

## Public expenditures for energy R&D in Austria 2009

### Summary

A. Indinger, M. Katzenschlager

Berichte aus Energie- und Umweltforschung

# 74b/2010

**Imprint:**

Owner and Publisher:

Austrian Federal Ministry for Transport, Innovation and Technology  
Radetzkystraße 2, A-1030 Vienna, Austria

Responsibility and Coordination:

Division for Energy and Environmental Technologies  
Head: Michael Paula

<http://www.nachhaltigwirtschaften.at>

# Public expenditures for energy R&D in Austria 2009

## **Summary**

DI Andreas Indinger  
Marion Katzenschlager

Austrian Energy Agency

Vienna, October 2010



## Energy R&D Public Expenditure in Austria 2009

### Summary

Membership of the International Energy Agency (IEA) obligates Austria to report on an annual basis all publicly financed energy research and development projects. The Austrian Energy Agency has been allocated the task of compiling and analyzing the relevant data by the Austrian Ministry for Transport, Innovation and Technology (BMVIT). This survey fulfils not only international requirements but also shows the importance of energy research in Austria and helps to set and test policy goals as well as to recognize respective trends at an early stage.

The following report is structured according to the requirements of the IEA and the standards of the Frascati-Manuals (2002, OECD).

In 2009, Austrian public expenditure for energy-related research amounted to 92,268,114 EUR, thus rising by about 30% (21.1 million EUR) in comparison to the previous year (2008). Diagram 1 shows the annual expenditure since 1977. Inflation-adjusted, expenditure in the last two years by far exceeds the post 70's oil crisis.

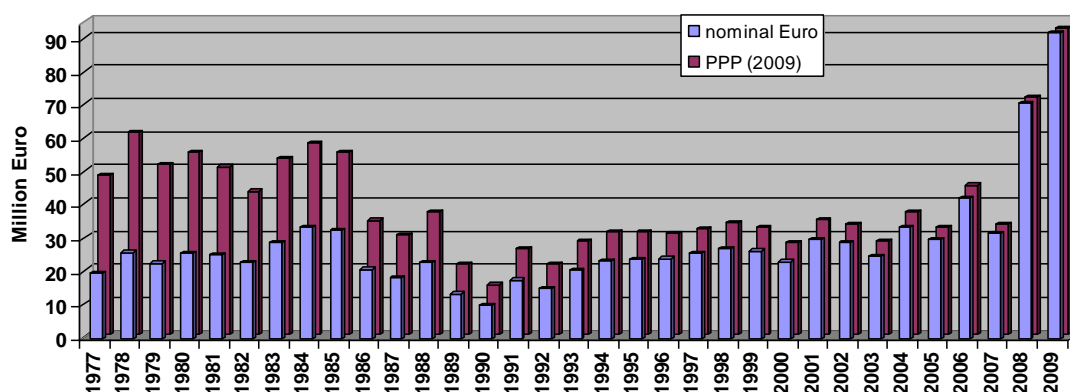


Diagram 1: Annual development of public expenditure on R&D into energy 1977 to 2009

The fields of expenditure are shown in the following table. Last year all areas, excluding fossil fuels and nuclear energy, showed substantial increase. Particularly significant, with an increase of 13.9 million EUR, is the energy efficiency sector.

Table 1: Changes in comparison to 2008 – Topics according to IEA-Code (2009)

|  | <b>Expenditure<br/>2009 in EUR</b> | <b>2009 vs 2008<br/>in EUR</b> | <b>2009 vs 2008<br/>in%</b> |
|--|------------------------------------|--------------------------------|-----------------------------|
| Energy efficiency                            | 37,434,226                         | +13,903,552                    | +59%                        |
| Fossil fuels                                 | 495,923                            | -2,213,716                     | -82%                        |
| Renewable energy sources                     | 32,569,399                         | +8,104,733                     | +33%                        |
| Nuclear fission and fusion                   | 2,981,261                          | -1,471,812                     | -33%                        |
| Hydrogen and fuel cells                      | 2,643,800                          | +275,677                       | +12%                        |
| Other power and storage technologies         | 6,481,875                          | +1,286,590                     | +25%                        |
| Other cross cutting technologies or research | 9,661,630                          | +1,216,134                     | +14%                        |
| <b>Total</b>                                 | <b>92,268,114</b>                  | <b>+21,101,158</b>             | <b>+30%</b>                 |

Diagram 2 shows the distribution according to area in 2009. The largest share is held by “energy efficiency”, closely followed by “renewable energy”. Accounting for around three quarters of the public expenditure, these two areas clearly show the priorities of energy research in Austria. The areas with the highest expenditure in these two fields are bioenergy (20 million EUR) and energy efficient buildings (around 15 million EUR).

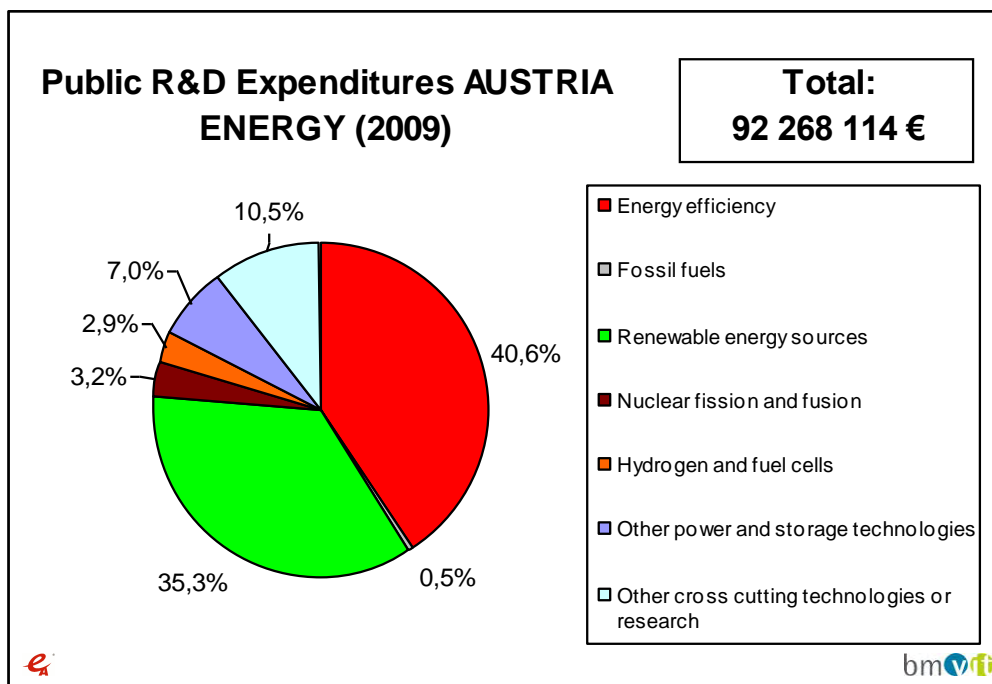


Diagram 2: Total energy research expenditure in Austria, 2009

Diagram 3 shows the development of annual expenditure in the individual areas since 1995. It is remarkable that the share of the main energy-research areas in Austria, energy efficiency and renewable energy, accounts for 78% of expenditure in 2009 – a level not reached in the last 15 years (the combined average for both areas being 61% between 1993 and 2006). This indicates the consequent setting of priorities.

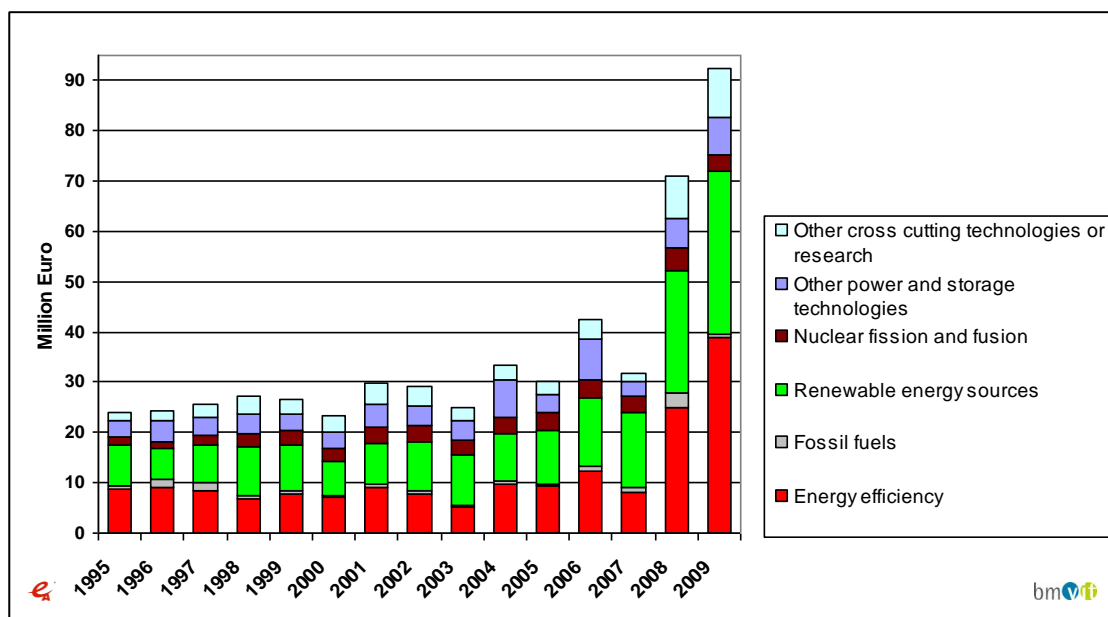


Diagram 3: Public expenditure 1995 to 2009, nominal<sup>1</sup>

The development of public expenditure and federal and regionally funded own research is shown according to institution in the following *table*. Only the expenditure of the Austria's science promotion fund (FWF) has been reduced, when compared to the previous year. All other institutions show increases. Unexpectedly, increases from the Climate- and Energy Fund have been minimal (the data analysed in here only shows the expenditure directly attributed to energy research). The bottom-up programmes of FFG tripled its energy related R&D expenditure within a year, while the regional expenditure was more than doubled.

Table 2: Changes compared to 2008 – Institutions (2009)

| Institution                                     | Expenditures 2009 in Euro | 2009 vs 2008 in Euro | 2009 vs 2008 in % |
|---|---------------------------|----------------------|-------------------|
| Federal ministries                              | 27,016,311                | +5,985,920           | +28%              |
| Climate and Energy Fund                         | 30,836,148                | +644,797             | +2%               |
| Länder (provinces)                              | 8,342,794                 | +4,813,096           | +136%             |
| Research Promotion Agency (FFG), Basisprogramme | 9,593,460                 | +6,335,260           | +194%             |
| Austrian Science Fund (FWF)                     | 1,201,718                 | -1,163,515           | -49%              |
| AWS (national promotional bank)                 | 1,565,027                 | +1,565,027           | +0%               |
| Non-university research institutions            | 4,966,606                 | +1,582,930           | +47%              |
| FHs (Universities of applied sciences)          | 1,649,172                 | +792,571             | +93%              |
| Universities                                    | 7,096,878                 | +545,072             | +8%               |
| Total   | 92,268,114                | +21,101,158          | +30%              |

The majority of expenditure (85.1%) was, as previously, processed directly via the granting bodies (federal ministries, regional government, funds). The remaining expenditure was

<sup>1</sup> A new IEA-Code came into force in 2006. This representation is based on the old IEA-Code in order to avoid distortion in the comparison.

issued via research institutes (non-university research institutions, universities and specialist high schools) from their public institutional funding. The distribution according to institution is shown in the following diagram.

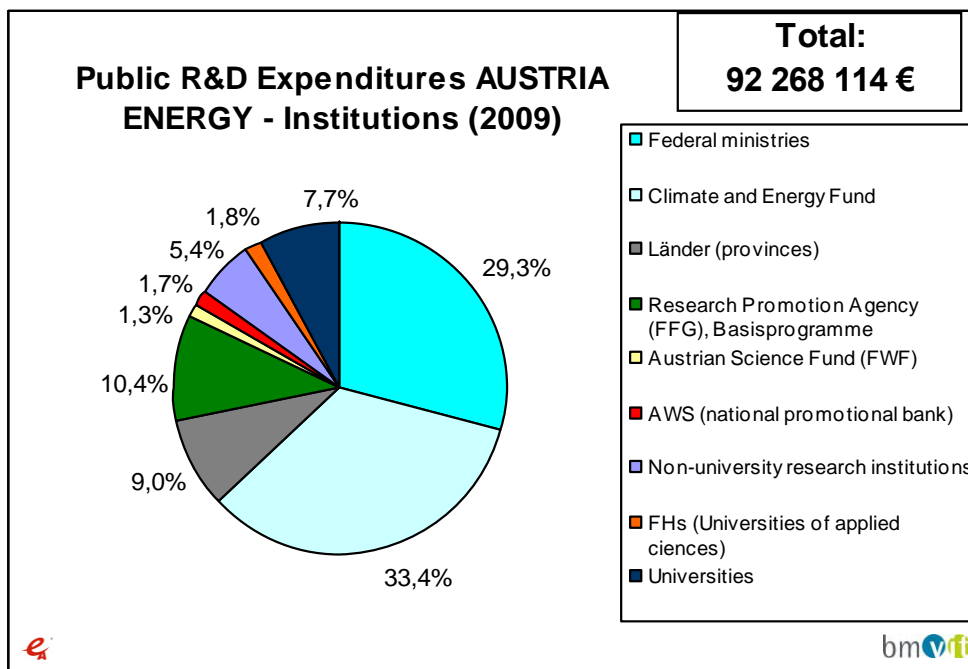


Diagram 4: Austrian energy research expenditure, 2009 – Institutions

The expenditure of the federal ministries, either directly from the responsible departments or via projects within their respective fields of responsibility (excluding the Climate and Energy Fund) increased by 6 million EUR totalling up to 27 million EUR in 2009. The majority of expenditure (80%) was made by the Federal Ministry of Transport, Innovation and Technology.

Projects generated via the “Neue Energien 2020” (“New Energies 2020”) program helped the Climate and Energy Fund achieve the position of the statistical unit with the highest expenditures in 2008 and 2009. The already high level of expenditure in 2008 (around 30 million EUR) increased slightly in 2009.

The total expenditure of the regional governments was 8.3 million EUR. The highest expenditure was in Vienna with around half of the energy related R&D, followed by Upper Austria with 19,5%.

In 2009 the Research promotion Fund (FFG) processed 62.7 Million EUR. The majority of transactions were related to programs run on behalf of the federal government and the Climate and Energy Fund. The FFG is clearly the main organisation for energy-related R&D funding for companies and researchers. The FFG-Basisprogramme (bottom-up programmes), that generally doesn’t process programs for the ministry or the Climate and Energy Fund, tripled their funding for R&D in connection with energy to 9.6 million EUR in 2009.

The expenditure of the Austrian Science Fund (FWF) for basic research within the energy sector, amounting to 1.2 million EUR, is clearly less than in the previous year.



A total of 0.4 million EUR was processed in 2009 by Kommunalkredit Public Consulting (KPC) for energy research projects.

The aws (Austrian Business Service), for the first time for 2009, reported expenditure of 1.6 million EUR for energy-related R&D. Further projects covered by other programs of the ministry were also issued and undertaken.

The expenditure of the (non-university) research institutions, for energy related R&D with own funding, continued to rise over the last years and reached 5 million EUR in 2009. More than half of the amount was invested by AIT (Austrian Institute of Technology), eight other organisations also used own funding.

There are currently 22 public universities in Austria, 11 of which reported energy relevant R&D with own funding. As in previous years, both the technical universities of Graz and of Vienna, reported the most resources. The expenditure by universities in 2009 remained relatively stable around 7 million EUR.

The privately run universities for applied research (Fachhochschulen, FHs), in contrast to the classical public universities, have a relatively short history: The opportunity to study for an academic scientific qualification at high school level was first introduced in 1994. 19 specialist high schools currently exist in Austria offering around 500 courses. 12 FHs have conducted energy R&D in the last years, using own funding. But the amount of expenditure fluctuated greatly, with expenditure in 2009 of 1.6 million EUR.

The analysis of expenditure by non-university research institutes, universities and specialist high schools shows only own resources (from federal and regional budgets for this institutions) committed to R&D projects by the institutions. Funds from private industry, EU-projects etc. are not included.

Diagram 5 shows the development of expenditure in the individual institutions since 1995.

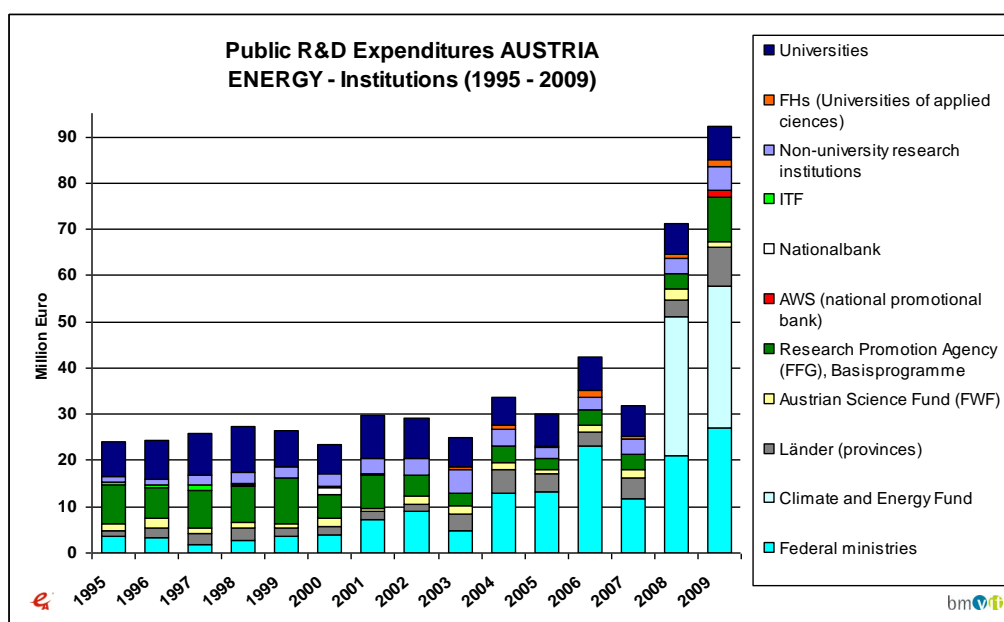


Diagram 5: Public expenditure 1995 to 2009 – institution, nominal<sup>2</sup>

<sup>2</sup> Up until 2002 the expenditure of the universities of applied research (FHs) was integrated in to the non-university research

According to the Frascati-Manual (2002), research and experimental development (R&D) has been divided into 3 groups. The full definition of these can be found in the full report. More than three quarters of the resources were used for applied research, whereas experimental development accounted for 16%. Elementary research accounted for a small but important share of 5%.

The relevance of energy research in relation to the economy of a country can also be analysed. This has been achieved here using the Gross Domestic Product (GDP) as shown in the following *diagram*. Publicly funded energy research had already reached 0.025% of GDP in 2008, substantially more than the previous year. In 2009, due also to the effects of a reduction of the GDP and increased expenditure on energy-related R&D, the previous year was once again substantially increased to 0.033%.

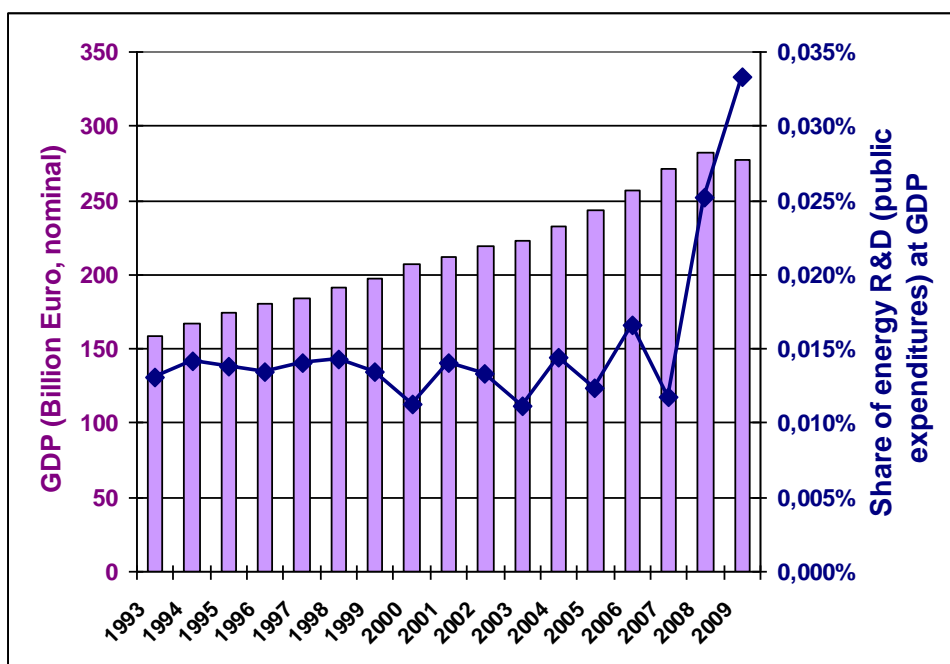


Diagram 6: Proportion of Austrian public expenditure on R&D into energy in relation to GDP, 1993 to 2009. (Source: AEA, Statistik Austria)

Compared with other OECD countries, Austria now holds place 10 of 24 for publicly funded expenditure on energy-related R&D in relation to GDP, moving up two places as compared with the year 2008. Regarding non-nuclear energy R&D expenditure, Austria holds position 6, moving up three places against the previous year (as can be seen in Diagram 7).

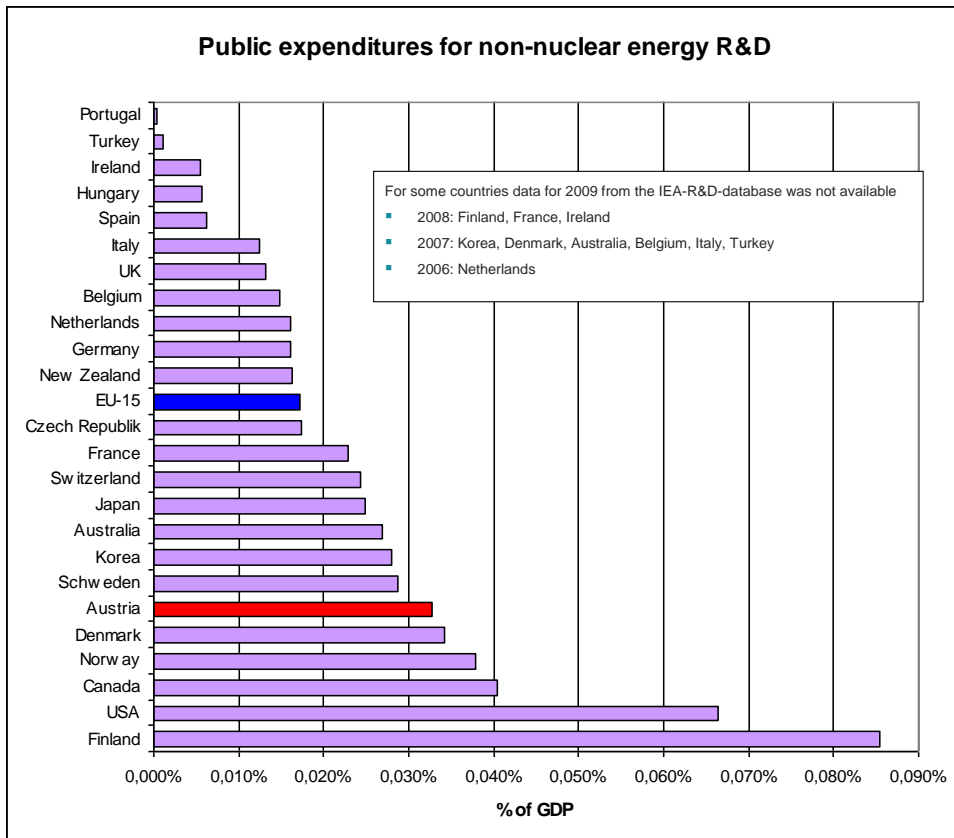


Diagram 7: Proportion of public expenditure on non-nuclear energy R&D in relation to GDP, 2009. Other countries according to available information (2006 to 2009). (Source. IEA, own analysis).

Around 900 projects<sup>3</sup> on energy related R&D were recorded and analysed for this report (an increase of nearly 200 from 2008).

The methods of data collection and analysis are described in the full report, also detailed analysis regarding topics and institutes and results from EU-programmes (7RP, IEE, RFCS). Furthermore, the full report (available only in German) includes comments on the expenditure of private business, an international comparison and further analysis.

<sup>3</sup> The methods of reporting for projects that have received funding from several sources, could lead to the same project being counted more than once. Although this would affect the total number of projects, the total expenditure is not affected by this. Financial double entries are eliminated by the method applied.