AGEB

AG Energiebilanzen

PREFACE

TO THE

ENERGY BALANCES

FOR THE

FEDERAL REPUBLIC OF GERMANY

CONTENTS

Aims and Objectives of the Energy Balances

In the Federal Republic of Germany, energy statistics are published by a number of bodies, often with considerable differences in presentation, data compression and demarcations. The associations of the German energy industry therefore formed Arbeits-gemeinschaft Energiebilanzen (AGEB – the Working Group on Energy Balances) in cooperation with economic research institutes with a view to evaluating statistics from all the fields of the energy industry on the basis of uniform criteria, compiling the information available in a coherent form and making the facts and figures concerned available to the public as energy balances.

These energy balances give an overview of interrelationships within the energy industry in the form of a matrix. They not only indicate energy consumption in the various sectors but also the flow of sources of energy from production to use in the various fields of production, conversion and consumption.

The structure and relevance of the energy balances mean that they occupy a central position in the system of energy statistics. They are used by politicians, companies and associations within the energy industry as well as by research institutes concerned with energy matters as a basis for analyses, forecasts and economic policy decisions in the field of the energy industry. However, energy balances are not only important for energy policy but also to an increasing extent for environmental policy. For example, it would be impossible to meet national reporting obligations under the UN Framework Convention on Climate Change without energy balances as a basis for the calculation of carbon dioxide emissions.

AGEB first published a series of consistent energy balances based on uniform areas, conversion factors and sector demarcations in 1971 for the period from 1950 to 1969. This series has been continued by energy balances for succeeding years drawn up with the same structure. Nowadays, AGEB can look back on a continuous series of energy balances covering the period since 1950 (within the borders which applied up to 3 October 1990). For the years from 1991 to 1994, separate energy balances were also published for the new states of eastern Germany and for Germany as a whole (within the borders which applied from 3 October 1990 onwards).

In order to maintain the information value of energy balances, it is essential to take

into account modifications to the statistics on which they are based, processes of change in the energy industry and the developing requirements of data users. Adaptations to the balances were already made in this respect in the 1970's. A further series of adjustments were required in the case of the energy balances published for the years from 1995 onwards. The main changes are as follows. The methods used for assessing sources of energy for which no uniform yardstick, such as inferior calorific value, is available have been changed in accordance with normal international practice. Changes have also been made in some of the columns (sources of energy) and lines (sectors) used in the balances on the basis of a new system adopted for the classification of manufacturing industry. In addition, for the years since 1995, energy balances have only been published for the territory of the Federal Republic of Germany as a whole. The statistics available no longer allow the production of separate balances for the original and new states of Germany.

These changes with respect to methodology, energy sources, sectors and the geographical area covered must be taken into consideration when comparing energy balances for different periods.

As of May 2002, the members of the Working Group on Energy Balances include six energy industry associations

- Bundesverband der deutschen Gas- und Wasserwirtschaft e.V. (BGW – the Association of the German Gas and Water Industry), Berlin,
- Deutscher Braunkohlen-Industrie-Verein e.V. (DEBRIV – the German Lignite Industry Association), Cologne,
- Gesamtverband des deutschen Steinkohlenbergbaus (GVSt – the General Association of the German Hard Coal Industry), Essen,
- Mineralölwirtschaftsverband e.V. (MWV – the Association of the German Petroleum Industry), Hamburg,
- Verband der Elektrizitätswirtschaft (the German Electricity Association) - VDEW - e.V., Frankfurt/M,
- VIK - Verband der Industriellen Energie- und Kraftwirtschaft e.V.(Association of the Energy and Power Generation Industry), Essen

and three economic research institutes

- Deutsches Institut für Wirtschafts-forschung (DIW Berlin – the German Institute for Economic Research), Berlin,
- Energiewirtschaftliches Institut an der Universität Köln (EWI – the Institute of Energy Economics at the University of Cologne), Cologne,
- Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI – the Rhine-Westphalian Institute for Economic Research), Essen.

In 1994, the Working Group on Energy Balances transferred responsibility for the preparation of energy balances to DIW. The energy balances published up to 1994 had been prepared by Gesamtverband des

deutschen Steinkohlenbergbaus (the General Association of the German Hard Coal Industry), Essen.

Further information on the Working Group on Energy Balances is available on the Internet under:

http://www.ag-energiebilanzen.de

Notes to the Energy Balances

1 Structure

The **energy balance** is a matrix showing supply, conversion and consumption figures for energy sources within a national economy or an economic area over a defined period in a form which is as comprehensive and detailed as possible.

The structure which has been used by the Working Group on Energy Balances for energy balances since 1995 is a table with 33 columns and 68 lines (including total and subtotal lines and columns).

1.1 Columns

Each of the columns in the energy balance represents an energy source which may be put to use either in the form of energy or for other purposes. The term **source of energy or energy source** is used to refer to all substances or sources in which energy may be stored in mechanical, thermal, chemical or physical form.[1]

In the energy balances, energy sources are divided into the following categories:

- Fossil fuels

  Fossil fuels are materials in which energy is stored in chemical form, including hard coal, lignite, petroleum, natural gas and substances produced by processing these materials, such as hard coal briquettes, hard coal coke, lignite briquettes, petrol and diesel fuel, fuel oil, coke oven gas and blast furnace gas.

- Renewable energy sources

  Renewable energy sources are energy sources that are either continuously available in nature or are renewed or replenished within foreseeable periods of a few generations. These include:

  - solar energy
  - ambient heat
  - wind energy
  - Hydropower
  - energy from biomass
  - geothermal energy

- Electricity

[1] Definition from "Begriffe der Versorgungswirtschaft", Part D, Section 1: "Energiewirtschaftliche Grundbegriffe". published by. VDEW/BGW, 1st edition, 1997, VWEW-Verlag, Frankfurt am Main.

- Nuclear fuels

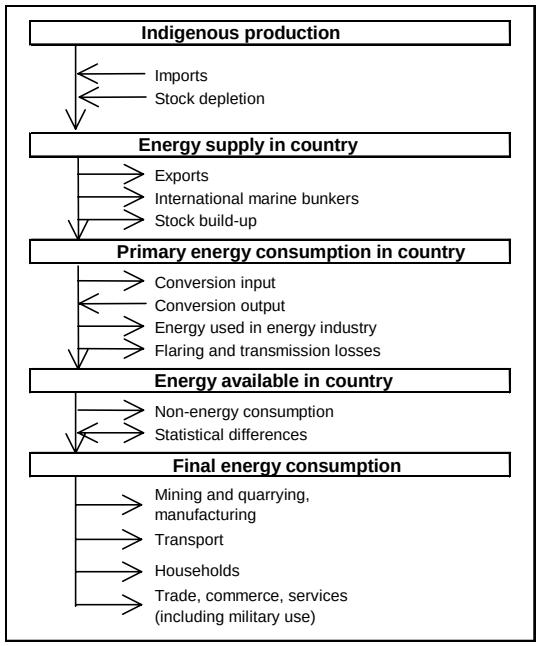
  Nuclear fuels include all substances from which energy stored in physical form may be released by atomic fission or fusion processes.

- District heat

1.2 Lines

The lines of the energy balance indicate the quantities of each energy source available, converted and consumed on the basis of the line structure indicated below:

Line structure of the German energy balance



The energy balance consists of three main sections:

- the PRIMARY ENERGY BALANCE,
- the CONVERSION BALANCE and
- the FINAL ENERGY BALANCE.

The **primary energy balance** is the first stage in the energy balance. In this stage, energy sources are recorded under the following headings:

- indigenous production,
- foreign trade with energy sources: imports and exports are indicated separately,
- international marine bunkers, i.e. the supply of fuel oils, diesel fuel and lubricants to German and foreign vessels in German ports; fuel supplied to inland and coastal vessels and for fishing is taken into consideration under "transport" (in the final energy balance),
- stock changes; stock withdrawals and build-up are indicated separately.

The **primary energy consumption in country** is therefore calculated from the **supply side** as the sum of energy production in the country, stock changes and net foreign trade, less international marine bunkers.

However, primary energy consumption can also be determined from the **consumption side** by calculating the sum of final energy consumption, non-energy consumption and net conversion.

The **conversion balance** considers the physical and chemical conversion of energy sources; conversion input and output are indicated separately (see Section 3.1).

Consumption in the course of energy production and in conversion as well as flaring and transmission losses (see Section 3.6) are also taken into consideration in the conversion balance.

The conversion balance and the primary energy consumption are used to calculate the **energy available in country following conversion balance**.

Among other things, this available energy is used for **non-energy consumption,** indicated in a separate line of the balance. Non-energy consumption is considered separately because some energy sources (such as hard coal, lignite, naphtha, fuel oils and natural gas) are also used as feedstocks for chemical processes. This heading also includes substances produced during conversion which are not needed because of their energy content but because of other properties (e.g. tar oils, coal derivatives and bitumen). These materials are shown under the headings "coal derivatives" and "other petroleum products" (see Sections 3.8 and 3.11).

Energy sources used within Germany for energy uses are indicated under **final energy consumption.** Final energy consumption represents the use of energy sources directly for the production of useful energy. Final energy consumption is broken down into the energy consumption of defined user groups and sectors.

The energy consumption figures for **industry** (**mining, quarrying, manufacturing)** are largely based on the statistics published by Statistisches Bundesamt (Federal Statistical Office). Industrial sectors are defined on the basis of the German Classification of Economic Activities, 1993 edition (WZ 93), sectors: mining, quarrying, manufacturing industry, which has superseded the classification of manufacturing industry (SYPRO) used until 1994.

In view of the changes in demarcation between the various sectors of industry, the figures for years before and after 1995 are only comparable with restrictions. The structure of the fourteen sectors of industry now used in the energy balances in accordance with WZ 93 are shown in Table 4.3.

Energy consumption for **transport** is divided into the following sectors:

- rail transport,
- road traffic,
- air traffic,
- coastal and inland shipping.

This figure only includes energy consumption for the direct performance of transport services by all means of transport in Germany, to the extent that

statistics are available. Indirect energy consumption (e.g. for the lighting of transport facilities) and fuel consumption for agriculture are not included.

The energy consumption figures for transport are generally based on statistics of deliveries to transport organizations. In some cases, the results of market research are also used.

As far as the sectors **private households, trade, commerce and services,** as well as military bases, are concerned, energy consumption data is not available or can only be derived from statistics. For the purposes of the energy balance, the final energy consumption of these sectors is assumed to be equal to deliveries of energy sources to the corresponding sectors.

This sector as a whole is very heterogeneous, including:

- private households,
- trade enterprises with less than 20 employees not included in manufacturing industry,
- business and trade premises,
- agriculture,
- commercial establishments,
- private and public service companies and organizations (including banks, insurance companies, laundries, hospitals, public authorities and the postal service.

In response to calls for greater transparency, this sector was subdivided into the following sectors in the energy balances from 1995 onwards:

- private households on the one hand and
- trade, commerce and services (including military facilities) on the other hand.

The energy consumption of trade, commerce and services is calculated by deducting the energy consumption of private households from the figure for the sector as a whole.

In order to allow a clearer assessment of the quality of the data presented, it must be expressly stated that this subdivision of the private households, trade, commerce and services sector is largely based on estimates and projections, which are in turn based on the results of market research.

It is not possible to give comprehensive energy consumption figures for military facilities. The figures which are available are included in the total for trade, commerce and services.

It is necessary to draw a distinction between final energy consumption (as the term is used in the energy balance) and the final stage in energy use, the **useful energy stage.** Useful energy is the form

of energy actually required by the energy user to meet an energy need.[2] These energy balances do not include any indication of useful energy consumption as neither well-founded statistics nor other sufficiently well-founded methods of estimating consumption are currently available.

2 Conversion Factors for the Uniform Evaluation of Energy Sources

In the energy balances, figures for each energy source are initially shown in the specific units in which it is normally measured. These figures are then added separately for each energy source in the subtotal and total lines. The units used for this purpose are tonnes (t), cubic metres (m^3), kilowatt-hours (kWh) and joules (J).

In order to make figures for different sources of energy comparable and to allow them to be added, it is necessary to express them in a common unit. Conversion factors are used for this purpose.

Since 1977, figures in other units have all been converted into joules. This unit, which is in accordance with the applicable statutory requirements, has now replaced the "calorie" (cal), the unit previously used for this purpose. One joule is equivalent to 0.2388 cal.

Figures for sources of energy normally measured in other units are converted into joules on the basis of their inferior calorific value (H_i), expressed in kilojoules (kJ = 10^3 J)**.** The multiple units used are terajoules (TJ = 10^{12} J) in the energy balances themselves and petajoules (PJ = 10^{15} J) in the evaluation tables.

For a transitional period, balances and evaluation tables are being issued not only in joules but also in tonnes of coal equivalent (t.c.e., 1 million t.c.e. = 29.308 PJ).

As the quality of some energy sources changes over the course of time, there are corresponding changes in the inferior calorific value. In the case of energy sources with changing inferior calorific values such as hard coal, lignite and petroleum products, the conversion factors are therefore adjusted from time to time.

There is no uniform value such as the inferior calorific value which can be used

[2] Normally, the following types of useful energy are distinguished: work (often referred to as "power" or "mechanical energy"), heat (including thermal electromagnetic radiation), including "cold" which is simply a reversed heat thermal flux, light, useful electricity and sound.

for expressing electricity imports and exports, water or wind power, solar energy or nuclear fuels used for electricity generation in comparable terms. In such cases, the **efficiency method,** similar to the procedure adopted by international organizations (IEA, EUROSTAT, ECE) has also been used in the energy balances for Germany since 1995.

In this method, a representative energy conversion efficiency of 33 % is used for assessing nuclear energy. In the case of electricity generation from hydropower and other renewable sources of energy that cannot be measured in terms of a calorific value (wind, solar energy), the energy input is assumed to be equivalent to the electricity generated. The calorific value of electricity, 3,600 kJ/kWh, is also used for assessing electricity imports and exports, corresponding to an "efficiency" of 100 %,

Up to 1994, a different method was used. It was assumed that electricity generated from hydropower, nuclear energy, waste products and waste heat and the surplus of electricity imports over exports could be substituted for electricity generated in conventional thermal power stations, reducing the energy input required at these stations. The average specific fuel consumption at conventional thermal power stations in public supply systems was therefore used for assessing the primary energy input required for generating such energy sources. In the case of electricity generated using waste products, sewage sludge and other renewable fuels, this method is still used as reliable inferior calorific value figures are not available for these fuels.

In comparison to the substitution principle previously applied, the efficiency principle results in higher primary energy figures for nuclear power and lower figures in the case of the other energy sources considered.[3]

3 Notes to Individual Balance Items

3.1 Use of the Gross Value Principle in the Conversion Field

In the conversion field, the gross value principle is always used. In other words, energy sources subject to a conversion process are included in full both in conversion input and in conversion output. This is for example the case with fuel oil used for power station firing. Considered separately, conversion input and output therefore include energy quantities that have been counted twice.

[3] Information on primary energy consumption in Germany from 1980 onwards, based on the efficiency principle, is available on the Internet under: http://www.ag-energiebilanzen.de

However, this duplication is eliminated in the line, "energy available in country following conversion balance" as only the difference between conversion input and conversion output is included.

The use of the gross value principle is problematical in cases where energy input declared as energy consumption in the underlying statistical material is in fact subject to conversion. This is the case in the metals (iron producing) and chemical industries. If both the energy sources used in these sectors of industry and the consumption of the energy sources generated by conversion were recorded, the energy sources originally used would be counted twice.

The methods used for avoiding duplication in these cases are described in the notes on the individual energy sources concerned.

3.2 Conversion Input for Electricity Generation

In the case of public thermal power stations, industrial power stations and nuclear power stations, only the fuel input actually used for electricity generation is recorded as conversion input.

As regards hydro, wind and solar power stations, the corresponding values in joules from the primary energy balance are also used as conversion input. Pumped storage is also taken into consideration in the conversion balance as this is a type of electricity conversion.[4] The electricity used for pumping is recorded as a conversion input and the electricity generated by the pumped storage station as a conversion output.

3.3 Conversion Input for Heat Generation

The fuel used for heat generation is included in the conversion input for combined heat and power plants and district heating stations. Combined heat and power plants and district heating stations are only taken into consideration to the extent that they supply district heat to third parties via pipelines in the form of hot water or steam. Energy sources used for the generation of heat to be used solely by the plant operator are recorded under the appropriate final energy consumption heading. This applies especially to industrial CHP plants. The fuel used for power generation is recorded under conversion, while the fuel used for heat generation is recorded under final energy consumption.

A more precise presentation of energy

[4] For this reason, the electricity generated by pumped storage statons is not included in hydropower generation in the primary energy balance (with the

used in CHP plants will only be possible when the results of appropriate surveys are available.

3.4 Use of Coke for Blast Furnace Gas Production

In blast furnace processes, among other things, coke is converted into blast furnace gas. This gas is an energy source and part of the gas produced is used directly in the gas furnace process, while part is supplied to other points. Blast furnace gas is therefore recorded in a separate column of the energy balance. If the gross value principle were applied to blast furnace gas, the energy concerned would be counted twice as both the coke used and the blast furnace gas itself would be recorded under energy consumption. In order to avoid this problem, the coke equivalent (based on the inferior calorific value) of the blast furnace gas produced is deducted from the coke used in the sector "manufacture of basic metals" ("iron-producing industry" up to 1994) and is shown as conversion input for blast furnaces. A similar approach is used in the case of converter gas produced in the steel production process.

Apart from smaller quantities for non-energy use, the total coke consumption of the "basic metal manufacturing" sector consists of the final energy consumption recorded for this user group and coke input to blast furnaces for conversion.

3.5 Other Energy Producers

The other energy producers shown in the energy balances include

a) coal derivative plants,
b) the chemical industry, to the extent that energy sources in the form of pyrolysis gasoline, residual gases and processing residues of petroleum products are returned to refineries (return product flows, see Section **3.10**),
c) petroleum and natural gas processing plants which produce condensate and used oil processing plants,
d) plants for the production of ores containing fertile or fissionable materials,
e) plants for the production or processing of fertile or fissionable materials,
f) wastewater treatment plants.

3.6 Flaring and Transmission Losses

Although all sources of energy are affected by losses, most of these losses are not recorded statistically and uniform treatment in the energy balances is therefore not possible. They are only indicated in the appropriate line for electricity, gas and district heat. Losses in the petroleum sector are indicated indirectly by the difference between

exception of electricity generated using natural inflows at pumped storage stations.

conversion input and output. Losses with respect to other energy sources are included in the "statistical differences line" of the balance.

3.7 Final Energy Consumption in Manufacturing Industry

The final energy consumption in manufacturing industry recorded by the Federal Statistical Office includes coke converted into gas in blast furnace processes, inputs for electricity generation and energy sources put to non-energy use. This use of energy is already included in the conversion balance and must be deducted from energy consumption in order to avoid duplication. Only the remaining quantities are then recorded as final energy consumption in the industrial sectors concerned.

3.8 Coal Derivatives

The main derivates of the coking of hard coal are crude tar and crude benzene, which are then processed in coal derivative plants. The products of processing include pitch used in the manufacture of hard coal briquettes, benzene used as a motor fuel and a variety of other substances that are put to non-energy use. These products include, for example tar oils (apart from fuel oil), benzenes (except when used as a motor fuel), toluenes, xylenes, solvent naphtha, crude naphthalene, crude phenol, crude cresol, crude xylenol and crude anthracene. As the entire output of the conversion processes must be recorded, these products are grouped together under "coal derivatives" in the energy balance. (Up to 1994, the headings "crude tar", "pitch, "crude benzene" and "other coal derivatives" were used.)

3.9 Other Lignite Products

Since 1995, lignite coke, fluidized bed coal, pulverized coal and dry coal have all been grouped together under the heading "other lignite products".

3.10 Naphtha

Naphtha is a light fraction produced during crude oil refining and the cracking of petroleum products. In the petrochemical industry, it is used almost solely for the production of base chemicals (such as olefins or aromatics) as feedstocks for plastic production. The full input for chemical conversion is shown in the energy balances (following the gross value principle).

During the chemical conversion process, about two thirds of the naphtha used are converted into base chemicals and one third is returned to the refinery process. These return products include pyrolysis gasoline, used as a high-octane

component of motor fuel. After deducting these returns, the naphtha consumption of the petrochemical industry is recorded under "non-energy use".

The returns are netted out in the conversion balance allowing the assignment of the energy sources to the sectors in which they are actually used without any duplication.

3.11 Other Petroleum Products

Petroleum products used solely for non-energy purposes are grouped together under this heading. These products include special grades of petroleum spirit, white spirit, paraffins, waxes, vaseline, bitumen and residues. Some petroleum and lubricants, especially part of the used oil available, are used as sources of energy.

3.12 Renewable Energy Sources

In the energy balances up to 1994, only wood, hydropower and sewage gas (together with sewage sludge, waste etc., to the extent that these materials were appropriately classified) were included under the heading of renewable energy sources.

The main problem in recording renewable energy sources is a lack of appropriate statistics. Apart from hydropower, sewage gas, sewage sludge and other similar substances, renewable energy sources are only included in official statistics to a very limited extent.

Since the energy balance for 1995, attempts have been made to provide information that is as comprehensive as possible by using all the official information sources available, the results of surveys conducted by companies, associations and institutes and associated measurement programmes. Detailed data are shown in a separate balance while renewable energy sources are grouped together under three main headings in the energy balances.

The main headings are listed below together with the detailed headings used in the separate balance:

- **Hydro, wind and photovoltaic energy**
  - Hydropower
  - Wind energy
  - Photovoltaic energy

- **Biomass and waste**
  - Wood (untreated wood, industrial wood residues, fallen wood and waste wood), straw and other solid biogenic materials,

- Biodiesel and other liquid biogenic materials
- Sewage gas including biogas
- Waste, sewage sludge, landfill gas

- **Other renewable energy sources**
  - Geothermal energy
  - Solar thermal energy
  - Gas-fuelled heat pumps
  - Electric heat pumps

3.13 Further Notes

In the energy balances for the years from 1995 onwards, the following additional changes have been made compared with the energy balances for preceding years:

- The "black lignite" column now includes the use of peat as a source of energy.

- Romonta (lignite wax) is included in "other lignite products".

- Converter gas generated during steel production is now grouped together with blast furnace gas.

- The figures for renewable energy sources include small hydropower plants (rating below 1 MW). The figures for photovoltaic (solar) and wind power generation are based on VDEW data. These are above the levels indicated in the official statistics. The total gross electricity generation figure (conversion output) is therefore higher than in the official statistics.

- The figures for wood fuel consumption have been significantly increased on the basis of market research results.

4 Appendixes

4.1 Energy Units and Conversion Factors (Standard Values)

The "Gesetz über die Einheiten im Meßwesen" (Law Concerning Units of Measurement, see BGBI. (Federal Law Gazette) I, p. 981) was enacted on 2 July 1969. This law and subsequent statutory instruments govern the conversion of customary technical units into SI (Système International d'Unités) units for official and business transactions in the Federal Republic of Germany. The use of SI units has been mandatory in the Federal Republic of Germany since 1 January 1976.

Defined units for energy:

- joule (J) for energy, work and heat quantities
- watt (W) for power, energy flow and thermal flux

1 joule (J) = 1 newton-metre (Nm)
= 1 watt per second (Ws)

Prefixes for energy units:

kilo	k	10^3	thousand
mega	M	10^6	million
giga	G	10^9	billion
tera	T	10^{12}	trillion
peta	P	10^{15}	quadrillion
exa	E	10^{18}	quintillion

Conversion factors:

Some conversion factors are given in the table below:

UNit	kJ	kWh	kcal	kg c.e.	kg o.e.
1 kJ	X	0.000278	0.2388	0.00003410	0.0000239
1 kWh	3600	X	860	0.123	0.0860
1 kcal	4.868	0.001163	X	0.00143	0.0001
1 kg c.e.	29308	8.141	7000	X	0.7
1 kg o.e.	41868	11.63	10000	1.429	X

4.2 Classification of Economic Activities in the Sectors "Mining and Quarrying, Manufacturing Industry" in accordance with the German Classification of Economic Activities, 1993 Edition (WZ93) for the Energy Balances for the Federal Republic of Germany

Segment	**WZ 93 Classification No.**
Quarrying, other mining	10.30, 12, 13,
Food and tobacco	15, 16
Paper	21
Basic chemicals	24.1
Other chemical industry	24 without 24.1
Rubber and plastic products	25
Glass and ceramics	26.1, 26.2, 26.3
Mineral processing	26 without 26.1, 26.2, 26.3
Manufacture of basic metals	27.1
Non-ferrous metals, foundries (ferrous and non-ferrous metals)	27.4, 27.5
Metal processing	27 without 27.1, 27.4 and 27.5; incl. 28
Manufacture of machinery	29
Manufacture of transp. equip.	34, 35
Other segments	All other classifications, apart from 10.10, 10.20, 11.10, 11.20, 23.1, 23.2, 23.3

4.3 Sources

All energy sources	**Bundesministerium für Wirtschaft (Federal Ministry of Economics** Electricity Industry Department – Annual Statistical Reports Gas Industry Department – Annual Statistical Reports **Statistisches Bundesamt (Federal Statistical Office)** Annual Figures for Manufacturing Industry Specialist series 4 Manufacturing Industry - Series 3.1 Production in Manufacturing Industry - Series 4.1.1 Employment, Turnover and Energy Supplies of Mining and Manufacturing Companies Series 6.4 Power Generation Facilities of Mining and Manufacturing Companies Specialist series 7 Foreign Trade - Series 2 Foreign Trade by Types of Goods and Countries Selected figures for the energy industry **Vereinigung Deutscher Elektrizitätswerke - VDEW - e.V.** VDEW annual statistics VDEW surveys concerning the use of renewable energy sources **Market research results, company data, calculations made by the Working Group**
Hard coal and lignite	**Statistik der Kohlenwirtschaft e.V.** Coal Mining in the Energy Industry of the Federal Republic of Germany – Annual Reports - Coal Industry Statistics Sales statistics and other unpublished energy statistics
Petroleum	**Bundesamt für Wirtschaft (Federal Trade Office)** Official Petroleum Statistics for the Federal Republic of Germany **Mineralölwirtschaftsverband e.V. (MWV)** Petroleum Statistics – Annual Reports **Wirtschaftsverband Erdöl- und Erdgasgewinnung e.V.** Annual Reports **Bundesministerium für Ernährung, Landwirtschaft und Forsten (Federal Ministry of Food, Agriculture and Forestry)** Diesel Consumption in Agriculture
Gases	**Statistisches Bundesamt, Außenstelle Düsseldorf (Federal Statistical Office, Düsseldorf Branch)** Iron and Steel Statistics; Fuel, Gas and Electricity Statistics **Wirtschaftsverband Erdöl- und Erdgasgewinnung e.V.** Annual Reports **Bundesverband der deutschen Gas- und Wasserwirtschaft e.V.** Gas Statistics - Annual Reports **Statistik der Kohlenwirtschaft e.V.** Gas Statistics **Deutscher Verband Flüssiggas e.V.** The LPG Market – Annual Reports
Other energy sources	**Arbeitsgemeinschaft Fernwärme e.V.** District Heating Reports
"Non-energy sources"	**Mineralölwirtschaftsverband e.V. (MWV)** **Verband der Chemischen Industrie e.V. (VCI)**