

# Energy R&D 2018

## Public Expenditures in Austria

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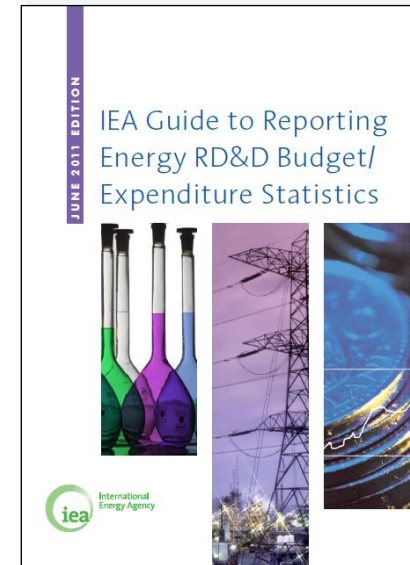
## About the survey

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



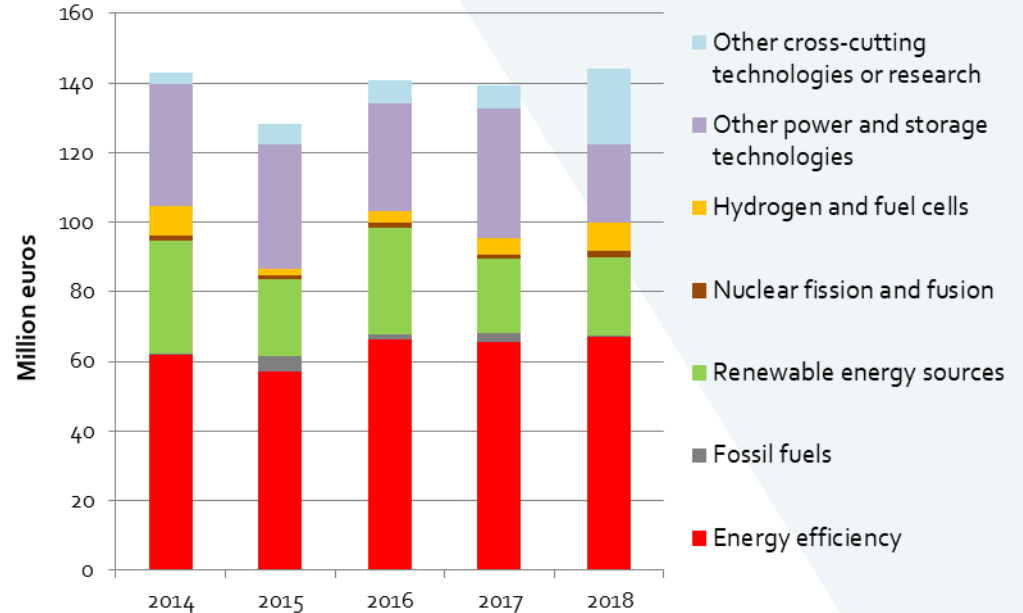
## About the method

- 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 2018) – not budgets!



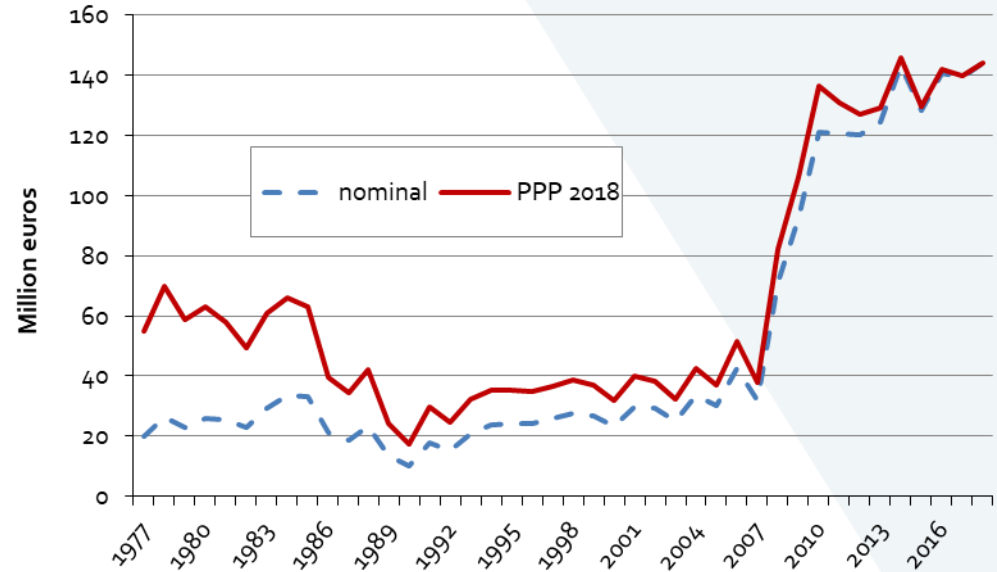
## Overview

- About 1,000 projects and activities of publicly funded energy-related RD&D registered in Austria.
- 2018: 144.1 million euros ...
- ... increasing the expenditures of 2017 by 4.7 million euros or 3.4%.



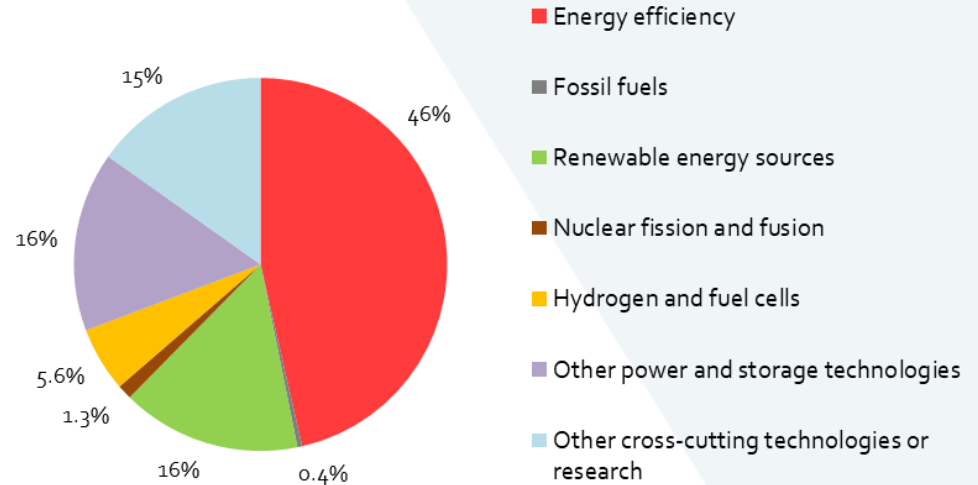
## Public energy R&D expenditures in Austria 1977–2018

During the last years, the high levels of R&D expenditures as experienced in the 1970s in consequence of the oil crises have (considering inflation-adjusted data) not only been reached again, but even more than doubled since 2010.



## Topics 2018

- Energy efficiency, smart grids & storage as well as renewables define the priorities of the publicly financed energy research in Austria.
- 2018 saw some large cross-cutting projects of the Austrian Climate and Energy Fund's "Flagship Region Energy", each addressing various sectors.



## Top ten sub-topics

Ranking 2018	Sub-topics	Expenditures 2018 (in million euros)
1	Hybrid and electric vehicles	19.3
2	Cross-cutting projects	18.3
3	Electricity transmission and distribution	13.7
4	Efficient residential and commercial buildings	11.5
5	Smart cities and communities	10.2
6	Energy efficiency in industry	8.8
7	PV	8.5
8	Biofuels	7.8
9	Hydrogen	7.7
10	Energy storage (excluding hydrogen, storage in vehicles and portable devices)	6.6

## Changes compared to 2017 – Topics

Topics according to IEA Code	Expenditures 2018 in euros	Changes compared to 2017 in euros	Changes compared to 2017 in %
Energy efficiency	66,863,650	+1,118,451	+1.7%
Fossil fuels	600,343	-1,759,511	-74.6%
Renewable energy sources	22,389,550	+1,033,373	+4.8%
Nuclear fission and fusion	1,829,147	+614,469	+50.6%
Hydrogen and fuel cells	8,079,027	+3,451,002	+74.6%
Other power and storage technologies	22,435,702	-14,765,413	-39.7%
Other cross-cutting technologies or research	21,866,602	+15,031,146	+220%
<b>Total</b>	<b>144,064,021</b>	<b>+4,723,517</b>	<b>+3.4%</b>



## Who financed energy research in 2018?



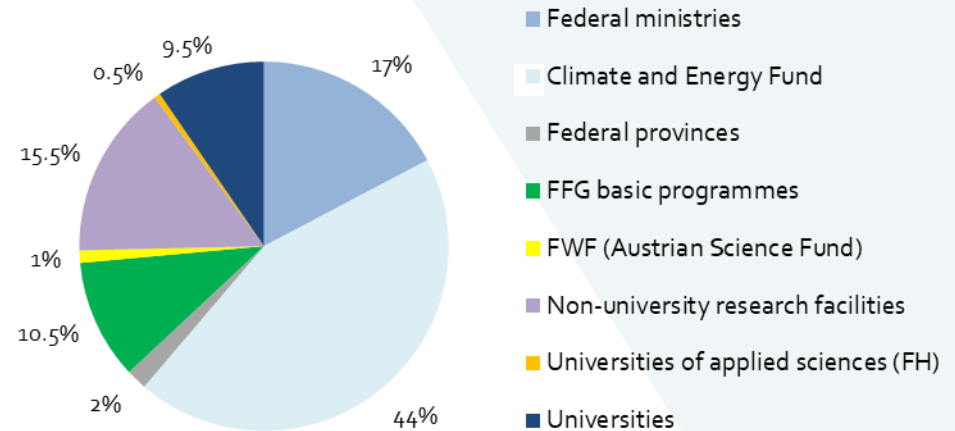
About 75% of this expenditure were provided by governmental authorities (federal, regional, funding organisations).



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

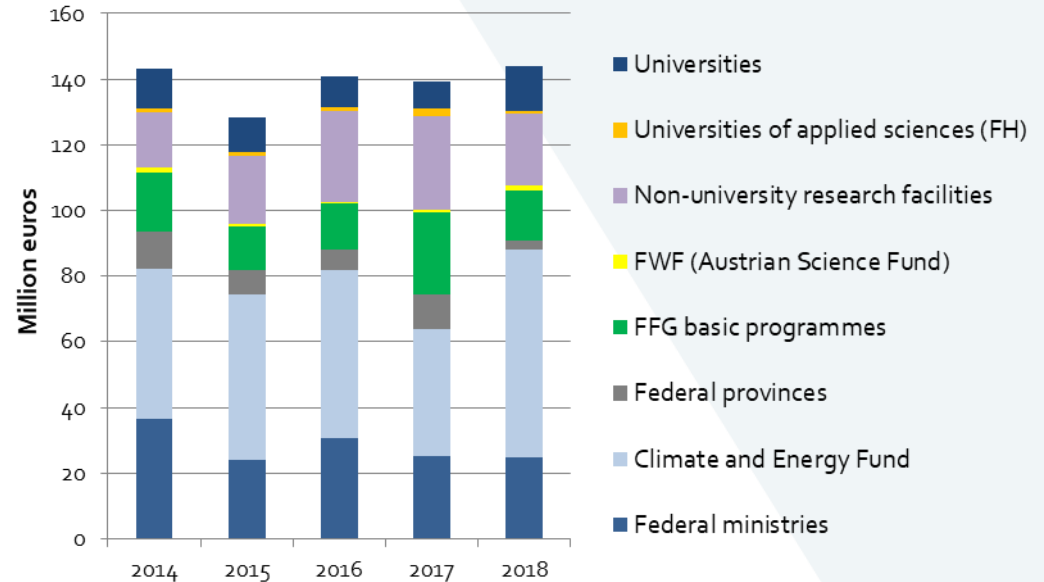


No third party financing or EU projects were covered in this survey.



## Institutions 2014–2018

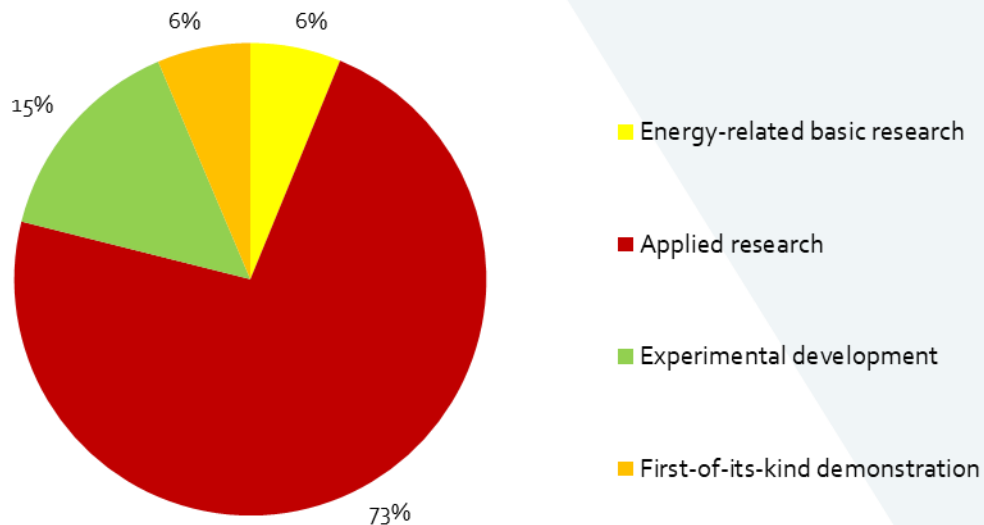
- The Climate and Energy Fund spent 63.3 million euros in 2018.
- The expenditures of the federal ministries totalled up to 24.9 million euros.



## Changes compared to 2017 – Institutions

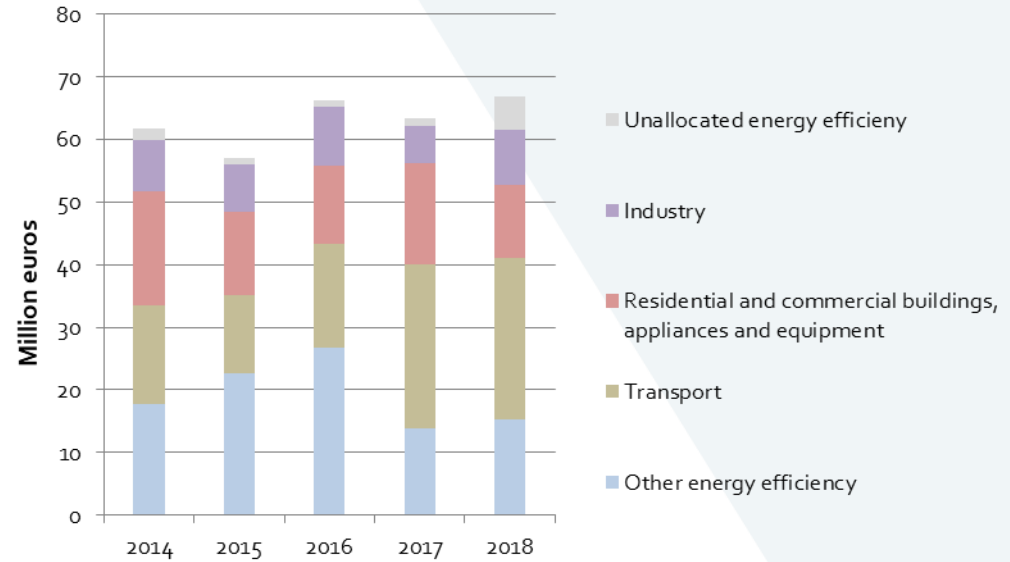
Institutions	Expenditures 2018 in euros	Changes compared to 2017 in euros	Changes compared to 2017 in %
Federal ministries	24,898,140	-204,506	-0.8%
Climate and Energy Fund	63,319,743	+24,621,066	+63.6%
Federal provinces	2,619,124	-7,920,553	-75.1%
FFG basic programmes	15,118,707	-9,881,530	-39.5%
FWF (Austrian Science Fund)	1,568,843	+546,066	+53.4%
Non-university research facilities	22,014,480	-6,141,400	-21.8%
Universities of applied sciences (FH)	761,092	-1,586,493	-67.6%
Universities	13,763,892	+5,290,867	+62.4%
<b>Total</b>	<b>144,064,021</b>	<b>+4,723,517</b>	<b>+3.4%</b>

## Areas of R&D 2018



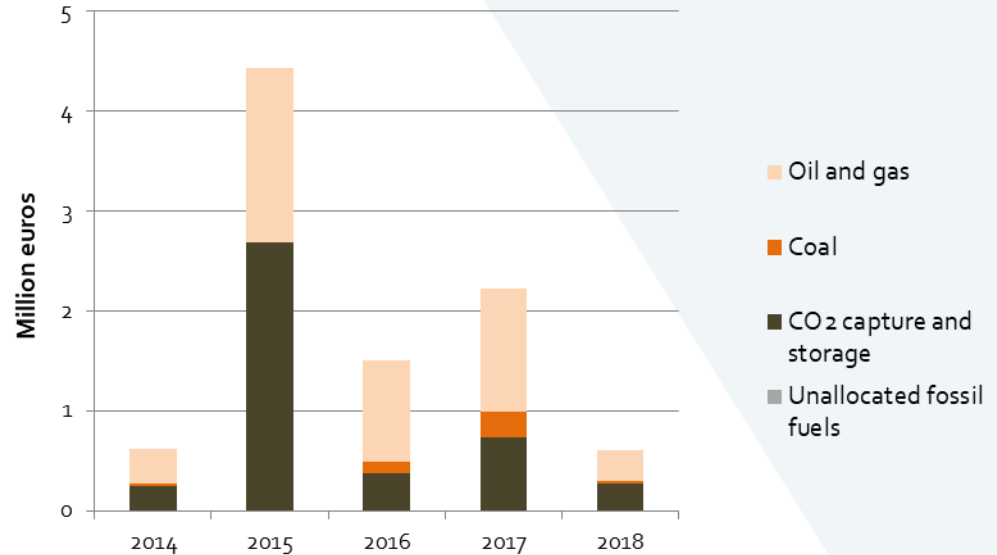
## Energy efficiency

- 66.9 million euros of the expenditures were used for the sector “energy efficiency” in 2018.
- 2017 and 2018: most activities in the sub-sector transport (focus on hybrid and electric vehicles)

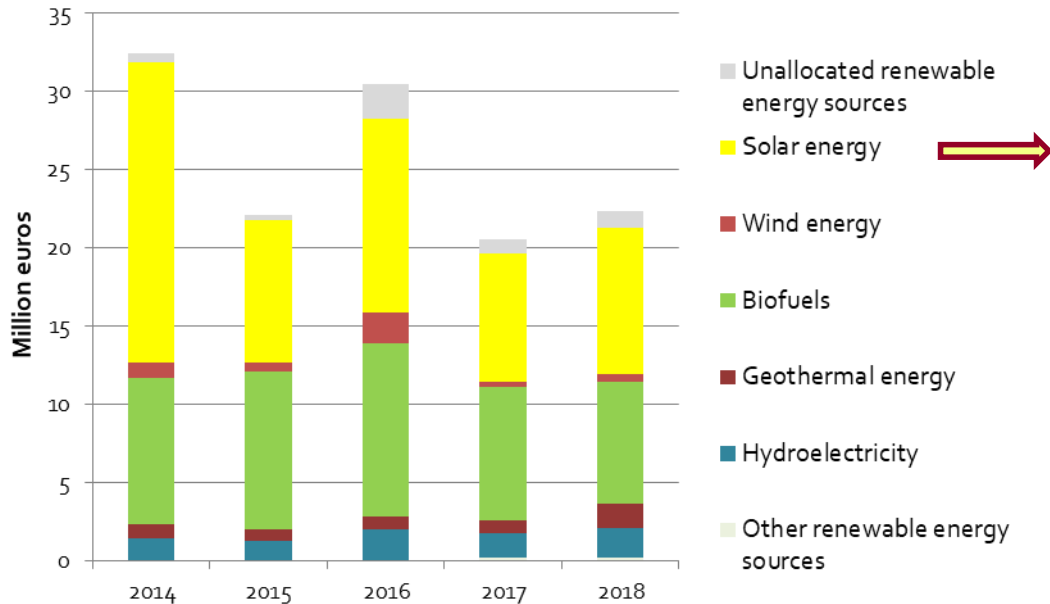


## Fossil fuels

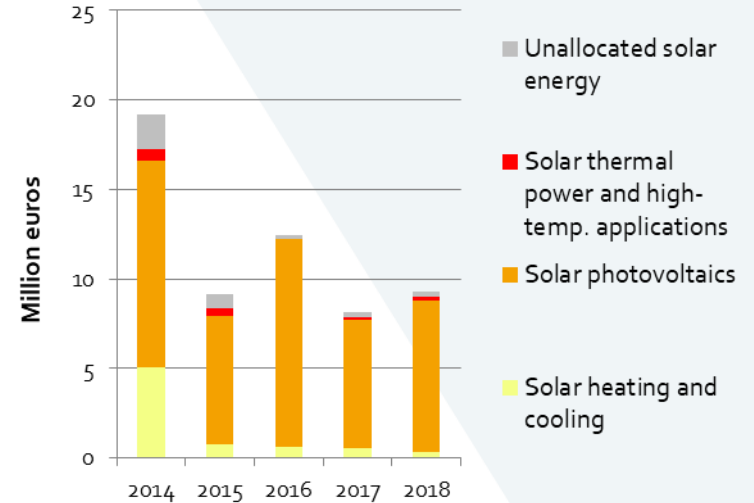
- 2018: substantial reductions in expenditures



## Renewables

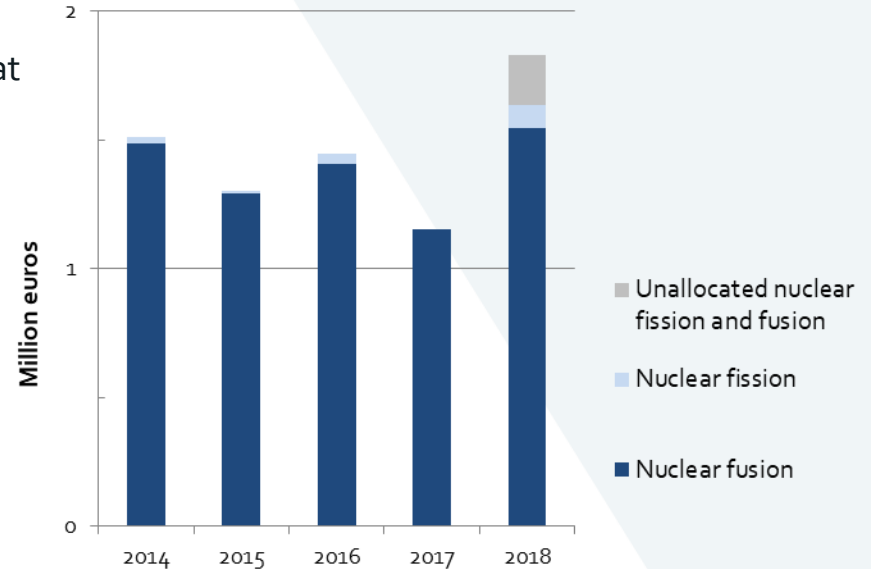


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## Nuclear fission and fusion

- 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.

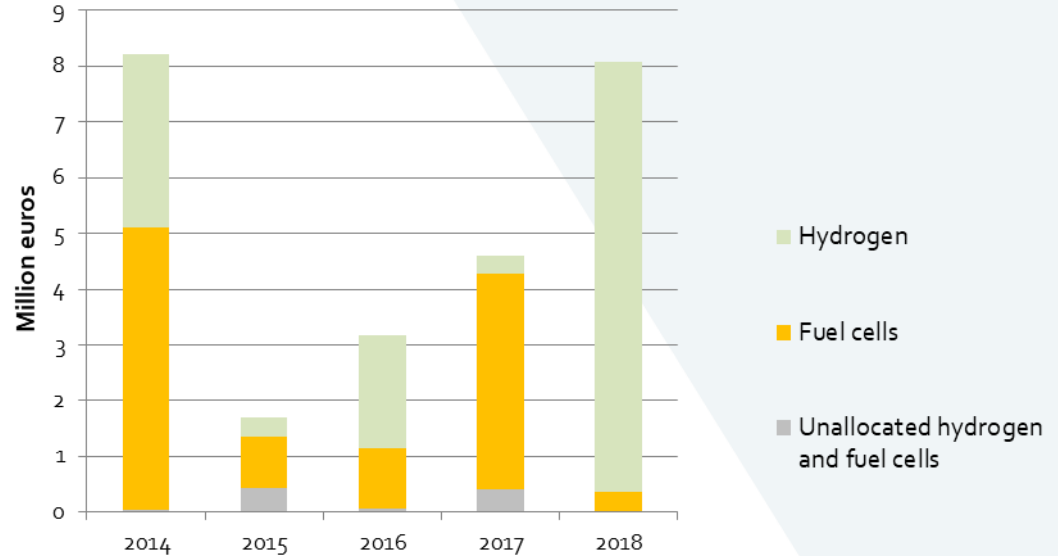




## Hydrogen and fuel cells

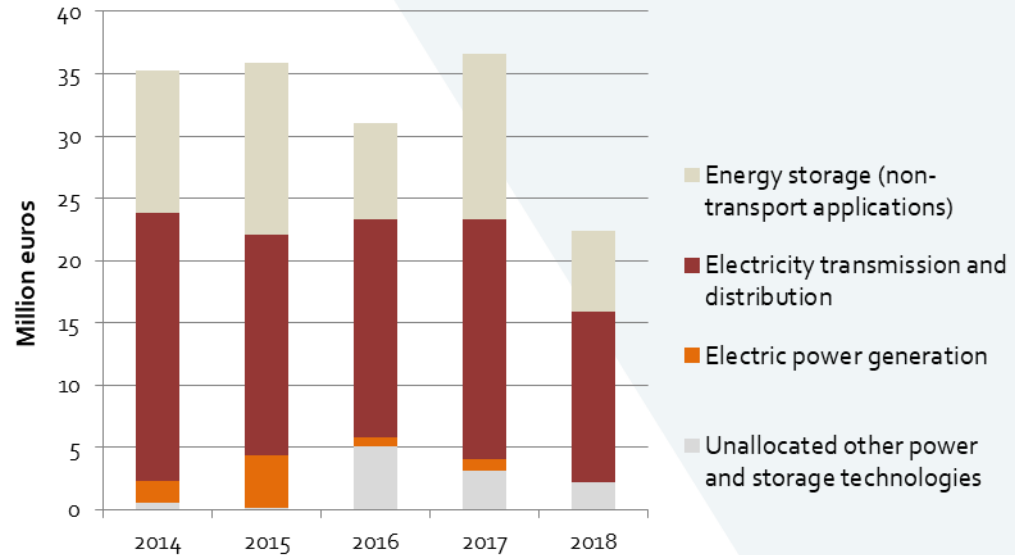
In 2018, clear switch of priorities compared to 2017:

- Substantial decrease in fuel cell activities
- Strong increase in hydrogen R&D



## Other power and storage

- Smart grids as well as storage technologies saw considerable reductions in 2018.
- Material shift to multi-sector projects expected (listed in another category, under “Other cross-cutting...”)



## Austrian Federal Ministries

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

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

**BMNT:** Sustainability and Tourism

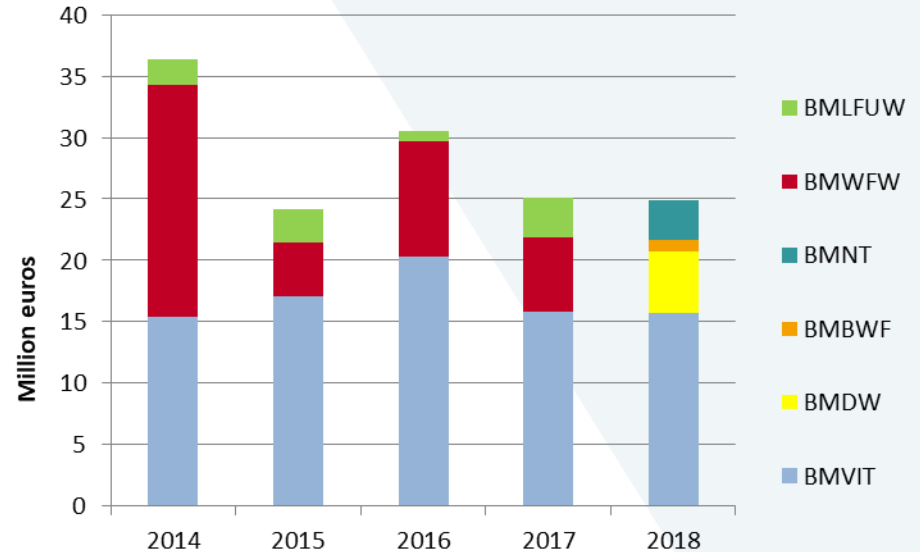
**BMBWF:** Education, Science and Research

**BMDW:** Digital and Economic Affairs

**BMVIT:** Transport, Innovation and Technology

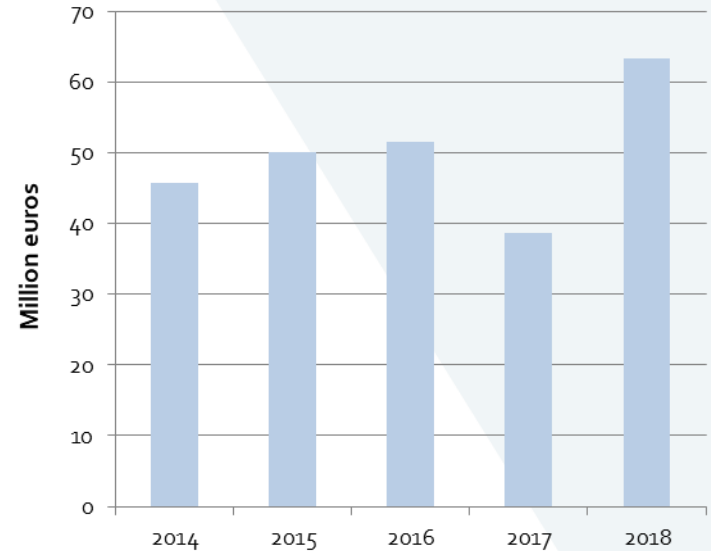
Expenditures of the Climate and Energy Fund, bottom-up programmes of FFG and the Austrian Science Fund (FWF) are not included, but shown separately.

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## Climate and Energy Fund

- Due to several energy research programmes, the Climate and Energy Fund spent 63.3 million euros in 2018.
- Both a substantial increase compared to 2017 as well as the highest amount since the fund's start in 2007.
- The Climate and Energy Fund is the institution which has annually provided the highest amount of finance for energy R&D since its beginnings.



## Funding agencies for R&D

Austria's national funding agencies assign the overwhelming share of financial resources to energy R&E provided by federal budgets. In 2018, 101.6 million euros had been contracted via these institutions.

- The **Austrian Research Promotion Agency (FFG)** contracted 96.4 million euros, the main share of ministries' budgets with additional bottom-up programmes for companies of 15 million euros.
- The **Austrian Science Fund (FWF)** financed energy-related basic research with 1.6 million euros.
- **Kommunalkredit Public Consulting (KPC)** administered 2.5 million euros.
- **Austria Wirtschaftsservice (aws)** provided 0.5 million euros out of their seed financing programme.

## Equity capital for R&D infrastructure

- The expenditures based on equity capital of the (non-university) research institutions provided by the government were 22 million euros; the predominant part of this sum was invested by the Austrian Institute of Technology (AIT).
- The universities spent 13.8 million euros of equity capital in total.
- The amount of 0.8 million euros of equity capital was invested by the sector of universities of applied sciences (so-called “Fachhochschulen” or FH).

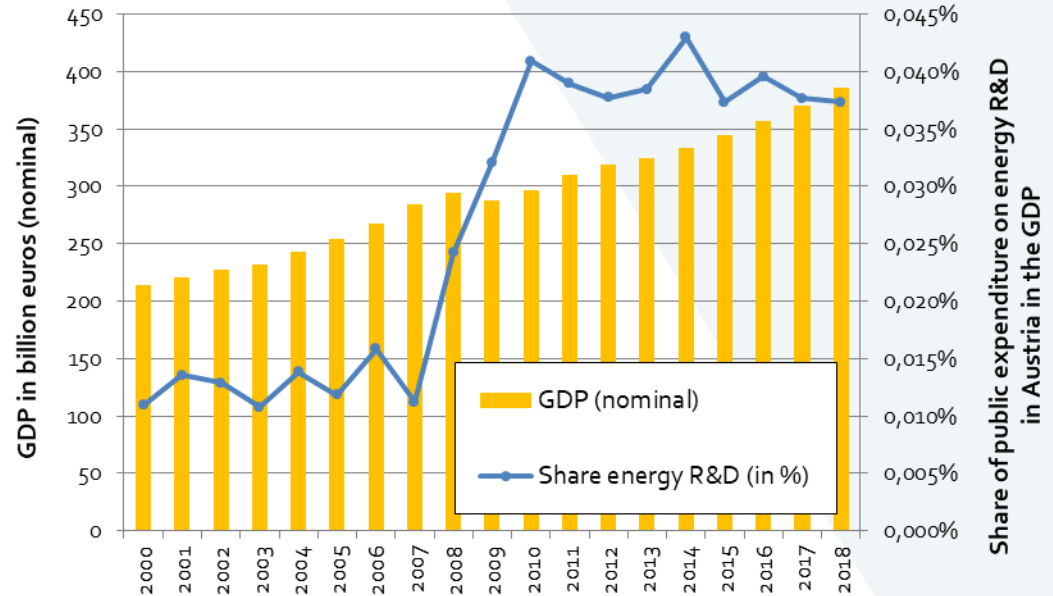
## Gender-specific project information

Data of 210 projects in 2018 with a total funding volume of 93.2 million euros show the following results:

- The share of women responsible for the technical or scientific part of work of each partner in a consortium is 13%.
- 30 consortia are led by women (14%).
- Female leaders of consortia are responsible for projects with a share of 16.5% in total fund.

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

- Stable level below 0.04% with a decreasing trend over the last nine years
- Higher priority for energy R&D (establishment of the Climate and Energy Fund, etc.) between 2007 and 2010





## Annual publication of data as full report

<https://nachhaltigwirtschaften.at/de/iea/publikationen/schriftenreihe-2019-19-energieforschungserhebung-2018.php> (only available in German)

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