Energy Efficiency Indicators Workshop
New Challenge: Doing so much more with so much less
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IEA Energy Efficiency Manuals

Key Insights from
IEA Indicator Analysis

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Why EE manuals?

- **Growing recognition of the importance of energy efficiency (the "hidden fuel")**

- **More detailed data needed to build meaningful energy use indicators**

- **The IEA received many requests from countries, individuals, organizations on several issues:**
  - **What indicators to use?**
  - **How to build these indicators?**
  - **How to collect the data needed for these indicators?**

Key Insights from IEA Indicator Analysis

Two complementary Manuals

Analysis of energy indicators

- **What are the basic indicators**
- **How to track the improvement in appliances energy efficiency**
- **What are the key insights from end-use level information**

Data for energy indicators

- **Where to find the basic information**
- **How to collect or develop data on unit energy consumption**
- **What are the different method used to develop data at the end-use level**

Key Insights from IEA Indicator Analysis

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How to gather information?

## Manual on Statistics for Energy Efficiency Indicators

- To guide the establishment of a data framework for energy efficiency indicators

- To support collection of internationally comparable data (e.g. those required by the IEA template and beyond)

- To exchange information and expertise on best existing practices across countries

- To identify main challenges and areas for improvement in the data collection

Manual on Statistics for Energy Efficiency Indicators

Key Insights from IEA Indicator Analysis

Table of Content

- **Introduction: why a manual?**
- **What are energy efficiency indicators?**
- **How to collect the data for indicators?**

- **Collecting what and how for the Residential secto**
- **Collecting what and how for the Services sector**
- **Collecting what and how for the Industry sector**
- **Collecting what and how for the Transport sector**

- **Validating the data**

- **Disseminating the data**

- **Annex: country practices**

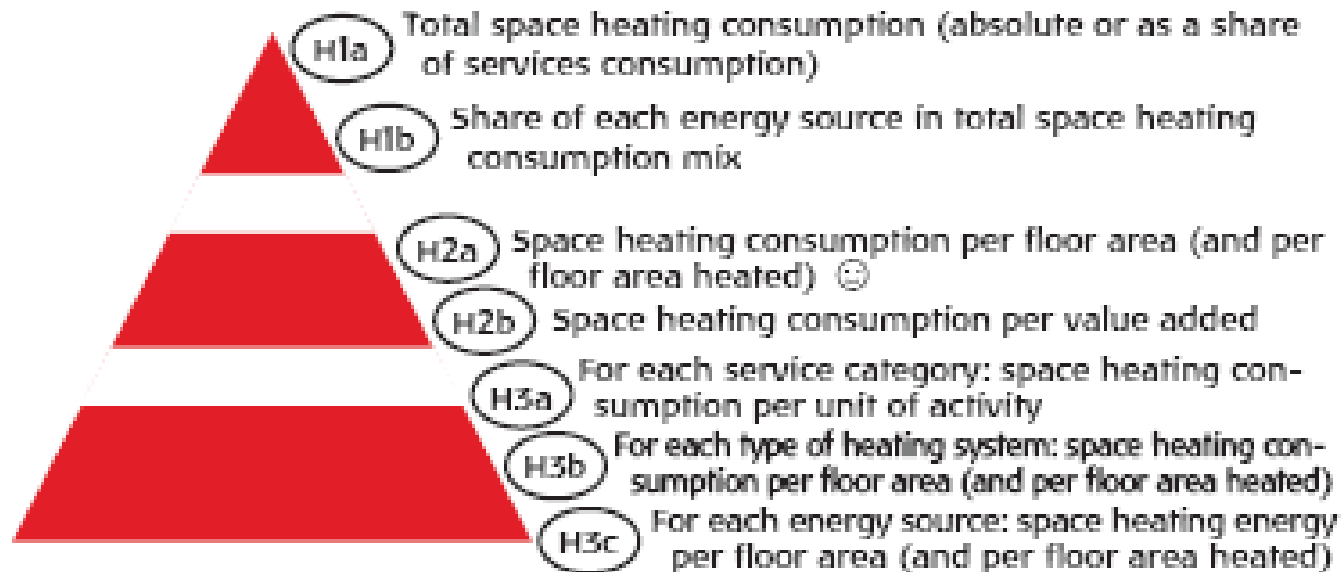*Key Insights from IEA Indicator Analysis*
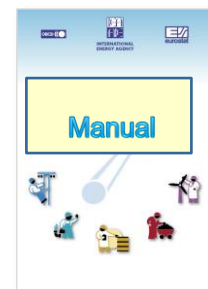
Structure of sectoral chapters

- **What does the residential sector mean and cover?**
- **Why is the residential sector important**
- **What are the main end-uses driving the consumption of**

  the sector?
- **What are the most frequently used indicators?**
- **The data behind the indicators**
  - **Energy consumption data**
  - **Activity data**
- **How to collect data?**
  - **Administrative sources**
  - **Surveying**
  - **Measuring and Metering**
  - **Modelling**

Key Insights from IEA Indicator Analysis

What are the most frequently used indicators?

Figure 6 • Pyramid of services space heating indicators

- **H1a** Total space heating consumption (absolute or as a share of services consumption)
- **H1b** Share of each energy source in total space heating consumption mix
- **H2a** Space heating consumption per floor area (and per floor area heated) ☺
- **H2b** Space heating consumption per value added
- **H3a** For each service category: space heating consumption per unit of activity
- **H3b** For each type of heating system: space heating consumption per floor area (and per floor area heated)
- **H3c** For each energy source: space heating energy per floor area (and per floor area heated)

Key Insights from IEA Indicator Analysis

**One recommended indicator
for each sector and end-use/subsector**

How to collect data? Synthesis from practices

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Administrative sources ....

As for the residential sector, administrative sources, such as those from government, utilities, international organizations or private companies, should be the first sources scanned to identify what data are already available and how those data could best be used. Tapping into those existing sources would generally lead to savings in time and costs. The following description of administrative data for the services sector is based on the submission of practices received by the IEA.

Surveying ....

Surveys were the most common methodology used to collect services data within the sample of practices submitted to the IEA. Surveys were performed for most of the service categories: office, retail space, health care, education, warehousing, food service, lodging, arts and entertainment. Of course, surveys alone may not be enough, and may need to be complemented by information deriving from building energy audits , or from modelling studies. The next paragraphs summarise the main characteristics of surveys derived from the practices received by the IEA.
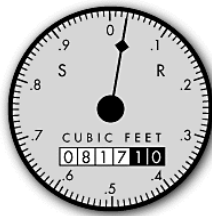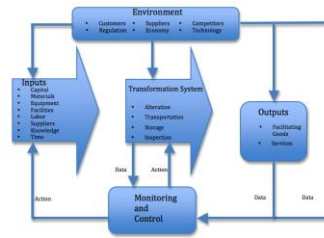
Measuring ....

Countries recognize the importance of undertaking measurements in the services sector to inform not only building owners about energy saving opportunities, but also government on potential policy interventions. Measurements in the services sector are particularly intensive because of the heterogeneous nature of the services categories and of the types of buildings. However, in the absence of other data, even small sample measurements can be effective to make initial estimates.

Modelling ....

Modelling is an integral part of the process to estimate energy consumption by end-use in the services sector, by itself, or to complement results from another methodology, such as for example a national survey. The key steps of a modelling work include: establishing the modelling framework, setting model assumptions, inputting data, running the model, validating its outcomes against data, and analysing results. The following paragraphs are based on the practices submitted to the IEA for services sector modelling.

Annex: country practices

- **A compilation of existing practices from across the world**

- **listed by end-use sector**
  residential
  services
  transport
  industry

- **and by methodology group**
  survey
  measuring
  modelling
  administrative

Key Insights from IEA Indicator Analysis

Background	Country	Hong Kong, China		R/Su/12
	Organisation	Electrical and Mechanical Services Department		
	Name of the survey	Energy Consumption Survey on Residential Sector		
	Survey purpose	• To determine total household energy consumption • To determine household appliances energy consumption • To collect household appliances diffusion • To collect household energy expenditure • To collect dwelling physical characteristics • To collect household occupant characteristics		

Data collection	Sample design	Stratified random sampling approach		
	Sample sources	National census		
	Collection methods	In-house visit		
	Sample/Population size	2 100 / 2 000 000	Response rate	Almost 100%
	Frequency	Every three years	Last time surveyed	2008
	Time to complete survey	45 minutes	Mandatory	No
	Incentive	No incentive		
	Survey respondents	Households		
	Elements collected	Dwelling type, dwelling floor area, building age, household occupancy, income, number of light fixtures, types of lighting, household energy consumption, information from energy bills, operating behavior of appliances, rating of appliances.		
	End-uses collected	Space cooling, domestic hot water, refrigerators, washing machines, televisions, computers, other small appliances.		

Notes and comments	Main challenges	• Quality of the interviewing staff • Recruiting, training and retaining project staff
	Possible improvements	Recruit experienced interviewers, organize training, conduct pilot survey, refine questionnaire, establish hot line with supervisor to provide assistance.
	Key best practice	A novel approach was devised to boost the response rate. Instead of one single sample being selected, each "single" sample is supplemented with two neighbouring samples (e.g. units one floor above and one floor below the selected sample). In the event the selected sample fails or is rejected, another sample with similar energy consumption characteristics can be used as supplement. The response rate can be brought to close to 100% without seriously distorting the characteristics of the samples.
	Other documentation	Available: Survey Report

Questions for discussion

- For each core chapter (residential, services, industry): what is your overall impression on the content?

- For each core chapter: is there anything major you would like to add or change?

- **Do you have any comments on the proposed pyramids, for each sector and for each end use / subsector?**

- Any other comment?

Manual on Analysis of Energy Efficiency Indicators

How to develop and interpret energy efficiency indicators?

- **Will provide selection of indicators that can be develop at each level of the *indicators pyramid***

- **Will assess each indicators by providing pros/cons; strength and weakness**

- **Will provide methodologies to quantify savings from energy efficiency**

- **Will cover the residential, services, industry, transport and power sector**

Key Insights from IEA Indicator Analysis

Manual on Analysis of Energy Efficiency Indicators

Targeted Audience

- ■ **Energy analysts**

- ■ **Academia**

- ■ **Statisticians**

- ■ **Policy-makers**

In both IEA Member and non-Member countries

Key Insights from IEA Indicator Analysis

Structure of the Manual

- **Introduction**
- **IEA methodology and concept**
- **Developing indicators for …**
  - Residential, services, industry, passenger transport, freight transport and power sector
- **Annexes**
  - Decomposition methodologies
  - Initiatives on the development of energy efficiency indicators

*Key Insights from
IEA Indicator Analysis*
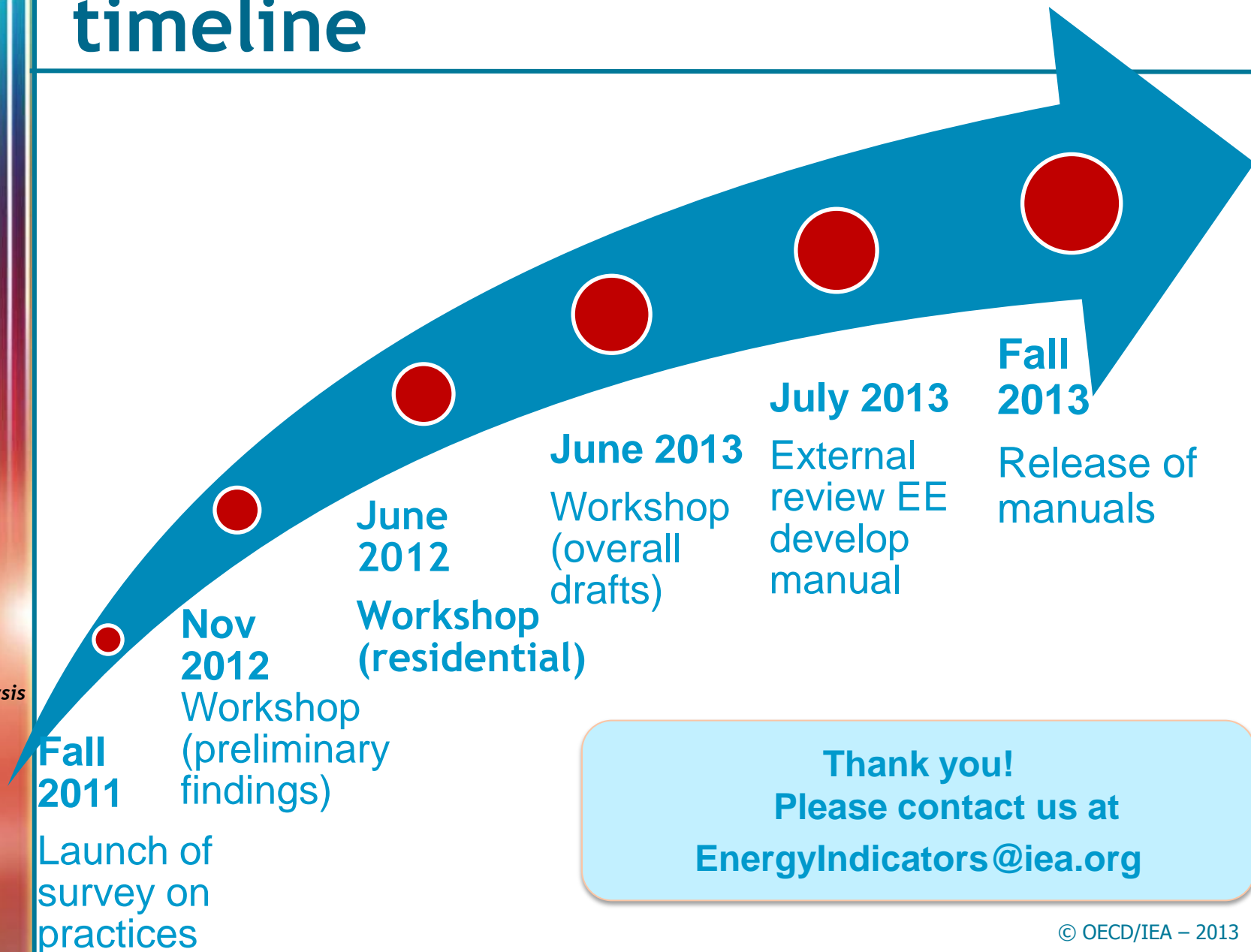
Structure of end-use chapters

- **What is driving energy use**
- **How energy is used and how it has evolved recently**
- **How to prioritise development of indicators**
- **Development of indicators by level of the pyramid**
- **Additional indicators explaining the changes in energy consumption**
- **Decomposition of changes in residential energy demand**

Key Insights from IEA Indicator Analysis

Country examples

- **Provide "real-life" examples of indicators**

- **Use of indicators in different context**
  - **Tracking efficiency improvement (e.g. ODEX, OEE Index, etc)**
  - **Assessing the impact of policies and programmes (e.g. appliances labeling)**
  - **Prioritising areas for immediate actions**

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Key Insights from IEA Indicator Analysis

Efficiency indicators manuals: timeline

Key Insights from IEA Indicator Analysis

Fall 2011
Launch of survey on practices

Nov 2012
Workshop (preliminary findings)

June 2012
Workshop (residential)

June 2013
Workshop (overall drafts)

July 2013
External review EE develop manual

Fall 2013
Release of manuals

Thank you!
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International Energy Agency