

# Energy R&D Public Expenditure in Austria 2013

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Survey carried out by the Austrian Energy Agency  
on behalf of the Federal Ministry of Transport, Innovation and Technology  
July 2014

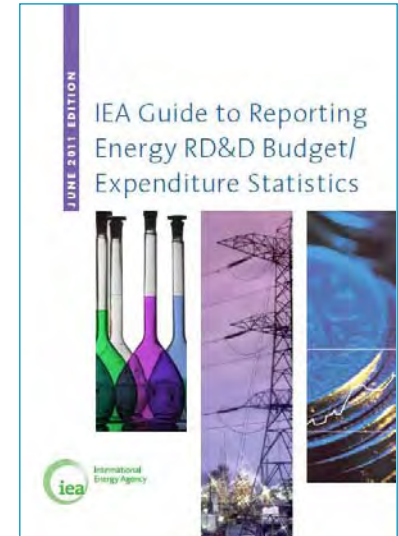
## About the Survey

- Being a member of the International Energy Agency (IEA), Austria is obliged to yearly record all energy related research, development and first-of-its-kind demonstration projects carried out in Austria and supported resp. 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.
- This annual survey is not only an international obligation but also allows emphasizing the importance of the energy research for Austria as well as creating and checking policy goals.
- This survey has been carried out annually since 1974.



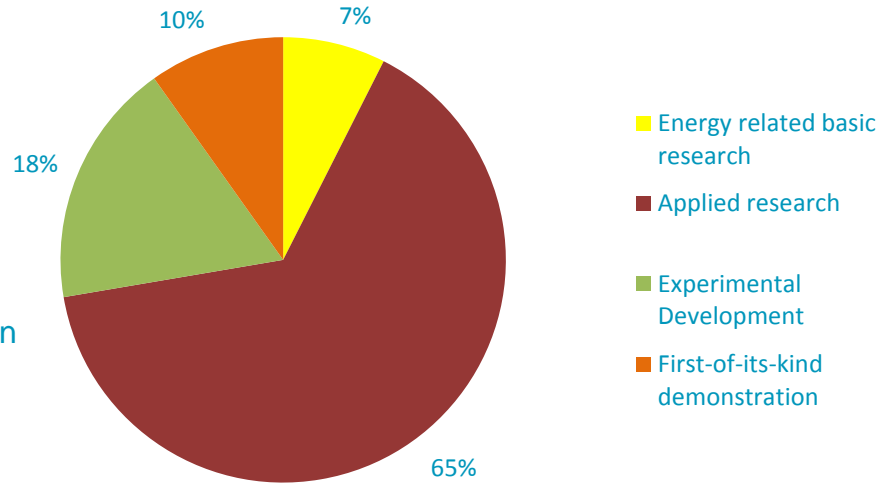
## About the method

- International standards set by IEA Guide to Reporting Energy RD&D Budget/Expenditure Statistics (June 2011) and OECD (Frascati manual).
- Data for Austria shows real expenditures (primarily obligations, that were actually committed during the year 2013) - no budgets!
- Some 1,100 energy research projects and activities have been registered and analyzed for the year 2013.
- Annual publication of data as full report.



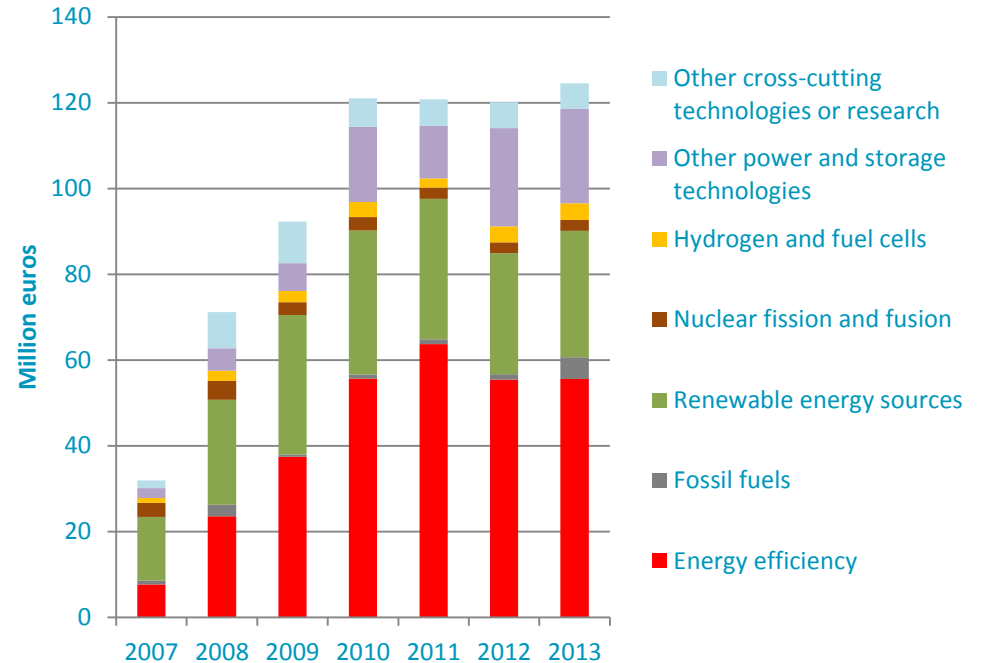
## Type of energy RD&D

- About 65% of the means were used for applied research (TRL 2 - 3).
- 18% for experimental development (TRL 4 - 6).
- First-of-its-kind demonstration (TRL 7 - 8) included in the data since 2011, amounted to 10% in 2013.
- Basic research (TRL 1 - 2) represented a small yet very important portion of 7%.



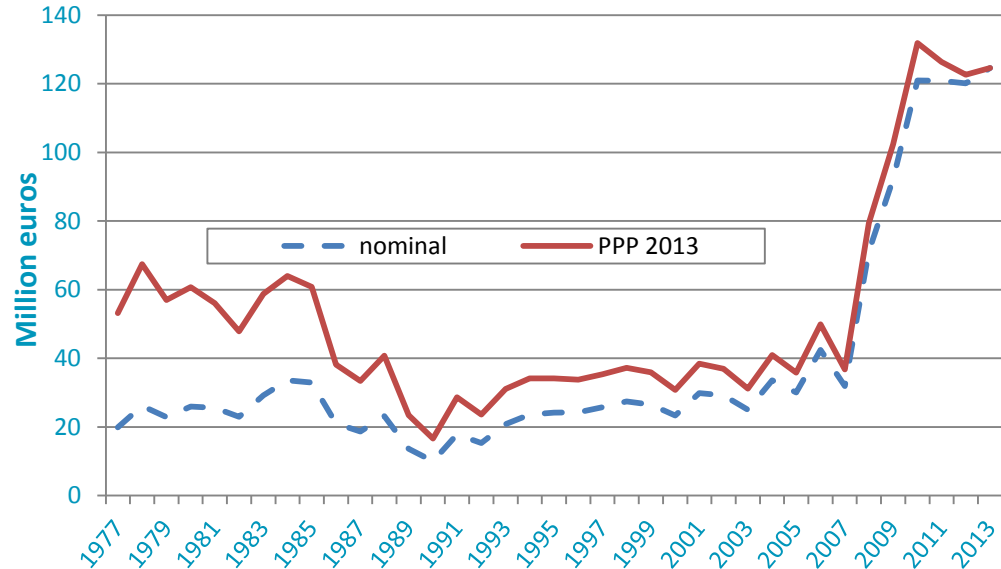
## Overview

- In 2013, Austria's public expenditure for energy-related research and development amounted to 124,545,848 euros, increasing the expenditures of 2012 by 3.7%
- The research areas of energy efficiency, renewables, smart grids and storage define the priorities of the publicly financed energy research within Austria.



## Public energy R&D expenditure in Austria 1977–2013

- During the last years, the high levels of R&D expenditure as experienced in the 1970s in consequence of the oil crises have (inflation-adjusted) again been reached and were even doubled since 2010.



## Who was financing?



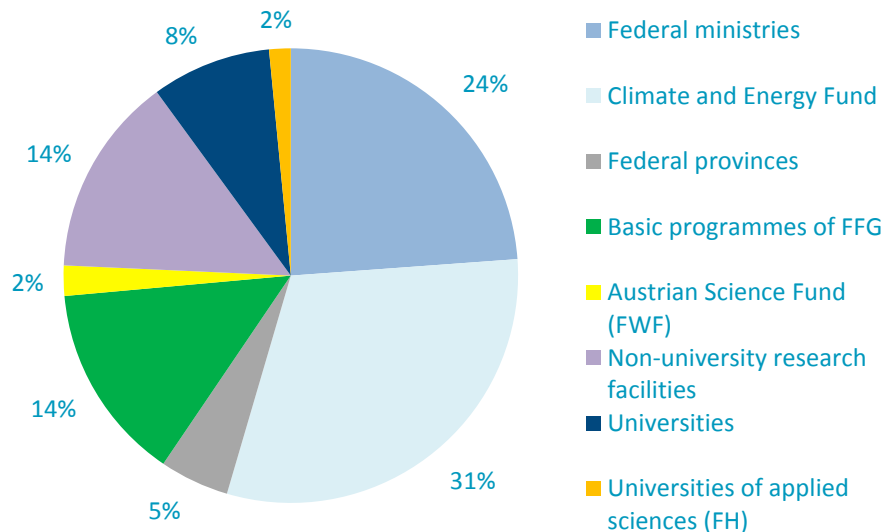
- About three quarters of this expenditure were provided by governmental authorities (federal, regional, funding organizations).



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

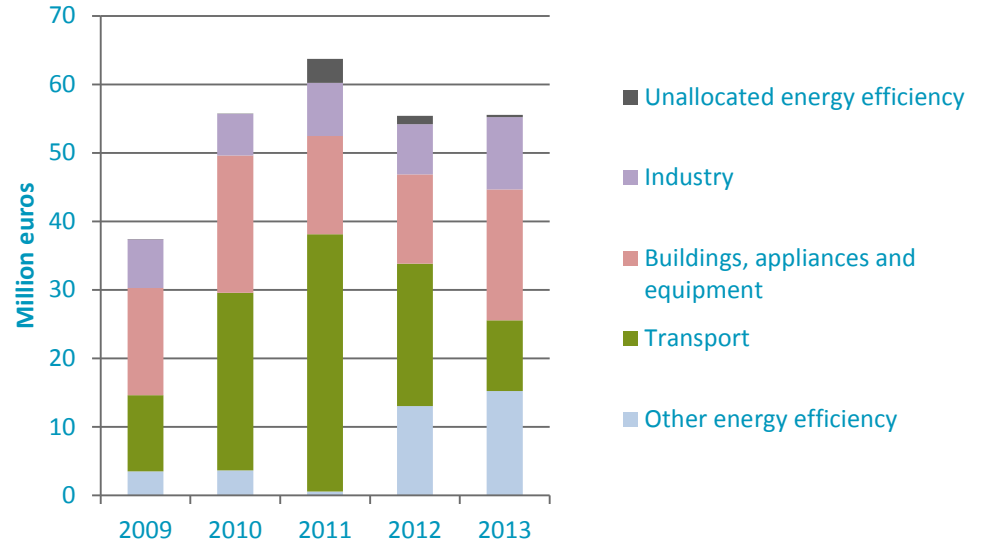


- No third party financing or EU projects were covered in this survey.



## Energy Efficiency

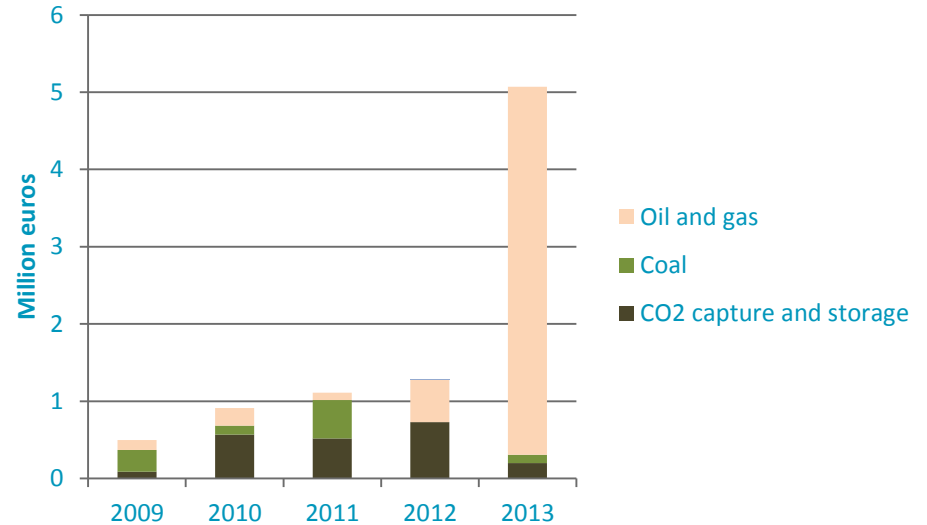
- Strong decrease in transport, focus 2013 on electric vehicle infrastructure.
- Increase in Buildings,...
- Other energy efficiency: substantial activities in RD&D in communities and smart cities.





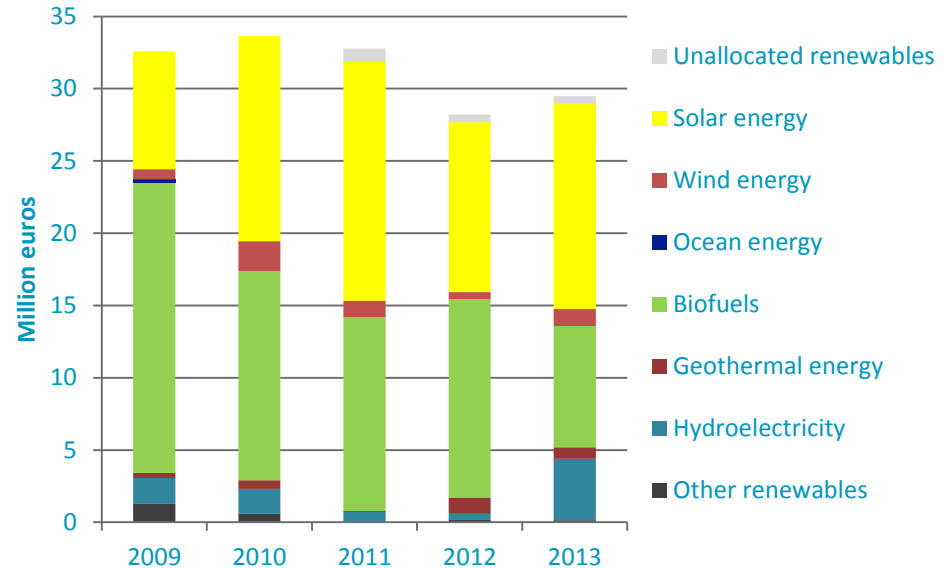
## Fossil Fuels

- 2013 RD&D activities primarily in the sector „Oil and gas **combustion**“.

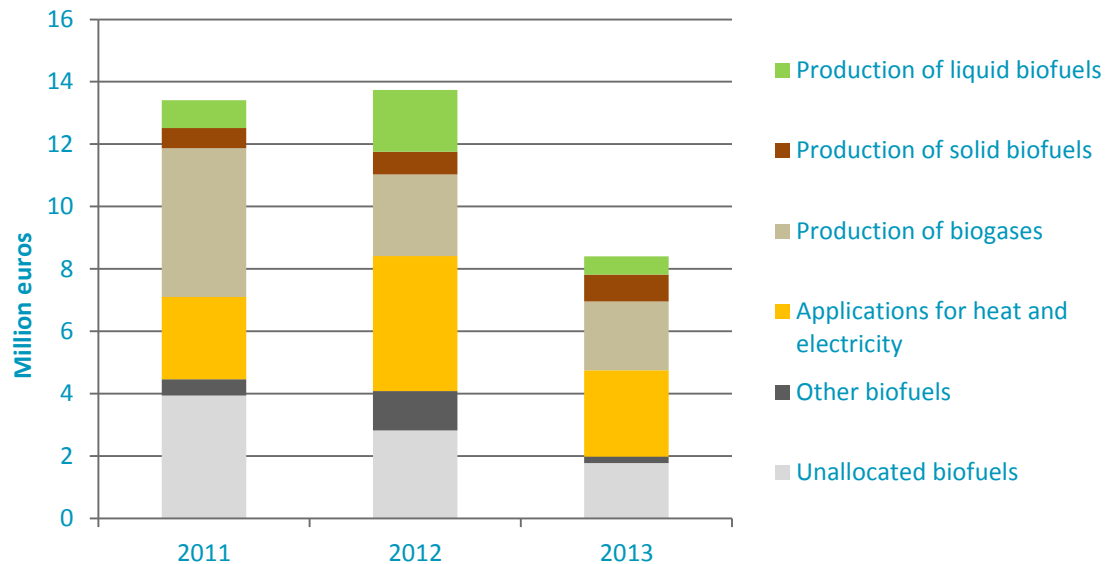


## Renewable energy sources

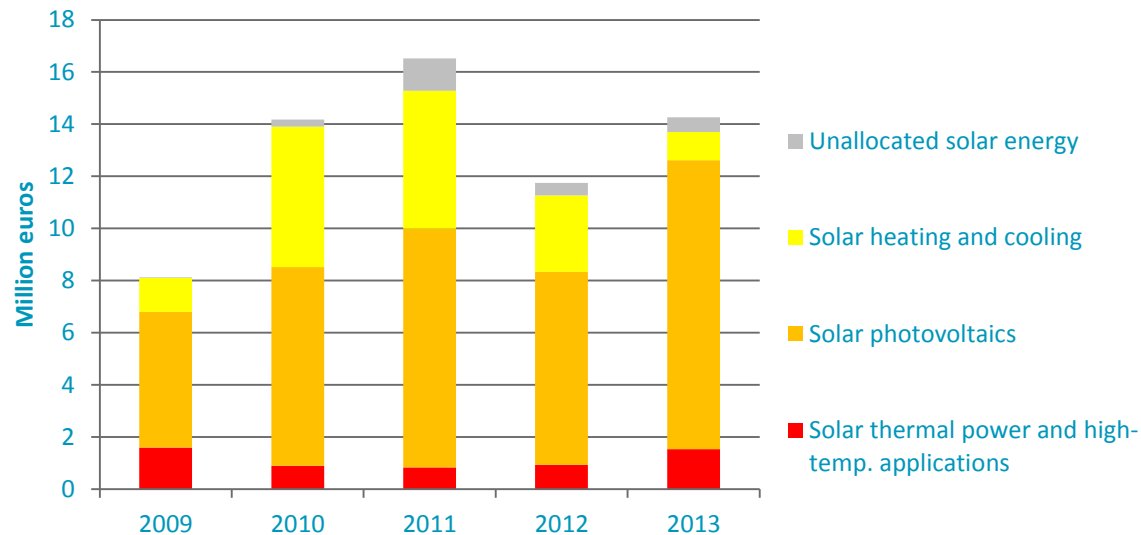
- Broad technology portfolio in renewable energy technologies has replaced biofuel-focus.
- Solar portfolio with a focus on PV.
- 2013: strong increase in hydroelectricity.



## Biofuels

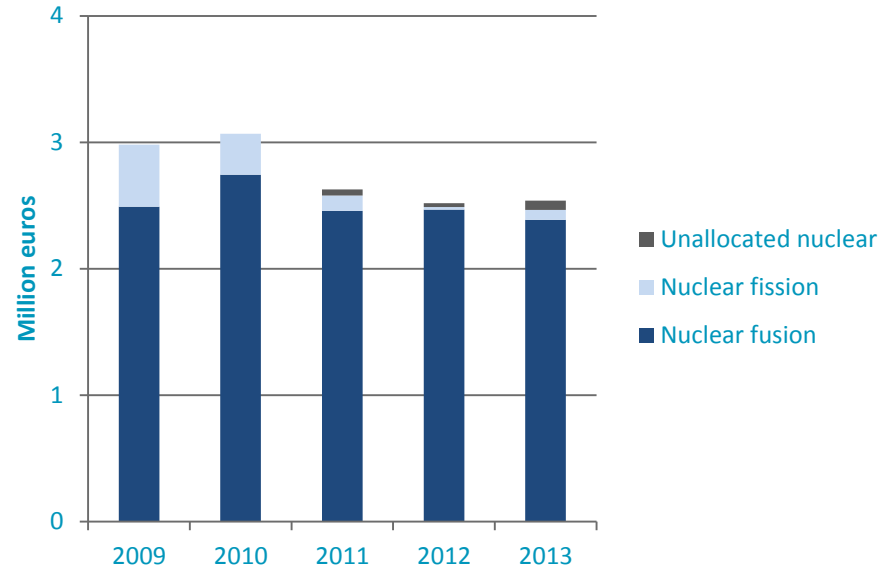


## Solar energy



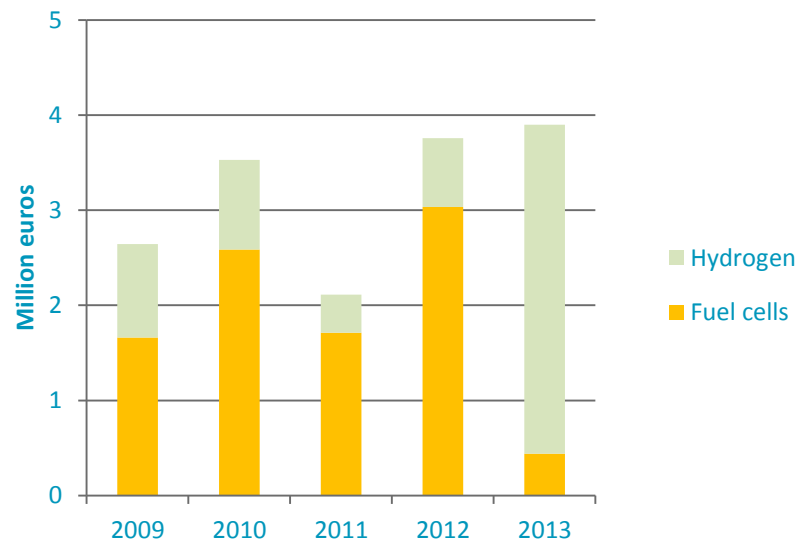
## R&D nuclear fission and fusion

- Projects in nuclear fusion are carried out primarily at universities under the association of EURATOM and the Austrian Academy of Sciences.
- R&D in nuclear fission on low financial level: waste management, environmental protection and plant safety.



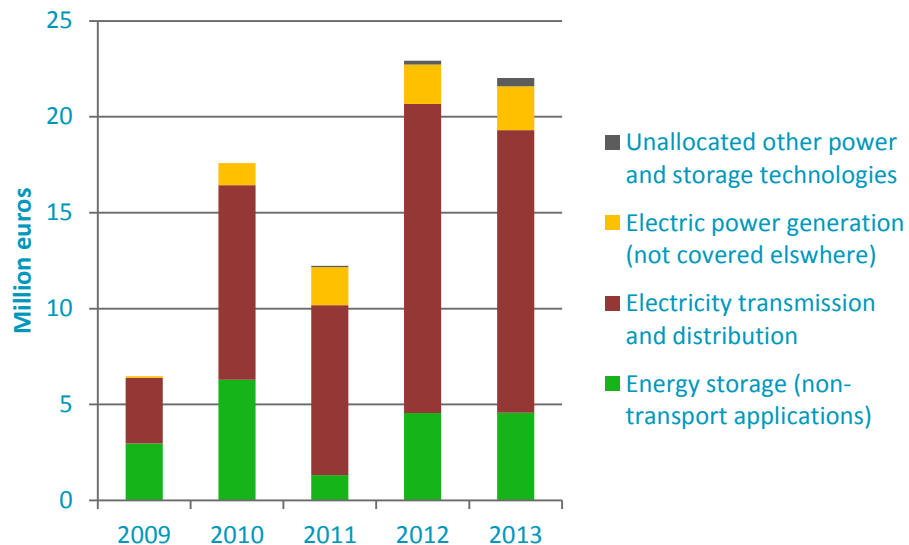
## Hydrogen and fuel cells

- 2012: RD&D focussing on fuel cells.
- 2013: RD&D focus on production of hydrogen (primarily financed by the Climate and Energy Funds).



## Other power and storage technologies

- Focus on electricity grids: 14.7 million euros (financed by AIT, federal ministries and bottom-up instruments of FFG)
- 2.5 million euros each for thermal and electricity storage (financed by Climate and Energy Funds, universities and federal ministries)

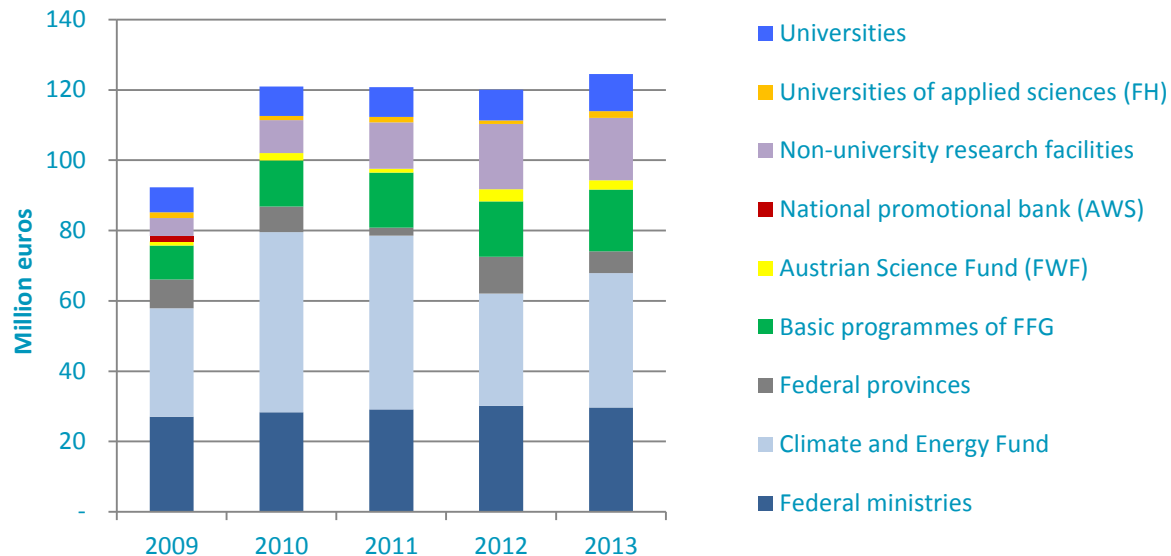


## Subcategories with the highest expenditures in 2013 (in million euros)

- Efficient residential and commercial buildings (about 16)
- Electricity transmission and distribution (14.8)
- PV (11.1)
- Energy efficiency in industry (techniques, processes, equipment and systems; 10.6)
- Communities, smart cities (10)
- Bioenergy (8.4)
- Hybrid and electric vehicles (7.6)
- Energy storage (non-transport applications; 4.8)
- Hydropower (4.3)
- Production and storage of hydrogen (3.5)



## Institutions financing RD&D (1)

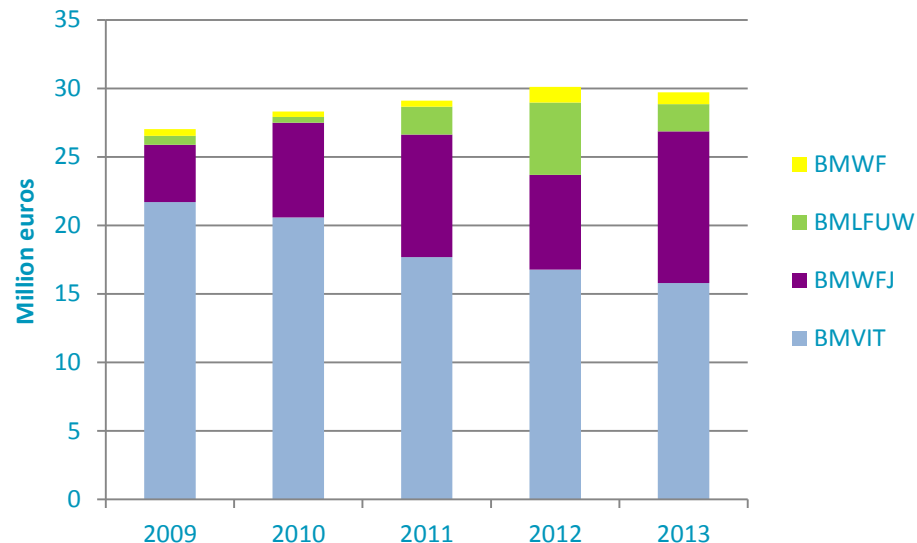


## Institutions financing RD&D (2)

- The expenditures of the federal ministries, either directly or via programs within their fields of responsibility (excluding the Climate and Energy Fund), totaled up to 29.7 million euros, with the Federal Ministry of Transport, Innovation and Technology investing more than half of this amount.
- The Climate and Energy Fund spent 38.2 million euros, substantially more than last year's expenditure.
- Total expenditures of the 9 federal provinces dropped down to 6.1 million euros (a minus of 41% in one year).
- The expenditure of the (non-university) research institutions was 17.7 million euros; about 92% of this sum was invested by the Austrian Institute of Technology – AIT.
- The universities spent 10.6 million euros in total with equity capital. Lead: Vienna University of Technology.
- The amount of 1.9 million euros was invested by the sector of universities of applied sciences (Fachhochschulen, FH) with equity capital.

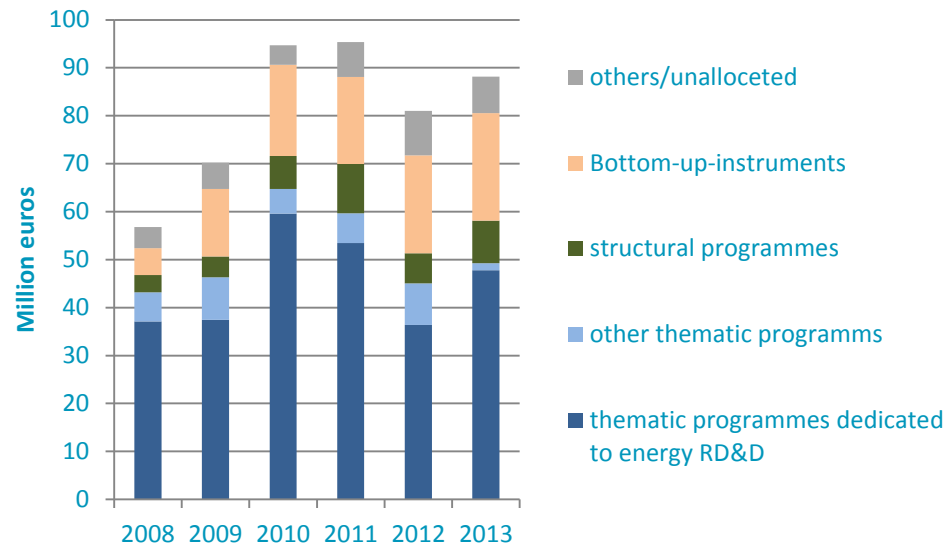
## Federal ministries

- BMWF: Austrian Federal Ministry for Science and Research (OLD)
- BMLFUW: Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management
- BMWFJ: Austrian Federal Ministry of Economy, Family and Youth (OLD)
- BMVIT: Austrian Federal Ministry for Transport, Innovation and Technology
- *New in 2014: Austrian Federal Ministry of Science, Research and Economy (BMWFW)*
- Expenditures of the Climate and Energy Fund, bottom-up programmes of FFG and the Austrian Science Fund (FWF) not included.



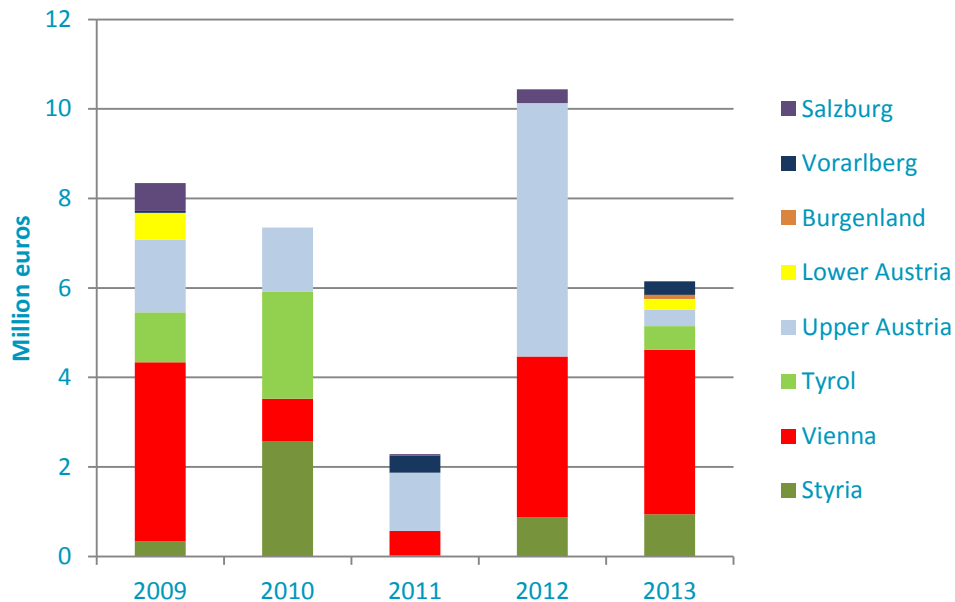
## RD&D-Instruments financed on federal level

- Key role of thematic programmes dedicated to energy RD&D of the Climate and Energy Fund and BMVIT.
- Substantial decrease in 2012 only partly recovered in 2013.



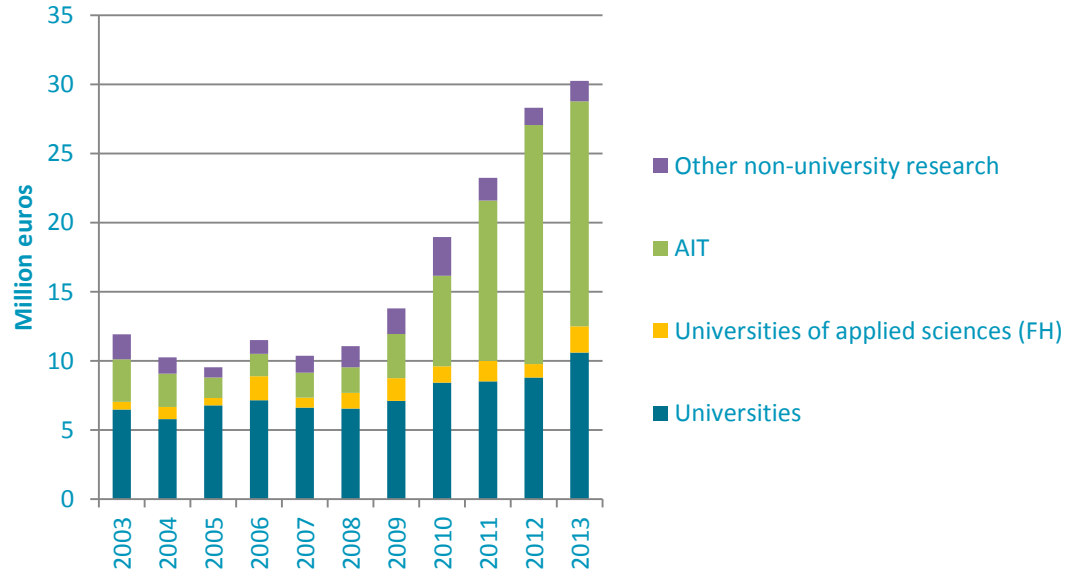
## Federal provinces

- High volatility of expenditures of individual federal provinces.

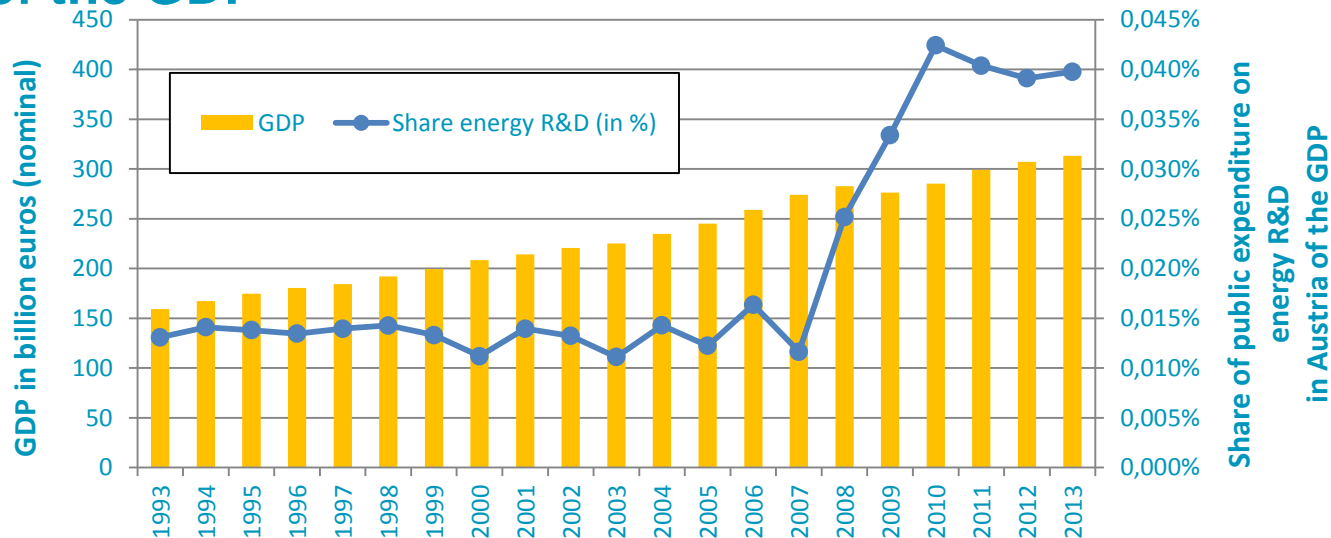


## Equity capital (basic financing) for R&D-infrastructure

- Substantial development of financing of research infrastructure with equity capital only at Austrian Institute of Technology – AIT.
- Sector heavily dependent on third-party financing (industry, project-based, EU-framework programmes).



## Share of public expenditure on energy R&D in Austria of the GDP



## Publications

- Andreas Indinger, Marion Katzenschlager, Energieforschungserhebung 2012 – Ausgaben der öffentlichen Hand in Österreich. In: BMVIT (Hrsg.) Schriftenreihe 27/2014
- Andreas Indinger, Marion Katzenschlager, Energieforschungserhebung 2012 – Ausgaben der öffentlichen Hand in Österreich. In: BMVIT (Hrsg.) Schriftenreihe 38/2013
- Andreas Indinger, Marion Katzenschlager, Energieforschungserhebung 2011 – Ausgaben der öffentlichen Hand in Österreich. In: BMVIT (Hrsg.) Schriftenreihe 55/2012
- Andreas Indinger, Marion Katzenschlager, Energieforschungserhebung 2010 – Ausgaben der öffentlichen Hand in Österreich. In: BMVIT (Hrsg.) Schriftenreihe 47/2011

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