Data sources

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Content

• What data are needed to build energy balances?
• Data collection strategies
• Data sources and data collection methods
Introduction

The collection of energy data must take into account:

- Scope of data items (products and flows);
- Selection of data sources;
- Coverage of statistical units;
- Organization of data collection processes;
- Reliability of collection methods.
What data are needed to build energy balances?
Energy products

- IRES 2.9: “Energy products” refers to products exclusively or mainly used as a source of energy. Biomass, waste etc. included only when used for energy purposes

Practically:
- Wood, or ethanol **excluded** when not used as an energy product.
- Lubricants (fossil non-energy products) **included** (allowing refinery balance checks)
Energy products

- Oil (gas diesel, motor gasoline, jet kerosene, LPG, bitumen, etc.).
- Coal (hard coal, brown coal, coal products, peat and peat products).
- Gases (natural gas, manufactured gases)
- Biofuels and waste
  - Solid biofuels (Fuelwood, Charcoal, Animal waste, Olive cake, etc.)
    - Liquid biofuels (biogasoline, biodiesel, bio jet kerosene)
    - Biogases
    - Industrial and municipal waste
- Electricity and heat
  - (from combustible fuels; hydro, solar thermal, solar PV etc.)
  - (private, public producers, households)
What flows are collected annually?

Production
- from plants/from refinery
- electricity and heat by source and type of plants

Receipt from other sources

Import and Export

Marine Bunkers

Stock Changes

= Total Energy Supply

Transfers and recycled products

Statistical Differences

Transformation Sector (21 sub-sectors)

Energy industries own use (17 sub-sectors)

Distribution Losses

Final Consumption =

Non Energy Uses

Final energy consumption
  - Industry Sector (15 sub-sectors)
  - Transport (6 sub-sectors)
  - Other Sectors (4 sub-sectors)
Commodity balances and CVs

Commodity balances - basic energy statistics
- combinations of products and flows
- flows grouped under the commodity header

Limitations of commodity balances
- different units/calorific values - commodities incomparable
- production double counted

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Data collection strategies
Scope and coverage of energy data collection involve:
- Conceptual design;
- Target populations;
- Geographical coverage.
Data collection strategies

Periodicity and frequency of data collection
• Reference period (time period to which data relate)
• Frequency of collection
• Point in time
Organization of data collection

Fundamental steps in producing energy statistics:

➢ Identify the production, supply, transformation and consumption flows for each fuel product;

➢ Assess the potential data sources for each stage of the energy chain;

➢ Consider the most appropriate collection methods.
Data sources and data collection methods
Data sources and data collection methods

- Household measurements
- Statistical data sources
- Administrative data sources
- Modelling
Data collection – administrative data sources

Public sector data
- Energy monitoring;
- Regulatory policies and audits;
- Assessment of policies, programmes, initiatives
- Taxes

Privately-owned data collected
- Trade associations;
- Energy research institutes.
Data collection – statistical data sources

Sample surveys

- Enterprise surveys
- Household surveys
- Household-enterprise surveys

Census

- Enumerates all the targeted units in the universe.

Trade-off between survey and census

Source: IEA, Energy Efficiency Indicators: Fundamentals on Statistics
Data collection – survey rules

- Surveys are an important source of data, but they are costly, so **collect only what is necessary**.
- Limit collecting data to what is needed but collect it.
Data collection – adding to an existing survey

Adding questions to an existing survey is a good choice when:

➢ Information required is specific and restricted in volume;
➢ The complexity of the data is low and questions are self-explanatory;
➢ The survey targets a specific group.

Advantages of using an existing survey are:
➢ Less expensive than a new survey;
➢ Respondent burden is normally lower.
Data collection – survey rules

If no existing survey can be used for data collection, the second option is to create a ‘new survey’.

Surveys are an important source of data, but they should be subject to certain rules:

• Surveys are costly
• Good survey needs a proper design
• Think about respondents
• Plan ahead
Data collection – modelling

Reduces cost, lower survey frequency, reduces extent and complexity of data collection.

Modelling can be used for:

- Conversion to calendar years
- Extrapolation (e.g., using coefficients)
- Estimation of non-metered consumption or non-marketed fuels
- Estimation of consumption of biofuels
- Calculation of useful heat.
Data collection – household measurements

Characteristics of household measurements:
- Energy consumption data for households
- Applicable to energy products delivered through a grid (electricity, gas)
- Expensive (but maybe the electricity/gas distributor is already collecting these data)
- Only possible way to collect data on energy consumption by purpose (cooking, lighting, heating – important for energy efficiency indicators).
Energy data collection system – an example

Statistical units

- Customs office
- Energy regulators
- Energy industry
- Energy consumers

Data users

- Energy efficiency office
- Ministry of Environment
- Academia
- International / regional organizations

Surveys → National statistical office

Trade → Ministry of Energy

Production → Ministry of Energy

Energy balance → Ministry of Energy

Energy efficiency indicators → Ministry of Energy

Energy statistics → Ministry of Energy