International Energy Agency

Introduction to Energy Data Collection

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SESRIC WEBINAR SERIES ON STATISTICAL EXPERIENCE SHARING ENERGY STATISTICS FOR THE SDG7 INDICATORS - 9 November 2021

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Outline

1. Fundamentals of energy statistics system
2. Energy data collection and compilation
3. Statistical confidentiality
4. Data quality
5. Recommendations and assistance

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1. Fundamentals of energy statistics system

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Fundamentals of energy statistics system

Collection system

Establish a **legal framework**;

Establish an **institutional arrangement:** e.g. national energy statistics committee;

Establish proper **reporting and dissemination mechanisms :** questionnaires, contacts, timetables, draft tables for dissemination, planning for a series of publications, etc.;

Allocate proper **resources** to collect/process/validate/disseminate data;

Review **methodology** and processes to adapt to changes.

Cost

Collecting any statistics has a cost. However not having proper information could lead to **higher costs**;

Limiting the collection strictly according to your needs.

Challenges

Liberalisation of the market: from one company to hundreds;

Confidentiality issues;

Lack of **resources**: they not follow work load, budget cuts, etc.;

Fast **turnover** in staff: lack of experience and continuity.

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The Data chain

Collection | Verification | Processing | Dissemination

Energy action:

- Production
- Transformation
- End-use

Primary data collection:

- Surveys
- Administrative sources
- Measures
- Estimations

Secondary data collection:

- International organizations
  - IEA
  - AFREC
  - Eurostat
  - OPEC
  - …

Data users:

- Civil servants (political process)
- Businesses
- Investors & Traders
- Journalists
- NGOs
- …

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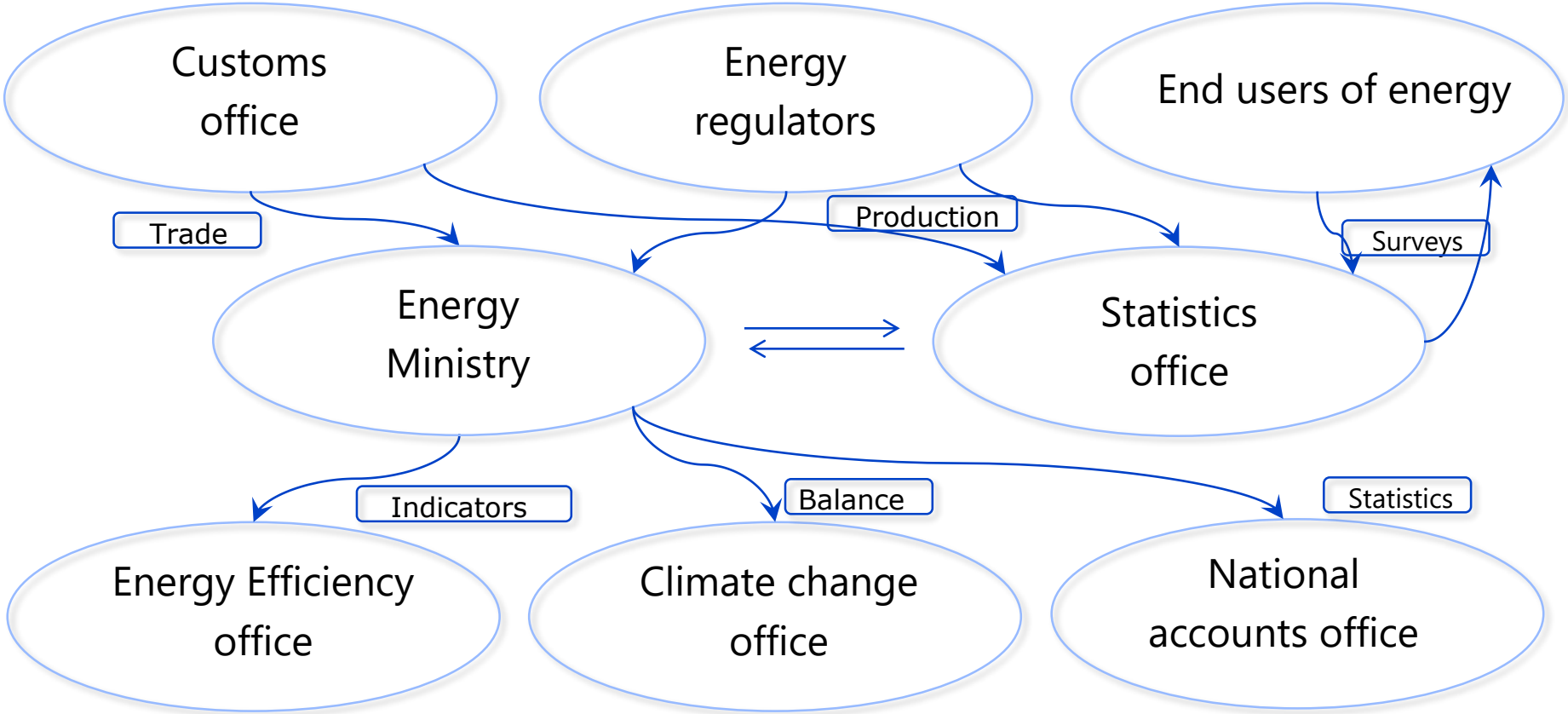
Collaboration is key



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Development of cooperation in data collection

How does bad cooperation show?

- *Discrepancies between published numbers;*
- *Several sets of official data on the same issue;*
- *Data not being fully utilized.*

Solutions

- *Memoranda of understanding;*
- *Regular meetings;*
- *Working Group;*
- *Energy statisticians participate in the design of the relevant surveys.*

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2. Energy data collection and compilation

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Data collection: Need a full picture of energy situation

Supply Data

Energy industries/producers, importers/exporters
Survey, administration data

Demand Data

Energy Consumers
End-use survey for households and enterprises

Integrated Approach

Using existing surveys, direct measurement, estimation and modelling

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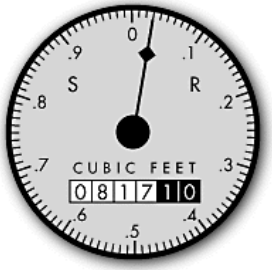
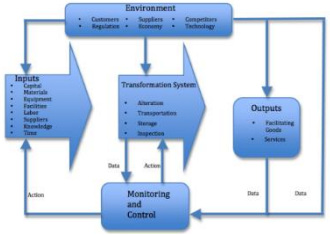
Main tools for data collections

- Administrative sources
  - Before starting new data collection
  - For example, data on fuel sold from ministry of transportation, trade from customs.
- Surveys
  - Representative sample
  - Possibly expanding existing

- Metering and measuring
  - Costly but very effective for monitoring specific equipment efficiency



- Modelling (Estimations)
  - Complementary to surveys or stand alone



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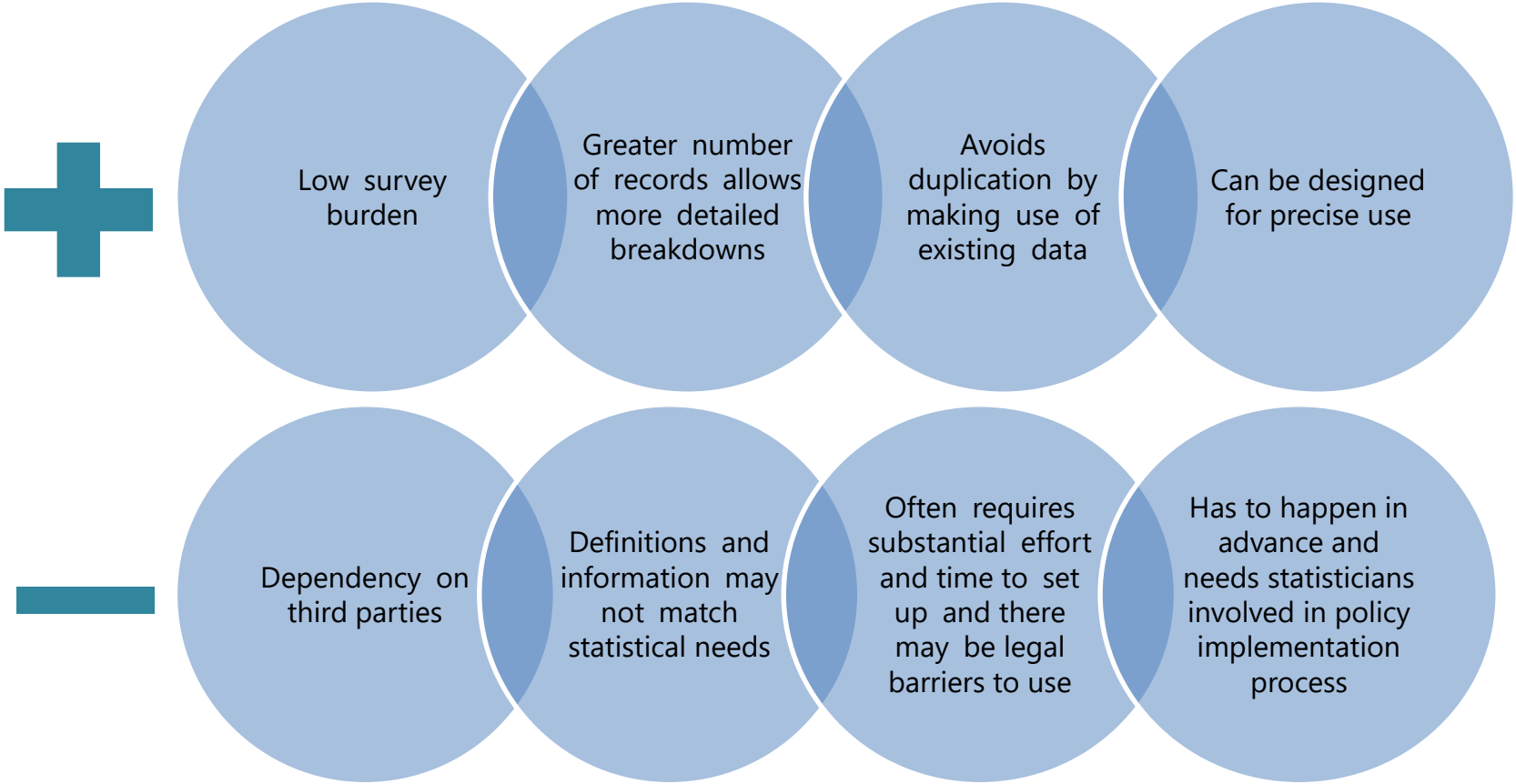
Pros and cons of administrative data



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Data sources: Surveys

Surveys

Enterprise

Household

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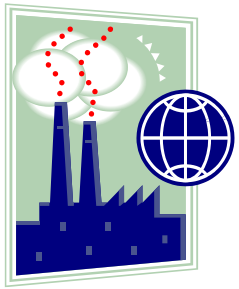
Enterprise surveys

- ***Energy Business surveys***
  - Supply side;
  - Energy service providers;
  - Census/Sample: Enterprises Surveys covering unorganised sectors such as trade, manufacturing and services on employment, output, value added.
- ***Large Energy Consumer surveys***

  Manufacturing/Industry sector:
  - Large energy consumption in few units;
  - Engage with energy manager/purchaser;
  - Energy expenses are large;
  - Response burden: make it a win-win situation.



Work with businesses in design of surveys, how can results help them?
Suppliers – market share? *Consumers* – efficiency advice?

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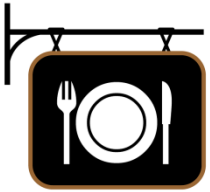
Enterprise surveys

- ***Small Business Consumer surveys***



Service Sector:

- Small energy consumption in many units;
- Energy expenses are relatively small;
- Response rate is low;
- These companies may not monitor their energy use as closely as industrial ones, as this is seldom their highest expenditure;
- Difficulties often even higher for non-market services (education, health, public administration);
- Energy costs included in the rent.

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Data sources: Surveys

Surveys

Enterprise

Household

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Household surveys

- ***Detailed data on household energy consumption:***
  - Space heating;
  - Water heating;
  - Cooking;
  - Space cooling;
  - Lighting and electrical appliances;
  - And other uses (swimming pool heating outdoor heaters, etc.).

Manual for statistics on energy consumption in household: EU countries

http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-13-003

(1) https://censusindia.gov.in/2011-prov-results/data_files/mp/02Introduction.pdf
(2) http://microdata.gov.in/nada43/index.php/catalog/137

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3. Statistical confidentiality

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What is statistical confidentiality?

- Data should not be revealed to third parties by mistake or through dissemination.

- The two main reasons for declaring data to be confidential in dissemination are:
  - Too few units in a cell;
  - Dominance of one or two units in a cell (thresholds of 80%-90%).

- An oil company in Czech Republic was taken over by a foreign company and claimed confidentiality:
  - Problem solved by *decoupling financial data and energy data.*

- Another example from the UK, with 3 LNG terminals not sharing data:
  - Problem solved by *getting the data with longer time-lag.*

- Can be used as an excuse, and it can be challenging to solve.
- Find a way to discuss the issue, build trust, find sensible, win-win solutions.

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4. Data quality

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Data quality: Good data starts from collection and finishes with dissemination

Relevance	Statistics meet the needs of the users
Accuracy and reliability	Statistics accurately and reliably portray reality
Timeliness and punctuality	Statistics are released in a timely and punctual manner
Coherence and comparability	Statistics are consistent internally, over time and comparable between regions and countries.
Accessibility and clarity	Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.

For more information please see:

Fundamental Principles of Official Statistics ; International Recommendation for Energy Statistics (IRES)
https://unstats.un.org/unsd/dnss/gp/FP-New-E.pdf ; https://unstats.un.org/unsd/energystats/methodology/ires/

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Data Validation: when collecting data, check internal consistency

- Some things to look out for…
  - Is the data set/survey questionnaire **complete**?
  - Does the detailed **breakdown match the total**?
  - Are there any **outliers**?
  - Do **units** seem correct?

- It is good practice to analyze the data validation processes to identify possible points of failure and introduce checks.

Process A

Requires extracting fields, summarizing data, reformatting data sets…

One or two items can be accidentally dropped from the large data set

Verification

Comparing before and after counts and totals of data can help

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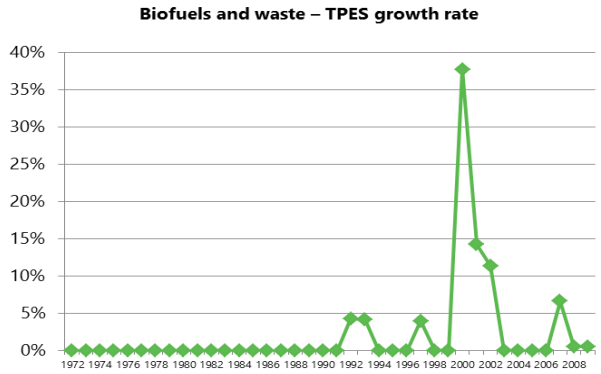
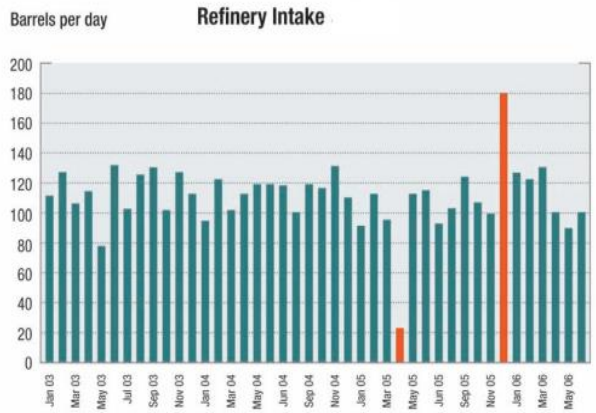
Data Validation: Breaks in time series must be explained

- Although breaks can happen when coverage improves or methodology changes, in general one should aim for a **consistent time series**.

- Certain flows are generally consistent over time, thus sudden increases or decreases should raise a red flag and trigger checks.

- **Unexplained** breaks or big changes in trends should be avoided, unless an explanation is found that justifies the break.





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5. Recommendations and assistance

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Country Practices Database

Русский 中文网页

ABOUT NEWSROOM TOPICS COUNTRIES STATISTICS DATA & PUBLICATIONS

Home » ClassicStats » Topics » Energy efficiency » EE Indicators Manual

Energy Efficiency Indicators Statistics: Country Practices Database

A supplement to the publication Energy Efficiency Indicators: Fundamentals on Statistics, this database presents practices on collection of data for developing efficiency indicators from a variety of OECD Members and non-Members.

Practices are searchable by country and territory, sector, methodology and type of available documentation. By sharing these experiences, we hope to help countries and organisations to develop their own energy efficiency indicators programmes.

Countries, territories and economies

- Albania
- Australia
- Austria
- Canada

Sector

- Industry
- Residential
- Services
- Transport

Methodology

- Administrative sources
- Measuring
- Modelling

Available content

- methodology
- project web site
- questionnaire
- report

Search by keywords

Reset Search

A platform to share expertise worldwide: practices are available in a searchable database.

Share your practice: *https://delegates.iea.org/delegates/eeindicatorsmanual/*

These practices were collected through a survey undertaken by the IEA in 2010. Please contact energyindicators@iea.org if you are able to provide more recent information for existing practices, or additional practices to be added in the database.

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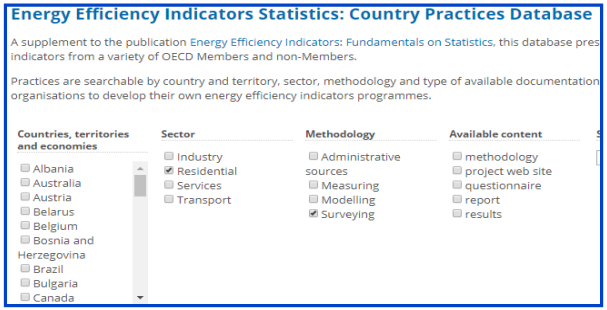
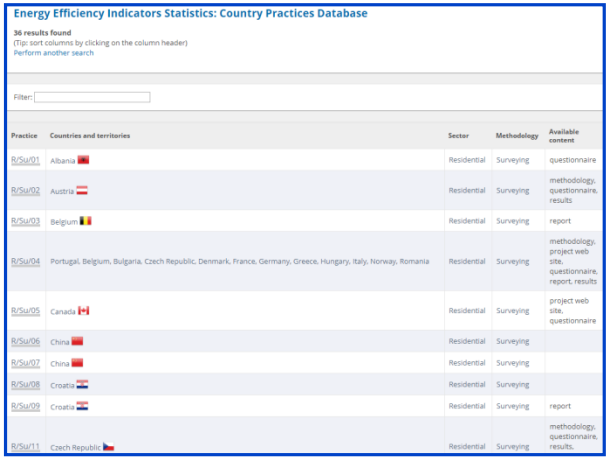
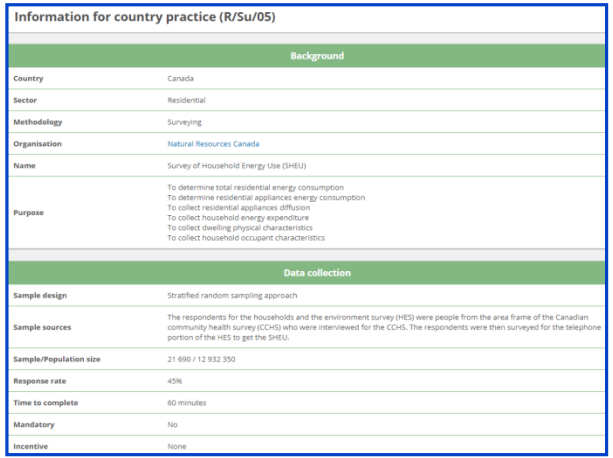
Country Practices Database



- Practices in surveying, administrative sources, modelling and metering across sectors;
- Questionnaires and other material available;
- Links to various national administrations' work.





An example of how to benefit from each other's work

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