Energy Efficiency Indicators: Fundamentals on Statistics

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2015 Interenerstat meeting

IEA, Paris, September 2015

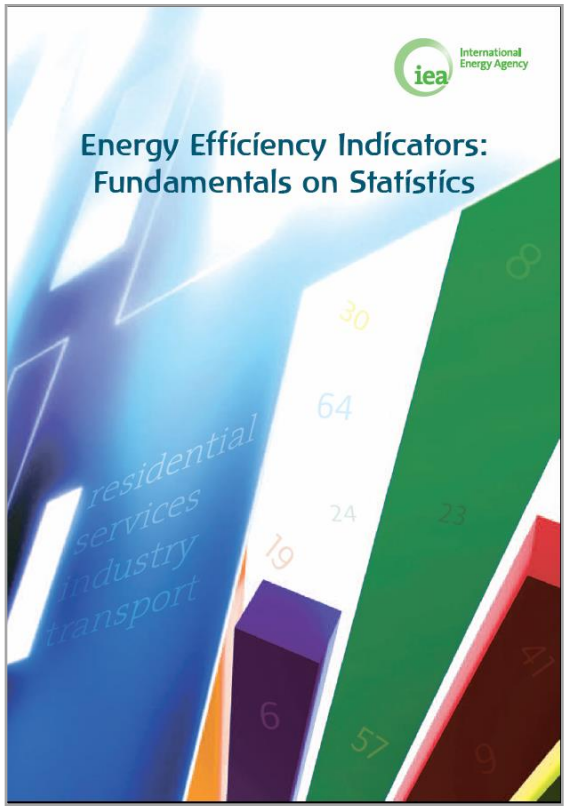
IEA's energy efficiency indicators work

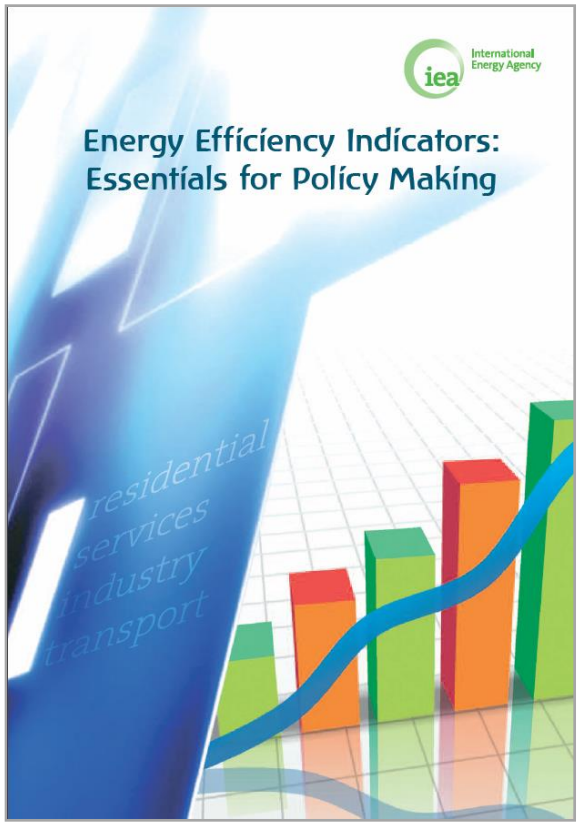
- **Produce meaningful cross-country analysis to provide guidance to policy-makers on:**
  - **Underlying drivers (economic activity & structure, income, prices…)**
  - **Trends in energy use and CO_2 emissions**
  - **Energy efficiency opportunities and progress**
  - **Policy effectiveness**

- **Establish a harmonised framework for data collection and analysis**
  - **Harmonisation => Comparability**
  - **Comparability => Understanding of global trends and drivers**

Request from member countries to provide a common methodological framework

A set of two IEA efficiency manuals: statistics and policy





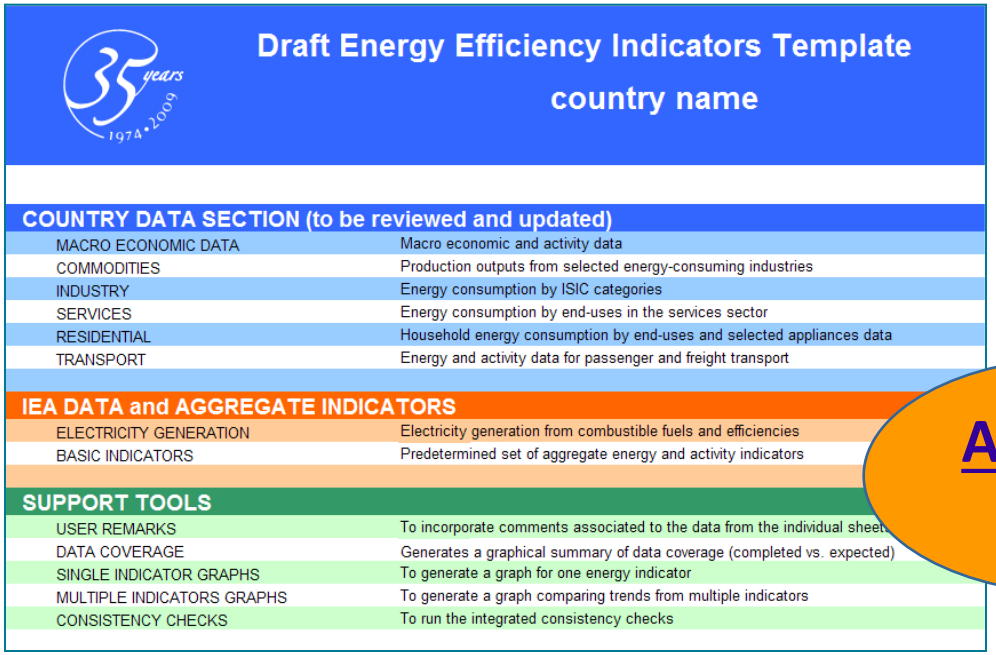
http://bit.ly/eei-statistics

http://bit.ly/eei-policy

Published in 2014 - free for download

Being translated (Russian, Chinese, Spanish)

Manual on statistics to support the recently established IEA end-use data collection



Draft Energy Efficiency Indicators Template

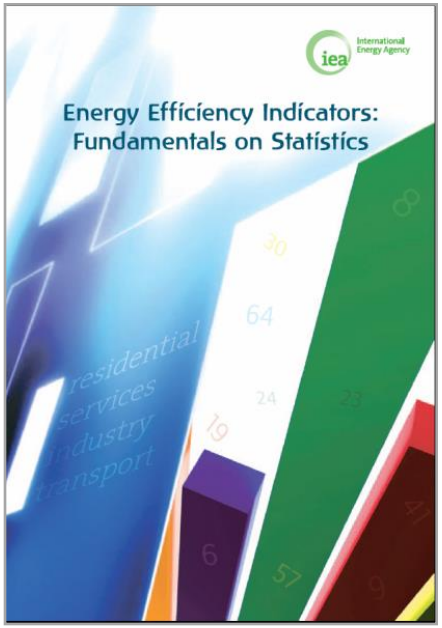
country name

COUNTRY DATA SECTION (to be reviewed and updated)	
MACRO ECONOMIC DATA	Macro economic and activity data
COMMODITIES	Production outputs from selected energy-consuming industries
INDUSTRY	Energy consumption by ISIC categories
SERVICES	Energy consumption by end-uses in the services sector
RESIDENTIAL	Household energy consumption by end-uses and selected appliances data
TRANSPORT	Energy and activity data for passenger and freight transport
IEA DATA and AGGREGATE INDICATORS	
ELECTRICITY GENERATION	Electricity generation from combustible fuels and efficiencies
BASIC INDICATORS	Predetermined set of aggregate energy and activity indicators
SUPPORT TOOLS	
USER REMARKS	To incorporate comments associated to the data from the individual sheet
DATA COVERAGE	Generates a graphical summary of data coverage (completed vs. expected)
SINGLE INDICATOR GRAPHS	To generate a graph for one energy indicator
MULTIPLE INDICATORS GRAPHS	To generate a graph comparing trends from multiple indicators
CONSISTENCY CHECKS	To run the integrated consistency checks

Available online

As an answer to a request from IEA Ministers in 2009, the IEA designed a template to collect data for energy efficiency indicators.

The manual on statistics for energy efficiency indicators



Providing a harmonized framework for data collection across sectors and end-uses

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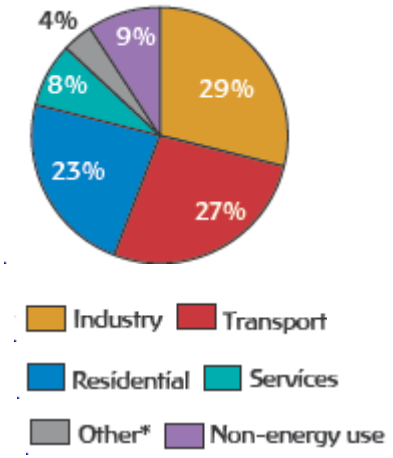
7 Collecting What and How for the Transport Sector

8 Validating the Data

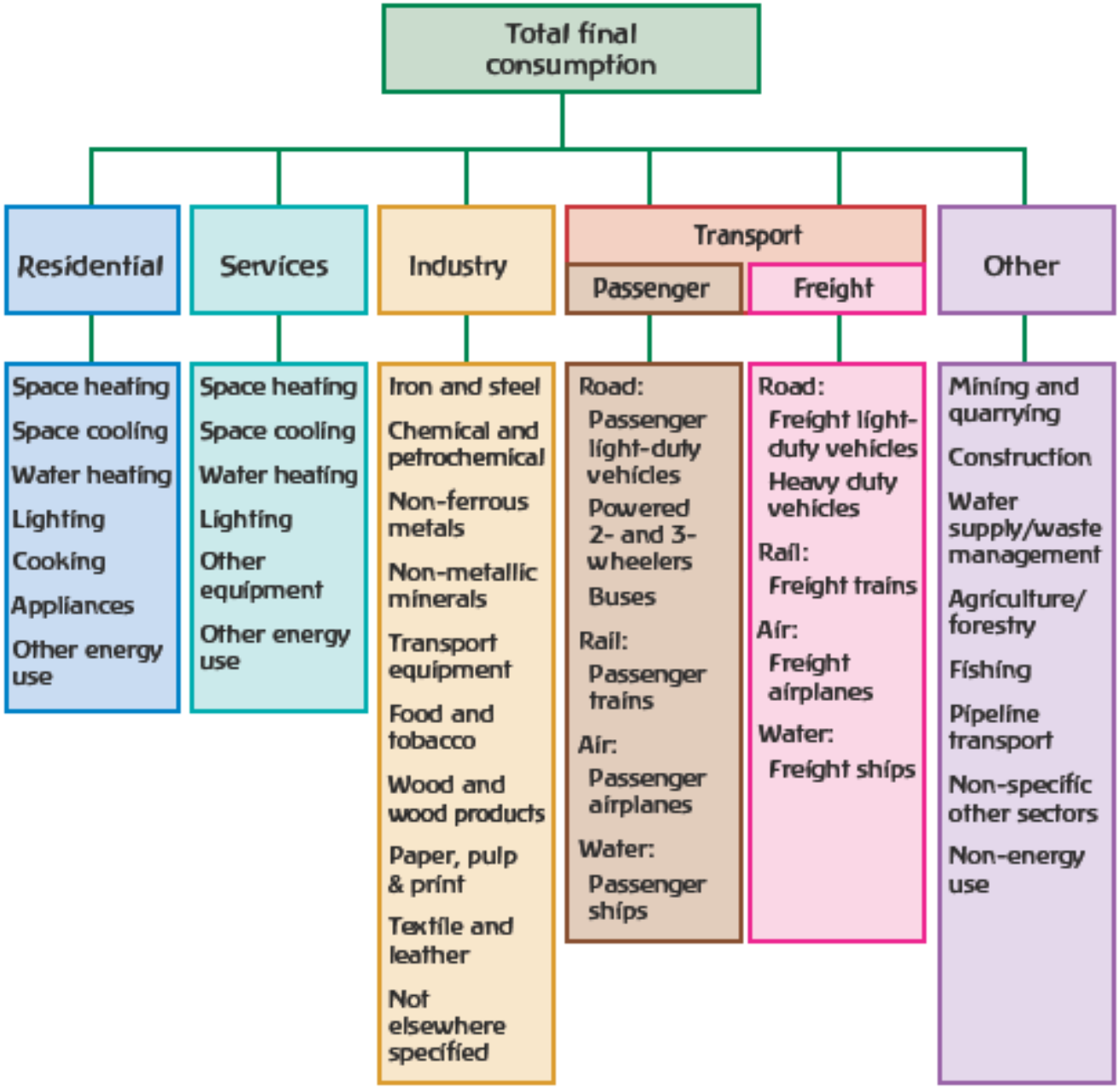
9 Disseminating the Data

Annexes

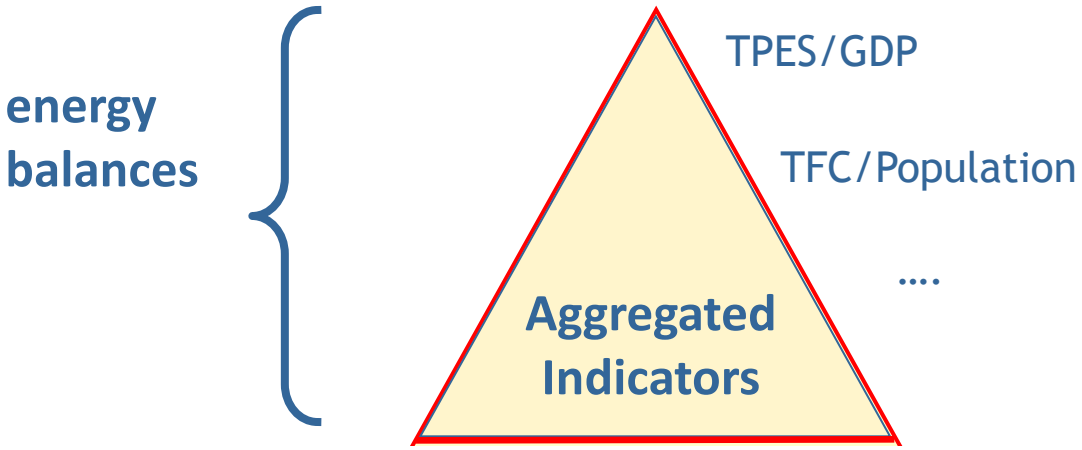
Shares of sectors in total final consumption for the world (1973 and 2011)



What data? Understanding end uses



The need to collect more disaggregated data



End use indicators: a variable level of detail

For each end use:

Indicators pyramid

1 – general

2 – detailed

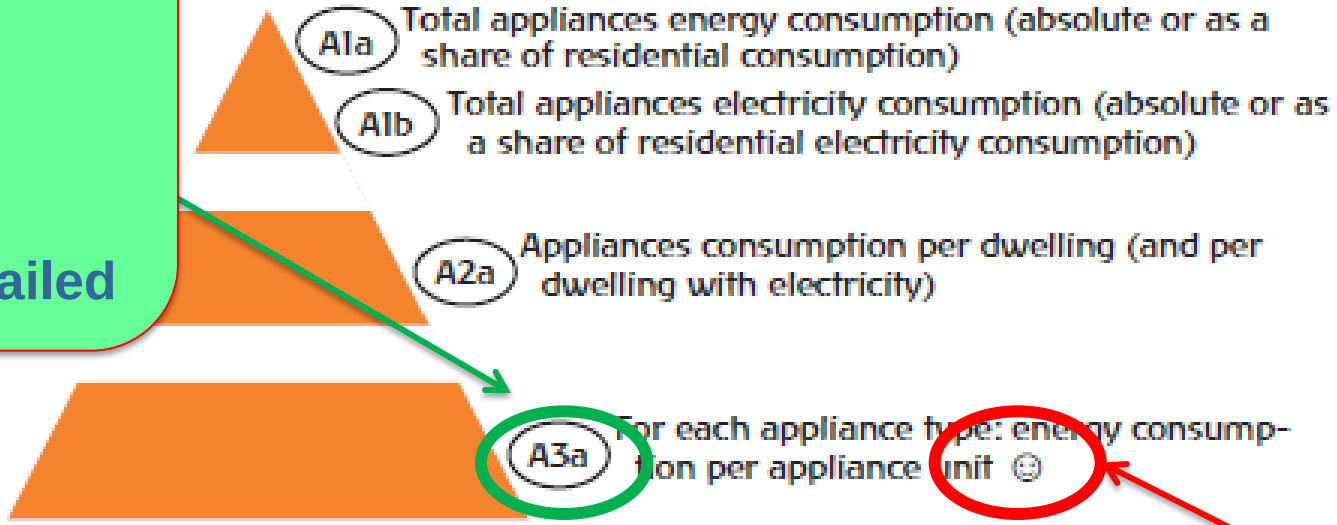
3 – very detailed

4 Residential

Appliance indicators

The top of the pyramid groups all the appliances into two indicators: the first one showing total energy use for appliances either in absolute value or in relative terms compared to total energy consumption of the residential sector (A1a); and the second one, as in the case of cooling and lighting, showing the same indicator but just for electricity since electricity is almost the only energy source used for appliances

Pyramid of residential appliances indicators



For each indicator of levels 2 and 3, the table gives the name, its coverage (overall or by specific type), the energy data and the activity data to be used. The column before the last gives the code number for the indicator and, when it applies, the last column highlights if the indicator is considered as the preferred indicator for a particular end-use.

20

A smiley face indicates the recommended indicator

Collecting relevant data as the key challenge

Table 7.3 • Summary of the main data needed for transport indicators and examples of possible sources and methodologies

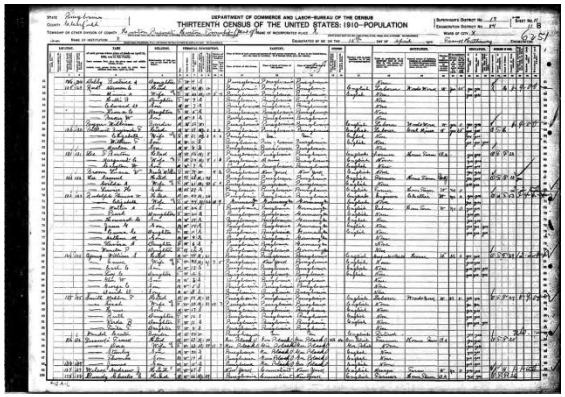
Data	Source	Methodology
Energy data		
Total transport consumption	National energy balance National energy statistics	Administrative sources Modelling
Consumption by sub-sector	National energy balance National energy statistics	Administrative sources Mobility surveys Modelling
Consumption by segment		Mobility surveys Modelling
Consumption by vehicle type		Mobility surveys Modelling
Activity data		
GDP, population	National statistics offices	Administrative sources
Vehicle-km (vkm)	Vehicle registers/ Roadworthiness testing services/ Inspecting organisations Municipalities/Transport authorities National and international databases Transport ministries	Measurements: odometer readings Measurements: road traffic count Administrative sources Mobility surveys Modelling
Passenger-km (pkm)	National and international databases Transport ministries	Administrative sources Mobility surveys
Tonne-km (tkm)	National and international databases Transport ministries	Administrative sources Mobility surveys, freight surveys

How do countries collect data?

Four main types of methods

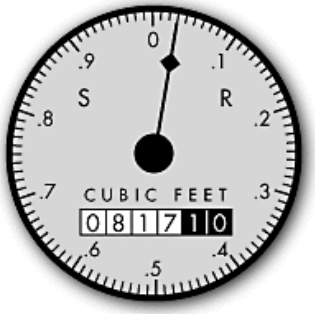
Methods used to collect data for indicators

- Administrative sources

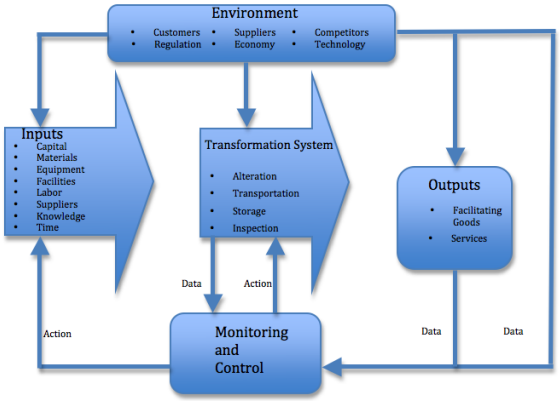


- Surveys

- Metering and measuring



- Modelling



Methods: sharing expertise from countries

Annex D:

160 country practices presented one by one

grouped

by sector

by methodology

Background			
Country	Austria		R/Su/01
Organisation	Statistics Austria		
Name of the survey	Household energy consumption survey		
Survey purpose	• To determine total household energy consumption • To determine household appliances energy consumption • 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	List of addresses, list of telephone numbers, labour force survey.		
Collection methods	• Computer assisted personal interview (CAPI) • Computer assisted telephone interview (CATI)		
Sample/Population size	14 000 / 3 429 720	Response rate	55%
Frequency	Every two years	Last time surveyed	2010
Time to complete survey	10 minutes	Mandatory	No
Incentive	None		
Survey respondents	Households		
Elements collected	Dwelling type, dwelling floor area, building age, household occupancy, energy-related renovations, household energy consumption and related expenditures.		
End-uses collected	Space cooling, space heating, domestic hot water, other: cooking.		

Notes and comments	
Main challenges	• Inconsistent responses • Response quality
Possible improvements	
Key best practice	A new approach to data control compared with previous surveys was taken for the first time in 2004 and continued in the follow-up survey runs. Up to and including the 2000 survey, only the individual energy sources themselves were checked for plausibility, any missing data were calculated (quantity-value pairs) and substitutions were made if necessary. Such routines of course continue to be used, with the additional step that the total of the reported energy consumption is then related to a calculated (fictitious) overall consumption. This fictitious overall consumption by the household is calculated from the data for that household, on the one hand (floor space, number of people in household) and pre-set parameters for the individual types of use (space heating, water heating, cooking, other purposes), on the other hand. Calculating the total reported energy consumption per household in this way involves some quite complicated plausibility routines, because one or more alternative quantities have to be calculated if the quantity-value pairs do not match and these alternative quantities then, when variably applied, lead to a number of different calculated overall energy consumption figures. The fictitious standard value is then used to select the quantity-value pairs that appear most probable.
Other documentation	Available: Surveying Methodology and Questionnaire

Background

Institution

Purpose …

Technical information:

Sample

Frequency

Data collected…

Comments:

Challenges

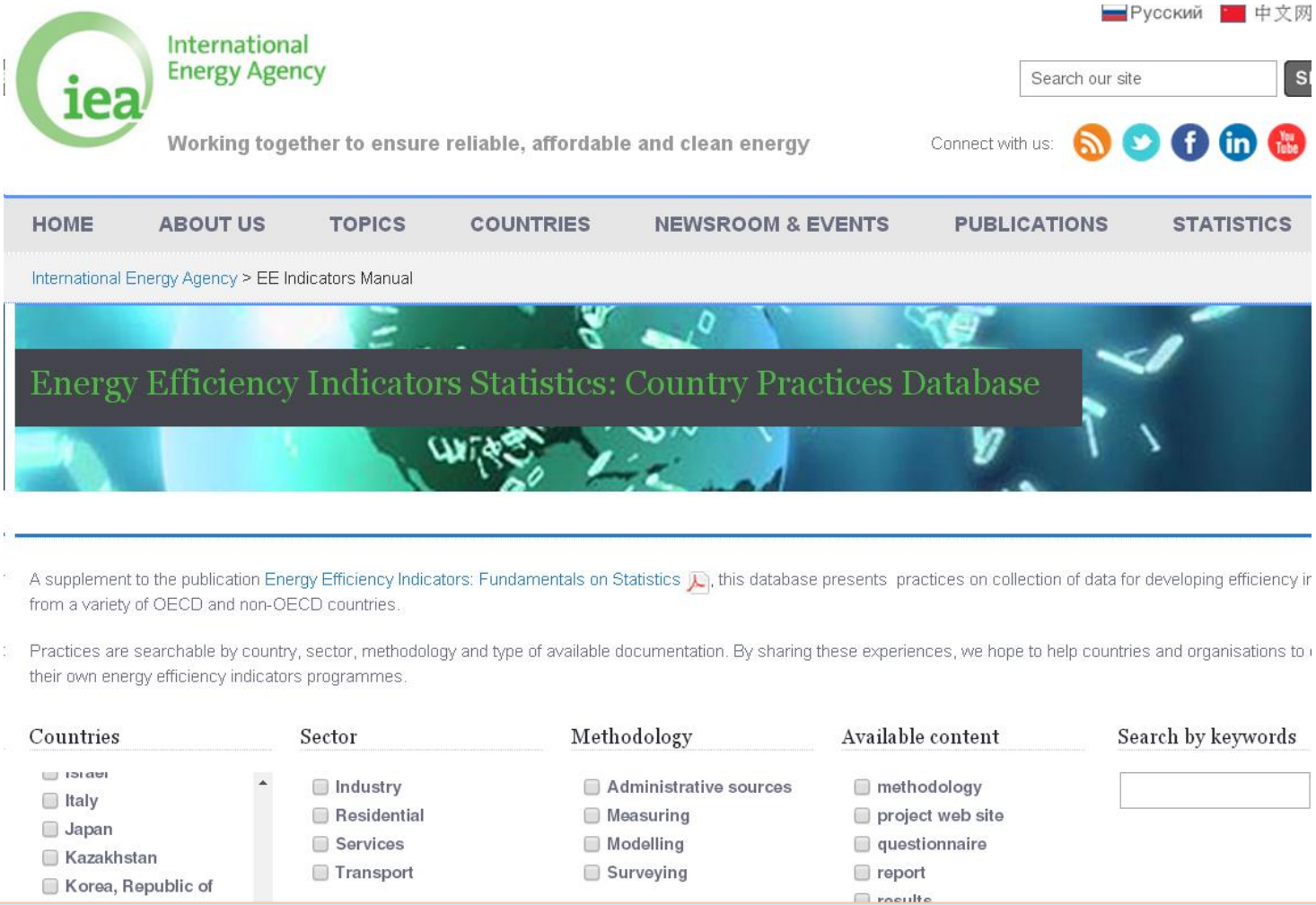
Tips

Documents

Links…

(e.version)

An online database of practices



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

http://www.iea.org/eeindicatorsmanual/

Thank you

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