from biomass
E15	Geological hydrogen
E19	Hydrogen production not elsewhere classified
E1UN	Unallocated hydrogen production

E2	Hydrogen storage
E3	Transport of hydrogen
E4	Hydrogen distribution infrastructure and systems
E5	Hydrogen uses
E51	Hydrogen use in oil refining
E52	Electricity generation from hydrogen
E59	Hydrogen uses not elsewhere classified
E5UN	Unallocated hydrogen uses
E6	Hydrogen-based fuels
E7	Fuel cells (excluding transport applications)
E9	Hydrogen, hydrogen-based fuels and fuel cells not elsewhere classified
EUN	Unallocated hydrogen, hydrogen-based fuels and fuel cells
F	**Heat and power generation, storage, and supply**
F1	Heat and power generation
F11	Heat and power generation technologies
F12	Heat and power generation supporting technologies
F19	Heat and power generation not elsewhere classified
F1UN	Unallocated heat and power generation
F2	Electricity transmission and distribution
F21	Electricity transmission and distribution technologies
F211	Cables and conductors
F212	AC/DC conversion
F219	Electricity transmission and distribution technologies not elsewhere classified
F21UN	Unallocated electricity transmission and distribution technologies
F22	Grid communication, control systems and integration
F221	Load management and integration

F222	Grid control systems and monitoring
F223	Standards, interoperability and grid cybersecurity
F229	Grid communication, control systems and integration not elsewhere classified
F22UN	Unallocated grid communication, control systems and integration
F23	Mini grids and microgrids
F29	Electricity transmission and distribution not elsewhere classified
F2UN	Unallocated electricity transmission and distribution
F3	District heating and cooling
F31	District heat pumps
F39	District heating and cooling not elsewhere classified
F3UN	Unallocated district heating and cooling
F4	Waste energy recovery and utilisation
F5	Energy storage (excluding transport applications)
F51	Electrical storage
F511	Batteries (excluding transport applications)
F512	Mechanical storage
F519	Electrical storage not elsewhere classified
F51UN	Unallocated electrical storage
F52	Thermal energy storage
F59	Energy storage not elsewhere specified
F5UN	Unallocated energy storage
F9	Heat and power generation, storage and supply not elsewhere classified
FUN	Unallocated heat and power generation, storage and supply
G	**CO2 capture and storage**
G1	CO2 capture
G11	CO2 capture from fossil fuels power plants

G12	Direct air capture
G13	Bioenergy with CO2 capture
G14	CO2 capture from industry
G19	CO2 capture not elsewhere classified
G1UN	Unallocated CO2 capture
G2	CO2 transport
G3	CO2 storage
G9	CO2 capture and storage not elsewhere classified
GUN	Unallocated CO2 capture and storage
H	**Critical minerals**
H1	Critical minerals exploration
H2	Critical minerals extraction
H3	Critical minerals refining and processing
H4	Critical minerals recycling
H9	Critical minerals not elsewhere classified
HUN	Unallocated critical minerals
Z	**Cross-cutting technologies and research**
Z1	Energy system analysis
Z2	Digital tools for energy systems
Z9	Cross-cutting technologies and research not elsewhere classified
ZUN	Unallocated cross-cutting technologies and research
UN	**Unallocated**
TOTAL	**TOTAL BUDGET**

Sectors

Long name	Short name	Definition
Total public	PUBLIC	Total public
Government	GOV	Government
State-owned	STATE	State-owned enterprises
Private sector	PRIVATE	Private sector

Types

Long name	Short name	Definition
Research, development and demonstration	RDD	Research, development and demonstration
Research and development	RD	Research and development
Demonstration	DEMO	Demonstration

Units of measure

Long name	Short name	Definition
Euro (constant prices and exchange rates)	EUR_R	Euro (constant prices and exchange rates)
National currency (nominal)	NC_N	National currency (nominal)
National currency (constant prices)	NC_R	National currency (constant prices)
Units of GDP	U_GDP	Units of GDP
USD (constant prices and exchange rates)	USD_R	USD (constant prices and exchange rates)
USD (constant prices and PPP)	USD_R_PPP	USD (constant prices and PPP)

Geographical coverage and country notes

Geographical coverage: countries

Long name	Short name
Australia	AUSTRALIA
Austria	AUSTRIA
Belgium	BELGIUM
Brazil	BRAZIL
Canada	CANADA
Czech Republic	CZECH
Chile	CHILE
Denmark	DENMARK
Estonia	ESTONIA
Finland	FINLAND
France	FRANCE
Germany	GERMANY
Greece	GREECE
Hungary	HUNGARY
Ireland	IRELAND
Italy	ITALY
Japan	JAPAN
Korea	KOREA
Latvia	LATVIA
Lithuania	LITHUANIA
Luxembourg	LUXEMBOURG
Mexico	MEXICO
Netherlands	NETHERLANDS
New Zealand	NEWZEALAND

Norway	NORWAY
Poland	POLAND
Portugal	PORTUGAL
Slovak Republic	SLOVAKIA
Spain	SPAIN
Sweden	SWEDEN
Switzerland	SWITZERLAND
Republic of Türkiye	TURKIYE
United Kingdom	UK
United States	USA
European Union	EU_COMMISSION

Geographical coverage: regions

IEA	IEATOT
Definition	Includes Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, the Republic of Türkiye, the United Kingdom and the United States.
IEA Americas	IEAAM
Definition	Includes Canada, Mexico and the United States.
IEA Europe	IEAEUR
Definition	Includes Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, the Republic of Türkiye and the United Kingdom.
IEA Asia Oceania	IEAAO
Definition	Includes Australia, Japan, Korea and New Zealand.

Country notes

Australia

Source: Department of Climate Change, Energy the Environment and Water
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

- Department of Education
  - National Collaborative Research Infrastructure Strategy (NCRIS)
  - Trailblazer Universities Program
  - Regional Research Collaboration Program (RRC) (2022, 2023, 2024 and 2025 only)
  - Strategic University Reform Fund (SURF) (2022, 2023 and 2024 only)
  - Australia's Economic Accelerator (2024 onward)
- Australian Research Council (ARC)
  - National Competitive Grants Program (NCGP)
- Commonwealth Science and Industrial Research Organisation (CSIRO)

The submission also includes RD&D funding by some State Governments. Coverage across states and territories is not comprehensive.

Data coverage

Excludes overseas territories.

Data for 2026 are an incomplete estimate that do not include all funding institutions and programs listed above.

Funding from CRC's, ARENA, ANLEC, and DISR are not included.
The submission does not include the Australian Government's direct funding for universities, administered through its research training and support programs, due to limitations in data reporting. Indirect funding for the higher-education sector through agencies such as the ARC is captured in the submission.

NCGP data cover fundamental research related to energy objectives dictated by Socio-Economic Objective (SEO) codes. No inclusion/exclusion has been made for international R&D due to the nature of the government funding.

Data at the fourth and fifth sublevels are not available for all projects.

Budgetary stage information

All data refer to the financial year; for example, 2025 refers to 1 July 2024 to 30 June 2025.

Expenditure by individual institution can vary greatly from year to year, and an agency's proportion of total spending will also vary (e.g. completion or termination of projects, etc.). The budgetary stages would change over the years, considering the completion of various long-term funded projects. Thus, depending on the funding institution, the budgetary stage may be final budget appropriation, obligations, or actual expenditures.

State-owned enterprises coverage

State-owned enterprises data are included starting from 2018.

The coverage for state-owned enterprises does not include all states and territories.

Private sector coverage

No data available.

Time series changes

For cycle 2021/2022, the data starting from 2018 have been updated to increase the coverage to state/territory and state-owned enterprises.

From 1999 to 2003, only aggregate figures are available for nuclear fission/fusion.

Data for 2009, 2010 and 2011 have been estimated by the Australian administration, causing breaks in series between 2008 and 2009.

In 1993, figures for nuclear fuel cycle include nuclear supporting technology data.

Prior to 1997, biofuels includes geothermal and other renewable energy not elsewhere classified.

Other information

N/A

Austria

Source: Austrian Energy Agency on behalf of the Austrian Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)

Latest submission: 2024/2025

Latest available data: 2024

Funding institutions/programmes included in the submission

- Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)
  - Energy Transition
  - Climate neutral city
  - Circular Economy
  - Mobility Transition
  - IPCEI (Important projects of common European interest)
- Climate and Energy Fund
  - Energy Research Programme
  - Zero Emission Mobility
  - Climate-neutral Industry
  - Austrian Climate Research
  - Technology and Innovation for the Climate-neutral city
  - IEA Research Cooperation
  - European and international cooperations
- Austrian Research Promotion Agency
  - General programme

All institutions and funding agencies are covered.

Data coverage

Government RD&D data cover federal and state units.

Financial flows from European programmes (Horizon 2020, Research Fund for Coal and Steel…) are excluded, national contributions on project level are included. Austrian contributions to the European Union budget are excluded. IEA TCPs (including common funds) are included.

Data are collected from a performer perspective as expenditures by using voluntary surveys for equity capital used by research organizations and universities and identifying contracted funding with data provided by funding agencies.

Details on methodology and sample coverage are available at:

https://nachhaltigwirtschaften.at/de/iea/publikationen/schriftenreihe-2025-25-energieforschungserhebung-2024.php

Estimated share of the sample of the total expenditure covered:

- Government: >95%
- Higher education: >80%

Budgetary stage information

The government data are based on obligation (vi). The private sector data are based on actual outlays (vii).

State-owned enterprises coverage

State-owned companies are covered in the R&D-surveys for the private sector. They are intentionally not covered in the detailed survey for IEA.

Private sector coverage

For every second year (2015, 2017, 2019, 2021, 2023), Austria provides a total annual sum for energy R&D for the whole private sector (including state owned) in the IEA questionnaire. Due to confidentiality and data protection, no individual technology figure is disclosed by the federal statistics authority.

Time series changes

N/A

Other information

N/A

Belgium

Source: Belgium Federal Government
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

Federal (nuclear)

- Federal Public Service Economy (https://economie.fgov.be/en)
    - NIRAS/ONDRAF
    - IRE
    - SCK CEN
    - Waste treatment and dismantling techniques for decommissioning of legacy facilities
    - BELSPO
    - Royal Military School
    - Energy Transition Fund grants

Contributions to CERN are not included.

Brussels-capital region

- Bruxelles Environnement (https://environnement.brussels/)
- Innoviris (https://innoviris.brussels/)

Flemish region

- Research Foundation Flanders (FWO) (https://www.fwo.be/en/).

- Flanders Innovation & Entrepreneurship (VLAIO) (https://www.vlaio.be/nl/andere-doelgroepen/flanders-innovation-entrepreneurship)
- Interuniveristy Micro-electronics Centre (Imec) (https://www.imec-int.com/en/home)
- Flanders Make (https://www.flandersmake.be/en)
- Flemish Institute for Technological Research (VITO) (https://vito.be/en)

"VLAIO" and "Research Foundation – Flanders" are funding agencies for research. IMEC, VITO, Flanders Make are strategic research centres who yearly receive a public funding amount (dotation) from the Flemish government.

Walloon region

- Walloon Public Service Energy https://energie.wallonie.be/fr/recherche-et-developpement-en-energie.html?IDC=8180
- Walloon Public Service Research https://recherche.wallonie.be/home.html

Data coverage

Government RD&D data cover federal and regional units.

For 2026 estimates, only data for nuclear budgets are available.

Federal (nuclear)

Data are collected with a hybrid methodology using voluntary surveys at the federal level.

Estimated share of the sample of the total expenditure covered:

- Government: 100%
  - Information obtained from SCK CEN, IRE, NIRAS/ONDRAF, BELSPO and the Royal Military School
- Higher education: 0%
- Business sector: 0%

Brussels-capital region

For the Brussels region, data provided are based on the individual analysis of the projects themselves. The data include all the projects in which there is a regional co-funding involved. 2025 data is only partial.

Flemish region

The figures are composed from the survey of the funding agencies (VLAIO and FWO) and some public institutions which are financed by the government for research activities.

Flemish data rely on the individual analysis of budgets of approved project proposals in the energy technology field and only includes Flemish public RD&D expenditures (no European / international / private co-funding budget is included).

Walloon region

Data are collected from a funder perspective as budgets. The data are derived from the budget and on the individual analysis of the projects themselves. Only the national/regional public funding has been considered for projects which are co-financed by Europe.

Budgetary stage information

Federal

Data provided are based on final budget appropriations (budgetary stage v).

Brussels-capital region

Data provided are based on obligations (budgetary stage vi).

Flemish region

Data for 2024 are based on final budget appropriations and 2025 data is provisional.

State-owned enterprises coverage

There are no state-owned companies.

Private sector coverage

No data available

Time series changes

Flemish region

For 2021 to 2023, a historical remapping was made automatically based on the concordance scheme. Due to automatization of the data collection process in one institution, they could not specify all figures in detail.

For 2024 and 2025, some institutions changed their reporting schemes, causing a difference in figures between 2024 and 2025 submissions.

Other information

N/A

Brazil

Source: Energy Research Office (EPE)
Latest submission: 2024/2025
Latest available data: 2024

Funding institutions/programmes included in the submission

- Financiadora de Estudos e Projetos (FINEP)
- Agência Nacional do Petróleo, Gás Natural e Biocombustíveis (ANP)
- Agência Nacional de Energia Elétrica (ANEEL)
- Banco Nacional do Desenvolvimento (BNDES)
- Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)
- Comissão Nacional de Energia Nuclear (CNEN)
- Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)

Data coverage

N/A

Budgetary stage information

Data are based on actual outlays.

State-owned enterprises coverage

No data available.

Private sector coverage

Among private investment data, only the amounts resulting from legal investment obligations established in Brazilian regulated programs are included. In Inova-e, these amounts are presented as 'publicly-oriented investments.' Given the limited scope of private investment and the mandatory nature of resource allocation, in this questionnaire we classify all investments as governmental.

Time series changes

From 2020, Demonstration projects are covered separately from R&D.

Other information

The dataset is the result of a project called Energy Big Push (EBP) that gathered all the relevant actors active in the energy innovation scenario of Brazil, including the Brazilian Ministry of Mines and Energy and the Ministry of Science, Technology and Innovation.

Obligation for minimum investment in R&D is allocated as public-oriented investment. This is the case of all investments under regulated programs of the Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP), and Brazilian Electricity Regulatory Agency (ANEEL).

Critical mineral categories have not yet been incorporated into the 2025 update of Inova-e. Therefore, some of these investments are currently included under batteries, storage, and EV transportation.

Reference documents can be founded on the inova e platform available at:

https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/Paginas/Plataforma-inova-e-panorama-dos-investimentos-de-inovacao-em-energia-no-Brasil.aspx

Canada

Source: Natural Resources Canada (NRCan), Government of Canada
Latest submission: 2024/2025
Latest available data: 2025

Funding institutions/programmes included in the submission

Figures are based on data from approximately 30 federal departments and agencies as well as all provincial and territorial governments. The Canadian process surveys all federal, provincial and territorial organizations funding energy RD&D related activities with the exception of municipalities. Government figures include combined data from federal departments and agencies and all of provinces and territories.

- Natural Resources Canada (NRCan)
  - Program of Energy Research & Development (PERD)
  - Energy Innovation Program (EIP) including EIP-Carbon Capture, Utilization, and Storage and EIP Smart Grids streams
  - Smart Grid Demonstrations
  - Energy Efficient Buildings RD&D
  - Electric Vehicle Infrastructure Demonstrations
  - Emission Reduction Fund (ERF)
  - Greener Neighbourhoods Pilot Program (GNPP)
  - Reducing Diesel
  - Oil Spill Response Challenge (OSRC)
  - Critical Minerals RD&D Program
- Atomic Energy of Canada Limited (AECL)
  - Revitalization of the Chalk River Laboratories
  - Federal Nuclear Science and Technology Work Plan
  - New Technology Fund Initiative
- Innovation, Science and Economic Development Canada (ISED)
  - Global Innovation Clusters (GIC)
  - Innovative Solutions Canada (ISC)
  - Strategic Innovation Fund (SIF)
- Sustainable Development Technology Canada (SDTC)
  - SD Tech Fund

- National Research Council Canada (NRC)
  - R&D programs
  - Industrial Research Assistance Program (IRAP)
- Natural Sciences and Engineering Research Council of Canada (NSERC)
  - Discovery Research
  - Research Training and Talent Development
  - Research Partnerships

Of approx. 30 federal departments/agencies, six federal organizations are identified as major spenders. Federal organisations are not listed in any particular order (i.e., ranked by spending). Provincial and territorial governments were also surveyed but the details of their major programs are not provided here.

Note that some program names change over time as the programs are renewed and/or combined with other programs.

Data coverage

The data cover national projects, national contributions to international RD&D programmes or organisations such as the International Atomic Energy Agency (IAEA) and OECD Nuclear Energy Agency (NEA) and international RD&D efforts under the IEA Technology Collaboration Programmes.

Budgetary stage information

All data refer to the fiscal year, for example, 2022 refers to April 1st, 2022, to March 31st, 2023.

Data up to and including 2023 refer to actual outlays. Data beyond 2023 are considered estimates based on the available data at the time of reporting.

State-owned enterprises coverage

For Canada, State-Owned Enterprises (SOEs) are reported only from provincial and territorial governments. SOEs are considered provincial or territorial Crown Corporations, such as electric or gas utilities. Not all provincial and territorial governments reported relevant spending from SOEs.

2012-2013 fiscal year was the first year Canada started reporting SOEs separately.

Private sector coverage

Canada's industry energy R&D data are published annually by Statistics Canada.

https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2710034701

Time series changes

N/A

Other information

Canada uses both funder and performer perspectives to collect energy RD&D data, as the investment flows externally outside the government (i.e., to the private sector) and also internally within the government (i.e., to national laboratories). NRCan, as a coordinator of the data, works with both performers and funders within the Government of Canada (GOC) to check and verify the data submitted. This process places enhanced measures to ensure accuracy and consistency of the data collected, including budgeted and estimated expenditures. For provinces and territories, each provincial/territorial government has its own coordinating ministry that is responsible for collecting the data, on behalf of its provincial/territorial government.

Chile

Source: Ministry of Energy
Latest submission: 2022/2023
Latest available data: 2022

Funding institutions/programmes included in the submission

No data available

Data coverage

The demonstration budgets are included in the R&D section.

Budgetary stage information

No data available

State-owned enterprises coverage

No data available.

Private sector coverage

No data available

Time series changes

N/A

Other information

The data for Chile have been submitted through the joint questionnaire between Mission Innovation and the IEA.

Czech Republic

Source: Ministry of Industry and Trade of the Czech Republic
Latest submission: 2024/2025
Latest available data: 2025

Funding institutions/programmes included in the submission

No details available.

Data coverage

No details available.

Budgetary stage information

No details available.

State-owned enterprises coverage

No details available.

Private sector coverage

No details available.

Time series changes

N/A

Other information

Publicly funded R&D projects can be searched through public databases and portals. These are mainly the ISVAV (https://www.rvvi.cz/) and the STARFOS portal (https://starfos.tacr.cz/cs). Based on individual code and project name, basic information can be found. These are mainly: the amount of eligible costs and the amount of public support (not for every year but only total amount), basic information about an institution carrying the research, project solution time, program of a concrete project, public tender number, R&D categories field, etc. Each specific project has an individual code that serves as a unique identifier. R&D projects data are collected by the Technology Agency of the Czech Republic (TA CR).

The above-mentioned public databases are managed by the Technology Agency of the Czech Republic (STARFOS), respectively by the Research, Development and Innovation Council (ISVAV). The Ministry of Industry and Trade with the help of the Technology Agency of the Czech Republic (TA CR), which has direct access to background data, such as eligible costs and public support for each individual year, searched specific energy projects in the Czech Republic within the STARFOS database. These projects were supplemented by already searched projects, as the search was carried out in 2015 while preparing one of the previous questionnaires. These projects were subsequently exported, including the key information necessary to complete the questionnaire.

Denmark

Source: Danish Energy Agency, Ministry of Energy, Utilities and Climate, Ministry of Higher Education and Science

Latest submission: 2025/2026

Latest available data: 2025

Funding institutions/programmes included in the submission

- Ministry of Higher Education and Science
  - Danish Innovation Fund
- Ministry of Climate, Energy and Utilities
  - Energy Technology Development and Demonstration Program
- ELFORSK

Data coverage

Excludes Greenland and the Faroe Islands.

Figures included in the Danish submission consist exclusively of funding of project proposals directed towards Danish RD&D programs. Contributions to international organisations and programmes are not included.

Data for Government funded demonstration are included in Government funded R&D.

Budgetary stage information

Data are based on obligations (budgetary stage vi).

State-owned enterprises coverage

Does not include data from state-owned companies in Denmark.

Private sector coverage

No data available

Time series changes

N/A

Other information

N/A

Estonia

Source: Ministry of Climate
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

- Estonian Research Council (https://www.etag.ee/en/funding/programmes/)
  - RITA, grant, personal funding
- Ministry of Economic Affairs and Communications
  - R&D programme for the National Development Plan of the Energy Sector until 2030

Data comes from the Estonian Research Information System (https://www.etis.ee/Portal/Projects/Index/?13=6140290f-bd20-4a4a-97f4-fd4d7d485efd__AND___14=6b7aee09-b5b1-4826-bab4-9da39ca1ee36__OR) , which is a database of research and development projects. Research that is not published or kept secret for business reasons is not included in the submission.

Data coverage

Data are collected from a performer perspective as expenditures.
All projects and other RD&D related activities by the evaluated institutions listed at: https://www.etis.ee/Portal/Institutions/Index?lang=ENG are registered at the Estonian Research Information System.

Budgetary stage information

Data are based on initial budget appropriations.

State-owned enterprises coverage

Data include state-owned energy companies belonging to the Republic of Estonia:

- Eesti Energia (https://www.energia.ee/en/ettevottest)
- Elering (https://elering.ee/en/about-elering)

Private sector coverage

The private sector data submitted come from public sources. Information on estimated coverage is not available.

Time series changes

Data prior to 2011 are not available.

Other information

Data reported under the name of Coal correspond to oil shale.

Finland

Source: Statistics Finland on behalf of the Energy Department, Ministry of Economic Affairs and Employment
Latest submission: 2025/2026
Latest available data: 2024

Funding institutions/programmes included in the submission

- Ministry of Economic Affairs and Employment
- The Finnish State Nuclear Management Fund
- Tekes - Finnish Funding Agency for Innovation / Business Finland
- VTT Technical Research Centre of Finland
- Geological Survey of Finland
- The Finnish Academy
- Ministry of the Environment
- Finnvera
- Nordic Investment Bank
- Ministry of Agriculture and Forestry.

Data coverage

R&D also includes demonstration budgets.

Budgetary stage information

Data are based on actual payments disbursed.

State-owned enterprises coverage

Business Finland and VTT Technical Research Centre, two state-owned enterprises, are included under government R&D spending. Other state-owned enterprises are not included.

Private sector coverage

Data are not available

Time series information

From 2021 data, the classification used to collect the data has been updated. Not all institutions are able to submit at the most disaggregated level yet.

Among the changes regarding the classification are the following: addition of hydrogen and fuel cells, split between electric and thermal storage, addition of geothermal energy, unallocated coal now includes coal (combustion & conversion) and peat research.

Other information

N/A

France

Source: Service de la Donnée et des Etudes Statistiques, Ministère de la Transition Ecologique et Solidaire

Latest submission: 2024/2025

Latest available data: 2024

Funding institutions/programmes included in the submission

13 public scientific and technical institutions, industrial and commercial institutions, public interest groups or public funding programmes:

- Agence de l'environnement et de la maitrise de l'énergie (ADEME)
- Agence nationale pour la gestion des déchets radioactifs (ANDRA)
- Agence nationale de la recherche (ANR)
- Banque publique d'investissement (BPI)
- Bureau de Recherches Géologiques et Minières (BRGM)
- Centre national de la recherche scientifique (CNRS)
- Centre Scientifique et Technique du Bâtiment (CSTB)
- Commissariat à l'énergie atomique et aux énergies alternatives (CEA)
    - ITER, Jules Horowitz reactor project
- Institut français pétrole énergies nouvelles (IFPEN)
- Institut de radioprotection et de sûreté nucléaire (IRSN)
- Institut français de recherche pour l'exploitation de la mer (IFREMER)
- Institut national de la recherche agronomique (INRA)
- Institut français des sciences et technologies des transports, de l'aménagement et des réseaux (IFSTTAR)

Data coverage

Government RD&D data cover central government units only.

It covers a combination of basic research/ applied research/ experimental development programmes as well as both energy related and fundamental research programmes.

French data include ITER contributions and exclude other EU or other international RD&D programmes and contributions to these programmes. Indirect funding related to the ITER project, via Euratom, is excluded from the submission.

Data are collected from a funder perspective as budget.

Includes Monaco and excludes the following overseas departments and territories: Guadeloupe, Guyana, Martinique, New Caledonia, French Polynesia, Reunion, and Saint-Pierre and Miquelon.

Budgetary stage information

The French data submission is mostly based on actual budget outlays (budgetary stage vii), with a few French institutions reporting on obligations.

State-owned enterprises coverage

SOEs are not included in the submission due to the business secrecy rules applicable in France.

Private sector coverage

No data available.

Time series changes

In 2010 the French Administration revised the RD&D budgets back to 2002. This results in a break in series between 2001 and 2002.

In 2018, International Thermonuclear Experimental Reactor (ITER) funding (via the Commissariat à l'énergie atomique et aux énergies alternatives -CEA-, GOVT R&D budgets) was added ("Other nuclear fusion" item) with also data from 2002 to 2017.

In 2017, a new structure (specialized in nuclear waste management) was added with data since 2002. No incidence on GOVT demonstration budgets: only GOVT R&D budgets was updated.

In 2021, the data transmitted by the CNRS (Centre national de la recherche scientifique) have been revised from 2002 to improve the coverage. This revision leads to an increase in the total R&D expenditure by 21% on average over the period 2002-2019 (from a minimum of 15% in 2019 to a maximum of 28% in 2009).

Other information

For data in 2024, a methodological change to one of the main operators in 2024 had to be made, which also impacts the results for previous years up to 2021. This operator only provides expenditure data at the time it is incurred (without considering the duration of the projects). This created significant instability in the data form one year to the next.

To remedy this, their data was smoothed over four years, after consulting with them.

Germany

Source: Federal Ministry for Economic Affairs and Energy
Latest submission: 2025/2026
Latest available data: 2024

Funding institutions/programmes included in the submission

- 7th & 8th Energy Research Programmes of the Federal Government
- Federal Ministry for Economic Affairs and Energy
- Federal Ministry of Education and Research
- Federal Ministry of Food and Agriculture
- State energy research activities

Data coverage

Government RD&D data cover federal and state units.

Data include basic research and applied research projects.

Demonstration budget data is included within the R&D category.

Data cover national projects and national contributions to international RD&D efforts under the IEA TCPs.

Figures on international or European programmes are not included.

Budgetary stage information

All data represents actual outlays (budgetary stage vii).

State-owned enterprises coverage

No state-owned-companies are included. Some research institutes incorporated as private entities receive grants for their basic funding directly from the federal government, but they also fund part of their research through private business contracts. Grants for basic funding is included as federal or state funding, but contract funding is not included.

Private sector coverage

No data available.

Time series changes

With the transition to the 7th Energy Research Programme, the data for 2019 onwards are based on a new categorization of energy research funding.

Data do not include the new Laender of Germany prior to 1992.

From 2003 onwards, the institutionally financed R&D activities of the Helmholtz centers are included. From 2018 onwards, the institutional funding for non-nuclear energy research is mainly allocated to category 8, “Unallocated”.

A number of supplemental energy research programs of other ministries and federal states were added to the data coverage beginning in 2023.

Other information

All government energy RD&D expenditures for project funding are managed with the electronic accounting system profi. The Federal Ministry for Economic Affairs and Energy uses a fine-grained categorisation system to match project expenditures to the categories of national and IEA energy RD&D reporting. The other ministries use similar systems. The sample coverage is 100%.

Greece

Source: General Secretariat for Research and Technology
Latest submission: 2010/2011
Latest available data: 2011

Funding institutions/programmes included in the submission

No details available

Data coverage

No details available

Budgetary stage information

No details available

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series changes

From 2000 onwards, Greece has provided only aggregated data until 2007.

Other information

N/A

Hungary

Source: National Research, Development and Innovation Office (NRDIO)
Latest submission: 2025/2026
Latest available data: 2025

Funding institutions/programmes included in the submission

- National Research, Development and Innovation Office

Data coverage

Data refer to projects supported by Hungarian budgetary funds (the National Research, Development and Innovation Fund).

Reclassification of relevant projects funded by the NRDI Fund was conducted from 2021 onwards, in compliance with the IEA's revised classification framework effective from late 2025.

Budgetary stage information

Data are based on obligations.

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series changes

Data for 1995, 1996, 1998 and 1999 are not complete.
New data were received for the period 2013-2016 in cycle 2016/17, explaining the break in time series between 2012 and 2013.

Other information

In most of the cases in Hungary, RD&D funds are not allocated to a specific field of science but are assigned to different projects through calls for proposals. Thus, energy obligations may vary from year to year.
Further details about Hungarian RD&D budgets are available on the NRDIO's website.

Ireland

Source: Sustainable Energy Authority of Ireland
Latest submission: 2024/2025
Latest available data: 2024

Funding institutions/programmes included in the submission

- Sustainable Energy Authority of Ireland (SEAI)
  - National Research Funding Programme
  - Clean Energy Transition Partnership
  - Geothermica
- Department of Agriculture, Food and the Marine (DAFM)
  - Competitive Research Funding Programme
- Department of Transport
  - Green Public Transport Fund
- Environmental Protection Agency (EPA)
  - EPA Climate Call
  - EPA Strategic Partnership Award
- Enterprise Ireland
  - Commercialisation Fund
- Geological Survey Ireland (GSI)
  - Geothermica/GSI Research Programme
- Marine Institute
  - Marine Institute's Marine Research Programme
  - Marine Research Programme – Industry-led Awards
- Research Ireland
  - SFI Future Innovator Prize
  - SFI Industry Fellowship
  - SFI Research Infrastructure
  - SFI Frontiers for the Future Programme
  - Strategic Partnerships Programme
  - SFI-US Partnerships
  - National Challenge Fund
  - SFI-IRC Pathways Programme
  - SFI Research Centres
  - New Foundation 2023
  - Employment Based Postgraduate programme
  - EPS Postgraduate Application
  - EPS Postdoctoral Application
  - Ulysses Advanced Laureat Awards
  - Government of Ireland Postgraduate Award
  - Government of Ireland Postdoctoral Award
  - Starting Laureate Award
- Shared Island Initiative (Department of Taoiseach)

Data coverage

For transnational projects (e.g., ERANET), only the financial contribution from the Irish agencies was included (when this information was made available to SEAI). For such projects, in-kind contribution from Irish agencies was not accounted for in the reporting (when this information was made available to SEAI); Irish funder's contribution had to be estimated in some cases. The value of funding provided by International/European organisations (e.g., European Commission etc.) is not included in the data.

Transnational projects in which Irish public funding agencies are participating as a partner or a lead were not included (e.g., Interreg projects).

Budgetary information

Data from 2016 are based on awarded budgets (budgetary stage vi). The financial year runs from 1 January to 31 December.

State-owned enterprises coverage

Ireland does not have any state-owned enterprises.

Private sector coverage

No data available

Time series information

Data prior to 2015 consist of funding of project proposals directed towards Irish energy RD&D programs and are based on reported “actual expenditures”. Data include deployment prior to 2010. Data from 2016 onwards refer to a new data methodology based on a data collection run by SEAI with the main organisations, listed above, which disburse public funding.

Other information

Energy RD&D data are collected on an annual basis by SEAI and the majority of projects are then published on the National Energy Research Database. The data have been collected from a funder perspective as awarded budgets.

Italy

Source: Department of Energy, Ministry of Environment and Energy Security
Latest submission: 2025/2026
Latest available data: 2023

Funding institutions/programmes included in the submission

No details available

Data coverage

The Italian GOV R&D survey is census-based, considering that the target population includes all the institutions in the public sector (ESA 2010) known or assumed to perform R&D in the reference year (with the exclusion of those units included in the Higher education sector - HES). The main statistical source used for defining the target population of R&D performers is the most updated release of the Public Administration Register. In 2022, the target population comprised 387 public institutions.

Government sector coverage: 99.7% of the units (response rate for the reference year 2022).

A list of potential R&D performing units is based on:

- a list of known R&D institutes performing or funding research activities on a regular basis (ISTAT)
- institutions reporting R&D in previous R&D surveys (ISTAT)
- institutions receiving grants for R&D

institutions that applied to participate in the allocation of 5 per 1,000 of personal income tax (IRPEF) for scientific and university research and for health research (Italian Revenue Agency)

Budgetary information

No details available

State-owned enterprises coverage

The data for state-owned enterprises were obtained by merging data from R&D survey with data from the Istat Business Register for enterprises controlled by the State.

Private sector coverage

The Italian BES R&D survey is census-based, considering that the target population comprises all the active enterprises that potentially perform R&D, according to the information received from other statistical or administrative sources. In 2022, the target population comprised 13,263 legal units (respondents or non-respondents that were integrated) that correspond to 12,650 enterprises active in R&D.

Business sector coverage: 67.4% of the performers (response rate for the A reference year 2022)

The main statistical source used for defining the target population of R&D performers is the most updated release of the official Italian business Register, Asia 2022.

Other sources of information were:

- the list of the enterprises reporting R&D activities in the two previous R&D surveys
- the list of the enterprises reporting intramural R&D activities in the previous CIS
- the register of the contributors to international research programs
- the list of the enterprises operating in one of the Italian Scientific and Technological Parks

Since 2020, Italy has moved from the legal units (that is still the responding unit) to the enterprise as statistical unit of analysis.

Since 2016, Istat has implemented an imputation method to consider the non-response units. This action solves the issue of "under-estimations" of Italian business R&D expenditures and personnel, and it improves the quality of the results. It is a partial imputation of the non-response units because only the units in the previous two surveys that gave preliminary R&D data were considered in the imputation process. Specifically, in this process – based on a predictive regression imputation, applied to the two key variables (R&D expenditure and R&D personnel in FTE) – 2,345 non-response units were involved in the 2022 edition of the Italian BES R&D survey.

Time series information

N/A

Other information

The Italian BES R&D survey is a web survey. The data collection made use of the Istat Business Statistical Portal, a single entry point for Istat web-based data collection from enterprises. Istat Business Statistical Portal implements a new approach for the organisation and management of data collection processes.

The Italian GOV R&D survey is a web survey, the technique used for data collection is the self-compilation of a web questionnaire, which can be accessed from the Istat website dedicated to the survey.

Japan

Source: Ministry of Economy, Trade and Industry
Latest submission: 2025/2026
Latest available data: 2025

Funding institutions/programmes included in the submission

- Ministry of Economy, Trade and Industry (METI)
- Ministry of Environment (MOE), from 2018 onwards
- Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Data coverage

Data provided do not include budgets related to international RD&D programmes.

Budgetary information

Data provided are based on final budget appropriations (budgetary stage v).

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series information

The items included in Conservation were expanded in 1994. Earlier budgetary data are not comparable. Data for Japan cover budgets allocated by METI for all years and include the spending of MOE for the first time in 2018. In 2018 MOE represented 13% of the total national budget, which explains the break in time series between 2017 and 2018. This also affects the aggregates “IEA Total” and “IEA Asia Oceania”.

Other information

N/A

Korea

Source: Ministry of Climate, Energy, and Environment (MCEE), Korea Institute of Energy Technology Evaluation and Planning (KETEP)
Latest submission: 2025/2026
Latest available data: 2025

Funding institutions/programmes included in the submission

- Korea Institute of Energy Technology Evaluation and Planning (KETEP)

Data coverage

Data include RD&D budgets based on the technology development and international cooperation reflected in the Energy R&D Program of the MCEE.

Budgetary information

Data are based on actual outlays.

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series information

N/A

Other information

N/A

Latvia

Source: Ministry of Education and Science, Ministry of Economics, Central Statistical Bureau of Latvia
Latest submission: 2024/2025
Latest available data: 2023

Funding institutions/programmes included in the submission

- Ministry of Education and Science,
- Ministry of Economics
- Central Statistical Bureau of Latvia

Data coverage

Demonstration budgets are not included.
The information submitted in the sheet "ĢOVT R&D" has been provided by the Ministry of Education and Science. Additionally, the Ministry of Economics of Latvia has allocated public financing of approximately €486,269,218 to support business activities in research, development, and innovation (R&D&I) during the 2021–2027 EU programming period. This support is focused on the priority areas defined in Latvia's Smart Specialisation Strategy (RIS3), which includes five key domains. One of these strategic areas is Smart Energy and Mobility.

Budgetary information

N/A

State-owned enterprises coverage

Information on R&D investments by state-owned enterprises is collected and aggregated by sector, including energy.
More detailed information on R&D investments by individual state-owned enterprises can be found in the annual public reports on state-owned companies and state and municipal shareholdings, prepared by the Cross-Sectoral Coordination Centre of Latvia.
https://www.valstskapitals.gov.lv/lv/datu-bazes-un-gada-parskati/gada-parskati/

Between 2020 and 2023, no R&D investments were made by state-owned enterprises in the fields of culture or real estate management. The remaining sectors are either directly related to or have horizontal links with the energy sector.

Private sector coverage

The private sector data represent an estimate of R&D investments in the energy sector by private companies in Latvia and are based on economic activity classifications according to NACE Rev. 2 codes.

The coverage is partial, as the data were compiled specifically for the purposes of this questionnaire and are not routinely collected. They include only those companies whose primary activities fall under selected energy-related NACE codes. Additionally, due to confidentiality constraints, only aggregated totals are reported.

There are no data collected on private sector investments in R&D at the level of detail by domain as requested in the questionnaire. Therefore, to provide the most relevant available information, the data have been compiled on private sector investments in the energy sector based on companies' economic activities, using NACE Rev. 2 codes.

As the data for each NACE code are confidential, only the total aggregated amount has been reported, which has been entered in row 192 ("Total Budget") of the PRIVATE-SECTOR sheet.

Time series information

Latvia started providing data from 2020.

Other information

Most of the information provided in this questionnaire has been sourced from publicly available and officially approved reports. These serve as the main verified basis for the submitted data.

In contrast, information on private sector R&D investments classified by NACE Rev. 2 codes is not routinely collected, as such data is considered confidential and intended for internal use only. For the purposes of this questionnaire, the data was compiled specifically on request and reported in aggregated form only.

There are no detailed information to fully separate international or European R&D funding (e.g., Horizon Europe) from private sector data. While EU funding has been excluded where identifiable, complete exclusion cannot be guaranteed due to data limitations.

At this stage, detailed analytics on the distribution of this funding across RIS3 domains is not yet available, as the implementation of support programmes is still ongoing.

Lithuania

Source: Ministry of Energy of the Republic of Lithuania
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

- Research Council of Lithuania
- Ministry of Economy and Innovation of the Republic of Lithuania
- Public Institution Innovation Agency
- UAB Ignitis
- Vilnius Gediminas Technical University
- State Research Institute Centre for Physical and Technological Sciences
- AB Amber Grid
- LITGRID AB
- Ministry of Transport and Communications of the Republic of Lithuania
- Ministry of Education, Science and Sports of the Republic of Lithuania

- Ministry of Environment of the Republic of Lithuania
- Kaunas University of Technology
- Klaipėda University
- Vilnius University
- Lithuanian Energy Institute
- Confederation of Lithuanian Industrialists
- AB Energijos skirstymo operatorius ESO
- UAB EPSO-G
- UAB Baltpool
- UAB Tetas
- UAB Energy Cells
- UAB EPSO-G Invest
- Joint-stock company KN Energies
- Association of scientific research and technology organizations
- Vytautas Magnus University
- AB Kauno energija
- AB Klaipėdos energija
- AB Panevėžio energija
- AB Šiaulių energija
- AB Miesto gijos
- AB ORLEN Lietuva
- UAB Green Genius
- UAB Modernios E-Technologijos
- UAB Rapsoila
- UAB Metsolar
- UAB BOD Group

Data coverage

N/A

Budgetary information

The data are based on budget allocations.

State-owned enterprises coverage

State-owned utilities data are submitted separately in the SOE section and cover UAB Ignitis, AB Amber Grid, LITGRID AB, UAB EPSO-G, AB ESO, AB Miesto gijos, and UAB Energy Cells.

Private sector coverage

N/A

Time series information

Data prior to 2019 are not available.

Other information

N/A

Luxembourg

Source: Direction générale Recherche, propriété intellectuelle et nouvelles technologies, Ministère de l'Economie

Latest submission: 2013/2014

Latest available data: 2012

Funding institutions/programmes included in the submission

- Luxembourg Government, conventions are double signed by both the Minister of Economy and Minister of Finance.

Data coverage

The figures provided do not show the split between R&D and Demonstration since the split is not available within current reporting scheme.

Budgetary information

Data provided are based on obligations (budgetary stage vi).

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series information

Luxembourg has provided just partial information for 1991 to 2000.

Other information

N/A

Mexico

Source: Dirección General de Investigación, Desarrollo Tecnológico y Formación de Recursos Humanos, Secretaría de Energía
Latest submission: 2023/2024
Latest available data: 2024

Funding institutions/programmes included in the submission

- SENER – CONACYT
  - Fondo Sectorial de Hidrocarbos
  - Fonda Sectorial de Sustentabilidad Energética

Data coverage

The data cover national projects, national contributions to international RD&D efforts under the IEA Technology Collaboration Programmes. It includes contribution committed by the Energy Sustainability Fund for a project in collaboration with the European Commission.

Budgetary information

N/A

State-owned enterprises coverage

There are two SOEs in Mexico:

- Petróleos Mexicanos (PEMEX)
- Comisión Federal de Electricidad (CFE)

They are not included in the submission.

Private sector coverage

No data available

Time series information

Data for Mexico are available starting in 2013.

Other

N/A

Netherlands

Source: Netherlands Enterprise Agency (RVO.nl), Ministry of Economic Affairs and Climate Policy
Latest submission: 2024/2025
Latest available data: 2024

Funding institutions/programmes included in the submission

- • The Ministry of Economic Affairs (EZ)
- • The Ministry of Climate and Green Growth (KGG)
- • The Ministry of Housing and Urban Development (VRO)
- • The Ministry of Education, Culture and Science (OCW)
- • The Ministry of Infrastructure and Water Management (IenW)
- R&D budgets and expenditures of universities, as well as funding from local governments programs, are not included in the submitted data.
- Excludes the former Netherlands Antilles.

Data coverage

The data cover grants funded before 2nd September 2024.

RD&D budgets and expenditures of universities, as well as funding from local governments programs, are not included in the submitted data.

Excludes the former Netherlands Antilles.

The Netherlands submission does not include EU or international RD&D programmes, nor the Dutch contributions to IAEA, ITER or CERN.

Budgetary information

Data submitted are based on obligations (budgetary stage vi).

State-owned enterprises coverage

There are no state-owned enterprises.

Private sector coverage

No data available

Time series information

N/A

Other information

The data are also published in the publication IEA Publiek gefinancierd energie onderzoek.
The numbers given represent public spending on energy innovation in total. There is no distinction made between state owned and private enterprises.
Subsidy schemes such as VEKI, IPCEI (Hydrogen) and MEI are not included since they are focussing on Deployment and are not considered Demonstration or R&D.

New Zealand

Source: Ministry of Business, Innovation and Employment
Latest submission: 2025/2026
Latest available data: 2024

Funding institutions/programmes included in the submission

- Ministry of Business, Innovation and Employment
  - Endeavour Fund
  - Strategic Science Investment Fund Programmes
  - National Science Challenges and Partnerships
  - Provincial Development Unit
  - Callaghan Innovation

Data coverage

Government RD&D data cover central and state units.
Only national projects are covered in public energy RD&D.

Budgetary stage information

The data provided are based on actual expenditures.
The data refer to the financial year; for example, 2024 refers to 1 July 2024 to 30 June 2025**,** except the Unallocated data which refer to the calendar year.

State-owned enterprises coverage

There is one SOE, Transpower New Zealand Limited, for which no RD&D spendings have been identified.

Private sector coverage

No data available

Time series information

For cycle 2022/2023, the reallocation of projects to accommodate for the update of the ANZSRC research classification has been finalised. At the disaggregated level, this leads to time series breaks and improvement of the detail availability in a few cases.

There was a reallocation of codes, as the ANZSRC codes used to classify research have been revised. This may have a small impact on categorisation for fiscal year 20/21. Previous years have not been revised.

Callaghan Innovation have reviewed their history of allocating grant funds to energy-related projects. The timeseries has been revised from 2018 in the Unallocated category.

Other information

The value for 2021 GOVT R&D in Unallocated corresponds to the spendings of one government agency which didn't provide updated data for the current cycle.

Norway

Source: Climate, Industry and Technology Department, Ministry of Petroleum and Energy
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

- Research Council of Norway
- Enova
- Innovation Norway
- Norwegian Water Resources and Energy Directorate
- Statnett
- Statkraft

Data coverage

Includes the Svalbard archipelago (Spitsbergen).

Allocations for International R&D programmes are, in general, not included. However, support of Norwegian participation in ERA-NET Cofunds is included. In addition, some national programmes provide financial support to Norwegian actors that participate in international programmes. Such schemes are included in the Norwegian submission of the RD&D questionnaire.

The estimate for 2026 spending is incomplete and does not include all funding institutions listed above.

Budgetary stage information

The budgetary stage is different depending on the submitting institution. Some data are based on grants to individual projects while others are based on state budget allocation, depending on which funding scheme the data is collected from.

State-owned enterprises coverage

Included:

- Statnett
- Statkraft

Not included:

- Equinor (only partially state-owned)

Private sector coverage

No data available

Time series changes

Innovation Norway began using industry codes (NACE2007) for categorizing R&D support in the 2024/2025 submission. Data was retroactively updated to reflect the new methodology beginning in 2024. For 2023 and earlier, Innovation Norway mainly reported figures as demonstration with very little under R&D. From 2024 onwards, the reverse will be the case.

Other information

The Norwegian schemes for governmental RDD support are, for the most part, technology neutral. The actual allocations each year to various energy fields and technologies are based on the quality of the projects responding to the calls, i.e., competition among researchers and projects proposals, where the best projects are funded within available budgets. Reporting on final budget appropriations is only possible for very broad fields such as petroleum, CCS and energy efficiency/ renewable energy/ energy system/ storage.

Poland

Source: Department of Innovation and Development, Ministry of Science and Higher Education
Latest submission: 2024/2025
Latest available data: 2025

Funding institutions/programmes included in the submission

- Ministry of Science and Higher Education (MSHE)
- National Centre for Research and Development (supervised by MSHE for funding applied research)
- National Centre of Science (supervised by MSHE for funding basic research)
- The Łukasiewicz Research Network (state entity established to plan and coordinate scientific research and development projects in cooperation with the industry)

Data coverage

Other Polish ministries and institutes supervised by those ministries which may also fund demonstration projects and marginally R&D projects (MSHE is the primary funder of R&D projects) are not included.

Only R&D projects are included in the submission. Demonstration projects are not included.

Data reported include R&D projects funded or co-funded from public money. Financial means from EU structural funds are also included (Contributions from international organisations and EC framework programmes like H2020/Horizon Europe are not included).

All projects funded from science budget, including “State-owned R&D” and “Government pilot projects”, are included in the submission.

Data reported do not include all funds on energy R&D from MSHE’s budget (may include less than 50%). This is due to the structure of Polish science budget, which is divided into definite financing streams (based on a legislative regulation). Approximately half of the science budget is appropriated on statutory tasks of scientific institutions and other tasks that means that it is not the government (MSHE) that decides the objective of the funds but R&D institutions, including academia. As a result, funds on statutory tasks – as far as division on definite economy sectors is concerned, e.g., renewable energy – is difficult to measure.

Budgetary stage information

Data are based on obligations.

Data for 2025 are only initial estimation for ongoing or planned projects. The final data for this period will vary and should be higher.

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series changes

The reduction in funding for 2024, compared to 2022 and 2023, is attributed to a strategic shift in 2025. More funds were allocated to other priority areas such as Information and Communication Technology (ICT) and Environmental Protection, rather than to R&D programs in the energy sector. Strategic programs within these priority areas are launched successively to ensure comprehensive coverage of all key economic sectors in science policy. For instance, a new R&D strategic program in nuclear energy, named Nucleostrateg, is currently under development.

The decrease in energy R&D funding compared to the 2010-2015 period is due to the implementation schedule of priorities within the National Research Program. Energy was one of the seven main R&D priorities during that period, with the largest projects initiated between 2010 and 2015. In subsequent years, the focus shifted to projects from other priority areas. However, in September 2021, the government launched a new strategic R&D program in the energy sector, with a budget of 800 million PLN for 2021-2029. Additionally, other R&D programs aligned with the European Green Deal have been initiated and will receive funding in the coming years.

Other information

In Poland, the Ministry of Science and Higher Education is responsible for financing research (basic and applied research projects, experimental development and research infrastructure), while “sectoral” ministries (e.g. ministry for energy, climate, agriculture, environment, defence etc.) are responsible for the implementation of demonstration projects and for the deployment of new technologies in their respective areas.

Data reported are not official statistical data, but only estimations based on analysis carried out by MSHE and its supervised funding agencies. Data provided are based on obligations (Minister’s and its agencies programmes and projects) and on the individual analysis of the projects themselves.

The Polish Statistical Office delivers official statistical data for R&D in Poland. From 2013, the Polish Statistical Office presents government budget appropriations or outlays for R&D by socio-economic objectives (NABS), where energy is 1 of 13 objectives (among others are environment, agriculture, health, defence). However, those data are not detailed and divided into sub-areas as RES, fossil fuels, nuclear etc.).

Portugal

Source: Direção Geral de Energia e Geologia
Latest submission: 2025/2026
Latest available data: 2024

Funding institutions/programmes included in the submission

- National Foundation for Science and Technology
- MIT Portugal

Other institutions are also included in the submission.

Data coverage

Includes the Azores and Madeira Islands.

Under the IPCTN survey, the R&D entities included receive public funding to carry out their R&D activity, whether in the form of subsidies for R&D projects, research grants and other forms of hiring researchers or other personnel for R&D; and/or private funding for R&D in the form of payment for the provision of R&D services. Also included are entities that, although they do not receive funding specifically for R&D, allocate part or all their annual budget to R&D (in the form of payment of human resources salaries or other current and capital expenses).

Energy-related projects undertaken with the European Union or other countries (bilaterally or multilaterally) are included in the Portuguese energy RD&D data.

Budgetary stage information

Data are based on actual outlays.

State-owned enterprises coverage

No data available

Private sector coverage

The private sector covers all companies and private entities whose main activity is the production of goods and services, with the aim of selling them at a price that should approximately cover production costs. This sector also includes Private Non-Profit Institutions when the main activity is intended for the service of companies.

Time series changes

In 2013, the total budget triples because the figures include salaries and EU financing.

From 2016 onwards, data include funding from the National Foundation for Science and Technology and other funding agencies.

Other information

Increases in private sector spending in 2024 are a result of the Portuguese Resilience and Recovery Plan (PRR), which was approved in 2021. The PRR plan is intended to align investment with national objectives such as post-pandemic economic recovery, the climate and energy transition, and digitalization.

The data for 2023 were sorted based on replies to question 5 (Energy) of the Survey of the National Scientific and Technological Potential (IPCTN) provided by the R&I institutions/companies that perform RD&D. In this question, the nomenclature of socio-economic objectives (SEO) is based on the Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets (NABS 2007). For the 2021 survey, the IPCTN19 questionnaire form disaggregated the Energy objective to comply with the one-digit level of the IEA questionnaire.

In Portugal, the IPCTN has been held since 1982. The IPCTN follows the internationally established guidelines (OECD, Frascati Manual, 2015) with four institutional sectors: Business and Enterprise (Empresas), Government (Estado), Higher Education (Ensino Superior) and Non-profit Private (Instituições privadas sem fins lucrativos).

Information on the yearly survey are available here: https://www.dgeec.mec.pt/np4/206/

Results of the yearly survey are available here: https://app.powerbi.com/view?r=eyJrIjoiODBmMGRkZmQtZTFkYi00NTQ0LTg2YzAtNTY5MDNlY2FjZTdjIiwidCI6ImQ0MWIzMGNmLTgzMzEtNGJkNC05YTJkLTg3NGY1MmIwMDQxNSIsImMiOjh9

Slovak Republic

Source: Department of International Energy Relations, Ministry of Economy of The Slovak Republic
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

- Ministry of Education, Research, Development and Youth of the Slovak Republic (MERDY SR)
- Slovak Research and Development Agency
- Research Agency

Data coverage

Financial means from EU structural funds are included in the indicated amounts.
Data concerning specific budgets for demonstration projects or any “seed-capital” budgets for R&D are not available.

Budgetary stage information

Data until 2025 are based on actual outlays. Data for 2026 are based on obligations.

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series information

N/A

Other information

The Ministry of Education, Research, Development and Youth of the Slovak Republic (MERDY SR) is the central body of the state administration of the Slovak Republic for elementary, secondary and higher education, educational facilities, lifelong learning and for the state's support for research, development and youth.
The R&D agenda belongs to competencies of MERDY SR and is supported from the state budget via grant agencies (Slovak Research and Development Agency – SRDA, Scientific Grant Agency – VEGA).
The use of structural funds of European Union for research and development are administered by dedicated agency Research agency (RA) or directly via relevant section of MERDY SR - EU Structural Funds Section.
Industries and private companies are cooperating with academic institutions, but the funding for these activities is small.
Incentives for R&D – support from the state budget in SMEs and their cooperation with academic institutions – is implemented through Law no. 185/2009 Coll. and Commission Regulation (EU) No. 651/2014 (until now, no. 800/2008).

Spain

Source: Subdirección General de Planificación, Seguimiento y Evaluación, Ministerio de Ciencia, Innovación y Universidades,Subdirección General de Prospectiva, Estrategia y Normativa en Materia de Energía, Ministerio para la Transición Ecológica y el Reto Demográfico

Latest submission: 2025/2026

Latest available data: 2024

Funding institutions/programmes included in the submission

- Ministry of Science,Innovation and Universities
- National Research Agency (AEI)
- Center for Technological Development and Innovation (CDTI)
- Ministry of Ecological Transition and Demographic Challenge
- Institute for Energy Diversification and Saving (IDAE)
- Center for Energy, Environmental and Technological Research (CIEMAT)
- Superior Council of Scientific Research (CSIC)
- National Institute for Space Technology (INTA)
- Regional departments

Data coverage

Data reported are based on budget allocations (GBARD basis), including data from state and regional governments. Data covers ministries and regional departments (and their functional units, including public funding agencies) executing R&D expenditures from national and regional budgets in the year of reference (2024) and R&D expenditures from performers (Public Research Institutions) receiving direct funding from the national and regional budgets in the year of reference. Loans are not included.

Includes Autonomous Communities.

Some allocations for demonstration purposes are reported together with the R&D expenditures.

Budgetary stage information

Data are based on final budget allocations.

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series changes

From 2021 data, the methodology for collecting the data has changed, resulting in a break in the time series between 2020 and 2021. Until 2020, the data included exclusively the expenditures of the two main state funding agencies, i.e. AEI and CDTI.

Other information

N/A

Sweden

Source: Energy Analysis Department, Swedish Energy Agency
Latest submission: 2024/2025
Latest available data: 2025

Funding institutions/programmes included in the submission

- Swedish Energy Agency
- VINNOVA – Sweden´s Innovation Agency
- The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas)
- The Swedish Research Council (VR)
- Affärsverket svenska kraftnät (SVK)

Data coverage

International programmes such as ITER and expenditures to the IEA and the EU are included, but not the contribution for IEA and EU memberships.
Data are collected from a funder perspective as budget.

Budgetary stage

Data are based on actual outlays (budgetary stage vii), with the exception of 2026, which is based on final budget appropriations (budgetary stage v)

State-owned enterprises coverage

State-owned enterprises exist but are not covered in the data.

Private sector coverage

No data available

Time series change

N/A

Other information

N/A

Switzerland

Source: Swiss Federal Office of Energy, Energy Research & Cleantech
Latest submission: 2025/2026
Latest available data: 2026

Funding institutions/programmes included in the submission

- ETH domain
  - Basic financing and internal competitive programmes of the federal technical universities and research organisations (ETHZ, EPFL, PSI, EMPA, EAWAG, WSL)
- Swiss National Science Foundation (SNSF)

    - (Open) project funding (fundamental research)
    - National Research Programmes
- Swiss Innovation Agency (Innosuisse)
    - (Open) project funding (applied research)
    - Flagship Programme
    - EUREKA
    - COST
- Swiss Federal Office of Energy (SFOE)
    - Energy Research Programmes
    - Pilot and Demonstration Programme
    - SWEET
- Swiss Federal Nuclear Safety Inspectorate (ENSI)
    - Nuclear Safety and Radioactive Waste Research Programme
- State Secretariat for Education Research and Innovation (SERI)
    - Replacement measures Horizon 2020/Horizon Europe/Euratom
- Cantons
    - Basic financing of cantonal universities and universities of applied sciences

Data coverage

Estimated share of the sample of the total expenditure covered:

- Government (federal/regional): 100%
    - All the Swiss federal research organizations receive the survey. All the institutions dealing in energy research respond and declare their data in detail.
- Higher education: 100%

All the Swiss universities and universities of applied sciences receive the survey. All the institutions dealing in energy research respond and declare their data in detail.

Budgetary stage

The reported figures up to 2024 are based on actual outlays. The values for 2025 and 2026 are forecasts based on 2024. Since there is no specific budget for energy related R&D in Switzerland that there is a broad variety of national/regional funding bodies, the value is estimated from the year before.

State-owned enterprises coverage

Not applicable

Private sector coverage

No data available

Time series change

The expenditures in 2023 are on the same level than before 2021/2022. The dip was mainly caused by a smaller number of projects due to less energy-specific and smaller follow-up funding programmes after the closing of the large funding instruments SCCER and NRP 70/71. Recently, the participation in European projects – currently financed by national means (SERI) due to the non-association of Switzerland to Horizon Europe – has been steadily increasing.

Other information

Data are collected with a hybrid methodology by using voluntary surveys.

The Swiss RD&D statistics are based on the real expenditures per project. Data about projects entirely or partially funded by the federal government are available from federal databases. However, federal research organisations, federal and cantonal universities, as well as cantonal universities of applied sciences, also run internal or third-party financed projects (cantonal/private, national/international). Data about these projects are declared by the performers annually on a detailed questionnaire (per

project, including several classifications/categories). About 30% of the total expenditures are based on the survey.

Türkiye

Source: Scientific and Technological Research Council of Turkey (TÜBİTAK), Ministry of Energy and Natural Resources

Latest submission: 2025/2026

Latest available data: 2026

Funding institutions/programmes included in the submission

- Scientific and Technological Research Council of Turkey (TÜBİTAK)
  - Academic R&D Funding Directorate (ARDEB) including Public Research Grant Committee (KAMAG)
  - Technology and Innovation Grant Programs Directorate (TEYDEB)
  - Marmara Research Center (MAM) Energy Institute, Chemistry Institute and Materials Institute
- Department of Funding Programmes of Turkish Energy, Nuclear and Mineral Research Agency (TENMAK)
  - Research and Development Projects (TARGEP) for basic research
  - Product Development Projects (TUGEP) for applied research

Data coverage

The budget for TÜBITAK includes the public R&D funds that are provided to academic and private sector researchers, entrepreneurs, and/or research consortiums, including all related actors and public research institutes. Based on the responsibility area of TÜBİTAK, all national values represent R&D budgets and not demonstration.

The budget for TENMAK does not include projects in which Department of Funding Programmes are not involved. Based on the responsibility area of TENMAK the demonstration budget data are not included.

Budgetary stage

TUBİTAK data are allocated and realised budgets (final budget appropriations, budgetary stage v) for 2025 and only the budgets for 2026 represent estimated values.

TENMAK data is reported as final budget appropriations with the exception of 2026, where data is based on forecasts.

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series change

Data for 2014-2018 include European R&D project financial resources allocated in the corresponding years. The total values are EUR 3.97 million in 2016 and EUR 8.48 million in 2017 that have been converted to national currency based on the annual average conversion rates.

Data for 2024 onwards include TENMAK budget.

Other information

N/A

United Kingdom

Source: Department for Energy Security and Net Zero
Latest submission: 2024/2025
Latest available data: 2024

Funding institutions/programmes included in the submission

- Department for Energy Security and Net Zero (DESNZ)
- Department for Transport (DfT)
- Department for Environment Food And Rural Affairs (DEFRA)
- Foreign, Commonwealth and Development Office (FCDO)
- UK Research and Innovation Councils (UKRI), primarily:
  - Engineering and Physical Sciences Research Council (EPSRC)
  - Innovate UK
- Scottish Government
- The Government of Northern Ireland
- Department for Business and Trade
- Department for Science, Innovation and Technology
- Nuclear Decommissioning Authority (NDA)

Data coverage

Data include the Channel Islands.
All programmes funded directly by the UK government, regardless of where they take place are included.
Whilst it does not exactly correspond with the IEA energy RD&D data, the UK's Net Zero Research and Innovation Delivery Plan (2022-25) includes many of the energy RD&D programmes.
The Strategic Innovation Fund is not included in the reported figures.

Budgetary stage information

All data refer to the UK financial year; for example, the data year 2024 correspond starts April 1, 2024, and runs until March 31, 2025.
Data has therefore been included in this return for year 2024 based on actual data available for UK Financial Year 24/25. Data for year 2023/24 are estimates based on available information at the time of the submission to the IEA.

State-owned enterprises coverage

No applicable

Private sector coverage

No data available

Time series change

N/A

Other information

N/A

United States

Source: U.S. Department of Energy
Latest submission: 2016/2017
Latest available data: 2015

Funding institutions/programmes included in the submission

No information available

Data coverage

Includes Puerto Rico, Guam and the Virgin Islands and the Hawaiian Free Trade Zone.

Budgetary stage

No details available

State-owned enterprises coverage

No data available

Private sector coverage

No data available

Time series change

There is a large increase in RD&D spending observed in 2009 due to the increased expenditures associated with the American Recovery and Reinvestment Act of 2009 (stimulus) spending. This is a one-year appropriation (although actual expenditures may go into future years), and so 2010 saw a significant decrease.

Other information

The item III.1.1 “Solar heating and cooling” is included under the item I.2 “Energy efficiency-residential and commercial” as it cannot be easily separated.

The IEA is not able to provide any official information on energy technology RD&D for the United States for the period 2016 to present, due to lack of submission from the national administration. The IEA is closely working with the US administration to address this issue and looks forward to re-establishing the continuity of data provision.

Please note that in the interim the Secretariat estimates for the years 2016 onwards included in previous editions of this database have been removed, although selected estimated datapoints for the US totals are still used to derive the time series of the IEA aggregate. We look forward to providing data at the country level in future editions.

European Union

Source: European Union Directorate-General for Research and Innovation, Directorate for Energy
Latest submission: 2024/2025
Latest available data: 2025

Funding institutions/programmes included in the submission

- Horizon 2020
- Horizon Europe
- Innovation Fund
- Euratom
- Clean Hydrogen Partnership

Data coverage

Data up to 2021 cover projects supported under Horizon 2020 and Horizon Europe. Data for 2021 and onward include projects supported under Horizon 2020, Horizon Europe, the Innovation Fund, Euratom, and the Clean Hydrogen Partnership.

Data for 2024 and 2025 are based only on the Euratom programme and the Horizon Europe cluster 5 work programme on climate energy and mobility (including the calls from the Clean Hydrogen Partnership). Figures for 2024 and 2025 are therefore incomplete and will be revised in future editions.

The figures for nuclear fusion and fission are based on article 4 of the Euratom regulation [COUNCIL REGULATION (Euratom) 2021/765]. The Euratom programme has 3 programme lines: Fusion, Nuclear Fission and direct support to the JRC. Data are included under government R&D.

Horizon Europe is covering research and technology developments up to TRL7-8. The budgets provided for Innovation Actions (TRL6-8) are included under government R&D.

Projects supported by the Innovation Fund are seen as First of a Kind/Demonstration projects. The Innovation Fund 2024 calls support net-zero technologies, but since the calls are 'bottom-up' and it is not possible to break them down by technology, the figures are reported as unallocated. Data are included under government demonstration.

Budgetary stage information

Funding figures for the Innovation Fund refer to the total amount of grants approved for selected projects, with data attributed to the year of publication of the call for proposals.

Figures for all other programs refer to committed EU contributions to projects. Budgets for multi-year projects have been allocated to the year of the calls for proposals and are not spread across the duration of the project.

State-owned enterprises coverage

Not applicable

Private sector coverage

Not applicable

Time series change

The inclusion of additional funding programs (Euratom, Innovation Fund, and the Clean Hydrogen Partnership) in the 2025 edition led to upward revisions to figures for years 2021-2023 relative to previous editions of this database. Budgets for these programs were not included in data for years prior to 2021.

In 2022, the R&D budget is lower due to the transition from the Horizon 2020 programme to the Horizon Europe programme.

The European Union revised data back to 2018 with the 2020 submission to improve the attribution of funding to the specific years and technology categories.

Sectoral break-down of funding figures related to 2021 may show significant differences versus 2020. This change is due to the introduction of Horizon Europe, a new Framework Research programme, that began in 2021.

2021 funding figures under government demonstration (all related to the Innovation Fund Small-scale projects) were previously reported under year 2020. This correction aligns with the approach taken for government R&D funding where only projects for which finalised budget commitments are included.

Other information

The EU provided substantial support to energy harvesting and the “Smart Cities and Communities” initiative. As there is no dedicated category in the current template for “Smart Cities and Communities” (SCC), which is a very substantial spending item for the EU Horizon 2020 programme, SCC is included under item 73 “Other cross-cutting technologies and research – Other” in the current figures. SCC is covering energy efficiency in buildings and transport as well as renewable energy and electricity transmission and distribution.

International Energy Agency (IEA).

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