

COUNTRY PRACTICE IN ENERGY STATISTICS

Topic/Statistics:

Institution/Organization:

Country:

Date: 0

CONTENTS

Abstract	3
1. General information	5
1.1. Name of the statistics/topic	5
1.2. History and purpose.....	5
1.3. Reference period.....	5
1.4. Frequency	5
1.5. Dissemination.....	5
1.6. Regional level.....	6
1.7. Main users	6
1.8. Responsible authority	6
1.9. Legal basis and legally binding commitments	6
1.10. Resource requirements	6
1.11. International reporting.....	7
2. Statistical concepts, methodology, variables and classifications	7
2.1. Scope.....	7
2.2. Definitions of main concepts and variables.....	7
2.3. Measurement units.....	7
2.4. Classification scheme	8
2.5. Data sources	8
2.6. Population.....	8
2.7. Sampling frame and sample characteristics.....	8
2.8. Collection method	9
2.9. Survey participation/response rate.....	9
3. The statistical production process	9
3.1. Data capture and storage	9
3.2. Data editing	9
3.3. Imputation	10
3.4. Grossing up procedures	10
3.5. Analytical methods.....	10
4. Dissemination	10
4.1. Publications and additional documentation.....	10
4.2. Revisions	11
4.3. Microdata.....	11
4.4. Confidentiality.....	11
5. Quality	11
5.1. Relevance	11
5.2. Accuracy.....	12
5.3. Timeliness and punctuality	12
5.4. Accessibility	13
5.5. Comparability.....	13
5.6. Coherence and consistency.....	14
6. Future plans	14
Annexes	15

Abstract

Write a short abstract of the statistics, and try to limit it to one page. The purpose of the abstract is to give the reader a general overview of the statistics/topic. It should therefore include a brief overview of the background and the purpose of the statistics, the population, the sample (if relevant), the main data sources, and the main users of the statistics. The abstract should also mention what is the most important contribution or issue addressed in the country practice (e.g. the practice deals with challenges of using administrative data, using of estimation, quality control, etc.). If there are other elements that are considered important, please feel free to include them in the abstract.

Keep in mind that all relevant aspects of the statistical production will be covered in more detail under the different chapters in the template. Therefore, the abstract should be short and focused on the key elements. What the most important elements are can vary from statistics to statistics, but as a help to write an abstract you can use the table below. The table can either replace a text or can be filled out in addition to writing a short text.

The New Zealand Energy Use Survey (NZEUS) collects and publishes statistics detailing the energy used by the New Zealand economy. Businesses are asked to provide information on how much energy they use, how they use it, and energy management opinions. Individual data is aggregated to give published data at industry and national level.

NZEUS surveys a sample of all businesses in New Zealand. This is done over three years, with about a third of New Zealand's full economy sampled and surveyed in each year of a three-year cycle. The approximate breakdown is as follows:

- Primary industries (agriculture, forestry, fishing, and mining)
- Manufacturing, construction, trade, and transport
- Services (accommodation, communication, education, and administration)

The specific need for this data has been identified in the Energy Domain Plan (EDP) a collaboration among Statistics NZ, MED and EECA. The EDP identifies priorities in the field of energy statistics and information. The information delivered by NZEUS will help fill gaps in current energy statistics and provide a benchmark of energy use information for New Zealand businesses. It will also provide data to update modelling systems that provide energy-use estimates and future demand forecasts.

Key elements	
Name of the statistics	New Zealand Energy Use Survey
Background and purpose of the statistics	The purpose of the survey is to provide up-to-date, robust statistics on energy use across different sectors and industries of the New Zealand economy within a three year timeframe. The data gathered from businesses includes what energy they use, how they use it, as well as some simple questions on energy management.
Population, sample and data sources	Population: All businesses in New Zealand. Sample: 12,000 businesses Data Source: Paper based questionnaire - self complete.

Main users	<p>NZ's Energy Efficiency and Conservation Authority – to help guide policy to affect energy consumption</p> <p>NZ's Ministry of Economic Development – to assess models of energy use trends</p>
Important contribution or issue addressed	<p>Prior to the creation of these statistics there was no data available on energy use by end users. The survey was developed to fill this knowledge gap and provide detailed data on energy use to complement existing data on supply.</p>
Other remarks	<p>N/A</p>

1. General information

1.1. Name of the statistics/topic

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

New Zealand energy end use survey

1.2. History and purpose

State when the statistics were first published.

In 2006 a NZ Energy Domain Plan was compiled to assess the state of energy statistics. It was decided that the information collected on the supply of energy was comprehensive, but there was a gap in information about the end use of energy.

A pilot survey was carried out in 2006 to assess the viability of a survey on energy end use. The sample for this pilot was taken from NZ manufacturing businesses.

The ongoing energy end-use survey was started in 2008, resulting in published statistics in 2009. This was for a third of the economy. The other two thirds of the economy were covered in the next two years, giving a full economy view by 2011.

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

The main purpose is to understand how energy is used by businesses in NZ, both the amount of all different energy types, and for what broad purposes they are used for. This will help the users of the statistics to see where savings or changes could be made.

1.3. Reference period

State the time period the data are collected for.

The annual survey asks about energy use within the last year.

1.4. Frequency

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

The survey is carried out annually. A third of the economy is covered each year – which means a full cycle to give a full economy view takes three years.

1.5. Dissemination

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

Online publication.

http://www.stats.govt.nz/browse_for_stats/industry_sectors/Energy/energy-use.aspx

1.6. Regional level

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

Statistics are designed at national level only.

1.7. Main users

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

NZ's Ministry of Economic Development – to assess models of energy use trends
NZ's Energy Efficiency and Conservation Authority – to help guide policy to affect energy consumption

1.8. Responsible authority

Write the name of the institution and department/office with the main responsibility for disseminating the statistics (e.g.: Statistics Norway, Department of Economics, Energy and the Environment).

Statistics New Zealand, Industry and Labour Statistics, Business, Infrastructure, and Performance

1.9. Legal basis and legally binding commitments

State the national legal basis for the data collection. Include a complete reference to the constitutional basis, and web address to an electronic version (e.g.: The Statistics Act of 16 June 1989 No. 54, §§2-2 and 2-3, http://www.ssb.no/english/about_ssb/statlaw/forskrift_en.html).

The Statistics Act 1975.

http://www.stats.govt.nz/about_us/our-structure-and-values/statistics-act-1975.aspx

If the data collection is not based on a legal basis, give a short description of other agreements or volunteer arrangements.

N/A

If applicable, give reference to national and international commitments that are legally binding (e.g. EU statistical legal acts).

N/A

1.10. Resource requirements

Specify how the production of the statistics is financed (e.g. over the ordinary budget, project based support, financial support from other institutions or organization). If applicable, state the contracting entity (e.g.: Ministry, EU Commission, OECD). A contracting entity is any entity which is ordering a survey or the compilation of a statistics, and paying for it

Financial support from other institutions.

A funding pool was set up for energy related costs and the survey is funded from this. The major contributors are the Ministry of Economic Development and the Energy Efficiency and Conservation Authority.

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

Two full time equivalent employees

1.11. International reporting

List any international organizations and names of reporting schemes that the statistics are reported to. If available, also include the website where the reported data are published (e.g. International Energy Agency, Monthly Oil Statistics, UNSD, etc.).

N/A

2. Statistical concepts, methodology, variables and classifications

2.1. Scope

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

The statistics cover use of all energy products by businesses in New Zealand, classified according to Australian and New Zealand Standard Industrial Classifications definitions.

2.2. Definitions of main concepts and variables

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

Economically significant – an enterprise that meets at least one of these criteria:
greater than \$30,000 annual expenses or sales,
RME greater than 3,
is part of a group of enterprises,
is registered for GST and involved in agriculture and forestry
over \$40,000 of income recorded in annual tax return

RME – Rolling mean employment. A 12-month moving average of the monthly employee count.

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

Final consumption is all energy that is paid for and used for the production activities of a sampled business.

2.3. Measurement units

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

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

Each energy type is collected in its physical unit. It is presented in joules after applying a gross calorific conversion factor to the physical units.

2.4. Classification scheme

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

ANZSIC06 – Australian and New Zealand Standard Industrial Classification 2006

2.5. Data sources

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

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

Business survey.

2.6. Population

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

All economically significant businesses in New Zealand

Specify the following statistical units:

- Reporting unit
- Observational unit
- Analytical unit

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

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

The kind-of-activity unit is used for all aspects of the survey (although the full enterprise is considered during sample design).

2.7. Sampling frame and sample characteristics

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

The frame used is the Statistics NZ business frame. This is a register of all economically significant businesses in New Zealand, and includes information on a business's sales and purchases, RME, and type of activity.

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

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

The sample design was a two-way, one-stage stratified random sample. The stratification variables were ANZSIC06, GST sales, and rolling mean employment.

2.8. Collection method

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

A self-administered, paper based questionnaire is the sole collection method for this survey.

2.9. Survey participation/response rate

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

Target response rate for the survey is 80%. This is always achieved so the final response rate is a couple of percentage points over 80. A set of key respondents are identified and these have a required response rate of 100%.

3. The statistical production process

3.1. Data capture and storage

Describe how the data is captured and stored (e.g. if the respondent replies using Internet-based questionnaire, the received data are electronically transferred to the production database. Paper questionnaire responses are keyed manually to the production database).

Paper questionnaires are scanned and text recognition software picks up the responses. These are automatically transferred through to the processing system and production database.

3.2. Data editing

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

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

Automatic error detection is used to pick up inconsistencies and routing errors. The majority are automatically corrected too. Manual routines for detecting and correcting errors include early estimates, ranked lists, graphing responses, percentage contributions, etc.

3.3. Imputation

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

Item non-response is used where it is obvious that a response should have been included in a certain field. In this case random donor, from within the units strata, is used.

3.4. Grossing up procedures

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

The strata are based on ANZSIC codes, i.e, different industries, then horizontally split into size bands (based on RME and GST).

Relative sample error is calculated to assess uncertainty, by comparing the differences in stratification variables to actual responses and thus calculating the range of estimates that could have occurred had a different sample been selected.

3.5. Analytical methods

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

None

4. Dissemination

4.1. Publications and additional documentation

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

Online

http://www.stats.govt.nz/browse_for_stats/industry_sectors/Energy/energy-use.aspx

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

None

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

No

4.2. Revisions

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

No major revisions have been made or scheduled as yet. The survey is still relatively young so incremental improvements are being made each year but not through a major formal review process.

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

N/A

4.3. Microdata

Describe how microdata are stored.

The processing system was designed in-house, and also stores all the microdata – original, processed, editing, imputation, and historical data.

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

No, currently microdata is only stored for internal use.

4.4. Confidentiality

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

The Statistics Act 1975.

http://www.stats.govt.nz/about_us/our-structure-and-values/statistics-act-1975.aspx

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

All counts of businesses are randomly rounded to base three.

All summary estimates must pass a p% rule check. The p% rule states that an estimate is at risk if the value for any contributor can be calculated to within a certain accuracy.

Describe how confidential data are handled.

If a specific respondent's value can be estimated too closely then it would be hidden – either by aggregating categories or through suppression (with secondary suppression).

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

N/A

5. Quality

5.1. Relevance

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

The major needs of the users are to guide assumptions and models of energy use, and understand areas where greater energy efficiency could be achieved. Stakeholder needs are assessed, and if required, the questionnaire is updated on an annual basis.

5.2. Accuracy

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

The estimates are subject to sampling error as well as non-sampling error.

Measurement and processing errors

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

Measurement errors are problematic with businesses filling in responses about their energy use, and energy amounts are a difficult to visualise for people unaccustomed to them.

Non-response errors

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

Unit non-response ranges from 15-20% of the sample. This is expected, so the sample design is exaggerated to account for this non-response in the calculation of sampling errors and necessary sample sizes for accuracy levels. Unit non-response is more prevalent in smaller enterprise bands, these are corrected through weighting-up of other responses. This has not been specifically assessed for the NZEUS but the assumption is that the energy use of these businesses is similar and 'evens out'. Item non-response is assessed. If it is found to have a contribution over 10% to a certain estimate it will be further assessed and likely re-calculated.

Sampling errors

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

Relative sample error is calculated for the estimates of energy use by each high level industry breakdown. These are designed to be 10% for the major industries and energy types, but are relaxed to 20% for some of the less important estimates. The design RSEs were met for the major estimates too, but in some areas of lower focus, low sample numbers meant that, in the first year a sector was surveyed, the RSE values were much higher than anticipated.

Other sources of error

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

5.3. Timeliness and punctuality

Specify the time between the end of the reference period and publication.

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

There is a delay of a few months between collection and publication – final figures only. The data is collected between April and July then published in October. The reference period is the financial year before the collection, this can be different for some enterprise types (e.g. year-end June, year-end, April, or year-end Dec).

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

N/A

5.4. Accessibility

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

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

The Statistics New Zealand release calendar informs people of when the release will be. Technical notes are released along with the statistics, including general survey and sample information as well as any relevant period specific information. This is all released online, however users are able to contact Statistics NZ for extra information.

5.5. Comparability

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

Comparability over time

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

The NZEUS is a very new survey. Only one collection cycle has been completed so far, meaning there is no time-series to compare. A pilot survey was carried out originally but the methodology was tweaked for the eventual survey (most notably changing the responding unit from KAU to GEO) meaning comparability was difficult.

Comparability over region

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

NZEUS estimates are made for the entire country, and are not designed to be reliably broken down to smaller regional figures.

NZ is one of the first places to collect data on the end use of energy. This means these estimates are not as comparable to other countries and international organisations.

Comparability over other domains

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

N/A

5.6. Coherence and consistency

Discuss the coherence/consistency between preliminary and final figures.

N/A

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

N/A

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

Energy supply statistics have been produced in NZ for some time. The end use figures should match these so were checked against them and were coherent.

6. Future plans

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

N/A

Annexes

Illustrations and flowcharts

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

E.g.:

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

Time schedule

Include a time schedule for the different phases of the statistical production process. The statistical production process *may* be divided into the following phases. Phase 1-3 may only be relevant for when a new statistics/survey is set up.

1. **Clarify needs** (e.g. map users needs, identify data sources)
2. **Plan and design** (e.g. plan and design population, sample size, how to analyze and edit data)
3. **Build** (e.g. build and maintain production system, test production system)
4. **Collect** (e.g. Establish a frame, draw the sample, collect data)
5. **Edit** (e.g. identify and code micro data, edit data, imputation)
6. **Analyse** (e.g. quality evaluation, interpret, analyse)
7. **Disseminate** (e.g. publish data, user contact)

Questionnaires

Include the complete questionnaire(s)/survey form(s) used

Example of publication tables

Include an example of a typical table published for the statistics. Include web addresses if available online.

Detailed description on analytical methods

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