COUNTRY PRACTICE IN ENERGY STATISTICS

Topic/Statistics: Sample Survey on Energy Consumption of Households

Institution/Organization: Statistics Austria

Country: Austria

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CONTENTS

Abstract

The survey „Energy Consumption of Households“ is an independent module with voluntary response appended to the Labor Force Survey which is mandatory. The statistical purpose of the survey is to determine the dwelling-bound consumption with the associated expenditure of all fuels used and their assignment to the purposes space heating, water heating, cooking and other purposes. Further information digitally recorded within the telephone interview concern the type and the age of the heating system, possible additional heating systems, remedial actions and the regulation of the living space´s temperature. Apart from the use of energy in the household data on the energy consumption of vehicles is collected, such as kind of fuel, fuel consumption, vintage and annual mileage. The reference period of the required information matches the period of the last annual statement (e.g. annual electricity bill) respectively the last 12 months before the date of the interview.

General information about the household such as household size, size and age of the dwelling, legal relationship to the flat / house and primary heating system is taken from the basic program.

The aims of the analysis of the surveys on energy consumption of households (conducted since 1975, since 2004 with biennial periodicity) are twofold. The original aim, as required by law, is to record domestic energy consumption with the objective of making relevant information available for National Accounts. The second and meanwhile equally important aim is to improve the sectoral structure of energy consumption and expenditure on energy in the context of Energy Balances and Energy Accounts.

The basic design of the survey program has essentially remained the same over recent years but adaptations had to be made from time to time to account to changing general conditions. In September 2004, for example, following the complete restructuring of the entire micro-census (switch from face-to-face interviews to telephone interviews and simultaneously to paperless surveys), a totally new plausibility program was introduced for data control.

One reason for ongoing changes can be seen in ever-increasing requirements in terms of compiling the Energy Balances. Original aim of the energy balances was to depict the general Austrian energy supply situation with the accuracy and timeliness necessary for political decisions of general principle and to describe the role played by energy supply within the Austrian economy (National Accounting relevance). Now, further purposes are documenting Austria's international commitments to storing energy sources (IEA agreement) and the impacts of promotional measures (such as promotion of solar energy or heat pumps, Cogeneration Directive) and political steering measures (such as the Green Electricity Act) on a high level of detail.

They also serve for the main basis of calculation of Austria’s Kyoto-relevant, energy-based greenhouse gas emissions (reference approach) by the Austrian Umweltbundesamt (Austrian Environment Agency) and the EU. A further issue is to check the adherence to EU-Directives concerning energy efficiency and energy services (Energy Efficiency Directive) by means of the energy balances (final energy consumption).

Ongoing adaptations are necessary as changes of political and economical frameworks, e.g. the liberalization of the energy market, severely reduce the data availability for the supply account in the context of producing the balance sheet. According to this, new models have to be developed and implemented, that considerably build on an improved data basis for the supply account of the energy balance.

Key elements

Name of the statistics	Sample Survey on Energy Consumption of Households
Background and purpose of the statistics	**Background**: The demand for energy data rocketed following the oil price shock in the nineteen-seventies. We have therefore carried out our own sample survey on domestic energy consumption since 1975. **Purpose**: 1. Quality improvement of the Energy Balances. 2. Compilation of purposes (qualitative), amounts / expenses of the use of energy per fuel at main residences; Compilation of the kind / age of heater, 2. heater system, air condition, thermal insulation; use of energy concerning the private automobile sector: fuel type, kilometers travelled per year, avg. fuel consumption per 100 km, aircondition
Population, sample and data sources	Stratified random sample by NUTS 2 derived from the Register of residents (coverage 2010: 15.784 Austrian housing units with main residence)
Main users	Statistics Austria, Directorate Spatial Statistics and Directorate Macro-economic Statistics, Umweltbundesamt (Federal Ministry of Agriculture, Forestry, Environment and Water Management, Federal Ministry of Economy), Family and Youth (BMWFJ), Science
Important contribution or issue addressed	Energy balance, energy accounts
Other remarks	Residence principle

1. General information

1.1. Name of the statistics/topic

The statistics/topic could either be a specific energy statistics (e.g. electricity production) or a topic within energy statistics (e.g. energy balances). For more information, please see Section III of the Instructions.

Energy Consumption of Households

1.2. History and purpose

State when the statistics were first published.

1975

Describe briefly the main purpose of producing the statistics and why it is relevant.

The main purpose of the survey is to draw up and to improve the quality of energy balances (physical and monetary). As this concept has been tried and tested, it will be used for subsequent surveys.

1.3. Reference period

State the time period the data are collected for.

1.4. Period of the last annual account (e.g. for electricity), resp. the last 12 months before the term of the survey Frequency

Specify how often the statistics are disseminated (e.g. annually, monthly, quarterly, etc.). If the statistics are not produced at regular intervals, state at what times they have been produced in the past and the main reasons behind the irregularities.

Since 1975 up to 1989, the survey was conducted in March at biennial intervals. Thereafter the intervals were lengthened: the following surveys were carried out in March 1993, June 1997 and June 2000. Since 2004, the survey on household´s energy consumption is conducted biennial again.

1.5. Dissemination

Describe how the statistics are published (e.g. printed publications, online publications, online databases, etc.). If applicable, include the web address to the main website of the statistics.

The Sample Survey on Energy Consumption of Households is currently published solely on the Internet on the Statistics Austria website – Energy.

1.6. Regional level

State the lowest geographical level (e.g. administrative regions, municipalities, etc.) for which the statistics are made available to the public.

Austria and its federal provinces (Laender= NUTS 2)

1.7. Main users

Identify the key users of the data and the main applications. Include both internal and external users, and if possible try to distinguish between end users and others.

- Statistics Austria: Directorate Spatial Statistics and Directorate Macro-economic Statistics,
- Federal Ministry of Agriculture, Forestry, Environment and Water Management
- Federal Ministry of Economics, Family and Youth
- Umweltbundesamt (Austrian Environment Agency)
- Austrian Energy Agency
- Various institutes for scientific research, universities, media etc.

1.8. Responsible authority

Statistics Austria, Directorate Spatial Statistics, Division of Energy and Environment

1.9. Legal basis and legally binding commitments

Bundesgesetz über die Bundesstatistik (Federal Statistics Act 2000) in the current version.

Five-year contracts with the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) and the Austrian Federal Ministry of Economy, Family and Youth (BMWFJ – previously BMWA)

Regulation (EC) No. 1099/2008 of the European Parliament and of the Council of 22 October 2008 on Energy Statistics.

1.10. Resource requirements

The survey itself is financed from the ordinary budget, the implementation into energy balances and energy accounts is paid by BMLFUW and BMWFJ, of which each covers 50% of the implementation costs

Specify the resource requirements for producing the statistics (e.g. man-labour days, number of workers involved in the statistical production process of the statistics/topic in question).

2-person month

1.11. International reporting

None

2. Statistical concepts, methodology, variables and classifications

2.1. Scope

Describe the scope of the statistics (e.g. the statistics cover supply and use of all energy products in Norway, classified according to International Standard Industrial Classification of All Economic Activities – ISIC).

The statistics cover the energy consumption of Austrian Households.

2.2. Definitions of main concepts and variables

Describe the main concepts (e.g.: territory principle, resident principle, net calorific value, gross calorific value).

Resident principle

Describe the main variables (e.g. how are the different energy products defined in the statistics? How are production, intermediate consumption, final consumption, transformation, feed stock, the energy sector, etc. defined?).

The first section of the survey comprises dwelling-bound consumption and the associated expenditure, broken down by the following fuels:

Coals: Hard coal, Lignite, Brown coal briquettes, Coke
Wood-based: fuel wood, pellets, wood briquettes (since 2008 recorded seperately), wood chips
Fuel oil
LPG
Electricity (non-interruptible / interruptible till 2008)
Natural gas
Solar, Photovoltaic (since 2010)
Heat pumps
District heating
Central heating in case of fuel unknown

differentiated according to end-use categories as follows:

Space heating,
Water heating,
Cooking
Other uses (only with concern to electricity: lighting, consumer electronics etc)

The second series of questions is concerned with the age of the primary heating system, the type of possible additional heating and cooling systems and thermal insulation.

The third, completely independent part of the survey relates to energy consumption of vehicles – vintage — fuel type – annual mileage – average fuel consumption per
100 km, in each case with a separate set of questions for the household's first and second car.

The submitted raw data also include non-survey information from the microsensus, such as the Laender-code, specifications on the dwelling (size, age) and the flat (m², number of persons, main heating system, legal status).

2.3. Measurement units

Describe in what unit the data is collected (e.g. physical unit (m3, metric tons), monetary unit (basic prices, market prices)). Describe in what unit the data is presented. Describe if the calorific values are collected (e.g. on a net vs. gross basis) and how they are used.

If applicable, describe the density of the energy product(s) and the estimated *thermal efficiency coefficients* of different energy products and consumer groups or by appliance. Thermal efficiency coefficient indicates the share of the energy products which is actually usable for end consumption. Descriptions of density and thermal efficiency coefficient could alternatively be put in an annex.

Physical (kg, ltr, stere, kWh, m³), monetary units (€) and other quantitative consumption units according to district heat (see Annex IV)

2.4. Classification scheme

Include references to relevant international and national standard classifications. If national, give a brief description of the standards. If available, include web addresses to the electronic version of the standards).

• Sectoral classification of Joint IEA/ECE/EUROSTAT Questionnaires aggregated from NACE categories • NUTS-classification for statistics on regional representation

2.5. Data sources

Give an overview of the different data sources used in the collection and compilation of the statistics/topic (e.g. household survey, enterprise/establishment survey, administrative data/registers, foreign trade statistics, production statistics and other primary/secondary data sources).

Examples of administrative sources/registers are: business register for enterprises and establishments, population register, land register, housing and building registers, tax registers, international trade registers, etc.

Labour force survey (obligatory apply) with the following question module concerning energy consumption of households

2.6. Population

Describe the entire group of units which is the focus of the statistics (the population).

Austrian Households at their main residence

Specify the following statistical units:

- Reporting unit
- Observational unit
- Analytical unit

Examples of different kind of statistical units include: enterprise, enterprise group, kind-of-activity unit (KAU), local unit, establishment, homogeneous unit of production.

In most cases the reporting unit, observational unit and analytical unit are identical, but there are examples where this is not the case. In electricity statistics, you may find that energy companies (the reporting unit) provide data about different consumers like the individual household or manufacturing

company (the observational unit). The analytical unit may be a group of energy consumers, defined by the ISIC.

The reporting unit, the observational unit and the analytical unit are Austrian households at their main residence.

2.7. Sampling frame and sample characteristics

Describe the type of *sampling frame* used in the collection and compilation of the statistics (e.g. list, area or multiple frames). A sampling frame is the source material or device from which a sample is drawn. Note that the sampling frame might differ from the population.

Within the frame of the labor force survey (mandatory, Random sample of ~20.000 homes derived from the Central Register of Residents, broken down by Laender (federal provinces of Austria, NUTS 2) the respondents are asked to volunteer the sample survey "Energy Consumption of Households".

For each survey(s) used for the compilation of the statistics, specify the *sampling design* (e.g. random, stratified, etc.). Describe the routines employed for updating the sample. Include information about the sample size, and discuss to what extent the sample covers the population (e.g. energy consumption in the sample compared to total energy use by the population).

Note that chapter *2.7: Sample frame and sample characteristics* may overlap with chapter *3.4: Grossing up procedures.*

Random sample survey

2.8. Collection method

For each survey used for the compilation of the statistics/topic, describe how the data are collected (e.g. face-to-face, telephone, self-administered, paper and internet-based questionnaires, or administrative data and registers).

As the data collection in frame of the micro-census is totally paperless since 2004, the telephone interviewers don´t get the classic paper questionnaires but so called interviewers´ guides. In detail, the Domestic Energy Consumption is collected 1/5 by Computer assisted personal interviews (CAPI, face to face) and 4/5 via a Computer Assisted Telephone Interview (CATI). For energy consumption the 2006 survey is an exception because no face to face interviews were conducted.

2.9. Survey participation/response rate

For each survey used for the compilation of the statistics/topic, specify the average response rate, or refer to response rates for specific surveys conducted.

The respondent rates for the single surveys are: 2004 *74.2 %* 2006 *49.7 %* 2008 *62.0 %* 2010 *54.4 %*

3. The statistical production process

3.1. Data capture and storage

The Domestic Energy Consumption is collected 1/5 by Computer assisted personal interviews (CAPI, face to face) and 4/5 via a Computer Assisted Telephone Interview (CATI). The results are stored in a database and as a csv-file. After removing non participating households and incomplete interviews, the file is imported to an ACCESS database providing possibility checks and data analysis.

3.2. Data editing

Describe the regular routines employed for detecting and correcting errors. This may include:

- Manual routines for detecting and correcting errors
- Automatic error-detection (and correction)
- Micro- and macro editing procedures
- Data validation procedures
- Outlier identification
- Processes and sources used for quality controls

Up to and including the 2000 survey, only the individual energy sources themselves were checked for plausibility (plausibility checks of the stated quantities with reference to the stated values and annual average prices), any missing data were calculated to quantity-value pairs and substitutions were made if necessary. These routines continue to be used supplemented by the relation of the total reported energy consumption to a calculated (fictitious) overall consumption. This assumed overall consumption of one household is calculated by use of given information on the household (floor space, number of people in household) and pre-set parameters for the individual types of use (space heating, water heating, cooking, electricity use for other purposes). Calculating and correcting the total reported energy consumption per household in this way involves some quite complicated plausibility routines, because one or more alternative quantities have to be calculated if the reported overall energy consumption is beyond the tolerance-range of ±50% of the fictious overall energy consumption.
Being a main data source for energy balances the results are compared together with other statistics on energy consumption (the material input statistics, the sample survey on energy consumption of small to medium-sized establishments in the manufacturing industries and construction and the sample survey on energy consumption of the service sector) with the quantities of fuels available. This procedure guarantees that unrealistic results can be identified quickly.

3.3. Imputation

Describe the principles for imputation and the assumptions that these principles are based on.
Note that this chapter may overlap with chapter *3.2: Data editing* and chapter *5.2: Accuracy*

Not relevant

3.4. Grossing up procedures

Describe how the population is divided into strata and what statistical models the estimations in the strata are based on. Describe how sub-indices are combined into aggregate indices and how uncertainty is estimated.

The extrapolation is carried out **independent from the micro-census** (exception: questions on the car) with the following grossing-up factors:

Laender (implemented in the microcensus) Size and age of the dwelling (implemented in the microcensus) Number of gas meters attributed to households (provided by E-CONTROL Ltd) Number of installed wood chip boilers (provided by the Chamber of Agriculture of Lower Austria) Number of pellets boilers (provided by the Chamber of Agriculture of Lower Austria)

3.5. Analytical methods

Give a description of any analytical methods used to adjust the data (e.g.: seasonal adjustment and temperature adjustment). A more detailed description of the analytical method can also be included as an annex.

Due to the biennial conduction of the survey that does not cover a calendar year and the necessity of implementing the survey´s results into the energy balances, in between years have to be interpolated and the results have to be adjusted by using heating degree days.

4. Dissemination

4.1. Publications and additional documentation

Describe the form of dissemination of the statistics/topics in question (e.g. printed publications, website, etc.). Please provide relevant website link(s) if available.

Tables and charts are available on the website of Statistics Austria: Overall Energy Consumption of Households: Tables

Give a complete reference to publicly available statistics databases where data from the statistics can be extracted. Include web addresses if available online.

User defined tables and charts can be generated in Superweb: Overall Energy Consumption of Households: Statistical Database Superweb

Indicate whether you charge users for access to the statistics at any level of aggregation.

Single data (household´s level): with costs Aggregated Data as published: no costs Aggregated data non-published: with costs

4.2. Revisions

Describe the current revision policies. E.g.: Is historical data revised when new methodology, new definitions, new classifications etc. are taken into use? Is the data continuously revised, or is the data revised at certain points in times (e.g. every third year, annually, etc.)?

Historical data was revised continuously in case of getting better information e.g. on the number of households connected to the gas grid. Further revisions were conducted continuously since a new methodology to estimate the annual need for space heating per m² was established in 2008.

If applicable, describe any major conceptual or methodological revisions that have been carried out for this statistic/topic in the past.

Historical data was revised continuously in case of e.g. getting better information on the number of households connected to the gas grid. Further revisions were conducted continuously since a new

methodology to estimate the annual need for space heating per m² was established in 2008. Conceptual revisions concern adaptions to be made due to changes of the energy-mix in households.

4.3. Microdata

Describe how microdata are stored.

Microdata (raw data and plausibility checked and corrected data) are stored in ACCESS-Databases.

Specify if microdata are available for scientific and/or public use. If so, describe under what conditions these are made available.

Microdata are available for scientific and/ or public use, as all data are anonymized. These data can be bought after signing a statement of agreement for data transfer.

4.4. Confidentiality

Describe the legal authority that regulates confidentiality, and what restrictions are applied to the publication of the statistics.

The publication and data supply to third parties follow strictly the Federal Statistics Act 2000 in the current version. That means data are only supplied in anonymized form, therefore no conclusions to single households are possible.

Describe the criteria used to suppress sensitive data in statistical tables (cell suppression).

Not relevant

Describe how confidential data are handled.

Personal data (e.g. name, address, telephone number, etc.) were deleted before publishing or supplying the data to third parties.

Describe any confidentiality standards that go beyond what is legally required.

Not relevant

5. Quality

5.1. Relevance

State to which degree the statistical information meet the real needs of clients/users.

The main purpose of the survey is to draw up and to improve the quality of energy balances (physical and monetary). As this concept has been tried and tested, it will be used for subsequent surveys.

5.2. Accuracy

State the closeness of computations or estimates to the exact or true values that the statistics were intended to measure.

Measurement and processing errors

Discuss the measurement and processing errors that are relevant for the statistics. Try as far as possible to give an estimation of the size and scope of the errors.

None known

Non-response errors

State the size of the unit non-response and the item non-response, distributed by important variables in the population (e.g. region, industry). Consider if the non-response errors are systematic, and if so, describe the methods used to correct it. Indicate whether the effects of correcting non-response errors on the results have been analysed, and, if so, describe them.

Cf. participation in the Survey

Sampling errors

Discuss the size of the sampling errors. Compare the population and sample with regards to important properties (e.g. coefficient of variance).

Sampling Errors:
The table below shows a summary of the sampling errors by energy sources, by weighted numbers of cases and weighted quantities, in each case for the overall result and the three types of use that were ascertained separately. Whereas the sampling error is within acceptable limits for the overall consumption of all energy sources, the uncertainty rises sharply with respect to individual energy sources according to types of use. This is due to the high variance in the energy source quantities used in combination with low numbers of cases.

Table 1: Sampling Errors at 95% Statistical Certainty 2003 to 2010

Fuel	Survey 2003 / 2004, Data for Austria			
	Nr. of Cases	Rel. Error in %	Amount	Rel. Error in %
Hard Coal	36.097	*19,7*	49.223.600 kg	*28,2*
Lignite	16.685	*29,8*	31.457.224 kg	*35,2*
Brown Coal Briquettes	41.504	*18,5*	39.689.258 kg	*25,8*
Coke	54.863	*15,0*	106.844.950 kg	*17,4*
Fuel Wood	889.193	*2,8*	3.557.024.948 kg	*4,0*
Wood Pellets & Wood Briquettes	66.923	*12,7*	169.275.672 kg	*16,4*
Wood Chips	33.328	*16,1*	324.386.052 kg	*18,1*
Fuel Oil	961.275	*2,9*	1.559.220.575 kg	*3,3*
LPG	58.042	*11,5*	33.565.338 kg	*15,1*
Natural Gas	1.060.812	*2,6*	1.414.141.207 m³	*3,5*
District Heating	634.989	*4,0*	5.091.418.411 kWh	*4,5*
Electricity	3.429.720	*0,0*	16.386.155.302 kWh	*1,3*
Solar Heat	156.961	*7,6*		
Ambient Heat	85.794	*10,7*		

Fuel	Survey 2005 / 2006, Data for Austria			
	Nr. of Cases	Rel. Error in %	Amount	Rel. Error in %
Hard Coal	41.013	*17,7*	42.098.894 kg	*24,0*
Lignite	13.907	*30,5*	13.659.642 kg	*51,0*
Brown Coal Briquettes	62.038	*13,8*	36.498.247 kg	*20,5*
Coke	45.884	*17,7*	74.510.118 kg	*21,7*
Fuel Wood	1.132.800	*2,1*	4.021.766.245 kg	*3,6*
Wood Pellets & Wood Briquettes	84.383	*7,8*	201.931.638 kg	*11,1*
Wood Chips	40.039	*3,2*	390.666.424 kg	*8,2*
Fuel Oil	968.068	*2,8*	1.516.713.066 kg	*3,2*
LPG	57.978	*15,0*	40.476.578 kg	*20,1*
Natural Gas	1.083.511	*0,0*	1.494.274.383 m³	*2,3*
District Heating	693.352	*3,6*	5.932.561.296 kWh	*4,5*
Electricity	3.510.448	*0,0*	16.759.831.841 kWh	*1,7*
Solar Heat	275.666	*6,0*		
Ambient Heat	153.706	*8,4*		

Fuel	Survey 2007 / 2008, Data for Austria			
	Nr. of Cases	Rel. Error in %	Amount	Rel. Error in %
Hard Coal	36.389	*19,0*	34.158.880 kg	*26,6*
Lignite	5.681	*45,9*	3.241.036 kg	*85,0*
Brown Coal Briquettes	50.927	*15,2*	29.027.466 kg	*25,8*
Coke	40.026	*18,2*	59.513.147 kg	*23,1*
Fuel Wood	1.189.929	*2,1*	3.879.876.258 kg	*3,4*
Wood Pellets	47.108	*1,4*	174.418.921 kg	*6,3*
Wood Briquettes	122.140	*9,5*	105.675.758 kg	*13,4*
Wood Chips	47.044	*0,0*	448.420.438 kg	*7,4*
Fuel Oil	898.671	*2,8*	1.289.121.855 kg	*3,3*
LPG	62.288	*14,3*	52.251.787 kg	*19,5*
Natural Gas	1.093.335	*0,1*	1.407.279.865 m³	*2,2*
District Heating	782.463	*3,0*	6.829.900.816 kWh	*3,9*
Electricity	3.570.889	*0,0*	16.686.351.572 kWh	*1,4*

Solar Heat	286.746	*5,8*		
Ambient Heat	165.090	*8,0*		

Fuel	Survey 2009 / 2010, Data for Austria			
	Nr. of Cases	**Rel. Error in %**	**Amount**	**Rel. Error in %**
Hard Coal	20.055	*31,7*	16.889.193 kg	*53,7*
Lignite	7.958	*52,2*	4.694.484 kg	*89,9*
Brown Coal Briquettes	35.539	*23,3*	19.818.586 kg	*38,3*
Coke	25.826	*29,6*	41.481.173 kg	*36,0*
Fuel Wood	1.172.905	*2,7*	3.770.766.186 kg	*4,4*
Wood Pellets	65.423	*0,0*	232.740.045 kg	*9,8*
Wood Briquettes	129.948	*11,4*	103.448.118 kg	*16,4*
Wood Chips	55.468	*0,0*	491.867.415 kg	*10,4*
Fuel Oil	842.615	*3,5*	1.218.217.524 kg	*4,5*
LPG	51.729	*19,5*	39.028.348 kg	*27,8*
Natural Gas	1.096.507	*0,0*	1.449.513.732 m³	*3,0*
District Heating	849.683	*3,4*	7.576.016.416 kWh	*5,1*
Electricity	3.594.603	*0,0*	16.961.792.450 kWh	*1,9*
Solar Heat	360.671	*6,3*		
Ambient Heat	195.141	*8,8*		

Sampling Effects: No effects of the sample observable; representativeness high

Non-sampling Effects: Not relevant

Other sources of error
Discuss other sources of errors that might be relevant for the statistics. E.g.: Model assumption errors, coverage errors

Not relevant

5.3. Timeliness and punctuality

Specify the time between the end of the reference period and publication.
If the statistics are published both as preliminary and final figures, specify the time between publication of preliminary and final figures. You should also point out whether the publication date is set according to certain rules (e.g. advance release calendar, a specific day or prior to other publications).

The results are available for the final energy balance of the following (current year under review 2011).
Preliminary results are not published.
Final results are published at latest as announced in the advance release calendar ("Veröffentlichungskalender") on the Statistics Austria website (only available in German): http://www.statistik.at/web_de/ueber_uns/veroeffentlichungskalender/index.html

Point out if there have been any major discrepancies between the planned publication date and the actual publication date in recent years. If so, state the length of this discrepancy and its cause.

No major discrepancies between the planned publication date and the actual publication date in recent years.

5.4. Accessibility

Describe how easily accessible the statistics are. In particular, is there an advance release calendar to inform the users about when and where the data will be available and how to access them?

Are metadata and other user support services easily available? Are there particular groups that don't have access to the published statistics (e.g.: visually disadvantaged)?

The statistics are easily to access on Statistics Austria website.

5.5. Comparability

Discuss the comparability of the statistics over time, geographical areas and other domains.

Comparability over time
Discuss comparability over time and include information about whether there have been any breaks in the time series of the statistics and why. Also describe any major changes in the statistical methodology that may have had an impact on comparability over time.

Comparability over time is only limited, in particular regarding the main energy sources, due to the completely revised analysis method used since 2004.

Comparability over region
Discuss comparability over geographical areas, and include information about whether the statistics are comparable to relevant statistics published by other countries and/or international organisations.

Spatial and sectoral comparability (sectoral and with regard to the energy sources included) with other EU or IEA member states (in the context of energy balances) is fulfilled.

Comparability over other domains
Discuss comparability over domains, and include information about whether the statistics are comparable between different industries, different types of households etc.

Not relevant

5.6. Coherence and consistency

Discuss the coherence/consistency between preliminary and final figures.

Coherence with comparable primary statistics used as data sources for energy balances (use of goods statistics, random sample of energy consumption in the service sector, random sample of energy consumption in the producing sector, useful energy analysis) is fulfilled.

Discuss the coherence/consistency between monthly, quarterly or yearly statistics within the same subject area. Can the results of different frequencies for the same reference period be combined in a reliable manner?

Yes

Discuss the coherence/consistency with other related statistics (also those produced by other institutions/organisations on the same subject).

The results of the survey 2008 were compared with the comparable ones from the pilot study "Electricity and Gas Consumption of Austrian Households 2008" and are fitting very well.

6. Future plans

Are there any current or emerging issues that will need to be addressed in the future? These could include gaps in collection, timeliness issues, data quality concerns, funding risks, confidentiality concerns, simplifications to reduce respondents' burden etc.?

The results of the survey 2012 will be compared with the ones from the pilot study "Electricity and Gas Consumption of Austrian Households 2012".

Annexes

Annex I
Illustrations and flowcharts

Illustrations and flowcharts are useful to summarize information and to get a better overview of the statistical production process. Illustrations and flowcharts can either be places in annexes or be included under relevant paragraphs in the template.

E.g.:

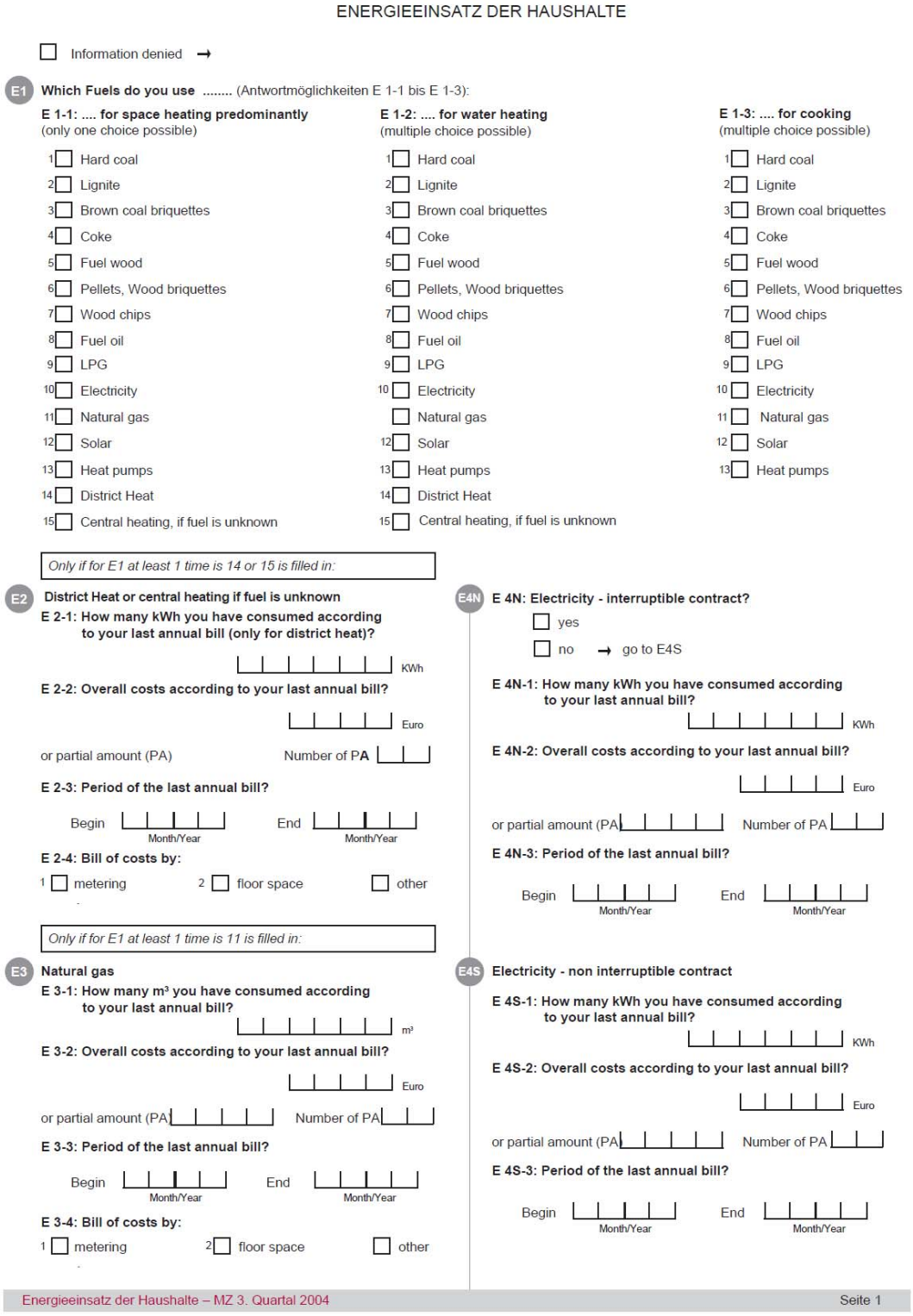
- A conceptual flowchart which illustrates the flow of data in the production of the statistics.
- A flowchart which illustrates the main tasks in the production process and the dependency between them.

Time schedule

	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Collect																			
Edit																			
Analyse																			
Disseminate																			

Annex II
Questionnaires

As the Survey on Energy Consumption of Households is conducted totally paperless, only the questionnaire of 2004 can be shown:



ENERGIEEINSATZ DER HAUSHALTE

☐ Information denied →

E1 **Which Fuels do you use** ..... (Antwortmöglichkeiten E 1-1 bis E 1-3):

E 1-1: .... for space heating predominantly (only one choice possible)	**E 1-2: .... for water heating** (multiple choice possible)	**E 1-3: .... for cooking** (multiple choice possible)
1 ☐ Hard coal	1 ☐ Hard coal	1 ☐ Hard coal
2 ☐ Lignite	2 ☐ Lignite	2 ☐ Lignite
3 ☐ Brown coal briquettes	3 ☐ Brown coal briquettes	3 ☐ Brown coal briquettes
4 ☐ Coke	4 ☐ Coke	4 ☐ Coke
5 ☐ Fuel wood	5 ☐ Fuel wood	5 ☐ Fuel wood
6 ☐ Pellets, Wood briquettes	6 ☐ Pellets, Wood briquettes	6 ☐ Pellets, Wood briquettes
7 ☐ Wood chips	7 ☐ Wood chips	7 ☐ Wood chips
8 ☐ Fuel oil	8 ☐ Fuel oil	8 ☐ Fuel oil
9 ☐ LPG	9 ☐ LPG	9 ☐ LPG
10 ☐ Electricity	10 ☐ Electricity	10 ☐ Electricity
11 ☐ Natural gas	☐ Natural gas	11 ☐ Natural gas
12 ☐ Solar	12 ☐ Solar	12 ☐ Solar
13 ☐ Heat pumps	13 ☐ Heat pumps	13 ☐ Heat pumps
14 ☐ District Heat	14 ☐ District Heat	
15 ☐ Central heating, if fuel is unknown	15 ☐ Central heating, if fuel is unknown	

Only if for E1 at least 1 time is 14 or 15 is filled in:

E2 **District Heat or central heating if fuel is unknown**

E 2-1: How many kWh you have consumed according to your last annual bill (only for district heat)?

_____ KWh

E 2-2: Overall costs according to your last annual bill?

_____ Euro

or partial amount (PA) Number of PA ____

E 2-3: Period of the last annual bill?

Begin ____ Month/Year End ____ Month/Year

E 2-4: Bill of costs by:

1 ☐ metering 2 ☐ floor space ☐ other

Only if for E1 at least 1 time is 11 is filled in:

E3 **Natural gas**

E 3-1: How many m³ you have consumed according to your last annual bill?

_____ m³

E 3-2: Overall costs according to your last annual bill?

_____ Euro

or partial amount (PA) ____ Number of PA ____

E 3-3: Period of the last annual bill?

Begin ____ Month/Year End ____ Month/Year

E 3-4: Bill of costs by:

1 ☐ metering 2 ☐ floor space ☐ other

E4N **E 4N: Electricity - interruptible contract?**

☐ yes

☐ no → go to E4S

E 4N-1: How many kWh you have consumed according to your last annual bill?

_____ KWh

E 4N-2: Overall costs according to your last annual bill?

_____ Euro

or partial amount (PA) ____ Number of PA ____

E 4N-3: Period of the last annual bill?

Begin ____ Month/Year End ____ Month/Year

E4S **Electricity - non interruptible contract**

E 4S-1: How many kWh you have consumed according to your last annual bill?

_____ KWh

E 4S-2: Overall costs according to your last annual bill?

_____ Euro

or partial amount (PA) ____ Number of PA ____

E 4S-3: Period of the last annual bill?

Begin ____ Month/Year End ____ Month/Year

Energieeinsatz der Haushalte – MZ 3. Quartal 2004 Seite 1

E5 **Do you use other fuels except electricity, natural gas, district heat, gasoline or diesel?**

☐ yes

☐ No → go to E6

E5a **Other fuels used:**

1 ☐ Hard coal

Amount in Euro/Year | Quantity/Year | kg ☐

2 ☐ Lignite

Amount in Euro/Year | Quantity/Year | kg ☐

3 ☐ Brown coal briquettes

Amount in Euro/Year | Quantity/Year | kg ☐

4 ☐ Coke

Amount in Euro/Year | Quantity/Year | kg ☐

5 ☐ Fuel wood

Amount in Euro/Year | Quantity/Year | kg ☐ | cm ☐

6 ☐ Pellets, Wood briquetts

Amount in Euro/Year | Quantity/Year | kg ☐

7 ☐ Wood chips

Amount in Euro/Year | Quantity/Year | kg ☐ | cm ☐

8 ☐ Fuel oil

Amount in Euro/Year | Quantity/Year | kg ☐ | liter ☐

9 ☐ LPG

Amount in Euro/Year | Quantity/Year | kg ☐ | liter ☐

12 ☐ Solar

Kollektorfläche | m² ☐

13 ☐ Heat pump

E6 **In which year your main heating system (for which you use the fuel given in E1-1... for space heating predominantly) was installed?**

When ____ Year

E7 **Do you use an additional heating system?**
(only one choice possible)

1 ☐ No

2 ☐ Central heating ratio from E1: ____

3 ☐ Gas convector heater

4 ☐ Electric heater with fixed radiator

5 ☐ Stove ratio from E1: ____

6 ☐ Supplenetary electric heating system

7 ☐ Solar plant

8 ☐ Heating pump

E8 **Do you use an air conditioner** in your dwelling (fix installed or mobile)?

1 ☐ yes 2 ☐ no

E9 **Which thermal renovations were realised at the last 10 years in yor dwelling?**
(multiple choice possible)

1 ☐ None

2 ☐ Boiler change

3 ☐ Heat insulation of external walls

4 ☐ Heat insulation of the topmost ceiling

5 ☐ Changes of windows

→

E10 **Car-Use**

First car

E 10-1-1: Year of construction ____ Year

E 10-1-2: Air conditioner incorporated?

1 ☐ yes 2 ☐ no

E 10-1-3: Fuel used?

1 ☐ Gasoline 2 ☐ Diesel 3 ☐ other

E 10-1-4: Km driven at the last year?

____

E 10-1-5: Fuel consumption in liter/100 km ____

Zweiter PKW

E 10-2-1: Year of construction ____ Jahr

E 10-2-2: Air conditioner incorporated?

1 ☐ yes 2 ☐ no

E 10-2-3: Fuel used?

1 ☐ Gasoline 2 ☐ Diesel 3 ☐ other

E 10-2-4: Km driven at the last year?

____

E 10-2-5: Fuel consumption in liter/100 km ____

Annex III
Example of publication tables

http://www.statistik.at/web_en/statistics/energy_environment/energy/energy_consumption_of_households/index.html

Overall Consumption of Fuels 2009/2010 IN GIGAJOULE

Fuels	Reference Parameters			Amount in Gigajoule (GJ)			
	Households (HH)	Floor Space (m²)	Number of Persons	Total	GJ by HH	GJ by m²	GJ by Person
Hard Coal	20 055	2 149 767	42 276	472 897	23.58	0.220	11.19
Lignite	7 958	773 706	17 299	45 536	5.72	0.059	2.63
Brown Coal Briquettes	35 539	3 231 310	72 842	382 499	10.76	0.118	5.25
Coke	25 826	3 156 648	62 931	1 169 769	45.29	0.371	18.59
Fuel Wood	1 172 905	149 938 907	3 243 366	53 963 435	46.01	0.360	16.64
Wood Pellets	65 423	8 247 796	190 142	4 022 679	61.49	0.488	21.16
Wood Briquettes	129 948	13 866 606	325 917	1 773 411	13.65	0.128	5.44
Wood Chips	55 468	7 792 186	188 596	5 604 337	101.04	0.719	29.72
Fuel Oil	842 615	100 366 110	2 074 609	52 139 710	61.88	0.519	25.13
LPG	51 729	6 335 883	139 218	1 795 304	34.71	0.283	12.90
Natural Gas	1 096 507	105 448 250	2 375 971	56 357 094	51.40	0.534	23.72
District Heating	849 683	66 082 198	1 744 465	27 273 659	32.10	0.413	15.63
Electricity	3 594 603	367 553 237	8 375 290	61 062 453	16.99	0.166	7.29
Solar Heat	360 671	48 163 507	1 066 698	4 101 028	11.37	0.085	3.84
Ambient Heat	195 141	27 067 074	566 430	4 411 622	22.61	0.163	7.79

S: STATISTICS AUSTRIA, Energy statistics: Domestic Energy Consumption 2009/2010. Compiled on 12 July 2011. - Households are counted for each fuel reported and therefore multiple counting occurs. The overall household number is given in the electricity line.

Detailed description on analytical methods

If relevant, a detailed description of analytical methods used in the statistical production (like seasonal adjustment, temperature adjustment etc.) may be described in an annex. A short description can also be included in chapter 3.5: Analytical methods or under other suitable chapters.

Annex IV

Description of the Methodology

On the Plausibility-checks of the Random Sample Survey

Energy Consumption of Households

Determination of the Annual Final Energy Consumption (FEC) and of the related End-use Categories' Shares in Austrian Households

(Special Surveys 2003 / 2004 bis 2009 / 2010)

Status: **March 2012**

Directory **Spatial Statistics**
Department Environmental and Energy Statistics

Author: **Eva Korus**

Introduction and Overview to the Processing Steps

The aim of the data processing is to obtain a data volume as large and plausible as possible that serves as a basis for the fuel specific analysis of the Final Energy Consumption (FEC) and its related end-use categories´ shares (for space and water heating, cooking and other purposes).

For this purpose, the reported information on consumed amounts and the expenses are checked for validity and plausibility, false data is corrected and missing values are complemented.

Overview of the Processing Steps

The evaluation of the survey "Energy Consumpton of Households" comprises the determination of the overall energy consumption and, based on this, the calculation of the consumption percentage for the end-use categories space heating, water heating, cooking and electricity use for other purposes.

The calculation of the FEC on household´s level and of the percentage by end-use category is basically divided into four processing-steps concerning different levels of aggregation:

1. Plausibility-checks and validation, completion and calculation of pair of variates on ***single data level*** (data-checks during the interview and checks on the overall data set),
2. Calculation of the *reported FEC* ***on household´s level*** as sum of all consumed fuel amounts and its check respectively correction by using the *assumed FEC* (range of tolerance -50% + 50%), which is defined as sum of the average consumption shares for space and water heating and cooking.
3. Grossing-up and aggregation of energy consumption by fuel and end-use category for Austria and the Laender taking into account external information (e.g. Number of households connected to the gas grid, age of the dwelling).
4. Determining fuel specific use of energy for the end-use categories space and water heating, cooking and other use of electricity.

1. Plausibility Checks:

The implementation of the plausibility-checks is conducted in ACCESS-VBA. The processing is based on the original, untreated data-set.

For checking the plausibility of single data sets the following set of tables with factors as follows are used:

- Fuel specific conversion factors with corresponding calorific values,
- Fixed upper limits of fuel amounts and corresponding expenses,
- Laender specific prices for natural gas, non- interruptible and interruptible electricity,
- Average prices for the other fuels,
- Average annual energy consumption for water heating and cooking and

- Average annual energy consumption for space heating per m² depending on the dwelling´s age and size.

Single Data Level

At first, common plausibility checks and data validation in accordance with data correction are conducted on ***single data level*** – that means that all data reported on household level is used:

a) Using upper thresholds concerning the annual energy consumption of every fuel; unrealistic amounts respectively costs are reduced.
b) Checks on impossible fuel – purpose combinations and correction if necessary (e.g. district heat, solar energy and heat pumps can´t be used for cooking).
c) Item non response in case of missing amount OR price: completion of pairs of variates by use of average consumption amounts / prices. Item non response in case of missing amount AND price: calculation of pairs of variates by use of average consumption depending on the purpose, the fuel and the number of persons in the household.

The plausibility checks are separated into two parts: Computer aided checks are run **during the interview** (software: BLAISE) on single plausibility items (e.g. fuel amounts above average, deviations beyond 50% of the market price). As the data validation can be suppressed during the interview to ensure finishing the survey, these checks have to be implemented in the second plausibility part again and checks or data-validation and -correction are conducted **on the overall dataset** by use of VBA-routines.

The allowed upper thresholds and average fuel prices are shown in table 1. For Laender-specific prices (only for private customers) concerning non-interruptible and interruptible electricity and natural gas see table 2.

Tab.1: Upper Limits of Annual Energy Consumption with Corresponding Expanse (Parameters for the surveys 2003/2004 bis 2009/2010)

	Upper Limits							
	2004		2006		2008		2010	
Fuel [phys. Unit]	Amount	Costs [€]	Amount	Costs [€]	Amount	Costs [€]	Amount	Costs [€]
Hard Coal [kg]	6.000	1.680	6.000	1.680	6.000	1.920	6.000	2.275
Lignite [kg]	6.000	1.500	6.000	1.500	6.000	1.944	6.000	1.800
Brow ncoal Briquettes [kg]	6.000	2.220	6.000	2.220	6.000	2.250	6.000	2.240
Coke [kg]	6.000	2.400	6.000	2.400	6.000	2.354	6.000	2.670
Fuel Wood [kg]	17.240	1.498	17.240	1.896	17.240	2.586	17.240	2.400
Fuel Wood [rm]	40	1.498	40	1.896	40	2.586	40	2.400
Pellets [kg] 1	12.000	2.880	12.000	2.880	12.000	2.160	12.000	2.412
Wood Briquettes [kg] 1	-	-	-	-	12.000	2.400	12.000	2.640
Wood Chips [kg]	20.000	1.076	20.000	1.620	15.360	791	15.360	850
Wood Chips [rm]	78	1.076	78	1.620	60	791	60	850
Fuel Oil [kg]	7.700	4.756	7.700	5.005	7.700	7.325	7.700	6.592
Fuel Oil [ltr]	9.133	4.756	9.156	5.005	9.156	7.325	9.156	6.592
LPG [kg]	2.900	5.220	2.900	5.220	2.900	3.732	2.900	4.000
LPG [ltr]	5.000	5.220	5.000	5.220	5.000	3.732	5.000	4.000
Non-interruptible Electricity [kWh]	20.000	3.068	20.000	3.464	20.000	3.462	20.000	3.603
Interruptible Electricity [kWh]	30.000	2.991	30.000	3.378	30.000	3.429	30.000	3.429
Natural Gas [kWh]	77.770	3.917	77.770	3.801	77.770	4.476	77.770	4.776
Natural Gas [m³]	7.201	3.917	7.201	3.801	7.201	4.476	7.201	4.776
District Heating [kWh]	50.000	6.500	50.000	6.500	50.000	5.000	50.000	7.500
Central Heating (fuel unknow n) [kWh]	50.000	6.500	50.000	6.500	50.000	5.000	50.000	7.500

[1] *Pellets and wood briquettes recorded separately since 2007/2008*

Tab.2: Laender-specific Average Prices of Non-Interruptible Energy, Interruptible Energy and Natural Gas for Private Customers (Parameters for the Surveys 2003/2004 bis 2009/2010)

	Non-interruptible Electricity [Ct/kWh]			
Laender	**2004**	**2006**	**2008**	**2010**
B	17,4034	17,9782	18,5281	19,0611
K	14,7677	16,7343	16,9656	17,4885
N	15,2259	17,6289	17,8334	18,6707
O	16,4448	18,1854	18,0893	19,1400
S	16,1037	18,3304	17,4841	17,5107
ST	15,9422	17,8600	18,2300	18,5070
T	14,0172	15,7878	15,7661	16,3463
V	13,7400	16,3221	15,1079	17,0906
W	14,3993	17,0704	17,7967	18,3008
	Interruptible Electricity [Ct/kWh]			
Laender	**2004**	**2006**	**2008**	**2010**
B	11,3122	11,6858	12,0433	12,0433
K	9,5990	10,8773	11,0276	11,0276
N	9,8969	11,4588	11,5917	11,5917
O	10,6891	11,8205	11,7580	11,7580
S	10,4674	11,9148	11,3647	11,3647
ST	10,3624	11,6090	11,8495	11,8495
T	9,1112	10,2620	10,2480	10,2480
V	8,9310	10,6094	6,8606	6,8606
W	9,3596	11,0957	11,5679	11,5679
	Natural Gas [Ct/kWh]			
Laender	**2004**	**2006**	**2008**	**2010**
B	5,0500	5,0377	5,6963	5,5836
K	5,1000	4,7317	5,9922	6,3552
N	4,5200	5,0575	5,3634	6,3676
O	5,2000	4,6155	5,7026	5,8783
S	5,4000	5,0773	5,7254	6,1568
ST	5,1900	4,8365	6,1330	6,1563
T	5,2300	5,4117	5,9312	6,4407
V	4,8900	4,9867	5,6600	5,8375
W	4,7510	4,2387	5,5993	6,4892

Prices for non-interruptible and interruptible electricity refer to the consumption category up to 3500 kWh per year and household, prices for natural gas refer to an annual average consumption of 15000 kWh per year

Completion and Creation of Pair of Variates

Completion of Pair of Variates in Case of Missing Amounts OR Costs

Incomplete pair of variates are completed by using average market prices (see Table 2) as follows:

- Laender-specific prices for non-interruptible / interruptible electricity and natural gas are based on information given by the energy suppliers (local players) and information derived from annual bills or further sources (e.g. internet publications).
- Concerning other fuels such as coals or LPG, the average prices are calculated by using the extreme value-adjusted median derived from completely reported pair of variates of the survey itself.

Creation of Pair of Variates in Case of Missing Amounts AND Costs

In case of unknown amount and costs for a fuel used in the household, the fuel amount is calculated by summing up assumed default amounts for the announced end-use categories as follows:

Tab.3: Average Values of Annual Energy Consumption for Water Heating and Cooking (Parameters for the Surveys 2003/2004 - 2009/2010)

End-Use Category	Nr. of Persons in the Household	Energy Demand	
		[kWh]	[GJ]
Water Heating [1]	pro Person	1199	4,3164
Cooking [2]	1	375	1,35
Cooking [2]	2	475	1,71
Cooking [2]	3	544,444	1,96
Cooking [2]	4	713,889	2,57
Cooking [2]	5 and more	883,333	3,18

[1] assumed as linear function; In case of using a heat pump for water heating, the share per person is reduced by one third (energy demand for the run of the heat pump). [2] assumed as a non-linear function;

Calculation of the Share for Water Heating

As a fuel is used for water heating and both, amounts and costs, are unknown, the households need for water heating is calculated as the average annual consumption in dependence on the number of persons living in the household (see table 3). In case of using more than one fuel for water heating, the calculated overall amount for water heating is divided by the number of all fuels reported for this end-use category.

Calculation of the Share for Cooking

In case of missing amounts and costs concerning the end-use category cooking, the amount and corresponding costs are computed as the average annual consumption in dependence of the number of persons living in the household (see table 3). In case of using more than one fuel for cooking, the calculated overall amount for cooking is divided by the number of all fuels reported for this end-use category.

Calculation of the Share for Space Heating

In contrast to the energy needs for water heating and cooking the energy consumption for space heating does not depend on the number of persons but is highly related to the dwelling´s size and age and the living space. Figures used are split into three construction

periods and into three classes of dwelling size (figures provided by the Technical University of Vienna) (see Tab.4):

Tab.4: Average Annual Energy Demand for Space Heating per m² in Dependence on the Building´s Size and Age (Parameters for the surveys 2003/2004 to 2009/2010)

Fuel	Detached / Semidetached Houses			Appartement Houses		
	Construction Period			Construction Period		
	A	B	C	A	B	C
Hard Coal [kg]	29,8	21,3	12,5	23,4	17,0	12,3
Lignite [kg]	86,2	61,7	36,1	67,7	49,1	35,7
Browncoal Briquettes [kg]	43,3	31,0	18,1	34,0	24,6	17,9
Coke [kg]	29,6	21,2	12,4	23,2	16,9	12,3
Fuel Wood [kg]	58,3	41,7	24,4	45,7	33,2	24,1
Pellets [kg] 1	48,3	34,6	20,2	37,9	27,5	20,0
Wood Briquettes [kg] 1	48,7	34,9	20,4	38,2	27,7	20,2
Wood Chips [kg]	73,2	52,4	30,6	57,4	41,6	30,3
Fuel Oil [kg]	19,5	14,0	8,2	15,3	11,1	8,1
LPG [kg]	18,2	13,0	7,6	14,2	10,3	7,5
Heat Pumps [kWh]	154,7	110,7	64,7	121,3	88,0	64,0
all fuels* [kWh]	232,0	166,0	97,0	182,0	132,0	96,0

*Construction Period A: till 1960; Construction Period B: 1961 to 1990; Construction Period C: 1991 to 2005; * concerns all fuels announced in kWh (except heat Pumps) and all fuel amounts converted to kWh*

As the number of flats per dwelling as well as the size and the age of the building are provided for every household by means of the Labor Force Survey, the figures for space heating needs are *directly* applicable to each single data record. Compared with the former method of using Laender-specific averages of fuel-specific energy needs for space heating, the new approach provides much more precise results.

Calculation of the Share for Space Heating in Case of more than one fuel used for Space Heating calculation

In case of 2 or more fuels used for space heating, the calculation of the overall share for space heating in the household is much more complex and therefore expanded by the following factors:

- The -50% lower threshold of the assumed FEC,
- The total of the reported FEC at this point of calculation,
- The heating system in forms of a single heater or central heating system and
- The predefinition of the share for space heating concerning the fuel predominantly used for space heating to 70% of all fuels used for space heating (the percentage of 30% is split in equal shares to the remaining fuels).

These factors are combined to calculate the share for space heating of one household as follows:

- If the sum of the *calculated* energy needs for water heating and cooking, all other *reported* amounts and 70% of the *calculated* share for space heating concerning the predominantly fuel for space heating *is less* than -50% of the lower threshold of the assumed FEC, the calculated share for the fuel used predominantly for heating amounts to 70% whereas 30% account for the additional heating fuels with unknown amounts.
- If the sum (see above) is equal or above the -50% lower threshold, the share for space heating concerning the predominantly used heating fuel is not assumed to account for 70% but to 100%. Further shares for space heating of additional heating fuels are not calculated with the exception of natural gas, wood pellets, wood chips, solar heat and heat pumps.
- Shares for space heating of fuels that are NOT the predominantly heating fuel represent the remaining 30% and are split in equal parts.

After computing the single shares the overall fuel consumption and corresponding costs are calculated in the following order: water heating, cooking, space heating. If a particular fuel is allocated to more than one end-use category, the single shares are summed up and for this total the costs are calculated by use of the average market prices.

2. Calculation of the annual Final Energy Consumption (FEC)

The consumed amounts that are reported in various physical units are converted (standardized) to kWh respectively GJ by means of calorific values. Default values of the average annual consumption per end-use category (space heating, water heating, cooking) enable the allocation of consumption shares for fuels were the amount as well as the costs have not been reported. Furthermore, default values are used to calculate the assumed FEC (= average energy need for space heating + average energy need for water heating + average energy need for cooking) of one household.

Data is checked by summing up the ***reported FEC*** on household´s level and compared with a target figure, the ***assumed FEC***. The ***assumed FEC*** is calculated by using default values for average FEC for space heating, average FEC for water heating and average FEC for cooking depending on the number of persons living in one household respectively the dwelling´s age and size.

A ±50% range of tolerance of the calculated assumed FEC is used and the overall fuel consumption per household is corrected in case of a divergence of the ***reported FEC*** of more or less than 50% compared to the ***assumed FEC***.

Household´s Level

Calculation of the Reported FEC and the Assumed FEC

The single data correction and completion / creation of pairs of variates is followed by the calculation of the recorded FEC on ***household´s level*** as sum of all fuels used; The reported FEC is compared to the assumed FEC – calculated by means of the end-use categories´ specific average annual amounts – , plausibility checked and possibly corrected. The

tolerance interval is ±-50% of the assumed FEC. Whether the annual energy consumption of a household can be classified as realistic or not, the following procedures are conducted:

1. At first the ***reported FEC*** is calculated as sum of all recorded, corrected and complemented energy consumptions (all converted to kWh) in the household. Exceptions on this are made for non-interruptible electricity consumption that is added by summing up the default values for space heating, water heating and cooking as well as for solar heat and heat pumps that are always calculated as sums of the average annual energy shares for space and / or water heating. Not implemented is the electricity consumption concerning the category 'other purposes' such as lighting, refrigerator or consumer electronics due to its large range of variation. This share is considered for the final energy consumption at first within the frame of the fuels´ aggregation on National- and Laender-scale.
2. As a comparable measure, the ***assumed FEC*** is used. This figure is calculated as the sum (kWh) of the average annual shares for space heating, water heating and cooking as those apply to the reported predominantly used heating fuel. In case of the main heating system is a single heater, the share for space heating has to be reduced by means of reducing the reported flat´s size (m²) to 60%. This applies to all fuel possibly used in single heaters.
3. If the reported FEC differs from the assumed FEC by more than 50%, it is to be assumed as unrealistic and the reported FEC stepwise corrected by use of the ±50%-tolerance range of the assumed FEC.

Correcting the FEC on Household´s Level in three Steps

The correction of the reported FEC is conducted by use of the 'target' of the assumed FEC which means in case of lower deviation or exceedance of the +50%-tolerance thresholds. All reported FEC within the thresholds are classified as realistic and therefore are not edited any further, all reported FEC outside the target are corrected as follows:

1. In a first step, all pairs of variates are proofed on plausible ratios of amount and costs. In case of unrealistic prices (the ratio of amount and costs is not in the ±25% tolerance interval), the amounts are corrected by means of the reported costs and the reported FEC is calculated anew. If the tolerance interval of the assumed FEC is already met at this point, the data record is accepted as plausible and no further corrections are conducted.
2. If all prices are within tolerance but the reported FEC is to high, the consumed ***amount of all fuels used*** is reduced stepwise till the +50% threshold of the assumed FEC is reached.
3. If all prices are within tolerance but the reported FEC is to low, the consumed ***amount of the predominantly fuel used for space heating*** is raised stepwise till the -50% threshold is reached whilst all other fuels´ amounts stay untouched.

Annotations on Determining the Tolerance Range of the Assumed FEC

The definition of the ±50% tolerance interval of the assumed FEC has been fixed by comparing results based on the use of intervals from -50% to +75% and -50% to +100%. As

table 5 shows, reducing the upper tolerance threshold from 100% to 50% leads to a reduction of the overall energy consumption of only 4.48%.

Major differences only become apparent at fuels-scale: major reductions only concern solid combustibles such as fossil fuels such as hard coal with 15% and renewables such as fuelwood with 8,98% and wood pellets with 14,66%. These results are in line with non-survey information on coals and wood based fuels, indicating an over estimation of the consumptions of those fuels if the results base on the +100%-threshold. Another reason to change the methodology is given by the fact that the percentages of reduced and raised amounts converge if the +50%-threshold is used, as can be seen in table 6.

Tab.5: Comparative Results on the Changes of Fuel Specific Energy Uses Using Different Tolerance Intervals of the Assumed FEC on National Level (calculated from Survey 2007/2008)

Fuel	Use of Energy per Fuel [GJ]		Change of the Use of Energy per Fuel	
	A: assumed EEE -50% +100%	B: assumed EEE -50% +50%	Difference A - B absolute [GJ]	Decrease [%]
Hard Coal	1.171.616,496	995.845,402	175.771,094	*15,00*
Lignite	33.535,074	31.890,226	1.644,847	*4,90*
Browncoal Briquettes	598.438,568	560.720,676	37.717,892	*6,30*
Coke	1.859.131,266	1.737.458,422	121.672,844	*6,54*
Fuel Wood	62.545.270,864	56.928.455,179	5.616.815,685	*8,98*
Pellets	3.151.661,440	3.019.197,827	132.463,612	*4,20*
Wood Briquettes	1.910.411,688	1.826.296,066	84.115,621	*4,40*
Wood Chips	6.070.215,440	5.180.545,521	889.669,919	*14,66*
Fuel Oil	58.377.932,169	55.913.795,525	2.464.136,644	*4,22*
LPG	2.518.195,306	2.468.046,835	50.148,471	*1,99*
Non-interruptible	54.682.824,390	53.516.754,478	1.166.069,912	*2,13*
Interruptible Electricity	6.143.290,501	6.038.571,355	104.719,145	*1,70*
Electricity Total	60.826.114,890	59.555.325,834	1.270.789,057	*2,09*
Natural Gas	55.030.661,481	53.516.326,241	1.514.335,239	*2,75*
Solar Heat	3.402.564,529	3.291.703,639	110.860,890	*3,26*
Heat Pumps	4.771.348,302	4.692.662,302	78.685,999	*1,65*
District Heating	22.216.214,818	22.007.065,192	209.149,627	*0,94*
Total	**284.483.312,331**	**271.725.334,888**	**12.757.977,442**	***4,48***

Tab.6: Comparative Results on the Extent of Corrections on Reported Data Using Different Tolerance Intervals of the Assumed FEC on National Level (calculated from Survey 2007/2008, not grossed up)

Correction of the Computed EEE	Range of the Assumed EEE			
	A: -50% +100%	B: -50% +50%	A: -50% +100%	B: -50% +50%
	Nr. of Households Concerned		Percentage of Households Concerned	
None	9.895	8.856	*79,80*	*71,43*
Increase	1.744	1.744	*14,07*	*14,07*
Reduction	760	1.799	*6,13*	*14,51*
Corrections in total	2.504	3.543	*20,20*	*28,58*
total	**12.399**	**12.399**	***100,00***	***100,00***

As can be seen in the table above, the choice of the ±50%-tolerance interval proves as a solid measure that considers possible under estimations and over estimations of the recorded FEC in a quite balanced way.

3. Grossing up

Fuel Level and Laender-Scale

In a finishing step, the reported energy amounts and costs that were corrected on household´s level as well as the calculated consumptions concerning solar heat and heat pumps are grossed up independently from the micro-census by use of the following criteria:

- Laender,
- Age of the dwelling,
- Size of the dwelling,
- 96% of all households connected to the gas grid as reported by E-CONTROL,
- 94 % of the number of pellets boilers (<=100 kW) as reported by the Chamber of Agriculture, Lower-Austria
- 100 % of the number of wood chips boilers (<=100 kW) as reported by the Chamber of Agriculture, Lower-Austria

These weighted and plausibility checked single data on household´s level are finally ***aggregated to fuels on National- and Laender-scale***. The results are presented in physical and energetic consumption amounts per household, per m² and per person with corresponding costs.

In contrast to earlier plausibility programs concerning the energy consumption of households, Laender-specific parameters have been implemented, providing substantially improved results of regional energy use.

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4. Determining fuel specific use of energy for the end-use categories space and water heating, cooking and other use of electricity.

The calculation of the allocation of the end-use shares on the overall energy consumption of the households (only households at their main residence) aims at the fuel specific calculation of the consumed amounts (physical and energetic) per household, per m² and per person for Austria and its federal provinces.

The calculation of the shares for ***space heating, water heating, cooking*** and ***other purposes*** (non-interruptible electricity only) per fuel is based on the plausibility checked and corrected single data.

- Having only ***one end-use category*** reported for a certain fuel its energy amount is applied to this type of use by 100%. With regard to electricity, this only concerns the category 'other purposes'.
- In case of the assumed FEC´s share for water heating or / and cooking of a particular fuel exceeds the overall amount of the same fuel, 50% of the fuel´s overall amount always accounts for space heating. If only one more end-use category is mentioned, its share also amounts to 50% whereas having reported both categories the ratio of energy need for water heating and cooking is applied on the remaining half.
- In case of the assumed FEC´s share for water heating or / and cooking of a particular fuel is less or equal the overall amount of this fuel, the share for space heating is equal the difference of total amount and average consumption for water heating or / and cooking. On the remaining residual the ratio of energy need for water heating and cooking is applied.

In case of electricity (non-interruptible and interruptible) used for space heating, not only the energy need for water heating and cooking in dependence on the number of persons per household have to be considered but also the average annual need for space heating per m². As this calculation takes into account the flat´s size, two scenarios have to be distinguished:

- In case of the assumed FEC´s share for space heating (according to the living space in m²) exceeds the electricity total, the share for space heating always amounts to 50% of the overall electricity consumption. The remaining 50% are split into 15% for water heating, 10% for cooking and electricity for other purposes (varying share that has always to be calculated in dependence of the combination of end-use categories).
- In case of the assumed FEC´s share for space heating is less or equal the electricity total, the amount for space heating is equal the average need for space heating with electricity considering the given m². The shares for water heating and space heating are equal their average annual consumption (dependant on the number of persons in the household) in consideration of the number of all fuels used in the particular end-use category. The remaining rest in comparison to the overall electricity amount is allocated to the end-use category 'electricity for other purposes'.

Annex V:

Standard documentation
Meta information

(Definitions, comments, methods, quality)

on Random Sample Survey

Energy Consumption of Households

This documentation applies to the reference period:

2003 bis 2011

Status: **23.02.2012**

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Contents

Executive Summary

The survey „Energy Consumption of Households“ is an independent module with voluntary response appended to the Labor Force Survey which is mandatory. The statistical purpose of the survey is to determine the dwelling-bound consumption with the associated expenditure of all fuels used and their assignment to the purposes space heating, water heating, cooking and other purposes. Further information digitally recorded within the telephone interview concern the type and the age of the heating system, possible additional heating systems, remedial actions and the regulation of the living space´s temperature. Apart from the use of energy in the household data on the energy consumption of vehicles is collected, such as kind of fuel, fuel consumption, vintage and annual mileage. The reference period of the required information matches the period of the last annual statement (e.g. annual electricity bill) respectively the last 12 months before the date of the interview.

General information about the household such as household size, size and age of the dwelling, legal relationship to the flat / house and primary heating system is taken from the basic program.

The aims of the analysis of the surveys on energy consumption of households (conducted since 1975, since 2004 with biennial periodicity) are twofold. The original aim, as required by law, is to record domestic energy consumption with the objective of making relevant information available for National Accounts. The second and meanwhile equally important aim is to improve the sectoral structure of energy consumption and expenditure on energy in the context of Energy Balances and Energy Accounts.

The basic design of the survey program has essentially remained the same over recent years but adaptations had to be made from time to time to account to changing general conditions. In September 2004, for example, following the complete restructuring of the entire micro-census (switch from face-to-face interviews to telephone interviews and simultaneously to paperless surveys), a totally new plausibility program was introduced for data control.

One reason for ongoing changes can be seen in ever-increasing requirements in terms of compiling the Energy Balances. Original aim of the energy balances was to depict the general Austrian energy supply situation with the accuracy and timeliness necessary for political decisions of general principle and to describe the role played by energy supply within the Austrian economy (National Accounting relevance). Now, further purposes are documenting Austria's international commitments to storing energy sources (IEA agreement) and the impacts of promotional measures (such as promotion of solar energy or heat pumps, Cogeneration Directive) and political steering measures (such as the Green Electricity Act) on a high level of detail.

They also serve for the main basis of calculation of Austria’s Kyoto-relevant, energy-based greenhouse gas emissions (reference approach) by the Austrian Umweltbundesamt (Austrian Environment Agency) and the EU. A further issue is to check the adherence to EU-Directives concerning energy efficiency and energy services (Energy Efficiency Directive) by means of the energy balances (final energy consumption).

Ongoing adaptations are necessary as changes of political and economical frameworks, e.g. the liberalization of the energy market, severely reduce the data availability for the supply account in the context of producing the balance sheet. According to this, new models have to be developed and implemented, that considerably build on an improved data basis for the supply account of the energy balance.

Energy Consumption of Households – Important elements	
Main purpose of the statistics	Compilation of purposes (qualitative), amounts / expenses of the use of energy per fuel at main residences; Compilation of the kind / age of heater, 2. heater system, air condition,, remedial actions; use of energy concerning the private automobile sector: fuel, kilometers travelled per yea, avg. fuel consumption per 100 km, aircondition
Observed unit / reporting unit / presentation unit	Stratified random sample by NUTS 2 derived from the Register of residents (coverage 2010: 15.784 housing units with main residence)
Type of statistics	Random sample survey
Data sources/Survey techniques	Labour force survey (obligatory apply) with the following question module concerning energy consumption in households
Reference period or due day	Period of the last annual account (e.g. for electricity), resp. The last 12 month before the term of the survey
Periodicity	Biennial
Survey participation	Voluntarily
Legal bases	Federal Statistics Act (consolidated version) in the current version, Regulation (EC) No. 1099/2008 of the European Parliament and of the Council of 22 October 2008 on Energy Statistics
Regional breakdown	Laender (NUTS 2)
Availability of the results	Preliminary results: not relevant Final results: 6 months after ending the survey
Other	

1. General information

1.1 Objective and purpose, history

The demand for energy data rocketed following the oil price shock in the nineteen-seventies. We have therefore carried out our own sample survey on domestic energy consumption since 1975. Up to 1989, the survey was conducted in March at biennial intervals. Thereafter the intervals were lengthened: the following surveys were carried out in March 1993, June 1997 and June 2000. Since 2004, the survey on household´s energy consumption is conducted biennial again whereas the carrying out of the survey takes place in the belonging to the firm telephone studio.

The surveys are usually conducted in the 3rd quarter of the year and as regards content cover the period of the last 12 month before the term of the survey. Due to restructuring the telephone studio, the survey 2010 took place from the 3rd to the 4th quarter[1].

The questions about domestic energy consumption are very significant as much as private households account for approximately 40% of Austria's final energy consumption.

The aims of the survey analysis are twofold. The original aim, as required by law, is to record domestic energy consumption with the objective of making relevant information available for National Accounts. The survey itself and the analyses to that end are therefore financed out of Statistics Austria's basic budget. The second, and in the meantime equally important aim is to improve the sectoral structure of energy consumption and expenditure on energy in the context of Energy Balances and Energy Accounts. The incorporation into the Energy Balances (conversion of the survey´s reference period to calendar years, estimation of the consumption of secondary residences) is financed in equal shares by the BMWFJ (Federal Ministry of Economics, Family and Youth) and the BMLFUW (Federal Ministry of Agriculture, Forestry, Environment and Water Management) under a private law contract.

The basic design of the survey program has essentially remained the same over the years. Adaptations had to be made from time to time, however, to take account of changing conditions or new situations. In September 2004, for example, following the complete restructuring of the entire survey (switch from face-to-face interviews to telephone interviews and simultaneously to paperless surveys), a totally new plausibility program was introduced for data control.

One reason for this was the ever-increasing requirements to be met by Energy Balances. Their original aim was to depict the general Austrian energy supply situation with the accuracy and timeliness necessary for political decisions of general principle and to describe the role played by energy supply within the Austrian economy (National Accounting relevance). They now also serve for documenting Austria's international commitments to storing energy sources (IEA agreement) and documenting the impacts of promotional measures (such as promotion of solar energy in Salzburg, Cogeneration Directive) and political steering measures (such as the Green Electricity Act) on a high level of detail. They also represent the main basis of calculation of Austria's Kyoto-relevant, energy-based greenhouse gas emissions (reference approach) by the Austrian Umweltbundesamt (Ministry of Agriculture, Forestry, Environment and Water Management) and the EU. Moreover, changing basic political and economic conditions, such as the liberalization of the energy market, severely reduce the availability of data for the supply account in the context of producing the balance sheet. These need to be replaced by developing and implementing

new models, essentially building on an improved data basis for the consumption side of the balance sheet.

1.2 Contracting entity

1.3 Main users

Statistics Austria, Directorate Spatial Statistics and Directorate Macro-economic Statistics, Umweltbundesamt (Federal Ministry of Agriculture, Forestry, Environment and Water Management, Federal Ministry of Economy), Family and Youth (BMWFJ), Science.

1.4 Legal basis

Federal Statistics Act (consolidated version) in the current version, private law contracts with the BMLFUW and the BMWFJ, Regulation (EC) No. 1099/2008 of the European Parliament and of the Council of 22 October 2008 on Energy Statistics.

2. Concepts and Processing

2.1 Statistical concepts and methodology

2.1.1 Statistical purpose

The first section of the survey comprises dwelling-bound consumption and the associated expenditure, broken down by the following fuels:

- Hard coal
- Lignite
- Brown coal briquettes
- Coke
- Fuel wood
- Pellets, Wood briquettes (2004, 2006)
- Pellets (since 2008)
- Wood briquettes (since 2008)
- Wood chips
- Fuel oil
- LPG
- Electricity (split up into non-interruptible and interruptible till 2008)
- Natural gas
- Solar
- Heat pumps
- District heat
- Central heating, fuel unknown

differentiated according to types of use as follows:

- Space heating,

- Water heating,
- Cooking
- Other uses (only with concern to electricity: light, consumer electronics etc)

The second series of questions is concerned with the age of the primary heating system, the type of possible additional heating systems, air condition and remedial actions.

The third, completely independent part of the survey relates to energy consumption of vehicles – age of car – air conditioning – fuel used – annual mileage – average fuel consumption per 100 km, in each case with a separate set of questions for the household's first and second car.

2.1.2 Observation unit / reporting unit / analytical unit

Austrian private households at their main residence

2.1.3 Data sources, coverage

Voluntary random sample survey stuck to the obligatory labor force survey

2.1.4 Reporting unit and respondents

Austrian private households at their main residence

2.1.5 Survey format

Random sample survey

2.1.6 Sample characteristics

Random sample of ~22.500 homes derived from the Central Register of Residents, broken down by Laender (federal provinces of Austria, NUTS 2).

2.1.7 Survey techniques / data transmission

The Domestic Energy Consumption survey is an independent module on a voluntary basis that is appended to the Labor Force Survey (mandatory). This, in turn, is collected 1/5 by Computer assisted personal interviews (CAPI, face to face) and 4/5 via a Computer Assisted Telephone Interview (CATI). For energy consumption the 2006 survey is an exception because no face to face interviews were conducted. The energy data, enriched by essential data from the Labor force survey such as size and age of the dwelling, household´s size, main heating system etc. are digitally transmitted to the Energy Department upon completion of the survey.

2.1.8 Survey questionnaire (including annotations)

As the data collection in frame of the micro-census is totally paperless since 2004, the telephone interviewers don´t get the classic paper questionnaires but so called interviewers´ guides. The last paper questionnaire concerning energy consumption in households was prepared for the survey 2003 / 2004. For all following surveys, the questions implemented in the digital acquisition program were compiled to manuals with annotations and instructions for the interviewers. All households receive a letter from Statistics Austria just in time before

the survey, explaining its purpose and scope and asking for preparing the latest (annual) bills for electricity, gas, district heating and other fuels.

Survey Questionnaire 2004: see Annex

2.1.9 Survey participation

Domestic Energy Consumption Survey – 3rd Quarter 2004			
Respondents		Absolute	Share
Valid	Participation agreed	14.582	*74,2 %*
	Participation denied	5.070	*25,8 %*
	Total	19.652	*100,0 %*
Domestic Energy Consumption Survey – 3rd Quarter 2006			
Respondents		Absolute	Share
Valid	Participation agreed	11.939	*49,7 %*
	Participation denied	12.073	*50,3 %*
	Total	24.012	*100,0 %*
Domestic Energy Consumption Survey – 3rd Quarter 2008			
Respondents		Absolute	Share
Valid	Participation agreed	12.399	*62,0 %*
	Participation denied	7.594	*38,0 %*
	Total	19.993	*100,0 %*
Domestic Energy Consumption Survey – 3rd – 4th Quarter 2010			
Respondents		Absolute	Share
Valid	Participation agreed	8.582	*54,4 %*
	Participation denied	7.202	*45,6 %*
	Total	15.784	*100,0 %*

2.1.10 Survey items, derived data elements, indicators (including definitions)

Cf. plausibility

2.1.11 Classifications

- Sectoral classification of Joint IEA/ECE/EUROSTAT Questionnaires aggregated from NACE categories
- NUTS-classification for statistics on regional representation

2.1.12 Regional breakdown

Laender (NUTS 2)

2.2 Production of Statistics, Processing, Quality assurance measures

2.2.1 Data capture

The data are collected via CATI (Computer Assisted Telephone Interview) and CAPI (Computer
Assisted Personal Interview) and are submitted electronically.

2.2.2 Coding

Not relevant

2.2.3 Editing and verification of external data sources

Not relevant

2.2.4 Imputation (in the case of missing values or incomplete data)

See document MZ_Energie_PlausMethodik_2012-02-10_en.docx

2.2.5 Grossing up procedures (weighting)

The grossing up is done with the of labor force survey´s criteria (as exclusive criteria only with regard to the questions on cars) and additionally with data on the number of dwellings by building size and construction period, the number of households connected to the natural gas grid and the heating systems available for wood chips and pellets (since 2008) in case of dwelling bound fuel consumption.

2.2.6 Processing steps on the way to the final data set, (other) models and statistical estimation techniques used

A new approach to data control was taken compared with previous surveys the first time in 2004 and continued till now. Up to and including the 2000 survey, only the individual energy sources themselves were checked for plausibility (plausibility checks of the stated quantities with reference to the stated values and annual average prices), any missing data were calculated to quantity-value pairs and substitutions were made if necessary. These routines continue to be used supplemented by the relation of the total reported energy consumption to a calculated (fictitious) overall consumption. This assumed overall consumption of one household is calculated by use of given information on the household (floor space, number of people in household) and pre-set parameters for the individual types of use (space heating, water heating, cooking, electricity use for other purposes). Calculating and correcting the total reported energy consumption per household in this way involves some quite complicated plausibility routines, because one or more alternative quantities have to be calculated if the reported overall energy consumption is beyond the tolerance-range of ±50% of the fictious overall energy consumption.

2.2.7 Other quality assurance measures

Being a main data source for energy balances the results are compared together with other statistics on energy consumption (the material input statistics, the sample survey on energy consumption of small establishments of the manufacturing industry and the sample survey

on energy consumption of the service sector) with the quantities of fuels available. This procedure guarantees that unrealistic results can be identified quickly.

2.3 Publication (accessibility)

2.3.1 Preliminary results

Not relevant

2.3.2 Final results

Not relevant

2.3.3 Revisions

Because of the methodological changes in 2004 the results of the surveys 2004 and 2006 were preliminary. With the results of the survey 2008 the adaptation phase of the analysis software has been finalized and all 3 surveys are grossed up again following common standards.

2.3.4 Published in:

The main results are published on the homepage of Statistics Austria.

2.3.5 Confidentiality

The publication and data supply to third parties follow strictly the Federal Statistics Act 2000 in the current version. That means data are only supplied in anonymized form, therefore no conclusions to single households are possibleQuality

2.4 Relevance

The main purpose of the survey is to draw up and to improve the quality of energy balances (physical and monetary). As this concept has been tried and tested, it will be used for subsequent surveys.

2.5 Accuracy

The table below shows a summary of the sampling errors by energy sources, by weighted numbers of case and weighted quantities, in each case for the overall result and the three types of use that were ascertained separately. Whereas the sampling error is within acceptable limits for the overall consumption of all energy sources, the uncertainty rises sharply with respect to individual energy sources according to types of use. This is due to the high variance in the energy source quantities used in combination with low numbers of cases.

Table 1: Sampling Errors at 95% Statistical Certainty 2003 to 2010

Fuel	Survey 2003 / 2004, Data for Austria

	Nr. of Cases	Rel. Error in %	Amount	Rel. Error in %
Hard Coal	36.097	*19,7*	49.223.600 kg	*28,2*
Lignite	16.685	*29,8*	31.457.224 kg	*35,2*
Brown Coal Briquettes	41.504	*18,5*	39.689.258 kg	*25,8*
Coke	54.863	*15,0*	106.844.950 kg	*17,4*
Fuel Wood	889.193	*2,8*	3.557.024.948 kg	*4,0*
Wood Pellets & Wood Briquettes	66.923	*12,7*	169.275.672 kg	*16,4*
Wood Chips	33.328	*16,1*	324.386.052 kg	*18,1*
Fuel Oil	961.275	*2,9*	1.559.220.575 kg	*3,3*
LPG	58.042	*11,5*	33.565.338 kg	*15,1*
Natural Gas	1.060.812	*2,6*	1.414.141.207 m³	*3,5*
District Heating	634.989	*4,0*	5.091.418.411 kWh	*4,5*
Electricity	3.429.720	*0,0*	16.386.155.302 kWh	*1,3*
Solar Heat	156.961	*7,6*		
Ambient Heat	85.794	*10,7*		

Fuel	**Survey 2005 / 2006, Data for Austria**			
	Nr. of Cases	**Rel. Error in %**	**Amount**	**Rel. Error in %**
Hard Coal	41.013	*17,7*	42.098.894 kg	*24,0*
Lignite	13.907	*30,5*	13.659.642 kg	*51,0*
Brown Coal Briquettes	62.038	*13,8*	36.498.247 kg	*20,5*
Coke	45.884	*17,7*	74.510.118 kg	*21,7*
Fuel Wood	1.132.800	*2,1*	4.021.766.245 kg	*3,6*
Wood Pellets & Wood Briquettes	84.383	*7,8*	201.931.638 kg	*11,1*
Wood Chips	40.039	*3,2*	390.666.424 kg	*8,2*
Fuel Oil	968.068	*2,8*	1.516.713.066 kg	*3,2*
LPG	57.978	*15,0*	40.476.578 kg	*20,1*
Natural Gas	1.083.511	*0,0*	1.494.274.383 m³	*2,3*
District Heating	693.352	*3,6*	5.932.561.296 kWh	*4,5*
Electricity	3.510.448	*0,0*	16.759.831.841 kWh	*1,7*
Solar Heat	275.666	*6,0*		
Ambient Heat	153.706	*8,4*		

Fuel	Survey 2007 / 2008, Data for Austria			
	Nr. of Cases	Rel. Error in %	Amount	Rel. Error in %
Hard Coal	36.389	*19,0*	34.158.880 kg	*26,6*
Lignite	5.681	*45,9*	3.241.036 kg	*85,0*
Brown Coal Briquettes	50.927	*15,2*	29.027.466 kg	*25,8*
Coke	40.026	*18,2*	59.513.147 kg	*23,1*
Fuel Wood	1.189.929	*2,1*	3.879.876.258 kg	*3,4*
Wood Pellets	47.108	*1,4*	174.418.921 kg	*6,3*
Wood Briquettes	122.140	*9,5*	105.675.758 kg	*13,4*
Wood Chips	47.044	*0,0*	448.420.438 kg	*7,4*
Fuel Oil	898.671	*2,8*	1.289.121.855 kg	*3,3*
LPG	62.288	*14,3*	52.251.787 kg	*19,5*
Natural Gas	1.093.335	*0,1*	1.407.279.865 m³	*2,2*
District Heating	782.463	*3,0*	6.829.900.816 kWh	*3,9*
Electricity	3.570.889	*0,0*	16.686.351.572 kWh	*1,4*
Solar Heat	286.746	*5,8*		
Ambient Heat	165.090	*8,0*		

Fuel	Survey 2009 / 2010, Data for Austria			
	Nr. of Cases	Rel. Error in %	Amount	Rel. Error in %
Hard Coal	20.055	*31,7*	16.889.193 kg	*53,7*
Lignite	7.958	*52,2*	4.694.484 kg	*89,9*
Brown Coal Briquettes	35.539	*23,3*	19.818.586 kg	*38,3*
Coke	25.826	*29,6*	41.481.173 kg	*36,0*
Fuel Wood	1.172.905	*2,7*	3.770.766.186 kg	*4,4*
Wood Pellets	65.423	*0,0*	232.740.045 kg	*9,8*
Wood Briquettes	129.948	*11,4*	103.448.118 kg	*16,4*
Wood Chips	55.468	*0,0*	491.867.415 kg	*10,4*
Fuel Oil	842.615	*3,5*	1.218.217.524 kg	*4,5*
LPG	51.729	*19,5*	39.028.348 kg	*27,8*
Natural Gas	1.096.507	*0,0*	1.449.513.732 m³	*3,0*
District Heating	849.683	*3,4*	7.576.016.416 kWh	*5,1*

Electricity	3.594.603	*0,0*	16.961.792.450 kWh	*1,9*
Solar Heat	360.671	*6,3*		
Ambient Heat	195.141	*8,8*		

2.5.1 Sampling effects

No effects of the sample observable; representativeness high

2.5.2 Non-sampling effects

Not relevant.

2.5.3 Quality of data sources

N/A

2.5.3.1 *Coverage (misclassifications, undercoverage / overcoverage)*

Not relevant

2.5.3.2 *Missing values (unit non-response, item non-response)*

Cf. Participation in the Survey

2.5.3.3 *Measurement errors (keying in errors)*

None known

2.5.3.4 *Processing errors*

None known

2.5.3.5 *Model based effects*

Concentration for the average prices used if substitution carried out for plausibility reasons.

2.6 Timeliness and punctuality

The results are available for the final energy balance of the following (current year under review 2011).
Preliminary results are not published.
Final results are published at latest as announced in the advance release calendar ("Veröffentlichungskalender") on the Statistics Austria website (only available in German): http://www.statistik.at/web_de/ueber_uns/veroeffentlichungskalender/index.html

2.7 Comparability

2.7.1 Comparability over time

Comparability over time is only limited, in particular regarding the main energy sources, due to the completely revised analysis method used since 2004.

2.7.2 Comparability over region

Spatial and sectoral comparability (sectoral and with regard to the energy sources included) with other EU or IEA member states (in the context of energy balances) is fulfilled.

2.7.3 Comparability over other domains

Not relevant.

2.8 Coherence

Coherence with comparable primary statistics used as data sources for energy balances (use of
goods statistics, random sample of energy consumption in the service sector, random sample of energy consumption in the producing sector, useful energy analysis) is fulfilled.

3. Outlook

The results of the survey 2012 will be compared with the ones from the pilot study “Electricity and Gas Consumption of Austrian Households 2012”.

Glossary

List of abbreviations

A	Austria
B	Burgenland
BMLFUW	Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management
BMWA	Austrian Federal Ministry of Economic Affairs and Labour
BMWFJ	Austrian Federal Ministry of Economy, Family and Youth
CAPI	Computer-Assisted Personal Interview
Car	Carynthia
CATI	Computer-Assisted Telefone Interview
CHP	Combined heat and power
EU	European Union
Fig	Figure
IEA	International Energy Agency

kg	kilogram
kWh	kilowatt hours
LA	Lower Austria
m^3	Cubic meter
S	Salzburg
ST	Styria
T	Tyrol
UA	Upper Austria
V	Vorarlberg
VIE	Vienna

Reference to supplementary documentation/publications

Annex
Survey Questionnaire 2004

ENERGIEEINSATZ DER HAUSHALTE

☐ Information denied →

E1 **Which Fuels do you use** ..... (Antwortmöglichkeiten E 1-1 bis E 1-3):

E 1-1: .... for space heating predominantly (only one choice possible)	**E 1-2: .... for water heating** (multiple choice possible)	**E 1-3: .... for cooking** (multiple choice possible)
1 ☐ Hard coal	1 ☐ Hard coal	1 ☐ Hard coal
2 ☐ Lignite	2 ☐ Lignite	2 ☐ Lignite
3 ☐ Brown coal briquettes	3 ☐ Brown coal briquettes	3 ☐ Brown coal briquettes
4 ☐ Coke	4 ☐ Coke	4 ☐ Coke
5 ☐ Fuel wood	5 ☐ Fuel wood	5 ☐ Fuel wood
6 ☐ Pellets, Wood briquettes	6 ☐ Pellets, Wood briquettes	6 ☐ Pellets, Wood briquettes
7 ☐ Wood chips	7 ☐ Wood chips	7 ☐ Wood chips
8 ☐ Fuel oil	8 ☐ Fuel oil	8 ☐ Fuel oil
9 ☐ LPG	9 ☐ LPG	9 ☐ LPG
10 ☐ Electricity	10 ☐ Electricity	10 ☐ Electricity
11 ☐ Natural gas	☐ Natural gas	11 ☐ Natural gas
12 ☐ Solar	12 ☐ Solar	12 ☐ Solar
13 ☐ Heat pumps	13 ☐ Heat pumps	13 ☐ Heat pumps
14 ☐ District Heat	14 ☐ District Heat	
15 ☐ Central heating, if fuel is unknown	15 ☐ Central heating, if fuel is unknown	

Only if for E1 at least 1 time is 14 or 15 is filled in:

E2 **District Heat or central heating if fuel is unknown**

E 2-1: How many kWh you have consumed according to your last annual bill (only for district heat)?

|_|_|_|_|_|_| kWh

E 2-2: Overall costs according to your last annual bill?

|_|_|_|_| Euro

or partial amount (PA) Number of PA |_|_|

E 2-3: Period of the last annual bill?

Begin |_|_|_|_| (Month/Year) End |_|_|_|_| (Month/Year)

E 2-4: Bill of costs by:

1 ☐ metering 2 ☐ floor space ☐ other

Only if for E1 at least 1 time is 11 is filled in:

E3 **Natural gas**

E 3-1: How many m³ you have consumed according to your last annual bill?

|_|_|_|_|_|_| m³

E 3-2: Overall costs according to your last annual bill?

|_|_|_|_| Euro

or partial amount (PA) |_|_|_|_| Number of PA |_|_|

E 3-3: Period of the last annual bill?

Begin |_|_|_|_| (Month/Year) End |_|_|_|_| (Month/Year)

E 3-4: Bill of costs by:

1 ☐ metering 2 ☐ floor space ☐ other

E4N **E 4N: Electricity - interruptible contract?**

☐ yes

☐ no → go to E4S

E 4N-1: How many kWh you have consumed according to your last annual bill?

|_|_|_|_|_|_| KWh

E 4N-2: Overall costs according to your last annual bill?

|_|_|_|_| Euro

or partial amount (PA) |_|_|_|_| Number of PA |_|_|

E 4N-3: Period of the last annual bill?

Begin |_|_|_|_| (Month/Year) End |_|_|_|_| (Month/Year)

E4S **Electricity - non interruptible contract**

E 4S-1: How many kWh you have consumed according to your last annual bill?

|_|_|_|_|_|_| KWh

E 4S-2: Overall costs according to your last annual bill?

|_|_|_|_| Euro

or partial amount (PA) |_|_|_|_| Number of PA |_|_|

E 4S-3: Period of the last annual bill?

Begin |_|_|_|_| (Month/Year) End |_|_|_|_| (Month/Year)

E5 **Do you use other fuels except electricity, natural gas, district heat, gasoline or diesel?**

☐ yes

☐ No → go to E6

E5a **Other fuels used:**

1 ☐ Hard coal

Amount in Euro/Year | Quantity/Year | kg

2 ☐ Lignite

Amount in Euro/Year | Quantity/Year | kg

3 ☐ Brown coal briquettes

Amount in Euro/Year | Quantity/Year | kg

4 ☐ Coke

Amount in Euro/Year | Quantity/Year | kg

5 ☐ Fuel wood

Amount in Euro/Year | Quantity/Year | kg | cm

6 ☐ Pellets, Wood briquetts

Amount in Euro/Year | Quantity/Year | kg

7 ☐ Wood chips

Amount in Euro/Year | Quantity/Year | kg | cm

8 ☐ Fuel oil

Amount in Euro/Year | Quantity/Year | kg | liter

9 ☐ LPG

Amount in Euro/Year | Quantity/Year | kg | liter

12 ☐ Solar

Kollektorfläche | m²

13 ☐ Heat pump

E6 **In which year your main heating system (for which you use the fuel given in E1-1... for space heating predominantly) was installed?**

When ____ Year

E7 **Do you use an additional heating system?**
(only one choice possible)

1 ☐ No

2 ☐ Central heating ratio from E1: ____

3 ☐ Gas convector heater

4 ☐ Electric heater with fixed radiator

5 ☐ Stove ratio from E1: ____

6 ☐ Supplenetary electric heating system

7 ☐ Solar plant

8 ☐ Heating pump

E8 **Do you use an air conditioner** in your dwelling (fix installed or mobile)?

1 ☐ yes 2 ☐ no

E9 **Which thermal renovations were realised at the last 10 years in yor dwelling?**
(multiple choice possible)

1 ☐ None

2 ☐ Boiler change

3 ☐ Heat insulation of external walls

4 ☐ Heat insulation of the topmost ceiling

5 ☐ Changes of windows

→

E10 **Car-Use**

First car

E 10-1-1: Year of construction ____ Year

E 10-1-2: Air conditioner incorporated?

1 ☐ yes 2 ☐ no

E 10-1-3: Fuel used?

1 ☐ Gasoline 2 ☐ Diesel 3 ☐ other

E 10-1-4: Km driven at the last year?

____

E 10-1-5: Fuel consumption in liter/100 km ____

Zweiter PKW

E 10-2-1: Year of construction ____ Jahr

E 10-2-2: Air conditioner incorporated?

1 ☐ yes 2 ☐ no

E 10-2-3: Fuel used?

1 ☐ Gasoline 2 ☐ Diesel 3 ☐ other

E 10-2-4: Km driven at the last year?

____

E 10-2-5: Fuel consumption in liter/100 km ____