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1. INTRODUCTION

The present report contains summarised information as regards the first exercise on quality reporting in the field of energy statistics in the European Union. It has been compiled using the information included in the quality reports sent by individual Member States to Eurostat in 2012. Other sources that have been consulted are metadata information, websites of the individual countries and data from the public free data sets maintained by Eurostat. The report uses data available at the date of 15 March 2014.

The quality concept applied in this report is in conformity with the definition developed by the European Statistical System. In this definition, quality consists of the following components: relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability and coherence. Each of the quality components is explained shortly at the start of each section in the report¹. In order to provide the most updated information, when dealing with components under the responsibility of Eurostat (like timeliness or punctuality in the publication of EU energy statistics), it will refer to the data received during the latest available transmission period at the time when this report has been drafted.

However, in many cases it is impossible to present the data as prescribed by the standard Eurostat format (whose instructions are laid down in the ESS Handbook on Quality Reports (EHQR) and the ESS Standard for Quality Reports (ESQR)), since energy statistical processes among countries are not homogeneous and also because in some cases the information delivered by the individual countries was not sufficiently detailed (or was not available in a readily exploitable format) to provide all necessary elements.

It must be highlighted that quality, coverage and timeliness of energy statistics are sometimes compromised as a consequence of e.g. budget cuts (both at Eurostat and Member States' level), additional data requests, diminishing expertise and liberalisation of the energy market (which multiplies the number of data sources).

Taking into account all these limitations, the main objective of this report is to analyse the main aspects of energy statistics data quality and detect areas to improve it in the future.

Eurostat wishes to thank the many experts in the countries participating in the conduct of the energy surveys, providing the data and descriptions as well as their support for the creation of this report.

¹ Most of the introductory texts shortly explaining each quality component are taken from the 'ESS Standard for Quality Reports', available at:
http://epp.eurostat.ec.europa.eu/portal/page/portal/ver-1/quality/documents/ESQR_FINAL.pdf

2. OVERVIEW

2.1. Coverage

This document covers all twenty-seven EU Member States² in 2012 (the period in which the information for the elaboration of this report was gathered): Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

However, when more updated information is available for some sections of this document (for example, more recent information or data involving additional countries), it has also been included in this report.

2.2. Legal basis

The main legal text in the area of energy statistics (and more particularly in the area of quality reporting on energy statistics) is Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics (and subsequent amendments), which provides for Quality Reports according to Article 6, Paragraph 4:

'Every five years, Member States provide the Commission (Eurostat) with a report on the quality of the data transmitted as well as on methodological changes that have been made.'

Paragraph 5 defines this further:

'Within 6 months of receipt of a request from the Commission (Eurostat), and in order to allow it to assess the quality of the data transmitted. Member States shall send to the Commission (Eurostat) a report containing any relevant information concerning the implementation of this Regulation.'

Other European Regulations having some influence on various energy data aspects in several areas (biofuels, renewables, cogeneration, energy efficiency and oil stocks) are the following:

- Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (Text with EEA relevance).
- Council Directive 2009/119/EC of 14 September 2009, imposing an obligation on member states to maintain minimum stocks of crude oil and / or petroleum products.
- Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (Text with EEA relevance).

In the area of energy prices, the most relevant legal text is the following:

² Additionally, some information about Norway (the only non-EU country that has provided information within the framework of the quality reporting exercise) has been included in the annexes.

- Directive 2008/92/EC of the European Parliament and of the Council of 22 October 2008 concerning a Community procedure to improve the transparency of gas and electricity prices charged to industrial end-users (recast) (Text with EEA relevance).

In addition to the above-mentioned legal texts, the role of quality reporting has been strengthened in Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European Statistics. Article 12.3 of this Regulation states that European statistics shall be developed, produced and disseminated on the basis of uniform standards and harmonised methods.

In addition to European regulations, many participating countries have their own national legislation in the field of energy statistics. Information on the national laws or regulations is not shown in this report.

2.3. Development of the first EU energy statistics quality reporting exercise

As stated above, this is the first quality reporting exercise in the field of European energy statistics. It was launched when, in the Energy Statistics Working Group meeting in 2010, a standard template for the first quality reporting exercise was presented for discussion. In order to reduce burden on Member States, the standard template consisted in:

1. A descriptive section (part A) to be filled in for all data collections fulfilling requirements of Regulation (EC) No 1099/2008
2. A detailed section (part B) to be filled in only for the collections deemed essential for completing the monthly and annual questionnaires.

Eurostat asked Member States officially to fill in the template with the necessary information by the end of 2011. In the Energy Statistics Working Group meeting in 2012 Eurostat reported on the progress of the exercise and announced the intention to carry on with a careful analysis of the submitted material, in order to assess their completeness and compliance with the requirements.

Following this analysis, several countries were contacted to complete or explain submitted information and many revised and improved their submissions.

It was observed that some Member States provided complete and very informative quality reports, which can be used as best practices for other countries. Unfortunately, other countries did not provide the information as required.

A summary of quality reports submitted by country was presented to the European Statistics Working Group in June 2013 and this report is based on information provided in that summary.

2.4. Brief Description of the main European energy data collections

2.4.1. Periodicity

Eurostat collects, processes and publishes annual and monthly energy statistics on quantities of numerous energy commodities, both primary (e.g. crude oil, natural gas, hard coal, etc.) as well as secondary (e.g. motor gasoline, gas/diesel oil, coke, patent fuels, etc.). Statistics are also produced on end-user prices of electricity and natural gas. A more detailed description of each data collection is shown below.

Annual statistics of energy

Collected statistics (most are joint collections with the International Energy Agency, IEA) cover essentially the production, transformation and consumption of numerous energy commodities; details on external trade of energy commodities and structural characteristics of the energy industry are also included. The annual Energy Balance Sheets of the Member States and the EU are the key output of this data collection. This module provides valuable information on the structure of the energy systems across the EU; it allows monitoring of major EU and national energy policies and targets (energy dependency, penetration of renewable energy sources, energy efficiency) while it contributes significantly in assessing the carbon dioxide annual emission inventories. Competition indicators and prices systems (both for gas and electricity) are also collected on annual basis.

Short-term statistics of energy

Monthly statistics can be classified as the so-called M-2/M-3 or M-1 data collections, depending on their timeliness.

Opposite to the annual energy data collections which cover the full spectrum of the overall energy flows in a given country [from supply, through transformation to final energy and non-energy consumption by sector and by fuel type], the M-1 monthly data collections are limited to the supply and only partially to the transformation side. Renewables are covered to a limited extent. Nonetheless, monthly energy statistics, although not as complete (nor directly comparable to annual statistics), provide quickly energy related tendencies long before annual data can be made available.

Monthly energy data (M-2 and M-3) are used for the early estimates of CO₂ emissions. Also, valuable information on oil and petroleum products emergency stocks is covered, in response to security of supply considerations.

Energy prices

Twice a year price-data of electricity and natural gas are collected, processed and published. The data are presented for several consumer bands and cover three levels of taxation. Once a year, together with the reporting for the second semester of the year, disaggregated price data [energy and supply, network cost, taxes and levies] are collected. The industrial end-user prices of electricity and natural gas are regulated, whereas the domestic end-user prices are collected on a gentlemen's agreement basis. Every year, reporting authorities are obliged to send the so called "price systems" that give details about the methodology that is applied in the countries to calculate the prices. Further, once a year competition indicators for electricity and natural gas markets are collected and published.

The table below shows periodicity of existing data collections (annual, short-term and biannual).

Table 1 - Periodicity of European energy statistics data collections

Name of data collection	Periodicity			
	Annual	Short-term (monthly)		Biannual
		M-2/M-3	M-1	
ENERGY_ELECT_A: Electricity and Heat Statistics	x			
ENERGY_NTGAS_A: Natural Gas Statistics	x			
ENERGY_PETRO_A: Oil Statistics	x			
ENERGY_SOLID_A: Solid Fuels Statistics	x			
ENERGY_RENEW_A: Renewable energy and wastes statistics	x			
ENERGY_NUCLEAR_A: Nuclear statistics	x			
ENERGY_CHP_A: Combined Heat & Power statistics [CHP]	x			
ENERGY_SOLID_M: Solid Fuels Statistics		x		
ENERGY_ELEC3_M: Electricity Statistics		x		
ENERGY_MOSOIL_M: MOS (Monthly Oil Statistics)		x		
ENERGY_MOSGAS_M: MOS (Monthly Natural Gas Statistics)		x		
ENERGY_SEGGAS_M: Short-term monthly Natural Gas Statistics			x	
ENERGY_SEGELE_M: Short-term monthly Electricity statistics			x	
ENERGY_JODIOIL_M: Short-term monthly Oil statistics			x	
ENERGY_PRELI_S: Energy Prices: Electricity industry, semester				x
ENERGY_PRELH_S: Energy Prices: Electricity households, semester				x
ENERGY_PRGAI_S: Energy Prices: Gas industry, semester				x
ENERGY_PRGAH_S: Energy Prices: Gas households, semester				x
ENERGY_PSELE_A: Price Systems: electricity	x			
ENERGY_PSGAS_2: Price Systems: gas	x			
ENERGY_CIELE_A: Competition Indicators: electricity annual	x			
ENERGY_CIGAS_A: Competition Indicators: gas annual	x			

2.4.2. Data collection and aggregation methods

In order to fill out the questionnaires of the above mentioned energy data collections with the required data, countries use their own data collection and aggregation methods. This information was provided in their quality reports, where Member States indicated which methods they use for their monthly and annual data collections.

Some of the methods used are:

- Census (without or with threshold)
- Sample surveys (using, for example, questionnaires, telephone interviews, household visits, etc.).
- Statistical compilation, especially in the case of aggregation of monthly data to obtain annual figures
- Use of administrative sources
- Modelling
- Estimations

Some countries' internal data collection methods are structured according to the phase of the supply chain (production, imports, exports, consumption, etc.), whereas other countries use different data collection methods depending on the type of fuel (liquid, solid, electricity and heat, renewables, etc.). Mixed approaches are also found.

Annex 1 provides more detailed information on data collection methods used by countries for monthly and annual data collections, per type of fuel.

It can be observed that sometimes it is very difficult to draw a clear mapping from the internal data collections at Member State level and the annual (Electricity, Coal, Oil, Gas Nuclear and Renewables) or monthly (Electricity, Coal, Oil and Gas) Eurostat questionnaires. For this reason, it is recommended to prepare the next quality reporting template in a way that will allow for easy identification of variables relating to Eurostat questionnaires and their connection to national surveys. It must be highlighted that some Member States (e.g. France and Ireland) provided very useful information on mapping diagrams to link their national statistical processes to Eurostat energy questionnaires.

As can be observed in the table, there are many combinations of methods used by Member States. In particular, it is important to note that some countries rely on the aggregation of their monthly statistics to build up annual statistics on the supply side, highlighting the importance of accurate and consistent monthly statistics to be able to draw reliable conclusions. Since monthly statistics provide quick information and are also used for many other purposes (e.g. early CO₂ estimates), it is of paramount importance to receive high quality monthly statistics (see section on *coherence and comparability* for more information on monthly data quality). For this reason, it is recommended to obtain more detailed information in the next quality reporting exercise about monthly surveys and propose measures to improve their accuracy and reliability.

3. RELEVANCE

Relevance is the degree to which statistics meet current and potential user needs. It depends on whether all statistics that are needed are produced and the extent to which concepts used (definitions, classifications etc.) reflect user needs.

It can be assessed by analysing the different users, who they are, what needs they have, whether they are satisfied, etc.

EU energy statistics are compiled according to regulations (see chapter on legal basis above) containing a defined list of variables, which reflect in particular the most relevant institutional users' needs. Examining the completeness of the statistics measured against the relevant regulation is also a way to assess the actual relevance of those statistics.

3.1. *The users*

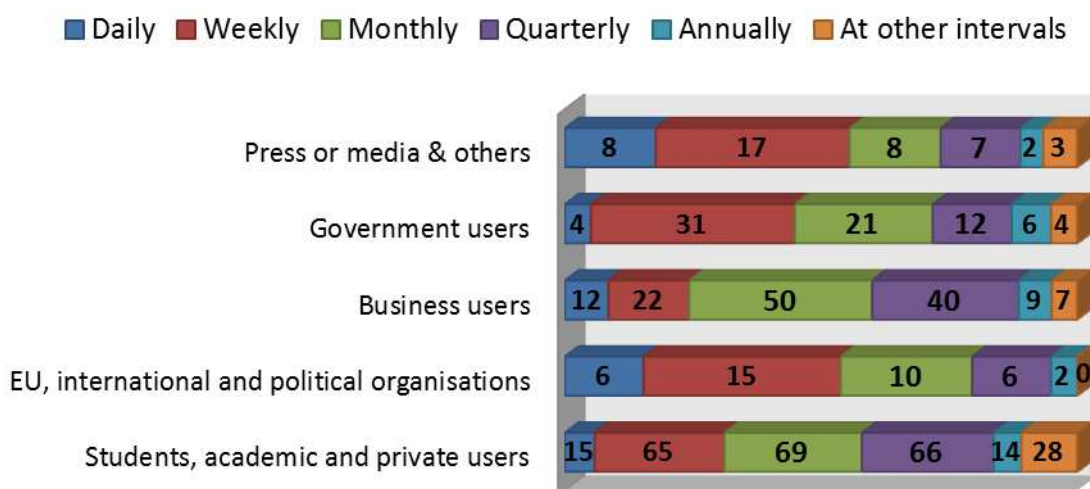
In the past, Eurostat has included in its general satisfaction surveys some questions targeted at users of energy statistics. In 2012, it was found that the highest number of Eurostat energy statistics users belonged to the group "students, academic and private users".

Table 2 – Users of energy statistics

Type of user	Number of respondents using Energy statistics	Total number of respondents	Percentage, %
Students, academic and private users	257	1417	18.10%
EU, international and political organisations	39	246	15.90%
Business users	140	719	19.50%
Government users	78	531	14.70%
Press or media & others	45	188	23.90%
Total	559	3101	18.00%

The following graph shows the frequency of energy statistics use by different groups of users.

Figure 1 – Frequency of energy statistics use



As can be observed, most of the users of energy statistics consulted these statistics on a weekly, monthly and quarterly basis.

However, the information about energy statistics until now obtained through the Eurostat general satisfaction surveys is considered insufficient. For this reason, a user satisfaction survey on energy statistics is in preparation in close collaboration with the Task Force "Future of Energy Statistics", with the aim of obtaining more detailed information about user satisfaction with the different energy data collections.

3.2. *Completeness*

If certain indicators, variables and/or domains foreseen by the ESS or other international regulations/ guidelines are not covered, the statistical outputs are *incomplete*. As regards energy statistics, the evaluation of the completeness of the statistical outputs can be carried out by comparing published data with requirements laid down in the main regulations.

Annexes B, C and D of Regulation (EC) 1099/2008 on energy statistics describes the scope, units, reported period, frequency and transmission modalities for, respectively, the annual, monthly and short-term monthly collections of energy statistics. Directive 2008/92/EC to improve the transparency of gas and electricity prices charged to industrial end-users describes the requirements to collect and compile electricity and gas prices for industrial end-users.

In order to assess the completeness of data which are published in Eurobase (Eurostat's dissemination database), an analysis of completeness is carried out by comparing data published in Eurobase for the year 2012 against the main requirements of the Regulation 1009/2008 and Directive 2008/92/EC. Annex 2 of this report contains a table showing the results of this analysis. This is just an overall exercise with the only objective to provide a general idea of the level of completeness of the most important energy data collections. A more detailed analysis should be done in order to obtain more precise information on additional items that could be added to Eurobase.

The main conclusion that can be extracted is that energy statistics published in Eurobase are complete, with some exceptions (e.g. some aggregates and products, capacity for production plants, etc.). Another aspect which is relevant to completeness concerns data that cannot be published for confidentiality reasons. While respecting the possibility of countries to declare their data as confidential, valid justification should be provided in these cases.

In some other cases, there are many data which are not included in the legal requirements, but are published on a voluntary basis, like household prices and many others.

Another important aspect refers to completeness of data sent by countries to Eurostat, particularly in the case of monthly data. Indeed, it has been observed that many countries send incomplete information in order to comply with the deadline required by the Regulation and afterwards they send revisions. However, legal compliance means both punctuality and completeness.

Practices of Member States vary a lot as regards monthly data revisions: some send revisions very often distributed all over the year. Others send a first version respecting the deadline and a final version (=1st revision) about 6 months after the end of the year.

Some countries are producing monthly data based on quarterly statistics, which does not allow them to send punctual and complete information.

Sometimes it is unavoidable to revise initial data, because e.g. data providers did not send their data in time and therefore provided initial data contained estimates.

But revisions are sent sometimes very late without any apparent reason. These situations should be prevented in the future by establishing a 'revision policy' aiming at improving the use of monthly (and also annual) data.

As stated above, due to data collection methods used by some countries, they cannot provide complete monthly data at the required deadline. If this happens and becomes a structural problem preventing them to comply with legal requirements, these countries should change their data collection methods to be fully compliant.

In summary, one recommendation following the analysis of completeness is to identify all products/aggregates which are legally required and are available at Eurostat level but not yet published (e.g. gas vented and gas flared) and proceed to analyse the feasibility of its publication in Eurobase.

On the other hand, there are also information available on additional products/aggregates which is not legally required. In this case and as a second step, the possibility to publish this information should also be analysed.

In order to avoid excessive revisions without a clear justification, a revision policy should be agreed to improve the use of monthly and annual data.

Finally, countries which are not able to fully comply with legal requirements should adapt their data collection methods to ensure that they can provide complete and punctual data in line with legal requirements.

4. ACCURACY

The accuracy of statistical outputs in the general statistical sense is the degree of closeness of estimates to the true values. Statistics can be different from the true values because of random variability (the statistics change from implementation to implementation of the survey due to random effects) and/or bias (the average of the possible values of the statistics from implementation to implementation is not equal to the true value due to systematic effects).

Several types of error, stemming from all survey processes, contribute to the error of the statistics (their bias and variability). A certain typology of errors is widely adopted in statistics. **Sampling errors** affect only sample surveys; they are due to the fact that only a subset of the population, usually randomly selected, is surveyed. **Non-sampling errors** affect sample surveys and complete enumerations alike and comprise: 1. Coverage errors; 2. Measurement errors; 3. Processing errors; 4. Non-response errors.

Data on energy is submitted on the basis of Annual Joint Questionnaires employing an internationally agreed methodology. Eurostat receives disaggregated data which are used to countercheck the results and to ensure consistency with the total amount of energy consumption.

Several Manuals (including the recent "[Manual for Statistics on Energy consumption in Households](#)") for the main areas of energy statistics have been developed over the last years, for example: [Energy Statistics Manual](#), [SHARES Tool Manual](#), [JODI Oil Manual 2nd edition](#). In addition to these Manuals, reporting guidelines also exist for the following areas: annual questionnaires for [Electricity and Heat](#), [Natural Gas](#), [Oil](#), [Coal](#), [Renewables and Waste](#), monthly questionnaires for [Oil and gas \(MOS\)](#), [JODI \(Joint Oil data initiative\)](#), half-yearly questionnaires for [Gas and electricity prices for household users](#).

The accuracy of the basic data depends on the quality of the national statistical systems and may vary from country to country. In several countries and for most energy commodities data provision by the companies is required by law. However, the emerging liberalisation process in some countries tends to negatively affect accuracy in some cases (due to multiplication of data sources, for example).

From time to time detailed surveys targeted to single sub-items (e.g. wood consumption in households) are carried out to improve the methodology. However, many problems are still observed in terms of accuracy of data provided by Member States, for example, relating to declarations of energy imports and exports or accuracy of monthly data.

As indicated above, accuracy (and, in general, quality of energy statistics) can be sometimes compromised as a consequence of a decrease in available resources (in Member States and Eurostat). Eurostat is highly concerned as regards this situation. For this reason, burden on respondents is an issue constantly discussed within the framework of the Task Force "Future of Energy Statistics".

Furthermore, several efforts have been carried out to decrease burden on respondents. For example, as a response to the increasing Oil & Petroleum Products Stocks statistics requirements under new European legislation, Eurostat has worked together with DG ENER and the IEA (International Energy Agency) and has achieved the methodological streamlining of the statistical reporting tools to serve all legal acts in place, hence

reducing the reporting burden of the Member States. Consumption data for natural gas and electricity combined with price data per unit allowed Eurostat to calculate national expenses in the household sector for these two energy commodities. This is a typical synergy effect that resulted in a decreased workload for all national reporting authorities that provide data for the PPP indicators. In addition, an example of new statistical production without any added burden on respondents is the CO₂ early estimates.

It is very difficult to provide reliable data on accuracy from the information received from Member States, one reason being that surveys carried out at the level of Member States use different data collection and aggregation methods and also because very few information about accuracy was received from participating countries, making it very difficult to quantify errors in a comparable way.

In order to obtain more comparable figures on accuracy in the future, it is recommended to structure the next quality reporting questionnaire addressed to Member States in a way that makes it easier to obtain information on accuracy in a standard and comparable way (e.g. using more standardised and close-ended questions).

4.1. *Sampling errors*

Sampling errors affect only sample surveys and arise from the fact that not all units of the frame population are surveyed. The *frame* is a device that permits access to population units, such as a list of companies operating in a certain energy field. *Frame population* is the set of population units which can be accessed through the frame and the survey's conclusions apply to this population. No data on sampling errors were consistently provided in the quality reports submitted by Member States to Eurostat. For this reason, it is recommended to study the possibility to ask for this information in a systematic way in the next quality reporting questionnaire.

4.2. *Non-sampling errors*

4.2.1. *Coverage errors*

Coverage errors (or frame errors) are due to divergences between the target population and the frame population. Possible divergence types are undercoverage (i.e. the frame population does not include all units of the target population), overcoverage (i.e. the frame population includes units which do not belong to the target population) and misclassification (i.e. units in the frame population which belong to the target population but are wrongly classified). Tables in annex 1 (from page 30) contain some information linked to the coverage of data collection methods used by Member States. However, no comparable information on coverage errors can be analysed due to the fact that countries did not supply this information in a systematic and standardised way. The only available information refers to some countries, which reported on the size of the target population for some surveys. In order to improve this aspect, the quality reporting questionnaire used in the next cycle should take into account this aspect and ensure that all countries report systematically on coverage errors.

4.2.2. Measurement errors

Measurement errors are errors that occur during data collection and cause the recorded values of variables to be different from the true ones. Their causes are commonly categorized as:

- *Survey instrument*: the form, questionnaire or measuring device used for data collection may lead to the recording of wrong values.
- *Respondent*: respondents may, consciously or unconsciously, give erroneous information.
- *Interviewer*: interviewers may influence the answers given by respondents.

No regular estimates of these errors are available for energy statistics and it seems difficult to obtain this information in the short or mid-term.

4.2.3. Processing errors

Between data collection and the beginning of statistical analysis for the production of statistics, data must undergo a certain processing: coding, data entry, data editing, imputation, etc. Errors introduced at these stages are called *processing errors*. For the moment, no estimates can be produced indicating the rate of processing errors in the energy statistics data collections. However, countries are encouraged to report on any processing error that they could detect in Eurostat's dissemination database.

4.2.4. Non-response errors

Non-response is the failure of a survey to collect data on all survey variables, from all the population units designated for data collection in a sample or complete enumeration. The difference between the statistics computed from the collected data and those that would be computed if there were no missing values is the *non-response error*.

As stated above, the information collected from Member States makes it very difficult to calculate a value of the non-response error, since many countries did not provide information on this aspect, and others did it only for some data collections. In order to be able to do so, more comparable information on non-response error will be needed in the next quality reporting exercise. However and in order to provide an overall idea on possible non-response errors, the following table gathers (when available) the information received from Member States as regards non-response rate for their surveys. NA (Not available) has been used for countries which have not provided any information on non-response rate for any of their surveys.

Table 3 - Non-response rate for energy surveys performed at Member State level (excluding data for prices)

Country	Survey / commodity	Frequency	Non-response rate
Austria	NA	NA	Information not provided
Belgium	Oil	Monthly	4%
Bulgaria	NA	NA	Information not provided
Cyprus	NA	NA	Information not provided
Czech Republic	Survey on the supply, stocks and deliveries	Annual	4%
	Survey of the power industry (public system, auto-producers)	Annual	4%
	Survey of the transformation industries (refineries, coking plants, briquetting plants and blast furnaces)	Annual	0%

Country	Survey / commodity	Frequency	Non-response rate
	Survey of the consumption of energy commodities in businesses	Annual	16%
	Survey on the supply of crude oil and petroleum products	Monthly	0%
	Survey on crude oil and petroleum product sources and stocks	Monthly	0%
Denmark	NA	NA	Information not provided
Estonia	Consumption for enterprises with less than 50 employees	Annual	10%
Finland	NA	NA	Information not provided
	Survey on the sales of petroleum products	Annual	0%
	Survey on the activities of the French petrochemical industry	Annual	0%
France	Natural gas, exhaustive survey	Annual	13%
	First survey on electricity production	Annual	Below 10%
	Second survey on the distribution of electricity and consumption data	Annual	Below 20%
	Natural gas, survey on supply (external exchanges) and consumption	Monthly	0%
	Survey on energy consumption covering solids, other gases, petroleum products, natural gas, heat and electricity, biomass, wastes and other renewables	Annual	Below 0.1%
	Survey on sales (=supply) of natural gas	Annual	0%
	Survey on companies feeding electricity into the grid	Annual	0%
Germany	Survey on industrial auto-producers of electricity in electricity only or in CHP plants	Annual	Below 1%
	Survey on heat production in heat plants	Annual	0%
	Survey on oil and oil products	Monthly	0%
	Survey on natural gas, covering the most important suppliers/traders and all producers	Monthly	0%
	Survey on electricity and heat production of main activity producer plants	Monthly	0%
	Survey of grid operators	Monthly	Below 1%
Greece	NA	NA	Information not provided
Hungary	Energy Balance of the Energy Sector	Annual	Around 0%
	Energy info operative collection of data in energetics	Monthly	0%
	Electricity: Final consumption	Annual	0%
	Renewables: Auto wind survey	Annual	0%
Ireland	Renewables: Biofuels survey	Annual	50%
	Renewables: Biogas survey	Annual	25%
	CHP survey, addressed to the 8 largest CHP suppliers/installers	Annual	0%
	CHP survey, addressed to 20 individual companies using CHP	Annual	50%
	Coal	Monthly	0%
	Gas	Monthly	Very low
Italy	Liquid fuels: Petrochemical industry production	Monthly	0%
	Liquid fuels: Refineries production	Monthly	0%
	Liquid fuels: Supply and consumption of crude oil products	Monthly	0%
	Electricity	Monthly	0%
Latvia	NA	NA	Information not provided
Lithuania	NA	NA	Information not provided
Luxembourg	NA	NA	Information not provided
Malta	NA	NA	Information not provided

Country	Survey / commodity	Frequency	Non-response rate
Netherlands	NA	NA	Information not provided
Poland	NA	NA	Information not provided
Portugal	NA	NA	Information not provided
Romania	E01 business survey	Annual	Around 10%
	E02 business survey	Annual	Around 10%
	P business survey	Annual	0%
	CTS on coal	Monthly	0%
	PTS on crude oil balance	Monthly	0%
	GTS on natural gas	Monthly	0%
	ELTS on electricity	Monthly	0%
Slovakia	Questionnaire on Sources and Distribution of Fuels and Energy	Annual	12%
	Questionnaire on Electricity and Heat Production	Annual	Below 8%
	Questionnaire on Crude Oil, Crude Oil Products and Natural Gas	Monthly	Below 5%
Slovenia	E-PE/L	Annual	Around 7%
	E1-EE/L	Annual	Negligible
	E2-SP/L	Annual	Negligible
	E3-TOP/L	Annual	Negligible
	E4-EEP/L	Annual	Negligible
	E5-EED/L	Annual	Negligible
	E1-EE/M	Monthly	Negligible
	E2-SP/M	Monthly	Negligible
	E3-SP/M	Monthly	Negligible
E4-EEP/M	Monthly	Negligible	
Spain	Annual Coal Output statistics	Annual	0%
	Coal Distillation Statistics	Annual	0%
	Natural Gas Industry Statistics	Annual	5%
	Electric Energy Industry Statistics	Annual	5%
	Monthly Coal Output statistics	Monthly	0%
	Natural Gas Statistics	Monthly	0%
	Oil Statistics	Monthly	0%
Monthly Electricity Energy Industry Statistics	Monthly	5%	
Sweden	NA	NA	Information not provided
United Kingdom	Natural gas: AG1	Annual	0%
	Natural gas: AG2	Annual	75% ³
	Electricity	Annual	0%
	Crude oil: 'PPRS, DORS and OSS surveys	Monthly	0%
	Natural gas: PPRS	Monthly	0%
	Natural Gas: QG1	Monthly	0%
Electricity	Monthly	0%	

When cross-checked with the table in annex 1, it can be observed that very few countries provided information on non-response rate for all their surveys, while many of them provided this information only for some of their surveys and some of them did not

³ As mentioned in Table 12 (annex 1), the scope of the AG2 data collection is very limited and only covers less than 5% of the market. For this reason, the high non-response rate does not have a significant impact on the overall data quality.

provide any information on non-response rate at all. For these reasons, it is very difficult to draw meaningful conclusions.

However, for surveys where this information is available, the non-response rate is usually low, with the exception of some specific cases.

In order to draw more meaningful conclusions in the future, it is recommended to provide clear instructions and design the next quality reporting questionnaire in a way in which Member States will report systematically on non-response rate for every survey.

5. TIMELINESS AND PUNCTUALITY

The *timeliness* of statistical outputs is the length of time between the event or phenomenon they describe and their availability.

The following tables provide a detail on the timelines of the different European energy data collections (covered and not covered by a legal act), from the end of the reporting period until the required date of transmission by Member States to Eurostat.

Table 4 - Timeliness of European energy statistics data collections covered by a legal act

Name of data collection	Timeliness
ENERGY_ELECT_A: Electricity and Heat Statistics	11 months
ENERGY_NTGAS_A: Natural Gas Statistics	11 months
ENERGY_PETRO_A: Oil Statistics	11 months
ENERGY_SOLID_A: Solid Fuels Statistics	11 months
ENERGY_RENEW_A: Renewable energy and wastes statistics	11 months
ENERGY_NUCLEAR_A: Nuclear statistics	11 months
ENERGY_CHP_A: Combined Heat & Power statistics [CHP]	12 months
ENERGY_SOLID_M: Solid Fuels Statistics	3 months
ENERGY_ELEC3_M: Electricity Statistics	3 months
ENERGY_MOSOIL_M: MOS (Monthly Oil Statistics)	55 days
ENERGY_MOSGAS_M: MOS (Natural Gas Statistics)	55 days
ENERGY_SEGGAS_M: Short-term monthly Natural Gas Statistics	1 month
ENERGY_SEGELE_M: Short-term monthly Electricity statistics	1 month
ENERGY_JODIOIL_M: Short-term monthly Oil statistics	25 days
ENERGY_PRELI_S: Energy Prices: Electricity industry, semester	2 months
ENERGY_PRGAI_S: Energy Prices: Gas industry, semester	2 months
ENERGY_PSELE_A: Price Systems: electricity (industrial data)	12 months
ENERGY_PSGAS_2: Price Systems: gas (industrial data)	12 months

Table 5 - Timeliness of European energy statistics data collections not covered by a legal act

Name of data collection	Timeliness
ENERGY_SHARES_A: Share of energy from renewable sources	12 months
ENERGY_PRELH_S: Energy Prices: Electricity households, semester	2 months
ENERGY_PRGAH_S: Energy Prices: Gas households, semester	2 months

Name of data collection	Timeliness
ENERGY_PSELE_A: Price Systems: electricity (households data)	12 months
ENERGY_PSGAS_2: Price Systems: gas (households data)	12 months
ENERGY_CIELE_A: Competition Indicators: electricity annual	10 months
ENERGY_CIGAS_A: Competition Indicators: gas annual	10 months

It must be highlighted that timeliness has been improved over the last years with the reduction from 3 months to less than 2 months in some energy data collections.

Punctuality is the time lag between the release date of data and the target date on which they were scheduled for release as announced in an official release calendar, laid down by Regulations or previously agreed among partners.

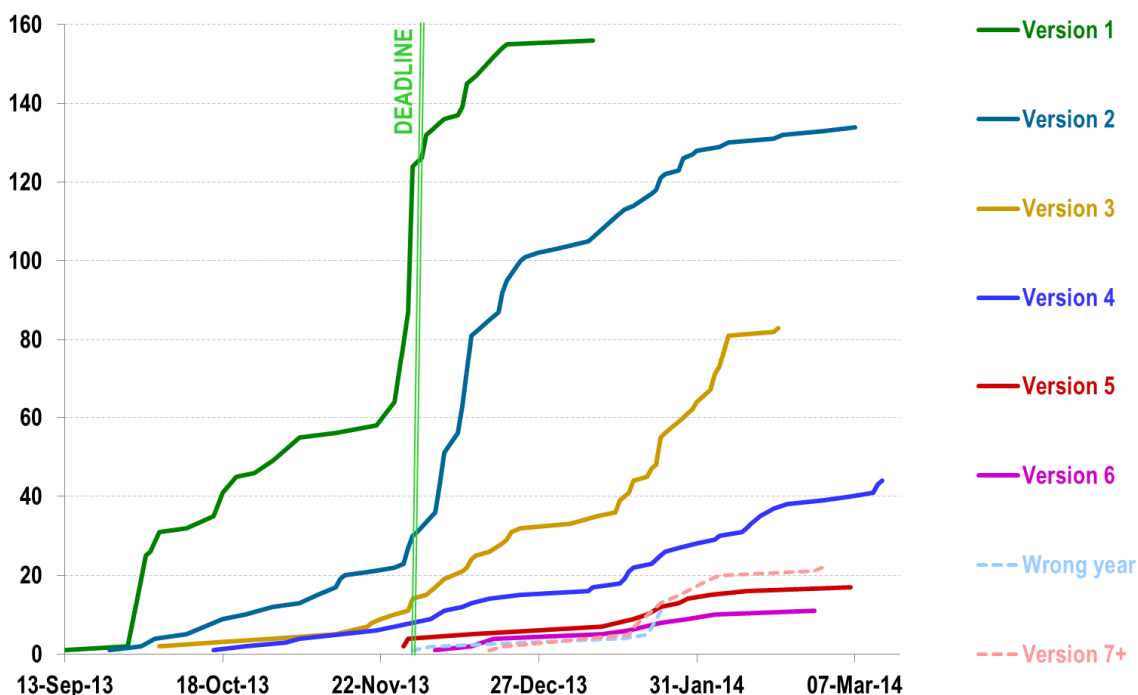
As regards annual energy data collections, the reception date, as established by the Regulation (EC) No 1099/2008 on energy statistics, is 30 November of the year $x+1$. During the last annual exercise (containing data for 2012) and for the most significant annual data collections (gas, oil, electricity, coal and renewables), only 81% of questionnaires had been received at the date of 30 November 2013 (first version of the questionnaire). This means that almost 20% of the main annual questionnaires were not punctual because they were received after the deadline.

As regards the publication date of these annual data collections, the legal deadline (as established by the Regulation (EC) No 1099/2008 on energy statistics) is 31 of January of the year $x+2$. In this case, these data collections were released on 17 February 2014, with a 17 days delay. This is partly due to some modifications in the joint annual questionnaires resulting in countries having troubles to provide complete and correct data in questionnaires. This is despite the fact that all changes were agreed well in advance and officially communicated to all countries more than a year in advance during the annual meeting of the Working Group on Energy Statistics. Additionally, internal Eurostat's IT-related problems (COMEXT, eDAMIS) have been experienced and contributed to this delay.

Although official release deadlines for different energy data collections are legally well established, no dedicated release calendar is in place for the European energy statistics main data collections on the Eurostat website. For this reason, a calendar including information on legal deadlines for transmission to Eurostat and for Eurostat's dissemination of the individual country data could help to improve information on timeliness and punctuality for energy statistics users. A tool allowing for a clear follow up of punctuality issues (indicating the dates when questionnaires were received from countries, when dissemination is foreseen, visualisation of the time lag between the release date of data and the target date, etc.) would be useful as well.

Another important aspect in relation to punctuality is the fact that many countries send the first version of their questionnaires before the legal deadline, but containing only incomplete, inaccurate, provisional or low quality data, which requires sending new versions of the same questionnaires. For example, as regards the most significant annual data collections (gas, oil, electricity, coal and renewables), the following graph shows the reception date of the different versions of the questionnaires until the date of 13 March 2014.

Figure 2 – Reception of versions of gas, oil, electricity, coal and renewables annual questionnaires



As can be observed, while 170 annual energy questionnaires are needed, a total of 478 were sent from countries by 13 March 2014, involving several revisions (more than 7 for several countries), some of them well beyond the deadline. This creates a ping-pong situation where multiple versions of the same questionnaire are sent back and forth for checks and corrections, which is clearly an aspect to be improved. A recommendation in this sense is to create clear instructions/procedures on the validation checks that are to be carried out at each level (countries and Eurostat), so it would be known beforehand whether a certain aspect of data quality needs to be improved before submitting the questionnaire.

6. ACCESSIBILITY AND CLARITY

According to the European Statistics Code of Practice, European statistics should be presented in a clear and understandable form, disseminated in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.

The **accessibility** of statistical outputs is the measure of the ease with which users can obtain the data, in other words, it is an attribute of statistics describing the set of conditions and modalities by which users can obtain data. It is determined by the physical conditions by means of which users obtain data: where to go, how to order, delivery time, pricing policy, marketing conditions (copyright, etc.), availability of micro or macro data, various formats (paper, files, CD-ROM, Internet, etc.).

The **clarity** of statistical outputs is the measure of the ease with which users can understand the data. In other words, it is an attribute of statistics describing the extent to which easily comprehensible metadata are available, where these metadata are necessary

to give a full understanding of statistical data. It is determined by the information environment within which the data are presented, whether the data are accompanied with appropriate metadata, whether use is made of illustrations such as graphs and maps, whether information on data accuracy are available (including any limitations on use) and the extent to which additional assistance is provided by the producer.

In summary, accessibility and clarity refer to the simplicity and ease with which users can access statistics, with the appropriate user information and assistance: a global context which finally enables them to make optimum use of the statistics.

For experienced and professional users, the whole output as regards energy data collections can be accessed through the Internet, using the open access Eurostat database (Eurobase). This tool allows for customised downloads, where users can select the required indicators, countries, time series, products and units. Through direct queries, customized tabulations of energy statistics results are available to users in electronic format. Additionally, balance sheets are produced once per year. All these data are can be consulted and downloaded free of charge.

For occasional users, articles with the most relevant information concerning the main energy data collections are published and kept up-to-date in electronic format in Statistics Explained. Press releases are also published when new relevant data becomes available. Additionally, the pocketbook "Energy, transport and environment indicators", published on a yearly basis, is accessible free of charge via the Eurostat webpage.

As stated above, clarity depends upon the quality of statistical metadata that are disseminated alongside the statistical outputs. As regards energy data collections, the following tables show for which tables and databases in Eurobase dedicated metadata are available. Please note that all tables and databases are under the responsibility of the E.5 (Eurostat Energy Unit), with the exception of the "Implicit tax rate on energy (tsdcc360)" table, which is under the responsibility of E.2 (Eurostat Environmental accounts Unit).

Table 6 - Availability of metadata for European energy data tables

Title of data collection	Type of data collection and level in the navigation tree	Dedicated metadata
Energy (t_nrg)	Folder of folders (Level 0)	No
Energy statistics - main indicators (t_nrg_indic)	Folder of data tables (Level 1)	Yes
Implicit tax rate on energy (tsdcc360)	Data table (Level 2)	Yes
Market share of the largest generator in the electricity market (ten00119)	Data table (Level 2)	No
Energy intensity of the economy (tsdec360)	Data table (Level 2)	Yes
Share of renewable energy in gross final energy consumption (t2020_31)	Data table (Level 2)	Yes
Electricity generated from renewable sources (tsdcc330)	Data table (Level 2)	Yes
Combined heat and power generation (tsdcc350)	Data table (Level 2)	Yes
Greenhouse gas emissions intensity of energy consumption (tsdcc220)	Data table (Level 2)	Yes
Energy statistics - quantities (t_nrg_quant)	Folder of data tables (Level 1)	No
Total production of primary energy (ten00076)	Data table (Level 2)	No
Primary production of coal and lignite (ten00077)	Data table (Level 2)	No
Primary production of crude oil (ten00078)	Data table (Level 2)	No
Primary production of natural gas (ten00079)	Data table (Level 2)	No

Title of data collection	Type of data collection and level in the navigation tree	Dedicated metadata
Primary production of nuclear energy (ten00080)	Data table (Level 2)	No
Primary production of renewable energy (ten00081)	Data table (Level 2)	No
Share of renewable energy in gross final energy consumption (tsdcc110)	Data table (Level 2)	Yes
Gross inland consumption of primary energy (ten00086)	Data table (Level 2)	No
Gross inland energy consumption, by fuel (tsdcc320)	Data table (Level 2)	Yes
Total gross electricity generation (ten00087)	Data table (Level 2)	No
Consumption of electricity by industry, transport activities and households/services (ten00094)	Data table (Level 2)	No
Final energy consumption (ten00095)	Data table (Level 2)	No
Final energy consumption, by sector (tsdpc320)	Data table (Level 2)	Yes
Final energy consumption of petroleum products (ten00096)	Data table (Level 2)	No
Final energy consumption of electricity (ten00097)	Data table (Level 2)	No
Final energy consumption of natural gas (ten00098)	Data table (Level 2)	No
Final energy consumption by industry (ten00099)	Data table (Level 2)	No
Final energy consumption by transport (ten00100)	Data table (Level 2)	No
Energy consumption of transport relative to GDP (tsdtr100)	Data table (Level 2)	Yes
Final energy consumption by households, trades, services, etc. (ten00101)	Data table (Level 2)	No
Electricity consumption of households (tsdpc310)	Data table (Level 2)	Yes
Energy dependence (tsdcc310)	Data table (Level 2)	Yes
Share of renewable energy in fuel consumption of transport (tsdcc340)	Data table (Level 2)	Yes
Energy statistics - prices (t_nrg_price)	Folder of data tables (Level 1)	Yes
Gas prices for industrial consumers (ten00112)	Data table (Level 2)	No
Gas prices for household consumers (ten00113)	Data table (Level 2)	No
Gas prices by type of user (ten00118)	Data table (Level 2)	Yes
Electricity prices for industrial consumers (ten00114)	Data table (Level 2)	No
Electricity prices for household consumers (ten00115)	Data table (Level 2)	No
Electricity prices by type of user (ten00117)	Data table (Level 2)	Yes

Table 7 - Availability of metadata for European energy databases

Title of data collection	Type of data collection and level in the navigation tree	Dedicated metadata
Energy (nrg)	Folder of databases and folders (Level 0)	No
JODI - monthly oil data (t-1) (nrg_jodi)	Database (Level 1)	Yes
Energy statistics - main indicators (nrg_indic)	Folder of databases (Level 1)	Yes
Market share of the largest generator in the electricity market - annual data (nrg_ind_331a)	Database (Level 2)	No
Annual nuclear statistics (nrg_ind_333a)	Database (Level 2)	No
Energy saving - annual data (nrg_ind_334a)	Database (Level 2)	No
Share of energy from renewable sources (nrg_ind_335a)	Database (Level 2)	No
Supply of electricity - monthly data (nrg_ind_342m)	Database (Level 2)	No
Supply of natural gas - monthly data (nrg_ind_343m)	Database (Level 2)	No
Energy statistics - quantities, annual data (nrg_quant)	Folder of folders (Level 1)	Yes
Energy statistics - supply, transformation, consumption (nrg_10)	Folder of databases (Level 2)	No
Supply, transformation, consumption - all products - annual data (nrg_100a)	Database (Level 3)	No

Title of data collection	Type of data collection and level in the navigation tree	Dedicated metadata
Supply, transformation, consumption - solid fuels - annual data (nrg_101a)	Database (Level 3)	No
Supply, transformation, consumption - oil - annual data (nrg_102a)	Database (Level 3)	No
Supply, transformation, consumption - gas - annual data (nrg_103a)	Database (Level 3)	No
Supply, transformation - nuclear energy - annual data (nrg_104a)	Database (Level 3)	No
Supply, transformation, consumption - electricity - annual data (nrg_105a)	Database (Level 3)	No
Supply, transformation, consumption - heat - annual data (nrg_106a)	Database (Level 3)	No
Supply, transformation, consumption - renewable energies - annual data (nrg_107a)	Database (Level 3)	No
Supply, transformation, consumption - wastes (non-renewable) - annual data (nrg_108a)	Database (Level 3)	No
Energy statistics - infrastructure (nrg_11)	Folder of databases (Level 2)	No
Infrastructure - electricity - annual data (nrg_113a)	Database (Level 3)	No
Infrastructure - biofuel production capacities - annual data (nrg_114a)	Database (Level 3)	No
Infrastructure - solar collectors' surface - annual data (nrg_115a)	Database (Level 3)	No
Energy statistics - imports (by country of origin) (nrg_12)	Folder of databases (Level 2)	No
Imports (by country of origin) - all products - annual data (nrg_121a)	Database (Level 3)	No
Imports (by country of origin) - solid fuels - annual data (nrg_122a)	Database (Level 3)	No
Imports (by country of origin) - oil - annual data (nrg_123a)	Database (Level 3)	No
Imports (by country of origin) - gas - annual data (nrg_124a)	Database (Level 3)	No
Imports (by country of origin) - electricity - annual data (nrg_125a)	Database (Level 3)	No
Energy statistics - exports (by country of destination) (nrg_13)	Folder of databases (Level 2)	No
Exports (by country of destination) - all products - annual data (nrg_131a)	Database (Level 3)	No
Exports (by country of destination) - solid fuels - annual data (nrg_132a)	Database (Level 3)	No
Exports (by country of destination) - oil - annual data (nrg_133a)	Database (Level 3)	No
Exports (by country of destination) - gas - annual data (nrg_134a)	Database (Level 3)	No
Exports (by country of destination) - electricity - annual data (nrg_135a)	Database (Level 3)	No
Energy statistics - quantities, monthly data (nrg_quantm)	Folder of folders (Level 1)	No
Energy statistics - supply, transformation, consumption (nrg_10m)	Folder of databases (Level 2)	No
Supply, transformation - solid fuels - monthly data (nrg_101m)	Database (Level 3)	No
Supply, transformation - oil - monthly data (nrg_102m)	Database (Level 3)	No
Supply - gas - monthly data (nrg_103m)	Database (Level 3)	No
Supply, transformation - nuclear energy - monthly data (nrg_104m)	Database (Level 3)	No
Supply - electricity - monthly data (nrg_105m)	Database (Level 3)	No
Energy statistics - imports (by country of origin) (nrg_12m)	Folder of databases (Level 2)	No
Imports (by country of origin) - solid fuels - monthly data (nrg_122m)	Database (Level 3)	No
Imports (by country of origin) - oil - monthly data (nrg_123m)	Database (Level 3)	No
Imports (by country of origin) - gas - monthly data (nrg_124m)	Database (Level 3)	No
Imports (by country of origin) - electricity - monthly data (nrg_125m)	Database (Level 3)	No
Energy statistics - exports (by country of destination) (nrg_13m)	Folder of databases (Level 2)	No
Exports (by country of destination) - solid fuels - monthly data (nrg_132m)	Database (Level 3)	No

Title of data collection	Type of data collection and level in the navigation tree	Dedicated metadata
Exports (by country of destination) - oil - monthly data (nrg_133m)	Database (Level 3)	No
Exports (by country of destination) - gas - monthly data (nrg_134m)	Database (Level 3)	No
Exports (by country of destination) - electricity - monthly data (nrg_135m)	Database (Level 3)	No
Energy statistics - prices (nrg_price)	Folder of folders (Level 1)	Yes
Energy statistics - gas and electricity prices - new methodology from 2007 onwards (nrg_pc)	Folder of databases (Level 2)	No
Gas prices for domestic consumers, from 2007 onwards - bi-annual data (nrg_pc_202)	Database (Level 3)	No
Gas prices for industrial consumers, from 2007 onwards - bi-annual data (nrg_pc_203)	Database (Level 3)	No
Electricity prices for domestic consumers, from 2007 onwards - bi-annual data (nrg_pc_204)	Database (Level 3)	No
Electricity prices for industrial consumers, from 2007 onwards - bi-annual data (nrg_pc_205)	Database (Level 3)	Yes
Electricity prices components for domestic consumers, from 2007 onwards - annual data (nrg_pc_204_c)	Database (Level 3)	Yes
Electricity prices components for industrial consumers, from 2007 onwards - annual data (nrg_pc_205_c)	Database (Level 3)	No
Energy statistics - gas and electricity prices - old methodology until 2007 (nrg_pc_h)	Folder of databases (Level 2)	No
Gas - domestic consumers - bi-annual prices - old methodology until 2007 (nrg_pc_202_h)	Database (Level 3)	No
Gas - industrial consumers - bi-annual prices - old methodology until 2007 (nrg_pc_203_h)	Database (Level 3)	No
Electricity - domestic consumers - bi-annual prices - old methodology until 2007 (nrg_pc_204_h)	Database (Level 3)	No
Electricity - industrial consumers - bi-annual prices - old methodology until 2007 (nrg_pc_205_h)	Database (Level 3)	No
Electricity - marker prices - bi-annual prices - data until 2007 (nrg_pc_206_h)	Database (Level 3)	No
Energy statistics - heating degree-days (nrg_esdgr)	Folder of databases (Level 2)	Yes
Heating degree-days by NUTS 2 regions - monthly data (nrg_esdgr_m)	Database (Level 3)	No
Heating degree-days by NUTS 2 regions - annual data (nrg_esdgr_a)	Database (Level 3)	No

As can be observed, many data collections do not have their own metadata, relying on more general metadata (for example, only one description of metadata for all annual data collections). In other cases, no metadata exist at all (e.g. monthly data energy statistics). It is recommended to develop metadata for at least the most important groups of data collections and whenever there are characteristics that make it necessary to have a dedicated metadata document. This could be the case for some annual and monthly data collections.

In order to obtain more reliable information on users' feedback about clarity of published data and ease of access to the data, a user satisfaction survey on energy statistics is in preparation (as mentioned above), with the aim of obtaining more detailed information about user satisfaction with the different energy data collections. It will also contain questions to evaluate clarity and ease of understanding, as well as ease of access to the data.

7. COHERENCE AND COMPARABILITY

The coherence of two or more statistical outputs refers to the degree to which the statistical processes by which they were generated used the same concepts - classifications, definitions, and target populations – and harmonised methods. Coherent statistical outputs have the potential to be validly combined and used jointly. Examples of joint use are where the statistical outputs refer to the same population, reference period and country but comprise different sets of data items (e.g. energy data and trade data) or where they comprise the same data items (e.g. energy data) but for different reference periods, countries, or other domains. Comparability is a special case of coherence and refers to the latter example where the statistical outputs refer to the same data items and the aim of combining them is to make comparisons over time, or across countries, or across other domains.

Eurostat carries out quality tests, mainly on the coherence and comparability of the provided information, in particular in the context of the energy balances. In addition, the questionnaires used for data transmission also have built-in coherence tests. Countries are contacted if problems are detected, like sharp variations across time series or inconsistencies among questionnaires, for example. From time to time specific actions targeted to selected items to improve the methodology – including time series – are carried out. Backwards calculations might be necessary in case of any changes in the methodology.

When originating from a single source, statistics are normally coherent in the sense that elementary results derived from the concerned survey can be reliably combined in numerous ways to produce more complex results. For this reason, checks of coherence in the area of energy statistics are difficult, since there is a high degree of normalisation among the energy-data producers. More particularly, Eurostat collaborates on methodological issues with the following international organisations: IEA (International Energy Agency), UN Statistical Commission, InterEnerStat (International Energy Statistics), IRENA (International Renewable Energy Agency), Asia Pacific Economic Cooperation (APEC), Latin-American Energy Organisation (OLADE), Organization of Petroleum Exporting Countries (OPEC), United Nations Statistics Division (UNSD), International Energy Forum (IEF) and the Energy Community. This means that in most of the cases data are fully comparable and in the most important cases joint questionnaires between Eurostat, IEA and UN are used. Eurostat verifies to the extent possible if the reported data respect the prescribed methodology. The underlying data collection methods are however the responsibility of countries providing data. The methodology is harmonised for all EU and OECD countries, thus including major world economies such as Australia, Canada, Japan, Korea and United States.

When originating from different sources, and in particular from statistical surveys of different nature and/or frequencies, statistics may not be completely coherent in the sense that they may be based on different approaches, classifications and methodological standards. For this reason, it could be more interesting to assess the coherence of Eurostat energy data with data collections from organisations which do not use the same reporting tools (which are not official reference in the area). Only an overall match can be expected from the comparison of these datasets and no statement can be made assuming that data from one source is of higher quality than the other.

Table 8 shows a comparison of CO₂ emissions produced from burning fossil fuels. Eurostat calculates early estimates of these figures for European countries, based on

monthly data collections. Since these values are based on the total consumption of fossil fuels, evaluating the coherence and comparability of these values is a useful step towards assessing the overall quality of monthly data. For the purpose of assessing coherence, the following table shows Eurostat data on CO₂ early estimates from fossil fuels for the year 2012 against figures published by the U.S. Energy Information Administration for the year 2011 (<http://www.eia.gov/countries/>).

Table 8 – Coherence assessment of carbon dioxide emissions from the total consumption of fossil fuels: Eurostat 2012 data against U.S. Energy Information Administration 2011 data (both in million metric tons of CO₂)

COUNTRY	US Energy Information Administration (2011) (A)	Eurostat (cumulated monthly data 2012) (B)	Relative difference = [(B-A)/A*100]
Austria	67 180	61 354	-8.7%
Belgium	131 060	85 939	-34.4%
Bulgaria	52 440	47 881	-8.7%
Cyprus	9 500	6 332	-33.3%
Czech Republic	92 400	99 646	7.8%
Denmark	46 660	38 908	-16.6%
Estonia	20 260	18 590	-8.2%
Finland	54 060	46 970	-13.1%
France	374 330	332 295	-11.2%
Germany	748 490	728 065	-2.7%
Greece	91 300	90 189	-1.2%
Hungary	49 560	43 175	-12.9%
Ireland*	36 570	36 132	-1.2%
Italy	400 940	365 688	-8.8%
Latvia	8 470	6 376	-24.7%
Lithuania	16 050	11 577	-27.9%
Luxembourg	11 870	10 272	-13.5%
Malta	6 830	2 720	-60.2%
The Netherlands	253 000	157 115	-37.9%
Poland	307 910	296 387	-3.7%
Portugal	54 170	44 388	-18.1%
Romania	86 190	74 954	-13.0%
Slovakia*	NA	NA	NA
Slovenia	15 830	14 979	-5.4%
Spain	318 640	257 760	-19.1%
Sweden	53 150	36 974	-30.4%
UK	496 800	471 530	-5.1%
TOTAL	3 803 660	3 386 196	-11.0%

* Irish monthly data on solids (coal and peat) could not be used because of confidentiality reasons. No data for Slovakia were found in the website of the U.S. Energy Information Administration.

Figures presented in this table in the column ‘Eurostat (cumulated monthly data 2012)’ deviate from figures published as early CO₂ estimates from energy, due to the fact that the Eurostat early estimates are corrected based on the IPCC reference approach method and this table only shows CO₂ results obtained by aggregation of monthly data.

As can be observed in the table, results are coherent in most of the cases, but there are certain countries for which there are very high differences (more than 10% from 2011 to 2012 from these two data sources). Some of these countries are Belgium, Hungary, Latvia, Lithuania, Luxembourg, Malta, the Netherlands and Portugal, which were also detected in the CO₂ early estimates Eurostat report as being countries for which monthly data quality had to be investigated and further improved.

The following two tables have the aim of comparing Eurostat data on biodiesel production for 2011 and biodiesel capacity for 2012 with data from the European Biodiesel Board (<http://www.ebb-eu.org/stats.php>) for the same years.

Table 9 – Comparability of 2011 biodiesel production: Eurostat data against European Biodiesel Board data (in thousand tonnes)

COUNTRY	European Biodiesel Board (A)	Eurostat (B)	Relative difference = $[(B-A)/A*100]$
Austria	226	238.6	5.6%
Belgium	472	273.9	-42.0%
Bulgaria	26	15.6	-40.0%
Cyprus	6	6.5	8.3%
Czech Republic	154	210.1	36.4%
Denmark/Sweden	225	339.1	50.7%
Estonia	0	0.0	0.0%
Finland	225	195.0	-13.3%
France	1 559	1 819.0	16.7%
Germany	2 800	3 082.0	10.1%
Greece	78	108.0	38.5%
Hungary	150	141.8	-5.5%
Ireland	26	26.9	3.5%
Italy	479	590.8	23.3%
Latvia	56	59.9	7.0%
Lithuania	79	79.9	1.1%
Luxembourg	0	0.0	0.0%
Malta	0	0.8	NA
Netherlands	370	491.0	32.7%
Poland	363	363.3	0.1%
Portugal	287	365.6	27.4%
Romania	101	107.1	6.0%
Slovakia	103	125.4	21.7%
Slovenia	0	0.4	NA
Spain	604	678.8	12.4%
UK	218	176.9	-18.9%
TOTAL	8 607	9 496	10.3%

As observed, although data are very comparable in some countries, there are also significant differences in the amount of biodiesel produced by other countries, showing that different methodologies are used to obtain data. It is important to note that this assessment only shows that there are differences in biodiesel production between Eurostat data and other sources, not prejudging on the quality of Eurostat data.

Table 10 - Comparability of 2012 biodiesel capacity: Eurostat data as received from countries against European Biodiesel Board data (in thousand tonnes)

COUNTRY	European Biodiesel Board (A)	Eurostat (B)	Relative difference = $[(B-A)/A*100]$
Austria	535	646	20.7%
Belgium	770	665	-13.6%
Bulgaria	408	64	-84.4%
Cyprus	20	14	-29.6%
Czech Republic	437	420	-3.9%
Denmark	250	0	-100.0%
Estonia	110	0	-100.0%

COUNTRY	European Biodiesel Board (A)	Eurostat (B)	Relative difference = [(B-A)/A*100]
Finland	340	0	-100.0%
France	2 456	3 178	29.4%
Germany	4 968	4 296	-13.5%
Greece	812	0	-100.0%
Hungary	158	150	-5.1%
Ireland	76	30	-60.6%
Italy	2 310	2 212	-4.2%
Latvia	156	173	10.9%
Lithuania	130	140	7.7%
Luxembourg	20	0	-100.0%
Malta	5	0	-100.0%
The Netherlands	2 517	2 051	-18.5%
Poland	884	989	11.9%
Portugal	483	776	60.7%
Romania	277	207	-25.5%
Slovakia	156	120	-23.1%
Slovenia	113	0	-100.0%
Spain	4 391	4 527	3.1%
Sweden	182	286	57.0%
UK	574	499	-13.1%
TOTAL	23 538	21 441	-8.9%

There are significant differences in the biodiesel capacity. Indeed, some countries failed to report their capacity to Eurostat (showing as zero in the table), while they report production (e.g. Finland and Greece). These figures are different in the dataset from the European Biodiesel Board data. This observation highlights the fact that there could be a need to investigate if there are some reasons for these apparent discrepancies (e.g. problems in the reporting methodology of biodiesel capacity to Eurostat). To overcome this problem in the short term, Eurostat has estimated the missing capacities. However, this aspect should be further studied and improved by e.g. creating clear instructions on the methodology to calculate and report on biofuels capacity or adapting the questionnaire. Other similar issues could be detected if more analysis of comparability were carried out in the future for checking data quality in the energy field.

Another interesting exercise is the comparison of aggregated Eurostat energy monthly data against Eurostat energy annual data for the flow and the same year.

Short-term statistics are not usually as accurate as annual ones. The reason is that timeliness plays against accuracy. For M-3 monthly data, Member States only have up to 3 months to collect and to process the requested information, while for annual statistics they have up to 11 months.

As observed in annex 1, for annual statistics many Member States collect data from a very big proportion of the statistical population, often even covering 100%. Sometimes, this cannot be done for monthly statistics because of time and financial restraints. Therefore, it is often unavoidable that aggregated monthly statistics differ from annual statistics for those countries which do not build up annual statistics by aggregating monthly data.

In spite of the above mentioned facts, it is interesting to compare both data sets to establish the level of agreement between the two. If a good agreement is given, no action is necessary; in case of big differences, the reason has to be found and corrective action should be implemented. Some Member States indicated in their quality reports that

certain types of industries (e.g. small producers) are underrepresented for the collection of monthly statistics. This shows at least that they are aware of certain shortcomings which might affect monthly data collections.

The level of consistency/comparability between the two datasets depends on different factors:

- The way annual statistics are produced: if annual statistics are not based on separate surveys, but are based on the compilation of monthly data collections, then the agreement of the two data sets should be high (see compilation methods used by Member States in annex 1).
- The number of providers: if it is small, then under-coverage in monthly surveys can be easily avoided. On the other hand, if this number is high, the level of agreement will be lower. There is no harmonised fixed acceptable maximum difference for the agreement between monthly and annual data.

This comparison between monthly and annual data is already carried out for several flows of all fossil fuels within the framework of the early CO₂ estimates annual exercise.

A single example has been reproduced here. The following table shows a comparison of aggregated monthly data [nrg_103m] against annual data [nrg_103a] for the year 2012 for gross inland consumption of natural gas in EU-27 countries.

Table 11 - Gross inland consumption of natural gas (TJ - NCV) - aggregated monthly data against annual data for 2012 (data extracted on 28 May 2014)

Countries	Total 2012 annual data (A)	Total 2012 aggregated monthly data (B)	Relative difference = [(B-A)/A*100]
Belgium	601 475	329 770	-45,2%
Bulgaria	102 625	79 594	-22,4%
Czech Republic	287 051	281 038	-2,1%
Denmark	145 886	138 151	-5,3%
Germany	2 923 196	2 814 948	-3,7%
Estonia	22 835	18 854	-17,4%
Ireland	168 076	173 475	3,2%
Greece	153 325	153 502	0,1%
Spain	1 180 239	1 182 644	0,2%
France	1 600 211	1 523 371	-4,8%
Italy	2 568 838	2 569 179	0,0%
Cyprus	0	0	0,0%
Latvia	50 709	50 716	0,0%
Lithuania	111 119	111 118	0,0%
Luxembourg	44 158	43 857	-0,7%
Hungary	347 752	358 854	3,2%
Malta	0	0	0,0%
Netherlands	1 381 760	1 367 721	-1,0%
Austria	310 433	307 210	-1,0%
Poland	569 447	569 380	0,0%
Portugal	164 651	168 567	2,4%
Romania	452 715	465 882	2,9%
Slovenia	29 730	27 091	-8,9%
Slovakia	182 767	225 478	23,4%
Finland	125 835	125 385	-0,4%
Sweden	42 144	34 926	-17,1%
United Kingdom	2 777 984	2 773 037	-0,2%
TOTAL	16 344 963	15 893 747	-2,8%

As observed, there are some differences in data, which are usually under 5-10%. However, there are several examples (Belgium, Bulgaria, Slovakia), where this difference is higher than 20% and even as high as 45%. This shows that comparing monthly against annual data in several energy domains can also be a useful tool to find out countries for which monthly data quality could be investigated and further improved. As stated above, similar comparisons are already carried out within the framework of the early CO₂ estimates annual exercise. However, a more structured way to provide feedback to countries and to incorporate improvements in monthly data quality is still possible.

8. CONCLUSIONS AND RECOMMENDATIONS

This report shows summarised information and conclusions as regards European energy statistics data quality, using the information included in the quality reports sent by individual Member States to Eurostat in 2012, in addition to other sources, like metadata information, websites of individual countries and other organisations, as well as data from the public free data set maintained by Eurostat.

European energy statistics are analysed according to the main quality components defined in the ESS, which are relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability and coherence. This analysis allows us to draw some conclusions and propose recommendations at different levels. The main recommendations concluded in this report can be summarised as follows:

- Obtain more detailed information in the next quality reporting exercise about monthly surveys and propose measures to improve their accuracy and reliability.
- Study the feasibility of publishing in Eurobase those products/aggregates which are available and yet not published. In a first step, focus on those which are required by regulations and as a second step, those which are available but not compulsory.
- Countries should adapt their data collection methods to comply with legal requirements in terms of punctuality and completeness of data delivery.
- Propose a data revision policy to improve the use of monthly and annual data. Countries to improve general data quality before first transmission (e.g. take into consideration the warnings and use the remarks sheet to clarify issues), in order to avoid questionnaires being sent back and forth resulting in waste of resources.
- Implement a release calendar in Eurostat's webpage with information on legal deadlines for transmission and dissemination of energy data.
- Create instructions/procedures on the validation checks that need to be carried out at each level (countries and Eurostat).
- Update and develop metadata for the main annual and monthly data collections.
- Evaluate clarity and ease of understanding, as well as ease of access to energy data in the next user's satisfaction survey.
- Evaluate whether it is needed to create more detailed instructions on the methodology to report on biofuels capacity or to adapt the questionnaire.
- Carry out more analysis of coherence and comparability by comparing monthly data against annual data and also by comparing with other sources and statistical processes (i.e. validation level 4 and level 5 checks).
- Structure the next quality reporting questionnaire in a way that makes it easier to draw a clear mapping from the country data collections and Eurostat questionnaires. It should also obtain information on accuracy (e.g. sampling errors, coverage, errors, non-response rate, etc.) and other quality dimensions in a comparable way (e.g. using more standardised and close-ended questions).

In summary, the first energy statistics quality reporting exercise aimed at obtaining general information and getting a first overview on the way statistics are obtained and compiled by Member States. Interesting conclusions have been reached. However, more detailed information will be needed in the future to further improve data quality. The preparation, coordination and follow up of the next quality reporting cycle will be of paramount importance to propose further improvements to data quality in the field of European energy statistics.

ANNEX 1. INFORMATION ON DATA COLLECTION METHODS PER EU MEMBER STATE IN 2012

This annex contains two tables with information on data collection methods used by each Member State (+ Norway) in 2012 in their energy data collections. The first table refers to annual data collections (gas, electricity and heat, liquid fuels, solid fuels and renewables). The second one refers to monthly.

Table 12 - Information on annual data collection methods per EU Member State in 2012

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Austria	Mandatory survey, covering all network operators, production facilities, storage facilities and distributors.	Mandatory survey, covering all network operators and all power plants \geq 1 MW (census with threshold).	Mandatory survey using administrative data. It covers all producers, importers/exporters, companies blending, or storing oil and/or oil products.	Based on import and export figures and on some consumption data	Different sources (e.g. survey on biomass district heating plants). All of these surveys are carried out only every 2 to 5 years. Data delivered on an annual basis are estimates based on these surveys.
Belgium	Mandatory Survey on the supply of natural gas, including deliveries to final consumers and other transformers. All supply undertakings are covered exhaustively.	A survey on the supply and consumption of heat and electricity. All households and industrial producers are taken into account.	Annual statistics are built on monthly collected data	Annual statistics are built on monthly collected data	According to a voluntary agreement, the three Belgian regions send regional data in July of the following year. All producers of renewables and waste are taken into account.
Bulgaria	Survey on the supply (production, external trade, bunkers) and stocks, survey of the transformation industries (refineries, coking plants, patent fuel plants and blast furnaces) and survey of the consumption in the manufacturing industry, agriculture / forestry and transport businesses. . Statistical units are covered exhaustively.	Survey of the power industry (public system, auto-producers) collecting information on electricity generation, heat production, capacities and fuel inputs. Statistical units are covered exhaustively	Survey on the supply (production, external trade, bunkers) and stocks, survey of the transformation industries (refineries, coking plants, patent fuel plants and blast furnaces) and survey of the consumption in the manufacturing industry, agriculture / forestry and transport businesses. . Statistical units are covered exhaustively.	Survey on the supply (production, external trade, bunkers) and stocks, survey of the transformation industries (refineries, coking plants, patent fuel plants and blast furnaces) and survey of the consumption in the manufacturing industry, agriculture / forestry and transport businesses. . Statistical units are covered exhaustively.	Detailed information on renewables is missing

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Cyprus	Not applicable	Statistics on the supply side (gross / net electricity generation, capacity, fuel consumption) and deliveries of electricity to final consumers for the grid connected installations are provided by the Electricity Authority of Cyprus. For the grid non-connected installations, statistics provided by the Ministry of Commerce.	Annual statistics are built on monthly collected data	Not applicable	Data are compiled by the Ministry of Commerce
Czech Republic	Survey on the supply, stocks and deliveries. Statistical units (Business Register units involved in exploitation, production of gaseous fuels, importers / exporters and wholesale traders) are covered exhaustively. Survey of the consumption and stocks in businesses. Enterprises > 20 employees in the manufacturing, construction, transport and agriculture sectors are surveyed exhaustively. For the other sectors, the threshold is 100 employees. In addition, enterprises with 20 to 100 employees are surveyed on the basis of a sample (ranging from 27% to 39% of the population, depending on the economic sector).	Survey of the power industry (public system, auto-producers) collecting information on electricity generation, heat production, capacities and fuel inputs. Business Register units with electricity generation / heat production (NACE 35.1, 35.3) as main or secondary activity are covered exhaustively.	Survey of the transformation industries (refineries, coking plants, briquetting plants and blast furnaces) collects relevant statistics on transformation activities (input, output, self-consumption). Statistical units are covered exhaustively.	Survey on the supply, stocks and deliveries. Statistical units (Business Register units involved in exploitation, production of solid fuels, importers / exporters and wholesale traders) are covered exhaustively.	Renewables are monitored, together with conventional fuels, through the "Annual Statistical Form on Fuels and Energy Consumption and Fuel Stocks"
Denmark	Supply statistics are calculated by aggregating the monthly figures; consumption statistics are obtained through a business survey addressed to all natural gas distribution companies.	Statistics are obtained complementing monthly aggregates with data from business surveys addressed to all companies producing electricity and/or heat sold to a public grid and to all electricity distribution companies. Every second year a survey on energy consumption in industry is carried out. The survey is addressed to all companies with 20 or more employees.	Supply statistics are calculated by aggregating the monthly figures; consumption statistics are obtained through a business survey addressed to all relevant importing or producing oil companies. Every second year a survey on energy consumption in industry is carried out. The survey is addressed to all companies with 20 or more employees.	Supply statistics are calculated by aggregating the monthly figures; consumption statistics are obtained through a business survey addressed to all companies importing coal and coke. Every second year a survey on energy consumption in industry is carried out. The survey is addressed to all companies with 20 or more employees.	Nine specific voluntary surveys are carried out to collect data on renewables. Every second year a survey on energy consumption in industry is carried out. The survey is addressed to all companies with 20 or more employees.

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Estonia	<p>Unique annual survey for all energy commodities. Supply data are collected from all enterprises, which produce, sell or store fuels, electricity or heat. Besides, all transport enterprises are surveyed. The data on the imports and exports are based on customs statistics, complemented with data submitted by enterprises. Consumption data come from enterprises with more than 50 employees, which are exhaustively surveyed. The rest of the enterprises are sampled using stratified random sampling.</p>	<p>Unique annual survey for all energy commodities. Supply data are collected from all enterprises, which produce, sell or store fuels, electricity or heat. Besides, all transport enterprises are surveyed. The data on the imports and exports are based on customs statistics, complemented with data submitted by enterprises. Consumption data come from enterprises with more than 50 employees, which are exhaustively surveyed. The rest of the enterprises are sampled using stratified random sampling.</p>	<p>Unique annual survey for all energy commodities. Supply data are collected from all enterprises, which produce, sell or store fuels, electricity or heat. Besides, all transport enterprises are surveyed. The data on the imports and exports are based on customs statistics, complemented with data submitted by enterprises. Consumption data come from enterprises with more than 50 employees, which are exhaustively surveyed. The rest of the enterprises are sampled using stratified random sampling.</p>	<p>Unique annual survey for all energy commodities. Supply data are collected from all enterprises, which produce, sell or store fuels, electricity or heat. Besides, all transport enterprises are surveyed. The data on the imports and exports are based on customs statistics, complemented with data submitted by enterprises. Consumption data come from enterprises with more than 50 employees, which are exhaustively surveyed. The rest of the enterprises are sampled using stratified random sampling.</p>	<p>Unique annual survey for all energy commodities. Supply data are collected from all enterprises, which produce, sell or store fuels, electricity or heat. Besides, all transport enterprises are surveyed. The data on the imports and exports are based on customs statistics, complemented with data submitted by enterprises. Consumption data come from enterprises with more than 50 employees, which are exhaustively surveyed. The rest of the enterprises are sampled using stratified random sampling.</p>
Finland	<p>No information has been provided on dedicated annual data collections for gas. Finland uses a general annual survey called: Energy use in manufacturing industry, which may contain data about gas.</p>	<p>The survey "Energy use in manufacturing industry" contains data on the volumes of used fuels and electricity supplemented by the amounts of purchased and sold electricity and heat in manufacturing industry. Additionally, data is collected annually with a survey addressed to heating plants. The data collection covers only separate heat production and corresponding fuels. Finally, another survey is the Electricity and heat production, which is a census covering all grid connected electricity producers. The data collection covers both electricity and heat production of the utilities.</p>	<p>No information has been provided on dedicated annual data collections for oil. Finland uses a general annual survey called: Energy use in manufacturing industry, which may contain data about oil.</p>	<p>No information has been provided on dedicated annual data collections for coal. Finland uses a general annual survey called: Energy use in manufacturing industry, which may contain data about coal. But most importantly, coal is gathered on a quarterly basis.</p>	<p>Dedicated surveys on "Solid wood fuels in heating and power plants" (covering total population of major heating and power plants using solid wood), "Fuelwood consumption in small-scale housing" (sample surveys conducted every 2-5 years) and "Wood pellets" (covering production, consumption, imports and exports of wood pellets)</p>

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
France	Mandatory survey, which is meant to collect data on the supply (physical imports and exports, transits, stocks) and consumption (in industries, agriculture and transport sectors and for producing heat and electricity) of natural gas. The survey is exhaustive: all natural gas operators are involved, including producers, distribution and storage operators and suppliers	Data collected through two mandatory surveys: one on electricity production, including renewable resources (hydroelectric, wind, biofuels and solar) and nuclear reactors, but excluding the photoelectric sector, and the other on the distribution of electricity which also collects consumption data. Both surveys are exhaustive.	Data are obtained from a variety of sources including surveys, customs and other administrations.	Data are obtained from a variety of sources including Insee surveys, customs and other administrations.	Data only collected through the electricity production survey
Germany	Mandatory annual survey on energy consumption (sectoral) in industries of NACE B and C covering the consumption of solids, other gases, petroleum products, natural gas, heat and electricity, biomass, wastes and other renewables. A census with threshold (more than 20 employees) is carried out. A mandatory annual survey on sales (=supply) of natural gas. A census is carried out.	Mandatory annual survey on energy consumption (sectoral) in industries of NACE B and C covering the consumption of solids, other gases, petroleum products, natural gas, heat and electricity, biomass, wastes and other renewables. A census with threshold (more than 20 employees) is carried out + A mandatory annual survey on sales (=supply) of natural gas. A census is carried out + Mandatory annual survey on companies feeding electricity into the grid. A census is carried out. Mandatory annual survey on industrial auto-producers of electricity in electricity only or in CHP plants covering industries of NACE B and C. Also heat production in CHP plants is to be reported. It also covers fuel input. A census with threshold (>1MW electricity) is carried out + Mandatory annual survey on heat production in heat plants covering also fuel input. A census with threshold (>2 MW thermal) is carried out.	Mandatory annual survey on energy consumption (sectoral) in industries of NACE B and C covering the consumption of solids, other gases, petroleum products, natural gas, heat and electricity, biomass, wastes and other renewables. A census with threshold (more than 20 employees) is carried out + Oil data mainly composed by aggregating monthly data	Mandatory annual survey on energy consumption (sectoral) in industries of NACE B and C covering the consumption of solids, other gases, petroleum products, natural gas, heat and electricity, biomass, wastes and other renewables. A census with threshold (more than 20 employees) is carried out + Mandatory annual survey on coal (hard coal, lignite) production, production of secondary coal products, stock holding. A census is carried out on producer level.	Mandatory annual survey on energy consumption (sectoral) in industries of NACE B and C covering the consumption of solids, other gases, petroleum products, natural gas, heat and electricity, biomass, wastes and other renewables. A census with threshold (more than 20 employees) is carried out.

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Greece	A census is addressed to all system operators, which then provide data on a voluntary basis.	Annual statistics are built by complementing monthly statistics with data obtained through a census addressed to all networks operators and a partial census addressed to all power plants above a threshold of 1 MW.	Annual statistics are collected by complementing administrative data with monthly data and with data obtained with a census addressed to all enterprises producing, importing/exporting, blending or storing oil and derivatives.	Annual statistics are built by complementing monthly statistics with data obtained through a detailed annual census. The surveyed variables include the primary production of hard coal and lignite, their calorific values, imports/exports, stocks and consumption.	No information provided
Hungary	<p>Four annual surveys are described. each of them applies to several sectors:</p> <ul style="list-style-type: none"> • “Energy Balance of the Energy Sector”. This mandatory business sample survey collects data on the supply, transformation and consumption of energy commodities and is addressed to companies that produce, store, trade (internally or externally), and transform energy products. The sample size is 420 and the response rate is around 100%. • “Report on Energy Consumption”. This mandatory business sample survey covers energy consumption for several purposes (including heating). Respondents include enterprises in agriculture and transport and all business units not covered by other statistical surveys. • “Energy Balance of the Industrial Sector”. This mandatory business sample survey covers imports, stocks, sales of energy commodities and electricity and heat generation. The sample includes mining, manufacturing and construction companies with more than 49 employees and all producers of electricity and/or heat, resulting in a total size of 3500 units. • “Report on Heat Producers and Suppliers”. This mandatory business survey covers data on electricity and/or generation, capacity and sales. The survey is addressed to all 300 companies producing or supplying heat. 				

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Ireland	Data are collected through a survey addressed to the unique Gas transmission operator in Ireland. The survey makes it possible to fill in Tables 1 (Supply of NG), 2a (Inland Consumption by Sector), 2b (Total Final Consumption by Sector). The industrial sub-sectoral breakdown is obtained through modelling.	Supply data are obtained through a monthly survey addressed to the unique electricity transmission system operator; monthly data are then aggregated in order to complete the EU annual questionnaire. Final consumption data are collected through an annual survey of all the 5 electricity suppliers. Estimation and modelling are used for the agricultural sector and for the industrial sub-sectoral breakdown. Autoproducer electricity consumption data are complemented with the figures obtained with the CHP annual survey, which collects information on plant capacities, fuel consumption, electricity and heat generated by the CHP plants. This survey is addressed to the 8 largest CHP suppliers/installers and to 20 individual companies using CHP.	Annual figures are obtained by aggregating monthly statistics	Data are collected through a monthly survey addressed to the 9 largest importers and producers. Monthly data are then aggregated in order to complete the EU annual questionnaire	Data are collected through 8 surveys: - Wood suppliers voluntary survey to all known wood suppliers, - Wood waste survey to all board mills and a selection of the major saw mills using wood waste for energy. - Municipal waste survey: data obtained through administrative sources. - Solar: sample survey based on administrative sources. - Auto wind survey: addressed to all 3 wind autoproducers. - Biofuels: combination of business survey and administrative sources; all the known biofuels companies are surveyed. For the remaining units, data were obtained from administrative sources. - Landfill gas: the 2 landfill gas operators managing most of the landfill gas are surveyed and data for the remaining sites are obtained from administrative sources. - Biogas survey: all known biogas installation are surveyed. For non-respondents data are estimated using the previous year's data.
Italy	Annual data are obtained by complementing aggregated monthly figures with administrative data (in the so-called "National Energy Balance" exercise)	Annual data are obtained by complementing aggregated monthly figures with administrative data (in the so-called "National Energy Balance" exercise)	Annual data are obtained by complementing aggregated monthly figures with administrative data (in the so-called "National Energy Balance" exercise)	Annual data are obtained by complementing aggregated monthly figures with administrative data (in the so-called "National Energy Balance" exercise)	No information provided

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Latvia	<p>“Survey on purchase and use of energy resources”, which covers the supply and consumption of solid and liquid fuels, natural gas, electricity and renewables. It is addressed to all government enterprises and to all private enterprises with more than 80 employees; enterprises with less than 80 employees are randomly sampled.</p> <p>“Survey on use of natural gas”. The questionnaire is addressed to the only enterprise in Latvia which imports and sales natural gas.</p>	<p>“Survey on purchase and use of energy resources”, which covers the supply and consumption of solid and liquid fuels, natural gas, electricity and renewables. It is addressed to all government enterprises and to all private enterprises with more than 80 employees; enterprises with less than 80 employees are randomly sampled. “Survey on activities of public electricity producers”. The questionnaire is addressed to enterprises which produce, import, export and sale electricity and to the operators of the electricity network.</p> <p>“Survey on production of heat and electricity”. The questionnaire covers all CHP plants and heat plants producing heat for sale.</p>	<p>“Survey on purchase and use of energy resources”, which covers the supply and consumption of solid and liquid fuels, natural gas, electricity and renewables. It is addressed to all government enterprises and to all private enterprises with more than 80 employees; enterprises with less than 80 employees are randomly sampled.</p>	<p>“Survey on purchase and use of energy resources”, which covers the supply and consumption of solid and liquid fuels, natural gas, electricity and renewables. It is addressed to all government enterprises and to all private enterprises with more than 80 employees; enterprises with less than 80 employees are randomly sampled.</p>	<p>“Survey on purchase and use of energy resources”, which covers the supply and consumption of solid and liquid fuels, natural gas, electricity and renewables. It is addressed to all government enterprises and to all private enterprises with more than 80 employees; enterprises with less than 80 employees are randomly sampled.</p>
Lithuania	<p>The “EN-01” questionnaire which collects data on solid and liquid fuels, natural gas, biogas and electricity. The variables surveyed are: stocks, production, transfers, imports and exports, national purchase and sale, consumption broken down by trend. The questionnaire is addressed to 1) all fuel and energy producers and suppliers regardless of the number of employees, and 2) enterprises depending on their size (more than 10/20 employees depending on the sector).</p>	<p>“EN-01” questionnaire. In addition, data on electricity and heat production are collected through two additional surveys addressed to enterprises producing electricity and/or heat for sale in power plants and other facilities using energy from chemical processes. The “EN-03” questionnaire on electricity distribution is addressed to the Lithuanian distribution network operator.</p>	<p>“EN-01” questionnaire + “EN-06” questionnaire on the annual balance of oil products (addressed to the only refinery in Lithuania).</p>	<p>“EN-01” questionnaire</p>	<p>No information provided</p>
Luxembourg	<p>Supply data obtained by aggregation of monthly data. Consumption data collected with an annual survey.</p>	<p>Supply data obtained by aggregation of monthly data. These figures are then aggregated and complemented with the figures obtained through two complementary annual electricity surveys (S1-ILR, S4-ILR)</p>	<p>Supply data obtained by aggregation of monthly data. Consumption data collected with an annual survey.</p>	<p>Aggregated figures from the S1-ENT1 survey</p>	<p>Biofuel statistics are collected through a specific annual survey (S4-AdmEnv). Other information collected with the ‘Environmental primes’ annual survey (S3-AdmEnv).</p>

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Malta	No further information provided	No further information provided	All data are collected from administrative sources (supply and consumption of liquid fuels)	No further information provided	No information provided
Netherlands	<p>Administrative source/Business survey (sample)/Household survey: • Energy sector: business survey, census</p> <ul style="list-style-type: none"> • Manufacturing: business survey, sample of 2500 • Transport: estimation based on registration of gas fuelled cars • Households: panel survey of 1500 households • Agriculture: annual agriculture census • Services: client files energy companies 	<p>Administrative source/Business survey (sample)/Household survey. Additional to the monthly/quarterly survey, all producing companies receive a survey about installations by type and capacity and annual input and output per installation</p>	<p>The oil companies are surveyed every month. The consuming companies are surveyed annually. Administrative data are used for annual figures.</p>	<p>Business survey (census) for the major consumers and small final consumers surveyed on a quarterly or annual basis. Consumption in households is estimated and a trend is projected. Data on trade with non-EU countries come from an administrative source (customs). Data on trade within the EU is based on a survey, as long as administrative data are not sufficient.</p>	<p>Where possible, administrative sources or other Statistics Netherlands' surveys are used. For solar energy, heat pumps and wood stoves/boilers (> 18 kW), specific surveys are used. Wood use in households data is collected via telephone/internet interview in combination with on-site visits every six years. For the other years a model is used.</p>
Poland	<p>Gas and oil statistics are produced on a monthly, biannual and annual basis. Statistical mandatory purposive sampling survey and administrative sources are used.</p>	<p>Electricity and heat statistics are produced on a monthly, quarterly and annual basis. Statistical mandatory purposive sampling survey targetting all producers and distributors of heat and electricity and large and medium (employing more than 9 employees) enterprises in the energy intensive branches. Administrative sources are also used. Estimation techniques are used where some data is missing.</p>	<p>Gas and oil statistics are produced on a monthly, biannual and annual basis. Statistical mandatory purposive sampling survey and administrative sources are used.</p>	<p>Solid fuels and manufactured gases statistics are produced on a monthly, quarterly, biannual and annual basis. Statistical survey targeted units and administrative sources are used.</p>	<p>Renewable energy statistics are produced on a monthly, quarterly and annual basis. Statistical mandatory purposive sampling survey and administrative sources are used. Estimation techniques are used where some data is missing.</p>
Portugal	<p>Annual statistics are elaborated from monthly and quarterly data, without carrying out specific annual surveys.</p>	<p>Monthly data are aggregated and complemented with data obtained from a census addressed to all network operators and power plants. The variables surveyed include the gross electricity production per source, the heat production of CHP and the electricity consumption.</p>	<p>Annual statistics are elaborated from monthly and quarterly data, without carrying out specific annual surveys.</p>	<p>Annual statistics are elaborated from monthly and quarterly data, without carrying out specific annual surveys.</p>	<p>Monthly data are complemented with data obtained with a specific annual census addressed to each installation producing electricity (with the exception of mini and micro generators with are reported as a group by the national distribution network operator).</p>

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Romania	The "E01" business survey on the supply (production, imports, exports, stock changes) and in situ consumption of solid, liquid, gaseous fuels and renewables. The target population is composed by all enterprises. The survey is a combination of census (all producers of primary and secondary energy, all transporters, all enterprises above a given threshold) and sample random surveyed through stratified sampling). Foreign trade statistics are used for imports and exports data.	The "E02" business survey on electricity and heat production. The target population is composed by all enterprises. The survey is a census for all producers of electricity and/or heat, main activity or auto-producers. All the respondents of this survey also fill in the "E01" survey.	E01 business survey + the "P" business survey on the input to refineries (crude oil, NGL, etc.) and output of finished products (refinery gas, LPG, etc.). The survey is a census for all refineries; all the respondents of this survey also fill in the "E02" survey. Administrative data from the National Customs Authority are used for bunkers data. Foreign trade statistics are used for imports and exports data.	E01 business survey	E01 business survey + Biomass consumption estimated based on another survey produced by the NSI.
Slovakia	"Annual Questionnaire on Sources and Distribution of Fuels and Energy", covering the production, stocks, import/exports, consumption (by types), sale and losses of all the energetic commodities (solid and liquid fuels, natural gas, electricity and heat, renewables).	"Annual Questionnaire on Sources and Distribution of Fuels and Energy". Annual Questionnaire on Electricity and Heat Production". This mandatory survey covers the production, import/exports, losses, own consumption, sale and capacity of electricity and heat, together with the consumption of fuels for their production (by types).	"Annual Questionnaire on Sources and Distribution of Fuels and Energy". "Annual Questionnaire on Production of Fuels from Crude Oil" covering the transformation activities from crude oil.	"Annual Questionnaire on Sources and Distribution of Fuels and Energy". "Annual Questionnaire of Solid Fuels Retail" covering the stocks and sale of solid fuels to households and non-manufacturing branches.	"Annual Questionnaire on Sources and Distribution of Fuels and Energy". "Annual Questionnaire about Renewable Sources of Fuel and Energy" covering the production and deliveries of renewables, production of heat and electricity from renewables.
Slovenia	The "E-PE/L" survey on the consumption and stocks of energy products, fuels and selected petroleum products, based on a sample composed by all units in the Business Register of Slovenia with 20 or more employees and all units with less than 20 employees but larger consumption of specific energy products. The "E9-PL/L" census on the supply and own use of natural gas and LPG.	The "E1-EE/L" census on the production and sale of electricity and heat by energy source. The "E2-SP/L" census on production, consumption and sale of auto-producers of electricity and heat. The "E3-TOP/L" census on heat supply: production by energy source, purchase, fuel consumption in heat only plants, distribution. The "E4-EEP/L" census on electricity supply: purchase, transmission, imports, exports, distribution losses. The "E5-EED/L" census on electricity and fuel consumption.	The "E-PE/L" survey and the "E8-NPT/L" sample survey on petroleum products trade.	The "E-PE/L" survey and the "E11-TG/L" census on the supply and sale of brow coal and lignite.	Detailed information on renewables is missing

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
Spain	Natural Gas Industry Statistics" business survey covers the consumption of natural gas by sector of activity of the final consumer. The survey is a census of all the supply companies in this sector.	"Electric Energy Industry Statistics" business survey covers the capacity and production of electricity by type of power plants; the fuel consumption in thermal plants; technical information on the technologies used in plants; the final consumption by sector of activity of the consumer. The survey is a census of all the companies in the sector (except for photovoltaic facilities, solar thermal and wind plants).	Annual statistics are obtained by aggregating monthly figures.	Annual Coal Output statistics" census. The variables surveyed include the stock changes, the consumption of coal products and the production of anthracite, other bituminous coal and subbituminous coal. "Coal Distillation Statistics" business survey covers the input and outputs of the transformation process in coke ovens (coking coal, coke, coke oven gas and blast furnace gas); the stocks, imports and consumption of coking coals; the stocks, production, exports and consumption of coke; the production and consumption of coke oven gas and blast furnace gas. It is a census of all companies in the sector.	"Renewable Energy statistics" census is addressed to all active companies in the sector (electricity and CHP plants, thermal production plants, biofuel production plants) to collect data on the production of electricity and capacity and on the consumption of renewable fuels in thermal plants.
Sweden	Statistics on the supply and consumption of electricity and gas are obtained with a total survey of some companies (for some domains a threshold applies).	Statistics on the supply and consumption of electricity and gas are obtained with a total survey of some companies (for some domains a threshold applies).	No information provided	No information provided	No information provided

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	Renewables
United Kingdom	<p>Two annual surveys (AG1, AG2) covering the production and deliveries of natural gas. AG1 annual survey covers the main gas suppliers. Statistics cover the deliveries of natural gas to transformers and final consumers according to their economic activity. It is a voluntary data collection which covers 95% of the market. The AG2 annual survey covers smaller suppliers (less than 5% of the market). It is a voluntary data collection. This information is complemented by administrative information on External Trade and information on storage capacity and volume flows provided by the operator of the National Grid.</p>	<p>Electricity statistics (generation by technology, deliveries by sector, capacity by technology, losses, fuel use and stocks) are collected surveying major generators, major suppliers and distributors. This survey is a census covering the public supply system generators with an installed capacity higher than 90MW (50MW for wind generators), suppliers with an annual volume higher than 50GWh and all the Distribution Network Operators. In addition, auto-producers are surveyed on a sampling basis. This information is complemented with administrative statistics on External Trade.</p>	<p>Monthly statistics are aggregated to annual figures</p>	<p>Annual sample covers 11 companies giving 90% sample coverage with an 80% response rate.</p> <p>100% coverage on coal production. Data collected from the Coal Authority. Licensed mines have an obligation to report the tonnage of coal produced to the Coal Authority.</p>	<p>Variety of data sources used – both survey and administrative</p>
Norway	<p>Data collection for domestic use of natural gas: Information about net domestic use of natural gas has been collected and used in the energy accounts and energy balances since 1994. From the reference year 2003 (with collection also of 2002 data) it has been used a new standardized questionnaire for sales of natural gas in Norway. The reference period is the calendar year, and the data collection is done yearly. The deadline for transmission is mid-February in the year after the reference year.</p> <p>The population is all companies and enterprises selling natural gas to end users in Norway. In addition, the data collection for energy use in manufacturing covers several energy flows, e.g. gas.</p>	<p>Data collection for yearly electricity statistics: The data collection is a sample survey; the size of the sample is approximately 3000 local kind of activity units (KAUs). The main rule is that local KAUs with more than 2 per cent of the occupation in industrial subgroup are chosen as big KAUs. The sample also includes a stratified sample of small local KAUs. The thousand largest KAUS accounts for about 94 per cent of the total energy consumption in manufacturing and mining.#</p> <p>The data collection for energy use in manufacturing also covers purchased and self-produced electricity.</p>	<p>Monthly statistics are aggregated to annual figures.</p>	<p>The data collection for energy use in manufacturing covers purchased coal, coke and petrol coke. The data collection is a sample survey; the size of the sample is approximately 3000 local kind of activity units (KAUs). The main rule is that local KAUs with more than 2 per cent of the occupation in industrial subgroup are chosen as big KAUs. The sample also includes a stratified sample of small local KAUs. The thousand largest KAUS accounts for about 94 per cent of the total energy consumption in manufacturing and mining. In addition, there is a yearly data collection on coal and coke for industrial consumption from the largest enterprises.</p>	<p>The data collection for energy use in manufacturing covers purchased and self-produced electricity, solid biomass and waste. Additionally, there is a data collection for use of fire wood in households.</p>

Table 13 - Information on monthly data collection methods per EU Member State in 2012

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels	
Austria	Mandatory survey	Mandatory survey	Mandatory survey	Monthly coal survey is on voluntary basis, mainly based on import and export figures	
Belgium	Mandatory Survey on the supply of natural gas – expressed in energy units. All supply undertakings are covered exhaustively.	Survey on the supply and consumption of heat and electricity. The target population consists of electricity producers and households; for the electricity producers a sample consisting in around 500 plants is considered (the threshold defining the sample is 1MW).	Survey of refineries, petrochemical industries and traders with an annual flow higher than 25ktonnes (around 60 companies).	Survey on the supply and consumption of solid fuels. The traders and major consumers (power stations, steel industry etc.) are covered exhaustively.	
Bulgaria	Survey on the supply of natural gas. Statistical units are covered exhaustively.	Survey on electricity generation, fuel consumption and stocks in public thermal power stations. Statistical units are covered exhaustively.	Survey on the supply of crude oil and petroleum products and on their deliveries to the internal market. Statistical units are covered exhaustively.	Survey on the supply of solid fuels (coal, lignite and derived products) and on their deliveries to the internal markets (broken down by major consumers). Statistical units are covered exhaustively.	
Cyprus	Not applicable	Monthly statistics on gross and net electricity generation are provided by the TSO; this information is complemented with statistics on renewable electricity generation provided by the Electricity Authority of Cyprus	Statistics on imports, exports, major consumers and stocks of oil and petroleum products are obtained from an extensive survey on petroleum trading companies, from data provided by the Customs & Excise Department (administrative data), the national stockholding agency and major consumers (Electricity Authority in Cyprus, cement industry).	Not applicable	
Czech Republic	Obtained from sources from the Regulatory Office	administrative Energy	Survey on the production and balance of electricity and heat by fuel. This survey is addressed to around 100 companies: all companies producing electricity and heat from coal, all companies with heat production more than 300 TJ per year from other fuels, all public companies and autoproducers with installed capacity more than 5 MW _e .	Surveys carried out on the supply of crude oil and petroleum products, as well as sources and stocks. All units dealing with oil exploitation, oil refining and petroleum products recycling, as well as those from the Business Register with main/prevaling activity related to oil / oil products (stockholding entities, petrochemicals, major consumers) are surveyed exhaustively.	Mandatory survey on the supply and consumption of coal and coal products addressed to all 11 producers (11 companies).

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels
Denmark	Statistics are obtained from administrative data (from the Danish Transmission System Operator) and through one business survey addressed to all natural gas distribution companies.	Statistics calculated from administrative data (from the Danish Transmission System Operator for electricity).	Business survey addressed to all importing or producing oil companies	Business survey addressed to all companies importing coal and coke. A specific business survey is addressed to all gas work gas companies.
Estonia	Data are collected through total inventories	Data are collected through total inventories	Data are collected through total inventories	Data are collected through total inventories
Finland	No information provided	No information provided	No information provided	Data on coal consumption and stocks is submitted quarterly
France	Data are collected through a mandatory survey, which is meant to collect data on the supply (external exchanges) and consumption and is addressed to all the distribution operators and to the main suppliers.	Monthly survey addressed to the three main producers and monthly information for the transport monopoly RTE.	Data on production are transmitted by the administrative authority (Direction Générale de l'Energie et du Climat - DGEC) + survey among the refineries. Data on imports and exports obtained from customs. Final stock data transmitted by DGEC and stock change is calculated. For data on demand, different sources are used: deliveries estimated by CPDP, Ministry of Defense for military uses, etc.	
Germany	Mandatory monthly survey on natural gas. It covers the most important suppliers/traders and all producers. A census with threshold (companies which deliver more than 50% of the total consumption and import themselves or feed quantities into pipelines > 10TWh) is carried out for suppliers/traders and producers.	Mandatory monthly survey on electricity and heat production of main activity producer plants and the monthly survey of grid operators. It covers electricity production in electricity only and in CHP plants and the heat production in CHP plants. Data on the fuels used are also collected. Feeding into the grid is distinguished between renewable and conventional electricity. A census with threshold (> 1 MW electricity) for the producer plants is used; a full census is carried out on the grid operators.	Mandatory monthly survey on oil and oil products. A census of all producers, importers, exporters of crude oil and of oil products is carried out. The sample size is about 320 units, which are reporting on differing level of detail. The non-response rate is 0. The supply data from this survey forms the basis for the annual oil data.	Mandatory monthly survey on coal production and supply
Greece	A census is addressed to all system operators, which then provide supply data on a voluntary basis.	Monthly data are obtained through a complete inventory addressed to all network operators together with a partial census addressed to all public power plants above 10 MW and to all autoproducers above 5 MW	Monthly statistics on both supply and consumption are obtained by complementing administrative data with the results of a census addressed to all enterprises producing, importing/exporting, blending or storing oil and derivatives.	A census is addressed to public and private companies to collect data on the production of hard coal and lignite, imports/exports and stocks

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels
Hungary	Two surveys for natural gas: - "Natural Gas Balance of Natural Gas Transporter" covering the supply and sales of the unique natural gas distributor. - "Natural Gas Balance of Natural Gas Storage" covering the stocks of the unique operator.	Electricity and CHP data are collected through four mandatory surveys:: "Information Considering Electrical Energy Transportation across the Borderline" collecting electricity import/exports data from the unique operator, "CHP Seller's Detailed Data Provision" and "Data Collection in connection with CHP Production" covering production and sales of electricity/heat, "Detailed Data collection of the Sellers of Electricity Energy produced from RES with Feed-in Tariff Support" covering the electricity/heat generation from renewables. Additional renewables data is obtained from the survey "Data Provision of Small Power Plants producing Electrical Energy either from RES or from Waste"	"Energyinfo operative collection of data in energetics" covering the supply and sales of solid fuels and energy sources. Business sample survey.	"Energyinfo operative collection of data in energetics" covering the supply and sales of solid fuels and energy sources. Business sample survey.
Ireland	Data on the supply of natural gas are obtained from administrative sources covering all units.	Supply data are collected through a survey addressed to the unique electricity transmission system operator; monthly data are then aggregated in order to complete the EU annual questionnaire. The variables surveyed make it possible to complete Table 1 (Gross and net electricity production) and 2 (Summary of production and consumption) of the EU monthly questionnaire.	Data on the supply of liquid fuels are collected through a statutory survey including most of the distributors and importers.	Data are collected through an individual monthly voluntary survey addressed to the 9 largest importers and producers. The data is then aggregated in order to complete the EU annual questionnaire.
Italy	Monthly questionnaire on supply data and consumption. This survey is a census	- Data are collected through a mandatory census covering the production and capacity in electricity power plants, the electricity consumption by economic activity and the consumption of fuel in power plants. These variables are collected for each main activity producer and autoproducer.	- Petrochemical industry production: monthly survey on the supply of petrochemical products (census) - Refineries production: monthly data on the supply of crude oil and semi-finished products (census). - Monthly survey on the supply and consumption of crude oil products (census).	Monthly survey on supply data. This survey is a census
Latvia	"Survey on consumption of natural gas". This survey is addressed to the unique company in Latvia which imports natural gas. Data are complemented with customs declaration on trade with third countries and with data from the State Revenue Service.	"Survey on work of cogeneration plants". All CHP plants are surveyed. "Survey on electricity production and fuel consumption". The enterprises producing, importing, exporting and selling electricity are surveyed. Data are complemented with customs declaration on trade with third countries and with data from the State Revenue Service.	"Survey on oil delivery to ships and aircrafts". All the enterprises dealing with oil products delivery to ships and aircrafts are surveyed. Data are complemented with customs declaration on trade with third countries and with data from the State Revenue Service.	"Survey on import, production and sale of solid fuel". All enterprises producing peat and all enterprises importing more than 1000 tons of solid fuels per year are surveyed. Data are complemented with customs declaration on trade with third countries and with data from the State Revenue Service.

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels
Lithuania	The "EN-11" questionnaire on the supply, consumption and stocks of fuel of the main fuels (oil and petroleum products, natural gas, coal, peat, coke) and electricity during the survey period. This survey is addressed to enterprises o extracting crude oil and peat o generating electricity and/or heat for sale (above 5 MW) o exporting/importing fuel o responsible for stocks o selling oil products.	"EN-11" questionnaire + "EN-12" questionnaire on electricity. The questionnaire is addressed to enterprises producing and/or importing/exporting electricity. Electricity data is complemented with data from the Industry Statistics Division of Statistics Lithuania.	The "EN-11" questionnaire. The "EN-16" questionnaire on oil product addressed to the unique refinery in Lithuania.	"EN-11" + "EN-14" questionnaire on peat, addressed to enterprises extracting and reprocessing peat.
Luxembourg	Supply data are collected on a monthly basis through specific surveys (Gas: S9-ILR). Monthly figures are then aggregated annually. For Gas, the aggregate is complemented with the figures from two complementary annual surveys (S6-ILR, S7-ILR)	Supply data are collected on a monthly basis (S5-ILR).	Supply data are collected on a monthly basis through specific surveys (Oil: S3-OCRA). Monthly figures are then aggregated annually.	Data collected by the Intra/Extrastat sample survey (S1-ENT1). Units include the 3 major importers (industries) and 11 minor importers (principally business for household products).
Malta	No further information provided	No further information provided	All data are collected from administrative sources (supply and consumption of liquid fuels)	No further information provided
Netherlands	Administrative source/Business survey (census). The main data set comes from the national gas transmission operator (GTS). In Netherlands there are two gas networks, a smaller and a major one. Both network operator are surveyed, further, data from a Dutch organisation for mining activities are used for the own use and flaring at production sites. Further data from Danish and English websites are used to determine imports form the UK and Denmark of natural gas produced at the North Sea and transported through the Netherlands.	The most relevant electricity producers are surveyed every month. The companies producing smaller amounts are surveyed every quarter. Quarterly surveyed companies are estimated for a month and, when necessary, revised on quarterly basis.	The oil companies are surveyed every month in a Business survey (census). Surveyed are all refineries and petrochemical plants with oil transformation, and all storage companies and wholesale traders within the duty free zone. Data on trade with non-EU countries come from an administrative source (customs). Data on trade within the EU is based on a survey, as long as administrative data are not sufficient.	Business survey (census) for all consumers in energy sector and manufacturing industries. Final consumption outside energy sector and steel industry is estimated on monthly basis and surveyed on a quarterly or annual basis. Import and export data come from the international trade statistics. Data on trade with non-EU countries come from an administrative source (customs). Data on trade within the EU is based on a survey, as long as administrative data are not sufficient.

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels
Poland	Gas and oil statistics are produced on a monthly, biannual and annual basis. Statistical mandatory purposive sampling survey and administrative sources are used.	Electricity and heat statistics are produced on a monthly, quarterly and annual basis. Statistical survey targeting all producers and distributors of heat and electricity and large and medium (employing more than 9 employees) enterprises in the energy intensive branches. Administrative sources are also used. Estimation techniques are used where some data is missing.	Gas and oil statistics are produced on a monthly, biannual and annual basis. Statistical mandatory purposive sampling survey and administrative sources are used.	Solid fuels and manufactured gases statistics are produced on a monthly, quarterly, biannual and annual basis. Statistical survey targeted units and administrative sources are used.
Portugal	A census addressed to all importers is carried out monthly to collect data on the supply. Moreover, data on consumption (sells to internal market by activity sectors and municipalities) are collected quarterly.	Monthly data are obtained through a census addressed to thermal power plants (primary energy consumption and production), and from the national distribution network (production, imports/exports, consumption).	A census addressed to all importers (and, for liquid fuels, refineries) is carried out monthly to collect data on the supply. Moreover, data on consumption (sells to internal market by activity sectors and municipalities) are collected quarterly.	A census addressed to all importers is carried out monthly to collect data on the supply. Moreover, data on consumption (sells to internal market by activity sectors and municipalities) are collected quarterly.
Romania	The "GTS" mandatory census on natural gas resources and deliveries. The surveyed population consists of all producers of natural gas	The "ELTS" mandatory census for all main activity producers of electricity	The "PTS" mandatory census on crude oil balance. The surveyed population consists of all refineries.	The "CTS" mandatory census on coal resources and consumption. The surveyed population consists of all consumers and importers of hard coal and coke.
Slovakia	"Monthly Questionnaire on Crude Oil, Crude Oil Products and Natural Gas", mandatory sampling survey which covers the production, stocks, purchase, import/exports of oil and oil products.	"Monthly questionnaire on Electricity and Heat Production" administered by the Statistical Office. This survey covers the supply of electricity and heat and the fuels for electricity and heat production.	"Monthly Questionnaire on Crude Oil, Crude Oil Products and Natural Gas", mandatory sampling survey which covers the production, stocks, purchase, import/exports of oil and oil products.	"Monthly Questionnaire on Solid Fuels and Selected Gaseous Fuels". This survey covers the production, stocks, purchase, import/exports, losses, consumption and sales (to branches) of solid fuels.
Slovenia	The "E9-PL/M" census on the supply and own use of natural gas and LPG. The "E6-NAF/M" survey on the supply of crude oil, natural gas, refinery feedstocks, additives and other hydrocarbons addressed to one refinery in Slovenia.	The "E1-EE/M" census on the production and sale of electricity and heat by energy source. The "E2-SP/M" census on production, consumption and sale of auto-producers of electricity and heat. The "E3-TOP/M" census on heat supply: production by energy source, purchase, fuel consumption in heat only plants, distribution. The "E4-EEP/M" census on electricity supply: purchase, transmission, imports, exports, distribution losses	The "E8-NPT/M" survey on petroleum products trade. The "E6-NAF/M" survey on the supply of crude oil, natural gas, refinery feedstocks, additives and other hydrocarbons addressed to one refinery in Slovenia. The "E7-NP/M" census on the production of petroleum products.	The "E11-TG/M" census on the supply and sale of brow coal and lignite. The "E10-TGT/M" survey on the trade of solid fuels.

Country	Gas	Electricity (and heat)	Liquid fuels (Oil and oil products)	Solid fuels
Spain	<p>"Natural Gas Statistics" business survey collects data on imports, exports, stocks and sales/consumption of natural gas. This survey is a census of all companies of the sector;</p>	<p>Monthly Electricity Energy Industry Statistics" census collects data on the production of electricity and is addressed to companies of the sector with capacity > 1 MW (for photovoltaics, solar thermal and wind plants, data are obtained from the National Energy Commission).</p>	<p>The "Oil Statistics" business survey covers the inputs and outputs to refineries; the stocks, imports and exports and the sales/consumption. The main products surveyed are: crude oil, naphtha, gasoline, kerosene, gasoil, fuel oil, LPG. This survey is a census of all the companies in the sector.</p>	<p>"Monthly Coal Output statistics" census is addressed to all companies. The variables surveyed include the stock changes, the consumption of coal products and the production of anthracite, other bituminous coal and subbituminous coal.</p>
Sweden	<p>Monthly data on supply (imports and stock changes) are obtained from the unique company responsible for the Swedish transmission system</p>	<p>No information provided</p>	<p>Data on the supply and deliveries of solid and liquid fuels are obtained with the "Monthly fuel statistics" total survey.</p>	<p>Data on the supply and deliveries of solid and liquid fuels are obtained with the "Monthly fuel statistics" total survey.</p>
United Kingdom	<p>Covered by the monthly PPRS and quarterly QG1 surveys: - The PPRS monthly census covers all licensees (production activities) operating on the UK Continental Shelf. It is a mandatory survey covering the upstream activities (production of Natural Gas and Natural Gas Liquids)). - The QG1 quarterly survey is a voluntary data collection (response rate 100%) and the deadline for data transmission is 30 days. This Information is complemented by administrative information on External Trade (Imports / Exports).</p>	<p>Electricity statistics (generation by technology, electricity supply, fuel use) are collected surveying major generators, major suppliers and distributors. This survey is a census covering the public supply system generators with an installed capacity higher than 90MW (50MW for wind generators), suppliers with an annual volume higher than 50GWh and the 15 Distribution Network Operators. This information is complemented with monthly information on External Trade and losses. In addition, a quarterly survey of auto-producers is carried out on a sampling basis complemented with a quarterly survey of smaller scale renewable electricity generation of the public supply system. Missing monthly information (coverage) is estimated on the basis of the previous quarter (quarterly) or last year (annual) statistics.</p>	<p>• Crude oil and petroleum products are covered by three monthly mandatory surveys: - The PPRS census covering exhaustively all licensees (production activities) operating on the UK Continental Shelf; data cover the supply (production, imports / exports and stocks) of crude oil, petroleum gases, condensates and feed-stocks. - The DORS census of refineries and petrochemical industries covering exhaustively the production, imports / exports and stocks of petroleum products. The deliveries to transformers and final consumers are reported also, based on an extended list of economic activities. - The OSS survey of major importers of petroleum products (including major supermarkets) covering imports and stocks of petroleum products. Information from Extrastat / Intrastat is used for quality control of the external trade data collected with the previous surveys.</p>	<p>Coal production figures are provided by the Coal Authority for each licensed mine. • Trade data from HMRC are used for imports and exports. • Coal consumed in the Iron and Steel Industry provided by the ISSB, with data on coking coal imports. • Generation data from 12 major power producers is obtained through DECC run surveys. Data on UK purchases, imports, UK sales, exports, consumption and stocks gathered from major coal producers and distributors all feed into the production of monthly coal statistics.</p>
Norway	<p>Data collection for production of oil and natural gas. Data covers all fields in production; the collection is therefore a census. The target population is all the producing oil and gas fields. The reporting unit is the Norwegian Petroleum Directorate.</p>	<p>Data collection for monthly electricity statistics, with monthly information on production, export, import and consumption of electricity.</p>	<p>Data collection for production of oil and natural gas. Data covers all fields in production; the collection is therefore a census. The target population is all the producing oil and gas fields. The reporting unit is the Norwegian Petroleum Directorate. In addition, there is a data collection for monthly sales of petroleum products. Data collection for production of refined petroleum products</p>	<p>Monthly data collection on the production of coal and coke</p>

ANNEX 2. ANALYSIS OF COMPLETENESS OF EUROPEAN ENERGY STATISTICS AGAINST LEGAL REQUIREMENTS

This annex shows an analysis of completeness of European energy data collections against legal requirements (Regulation 1099/2008 on energy statistics and Directive 2008/92/EC to improve the transparency of gas and electricity prices charged to industrial end-users). This is just an overall exercise with the only objective to provide a general idea of the level of completeness of the most important energy data collections. A more detailed analysis should be done in order to obtain more precise information on additional items that could be added to Eurobase. The annex contains three tables:

- Analysis of completeness of European annual energy statistics
- Analysis of completeness of European monthly and short-term monthly energy statistics
- Analysis of completeness of European statistics on energy prices

Table 14 - Analysis of completeness of European annual energy statistics against legal requirements

Relevant energy data collections published on Eurobase	Regulation 1099/2008 on energy statistics - Annex B (annual collections of energy statistics)				
	1. SOLID FOSSIL FUELS AND MANUFACTURED GASES	2. NATURAL GAS	3. ELECTRICITY AND HEAT	4. OIL AND PETROLEUM PRODUCTS	5. RENEWABLE ENERGY AND ENERGY FROM WASTE
Supply, transformation, consumption - solid fuels - annual data (nrg_101a)	Complete, only some subcategories linked to production and consumption missing. Calorific values are missing. Categories "Gas works gas, coke oven gas, blast furnace gas and other recovered gases" can be found in the annual results for gas).	NA	NA	NA	NA
Supply, transformation, consumption - oil - annual data (nrg_102a)	NA	NA	NA	Complete: Some sub-products, some sub-aggregates and some sectors are currently not available in their full detail, as Eurostat is revisiting the structure of its dissemination tables.	NA

Regulation 1099/2008 on energy statistics - Annex B (annual collections of energy statistics)					
Relevant energy data collections published on Eurobase	1. SOLID FOSSIL FUELS AND MANUFACTURED GASES	2. NATURAL GAS	3. ELECTRICITY AND HEAT	4. OIL AND PETROLEUM PRODUCTS	5. RENEWABLE ENERGY AND ENERGY FROM WASTE
Supply, transformation, consumption - gas - annual data (nrg_103a)	NA	Gas storage capacities, as well as some aggregates and sub- aggregates are not published.	NA	NA	NA
Supply, transformation - nuclear energy - annual data (nrg_104a) and Annual nuclear statistics (nrg_ind_333a)	NA	NA	Complete	NA	NA
Supply, transformation, consumption - electricity - annual data (nrg_105a)	NA	NA	Complete, with very few exceptions	NA	NA
Supply, transformation, consumption - heat - annual data (nrg_106a)	NA	NA	Complete, with very few exceptions	NA	NA
Supply, transformation, consumption - renewable energies - annual data (nrg_107a)	NA	NA	NA	NA	Complete, with the exception of some sub- aggregates, some capacities and calorific values of biofuels and charcoal
Supply, transformation, consumption - wastes (non-renewable) - annual data (nrg_108a)	NA	NA	NA	NA	Technical characteristics of installations (capacities) are not reported
Infrastructure - electricity - annual data (nrg_113a)	NA	NA	Complete	NA	NA
Imports (by country of origin) - all products - annual data (nrg_121a)	Complete	Complete	Complete	Complete	Complete

Relevant energy data collections published on Eurobase	Regulation 1099/2008 on energy statistics - Annex B (annual collections of energy statistics)				
	1. SOLID FOSSIL FUELS AND MANUFACTURED GASES	2. NATURAL GAS	3. ELECTRICITY AND HEAT	4. OIL AND PETROLEUM PRODUCTS	5. RENEWABLE ENERGY AND ENERGY FROM WASTE
Imports (by country of origin) - solid fuels - annual data (nrg_122a)	Complete	NA	NA	NA	NA
Imports (by country of origin) - oil - annual data (nrg_123a)	NA	NA	NA	Complete	NA
Imports (by country of origin) - gas - annual data (nrg_124a)	NA	Complete	NA	NA	NA
Imports (by country of origin) - electricity - annual data (nrg_125a)	NA	NA	Complete	NA	NA
Exports (by country of destination) - all products - annual data (nrg_131a)	Complete	Complete	Complete	Complete	Complete
Exports (by country of destination) - solid fuels - annual data (nrg_132a)	Complete	NA	NA	NA	NA
Exports (by country of destination) - oil - annual data (nrg_133a)	NA	NA	NA	Complete	NA
Exports (by country of destination) - gas - annual data (nrg_134a)	NA	Complete	NA	NA	NA
Exports (by country of destination) - electricity - annual data (nrg_135a)	NA	NA	Complete	NA	NA

Table 15 - Analysis of completeness of European monthly and short-term monthly energy statistics against legal requirements

Relevant energy data collections published on Eurobase	Regulation 1099/2008 on energy statistics						
	ANNEX C (Monthly energy statistics)				ANNEX D (short-term monthly energy statistics)		
	1. SOLID FUELS	2. ELECTRICITY	3. OIL AND PETROLEUM PRODUCTS	4. NATURAL GAS	1. NATURAL GAS	2. ELECTRICITY	3. OIL AND PETROLEUM PRODUCTS (JODI)
Supply, transformation - solid fuels - monthly data (nrg_101m)	Complete on products, but statistical difference and some concrete indicators are not published	NA	NA	NA	NA	NA	NA
Supply, transformation - oil - monthly data (nrg_102m)	NA	NA	Complete	NA	NA	NA	NA
JODI - monthly oil data (t-1) (nrg_jodi)	NA	NA	NA	NA	NA	NA	Complete
Supply - gas - monthly data (nrg_103m)	NA	NA	NA	Complete	NA	NA	NA
Supply of natural gas - monthly data (nrg_ind_343m)	NA	NA	NA	NA	Complete	NA	NA
Supply - electricity - monthly data (nrg_105m)	NA	Complete. Information about consumption published in the relevant fuel data collection	NA	NA	NA	NA	NA

Regulation 1099/2008 on energy statistics

Relevant energy data collections published on Eurobase	ANNEX C (Monthly energy statistics)				ANNEX D (short-term monthly energy statistics)		
	1. SOLID FUELS	2. ELECTRICITY	3. OIL AND PETROLEUM PRODUCTS	4. NATURAL GAS	1. NATURAL GAS	2. ELECTRICITY	3. OIL AND PETROLEUM PRODUCTS (JODI)
Supply of electricity - monthly data (nrg_ind_342m)	NA	NA	NA	NA	NA	Complete	NA
Imports (by country of origin) - solid fuels - monthly data (nrg_122m)	Complete	NA	NA	NA	NA	NA	NA
Imports (by country of origin) - oil - monthly data (nrg_123m)	NA	NA	Complete	NA	NA	NA	NA
Imports (by country of origin ⁴) - gas - monthly data (nrg_124m)	NA	NA	NA	Complete	NA	NA	NA
Imports (by country of origin) - electricity - monthly data (nrg_125m)		Complete	NA	NA	NA	NA	NA
Exports (by country of destination) - solid fuels - monthly data (nrg_132m)	Complete	NA	NA	NA	NA	NA	NA
Exports (by country of destination) - oil - monthly data (nrg_133m)	NA	NA	Complete	NA	NA	NA	NA
Exports (by country of destination ²) - gas - monthly data (nrg_134m)	NA	NA	NA	Complete	NA	NA	NA
Exports (by country of destination) - electricity - monthly data (nrg_135m)	NA	Complete	NA	NA	NA	NA	NA

⁴ Change of methodology for imports and exports of natural gas at monthly level from January 2013 on.

Table 16 - Analysis of completeness of European statistics on energy prices against legal requirements

Relevant energy data collections published on Eurobase	Directive 2008/92/EC to improve the transparency of gas and electricity prices charged to industrial end-users	
	Biannual	Annual
Gas prices for domestic consumers, from 2007 onwards - bi-annual data (nrg_pc_202)	Not required by Regulation	NA
Gas prices for industrial consumers, from 2007 onwards - bi-annual data (nrg_pc_203)	Complete	NA
Electricity prices for domestic consumers, from 2007 onwards - bi-annual data (nrg_pc_204)	Not required by Regulation	NA
Electricity prices for industrial consumers, from 2007 onwards - bi-annual data (nrg_pc_205)	Complete	NA
Electricity prices components for domestic consumers, from 2007 onwards - annual data (nrg_pc_204_c)	NA	Not required by Regulation
Electricity prices components for industrial consumers, from 2007 onwards - annual data (nrg_pc_205_c)	NA	Complete