

# Energy RD&D 2020

## Public Expenditures in Austria

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Austrian Energy Agency  
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## About the survey

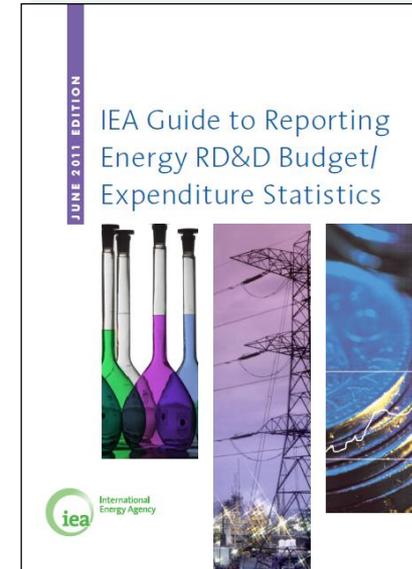
- Austria yearly records all energy-related research, development and first-of-its-kind demonstration projects (RD&D) financed by means of public funds.
- Allows emphasising the importance of energy research for Austria as well as creating and checking policy goals.
- Has been carried out annually since 1974.
- The Austrian Energy Agency has been appointed by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) to gather and evaluate the data.



AUSTRIAN ENERGY AGENCY

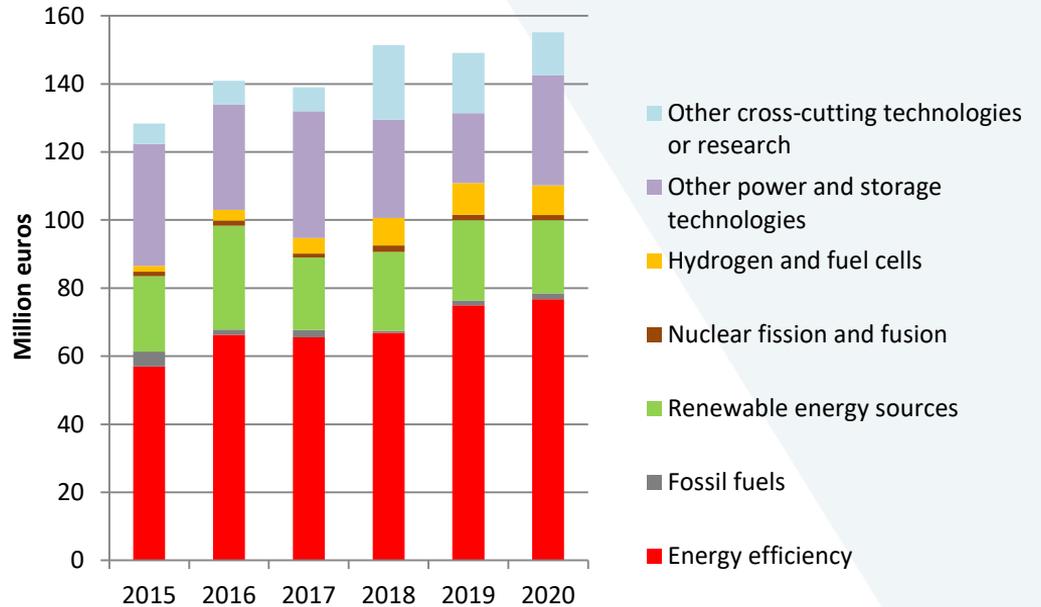
## About the method

- International standards set by IEA Guide to Reporting Energy RD&D Budget/Expenditure Statistics (June 2011) and OECD (Frascati Manual).
- Data for Austria shows obligations (money actually committed during the year 2020) – not budgets!



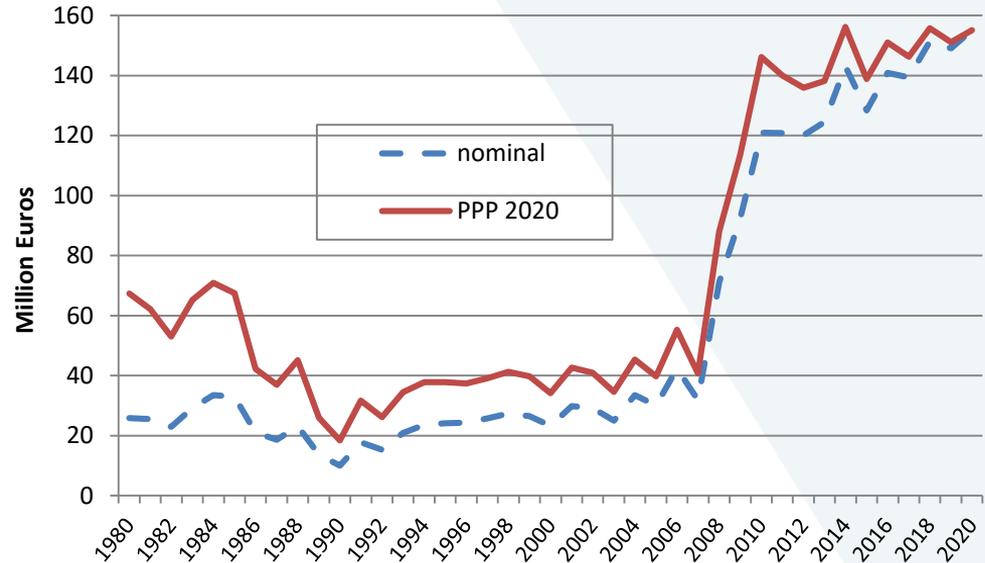
## Overview

- About 1,000 projects and activities of publicly funded energy-related RD&D registered in Austria.
- 2020: 155.2 million euros ...
- ... increase of 6.1 million euros or 4.1% compared to 2019.



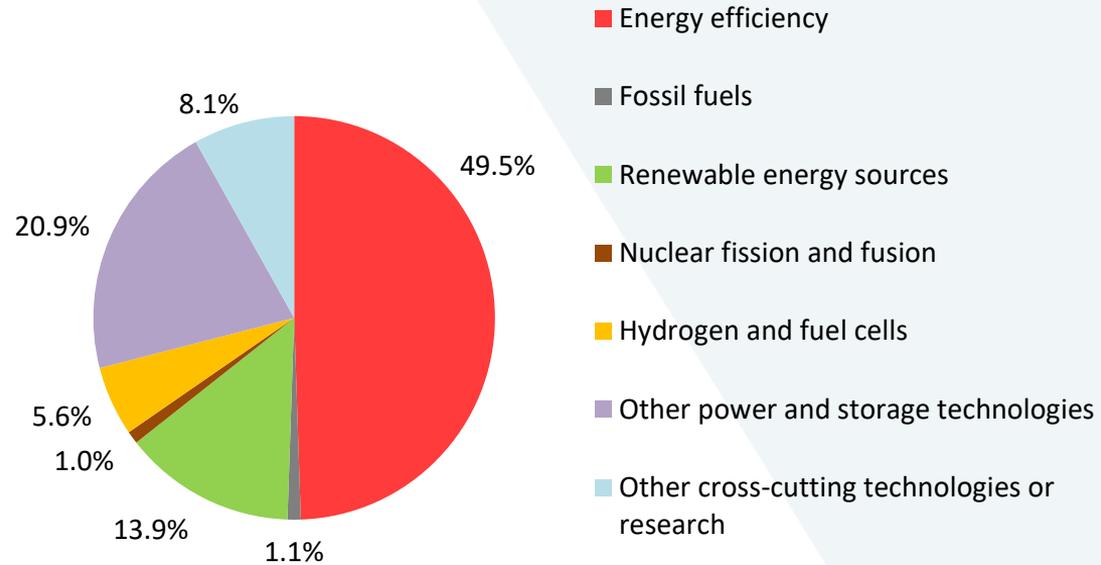
## Public energy R&D expenditures in Austria 1980 – 2020

- Highest value ever in 2020 (in nominal terms).
- Adjusted for inflation, the level of 2020 was already reached in 2014 and 2018.



## Topics 2020

Energy efficiency in transport, industry and cities/ buildings, renewables, and smart grids & storage define the priorities of the publicly financed energy research in Austria.



## Top ten sub-topics

| Ranking<br>2020 | Sub-topics                                                                    | Expenditures 2020<br>(in million euros) |
|-----------------|-------------------------------------------------------------------------------|-----------------------------------------|
| 1               | Hybrid and electric vehicles                                                  | 22.3                                    |
| 2               | Energy storage (excluding hydrogen, storage in vehicles and portable devices) | 19.5                                    |
| 3               | Smart cities and communities                                                  | 13.1                                    |
| 4               | Efficient residential and commercial buildings                                | 11.7                                    |
| 5               | Energy efficiency in industry                                                 | 11.7                                    |
| 6               | Biofuels                                                                      | 10.2                                    |
| 7               | Electricity transmission and distribution                                     | 10.1                                    |
| 8               | Other and cross-cutting technologies                                          | 5.6                                     |
| 9               | Fuel cells                                                                    | 5.4                                     |
| 10              | Basic energy research that cannot be allocated to a specific category         | 4.2                                     |

## Topics

| Topics according to IEA Code                    | Expenditures<br>2020 in euros | Changes<br>compared to<br>2019 in euros | Changes<br>compared to<br>2019 in % |
|-------------------------------------------------|-------------------------------|-----------------------------------------|-------------------------------------|
| Energy efficiency                               | 76,771,749                    | +1,851,202                              | +2.5%                               |
| Fossil fuels                                    | 1,651,486                     | +160,076                                | +10.7%                              |
| Renewable energy sources                        | 21,513,106                    | -1,991,755                              | -8.5%                               |
| Nuclear fission and fusion                      | 1,567,524                     | -36,350                                 | -2.3%                               |
| Hydrogen and fuel cells                         | 8,677,431                     | -689,946                                | -7.4%                               |
| Other power and storage<br>technologies         | 32,362,619                    | +11,823,443                             | +57.6%                              |
| Other cross-cutting technologies<br>or research | 12,641,120                    | -5,039,456                              | -28.5%                              |
| <b>Total</b>                                    | <b>155,185,035</b>            | <b>+6,077,214</b>                       | <b>+4.1%</b>                        |

## Who financed energy research in 2020?



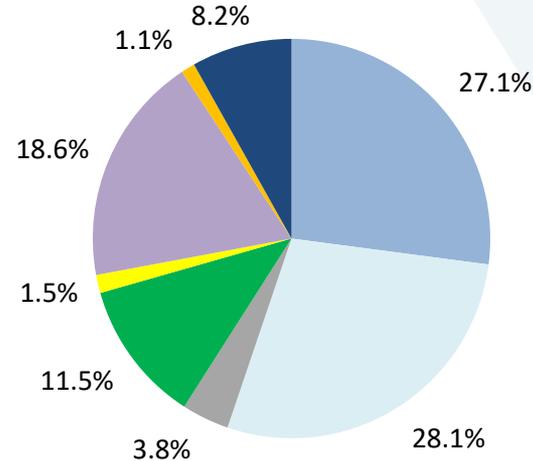
Almost three quarters of this expenditure were provided by governmental authorities (federal, regional, funding organisations).



The remaining part came from (publicly funded) research institutions and universities provided with equity capital.



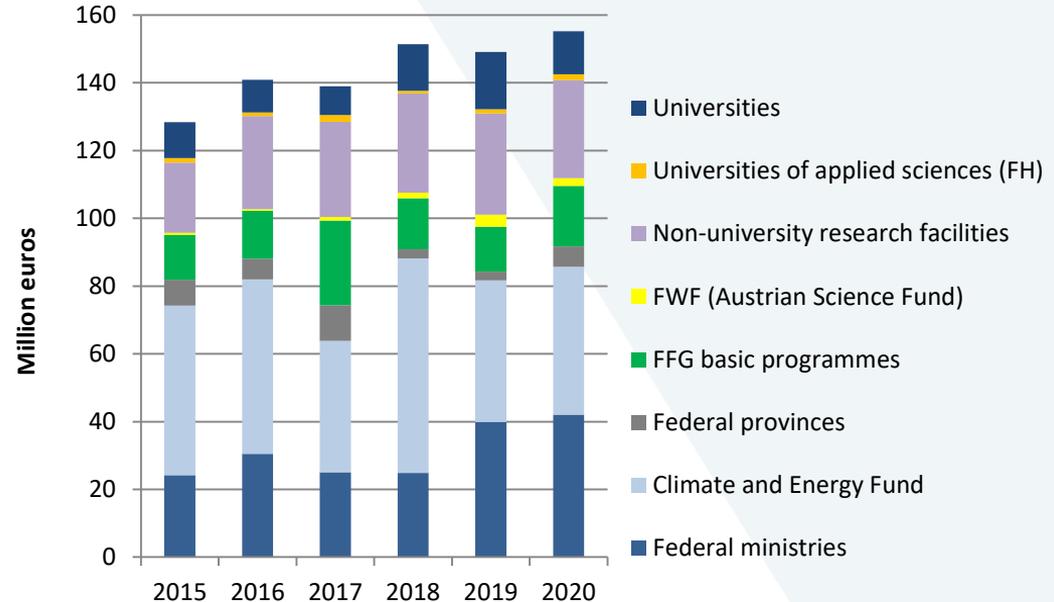
No third-party financing or EU projects were covered in this survey.



- Federal ministries
- Climate and Energy Fund
- Federal provinces
- FFG basic programmes
- FWF (Austrian Science Fund)
- Non-university research facilities
- Universities of applied sciences (FH)
- Universities

## Institutions 2015–2020

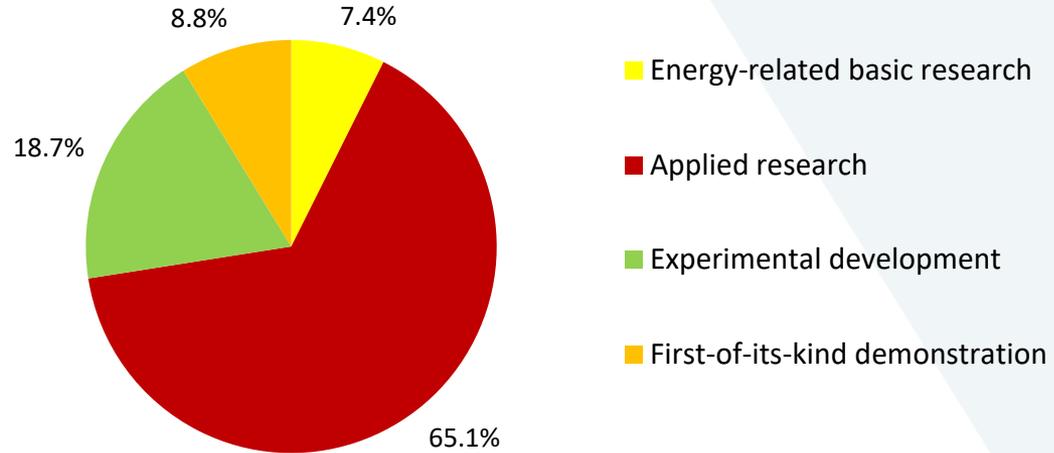
- The Climate and Energy Fund has continually provided the highest amount of finance for energy RD&D for the last decade (2020: 43.7 million euros).
- The expenditures of the federal ministries totalled up to 42.0 million euros in 2020.



## Institutions

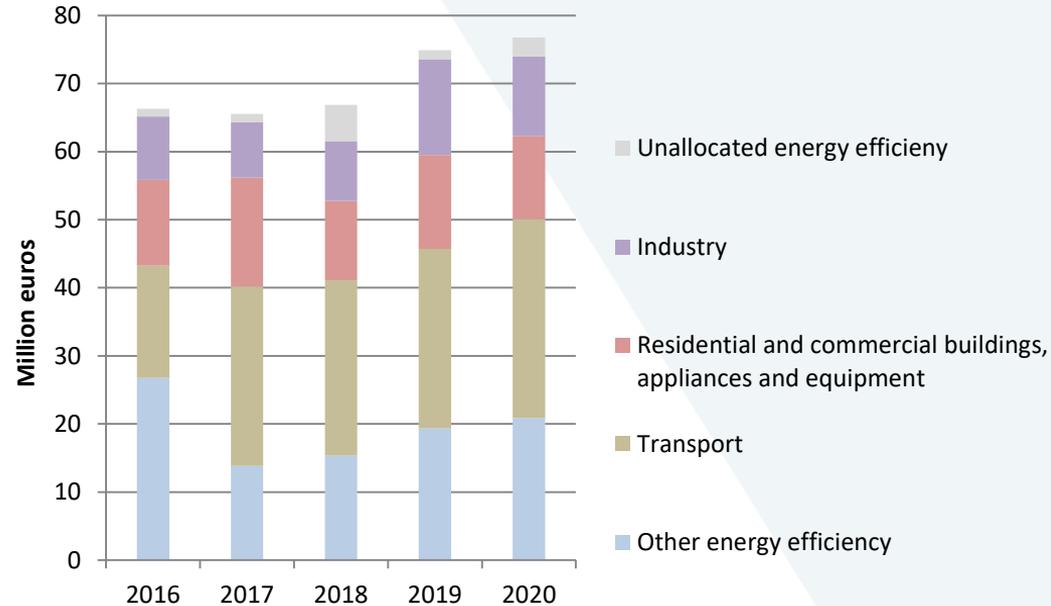
| Institutions                          | Expenditures<br>2020<br>in euros | Changes<br>compared to 2019 in<br>euros | Changes<br>compared to<br>2019 in % |
|---------------------------------------|----------------------------------|-----------------------------------------|-------------------------------------|
| Federal ministries                    | 42,019,946                       | +2,200,865                              | +5.5%                               |
| Climate and Energy Fund               | 43,676,854                       | +1,853,929                              | +4.4%                               |
| Federal provinces                     | 5,971,758                        | +3,322,562                              | +125.4%                             |
| FFG basic programmes                  | 17,901,462                       | +4,660,289                              | +35.2%                              |
| FWF (Austrian Science Fund)           | 2,276,681                        | -1,294,137                              | -36.2%                              |
| Non-university research facilities    | 28,924,953                       | -970,093                                | -3.2%                               |
| Universities of applied sciences (FH) | 1,746,324                        | +575,204                                | +49.1%                              |
| Universities                          | 12,667,057                       | -4,271,405                              | -25.2%                              |
| <b>Total</b>                          | <b>155,185,035</b>               | <b>+6,077,214</b>                       | <b>+4.1%</b>                        |

## Areas of RD&D 2020



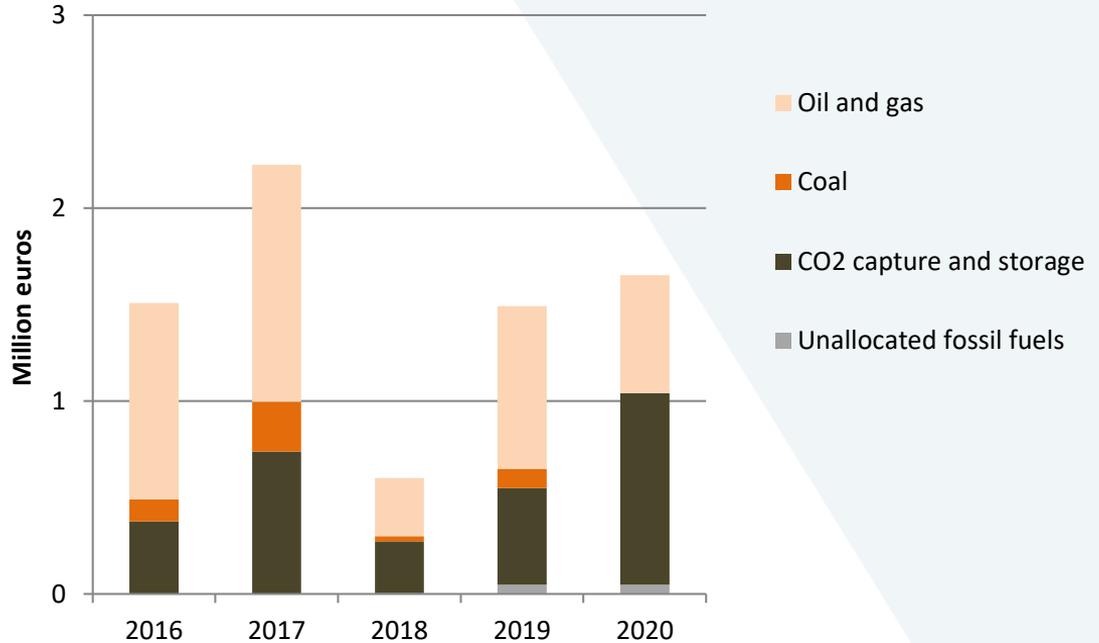
## Energy efficiency

- Transport 2020: 29.2 million euros (of which 22.3 million euros spent on technologies for HEV, batteries & charging)
- “Other energy efficiency”: smart cities (13.1 million euros), heat pumps (3.9 million euros), waste heat recovery (2.0 million euros)
- Buildings, etc.: 12.3 million euros
- Industry: 11.7 million euros

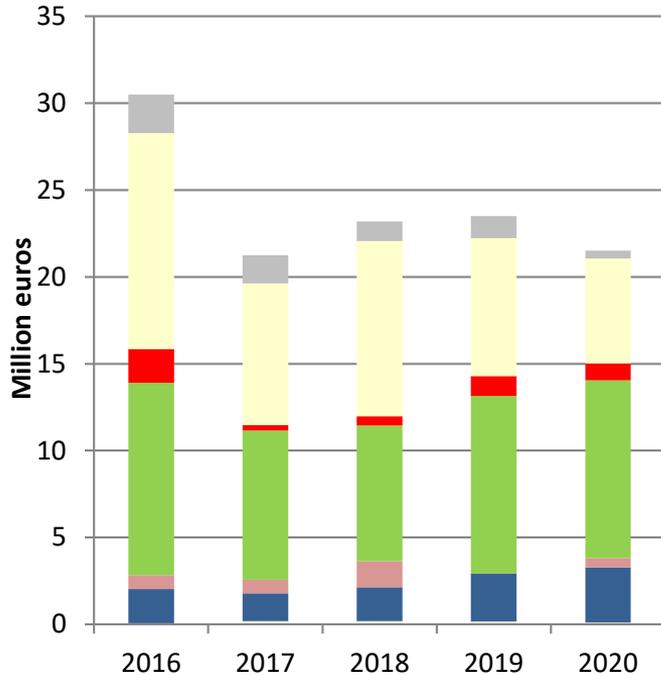


## Fossil fuels & CCS

This thematic area is not a priority in publicly funded energy research in Austria and far behind in terms of funding (2020: 1.7 million euros).

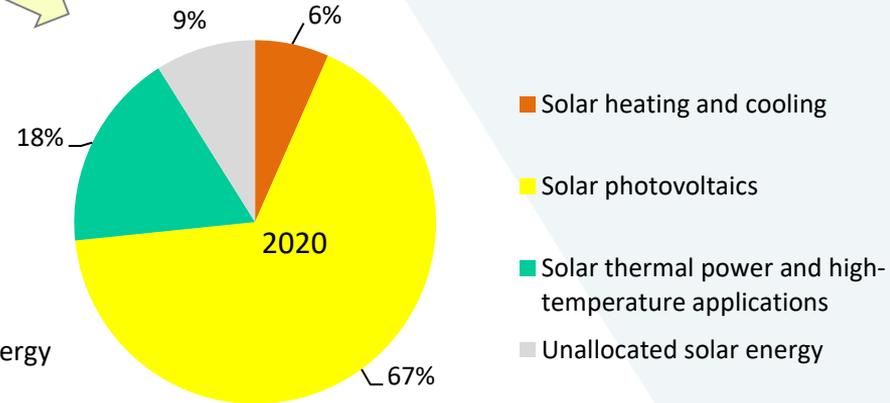
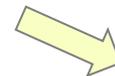


# Renewables



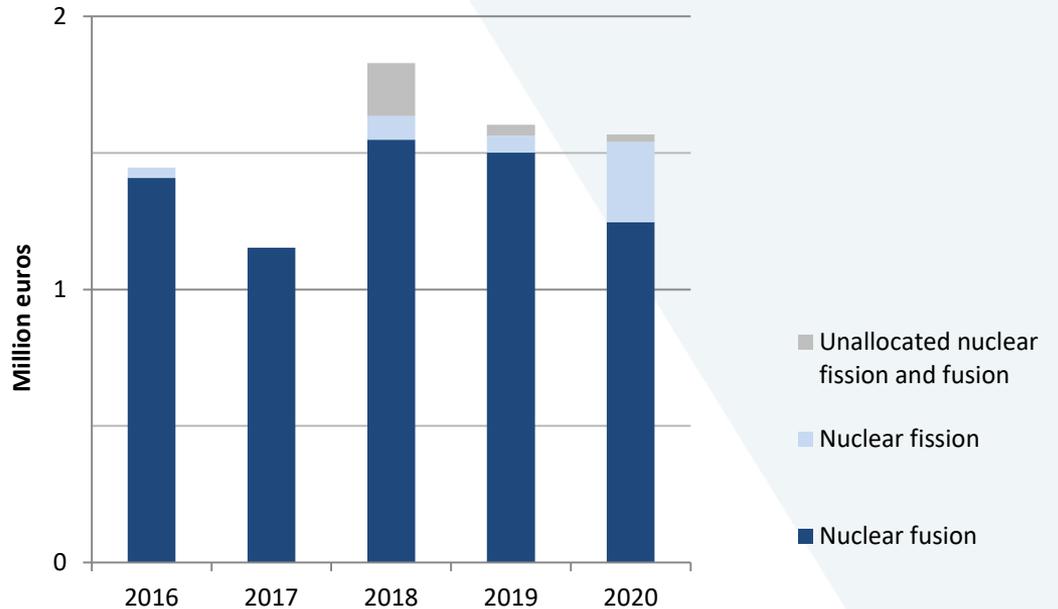
Energy RD&D 2020

-  Unallocated renewable energy sources
-  Solar energy
-  Wind energy
-  Biofuels
-  Geothermal energy
-  Hydroelectricity
-  Other renewable energy sources



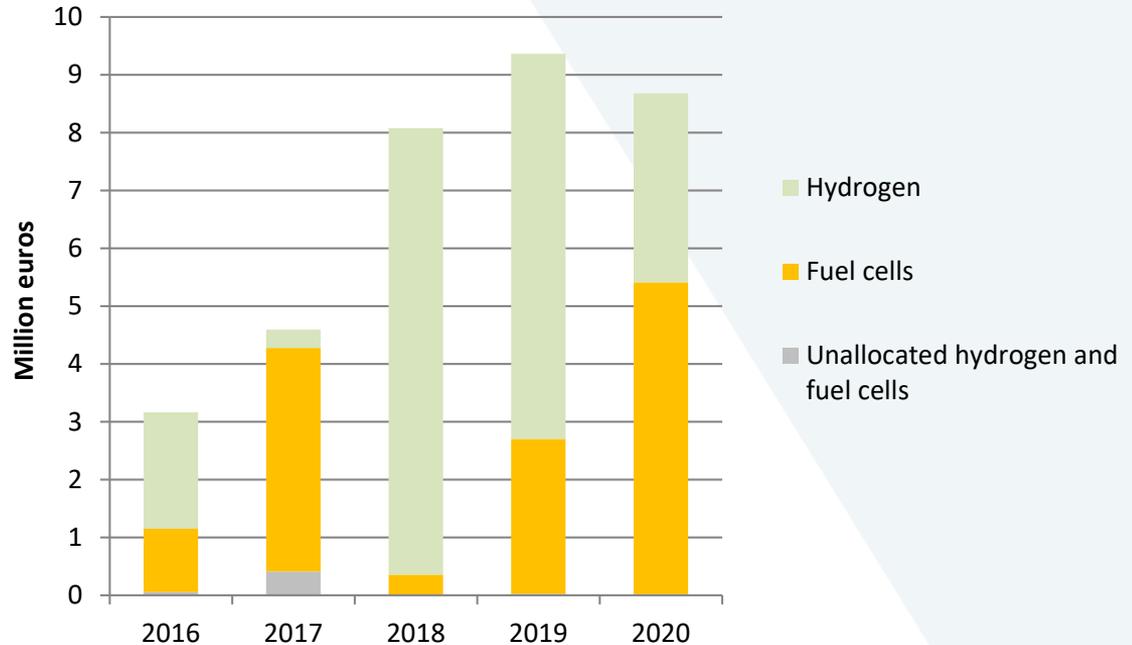
## Nuclear fission and fusion

- Projects in nuclear fusion are implemented primarily at universities under Fusion@ÖAW (ÖAW: Austrian Academy of Sciences) within the Horizon 2020 EUROfusion programme (started in 2014).
- Data only includes national financial contributions.



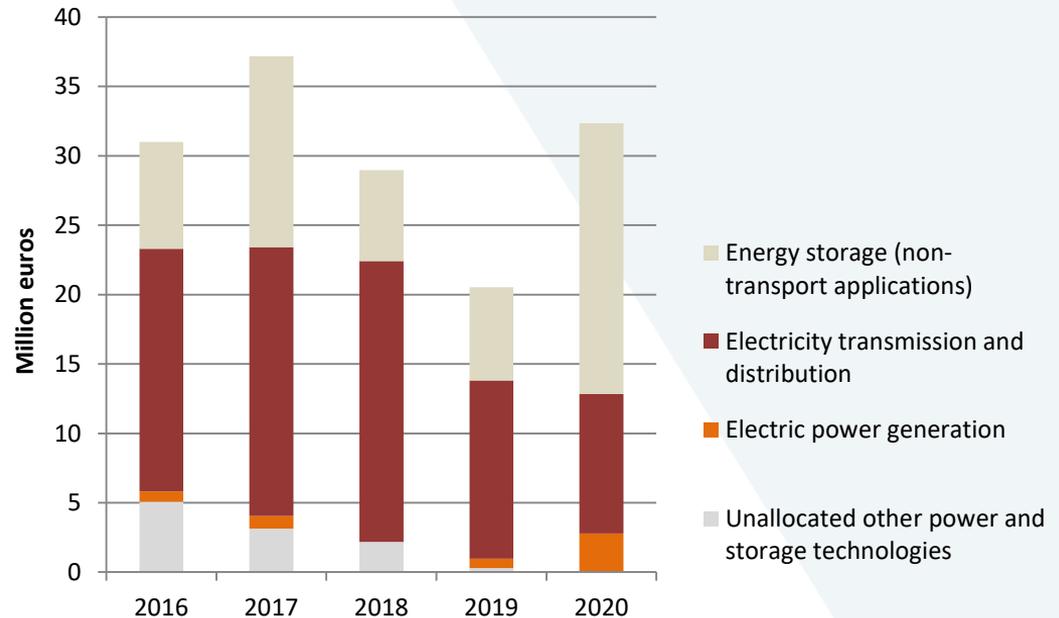
## Hydrogen and fuel cells

In 2020, expenditures amounted to 8.7 million euros (5.4 million euros for fuel cells and 3.3 million euros for hydrogen).



## Other power and storage

- Storage: strong increase up to 19.5 million euros (of which 7.7 million euros for stationary batteries)
- Transmission, distribution (including smart grids) declined to 10.1 million euros.



## Austrian Federal Ministries

**BMLFUW:** Agriculture, Forestry, Environment and Water Management (till 2017)

**BMWFW:** Science, Research and Economy (till 2017)

**BMNT:** Sustainability and Tourism (till 2019)

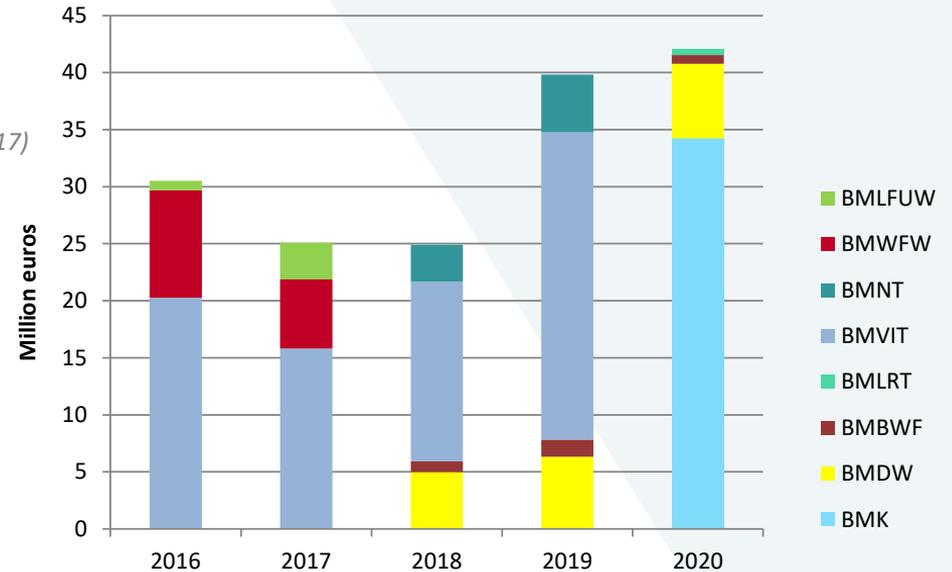
**BMVIT:** Transport, Innovation and Technology (till 2019)

**BMLRT:** Agriculture, Regions and Tourism (from 2020)

**BMBWF:** Education, Science and Research (from 2018)

**BMDW:** Digital and Economic Affairs (from 2018)

**BMK:** Climate Action, Environment, Energy, Mobility, Innovation and Technology (from 2020)



## Funding agencies for RD&D

Austria's national funding agencies assign the overwhelming share of financial resources to energy RD&D provided by federal budgets. In 2020, 103.3 million euros had been contracted via these institutions.

- The **Austrian Research Promotion Agency (FFG)** contracted 95.5 million euros, the main share of ministries' and the Climate and Energy Fund's budgets with additional bottom-up programmes for companies of 17.9 million euros.
- **Kommunalkredit Public Consulting (KPC)** administered 4.3 million euros for first-of-its-kind demonstration.
- The **Austrian Science Fund (FWF)** financed energy-related basic research with 2.3 million euros.
- **Austria Wirtschaftsservice (aws)** provided 1.2 million euros out of their seed financing programmes and the covid-funds.

## Equity capital for RD&D infrastructure

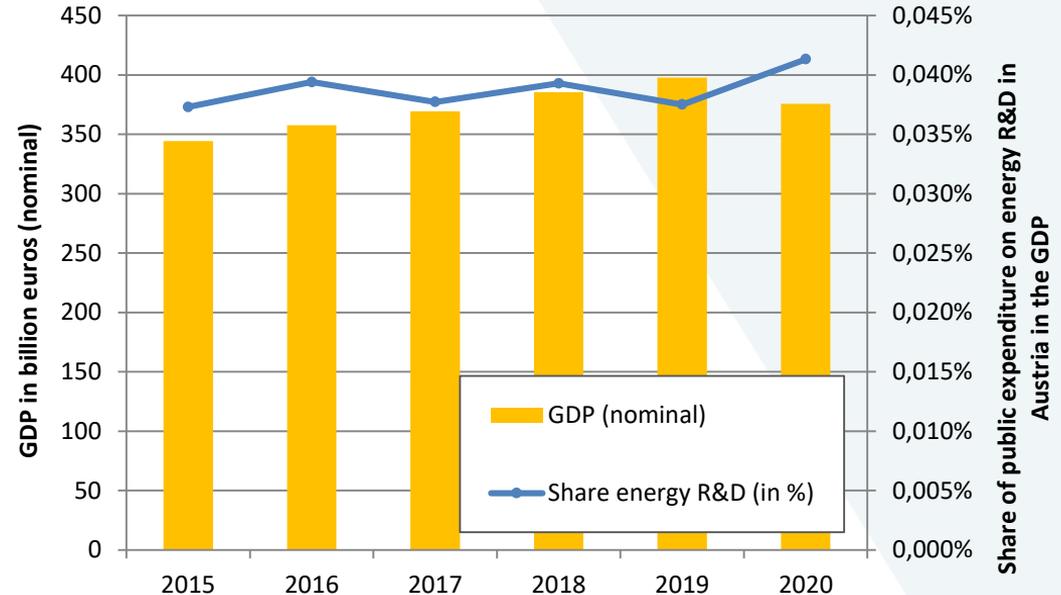
- The expenditures based on equity capital of the (non-university) research institutions provided by the government were 28.9 million euros; the predominant part of this sum was invested by the Austrian Institute of Technology (AIT).
- 8 out of 22 universities spent 12.7 million euros of equity capital in total (lead: TU Wien).
- The amount of 1.7 million euros of equity capital was invested by 5 (out of 21) universities of applied sciences (so-called “Fachhochschulen” or FH).

## Gender-specific project information

- In 2020, 38 out of 248 analysed projects (15.3%) were led by women, less than in the year before.
- In one-third of the analysed project portfolio, women are responsible for the technical or scientific part of at least one organisation in the consortium of the project, ore leading the consortium. The share of women in these leading positions in projects is 14.6%.
- On average, women as consortium leaders manage much smaller projects than their male colleagues.
- All these shares vary substantially between different programme lines and thematic areas.
- The gender-specific evaluation of project data shows that Austria certainly has some catching up to do in terms of the participation of women in energy research projects.

## Public energy RD&D expenditures in Austria per GDP

Due to a drop in GDP, caused by the corona-crisis, as well as higher expenditures for energy related R&D, the figure for this share increased to 0,041 % in 2020.



## Annual publication of data as full report

<https://nachhaltigwirtschaften.at/de/iea/publikationen/energieforschungserhebungen.php>  
(only available in German)

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