

G20 End-use Data and Energy Efficiency Metrics Initiative
Uncovering the role of digitalization for energy efficiency indicators

The IEA Energy efficiency indicators data collection

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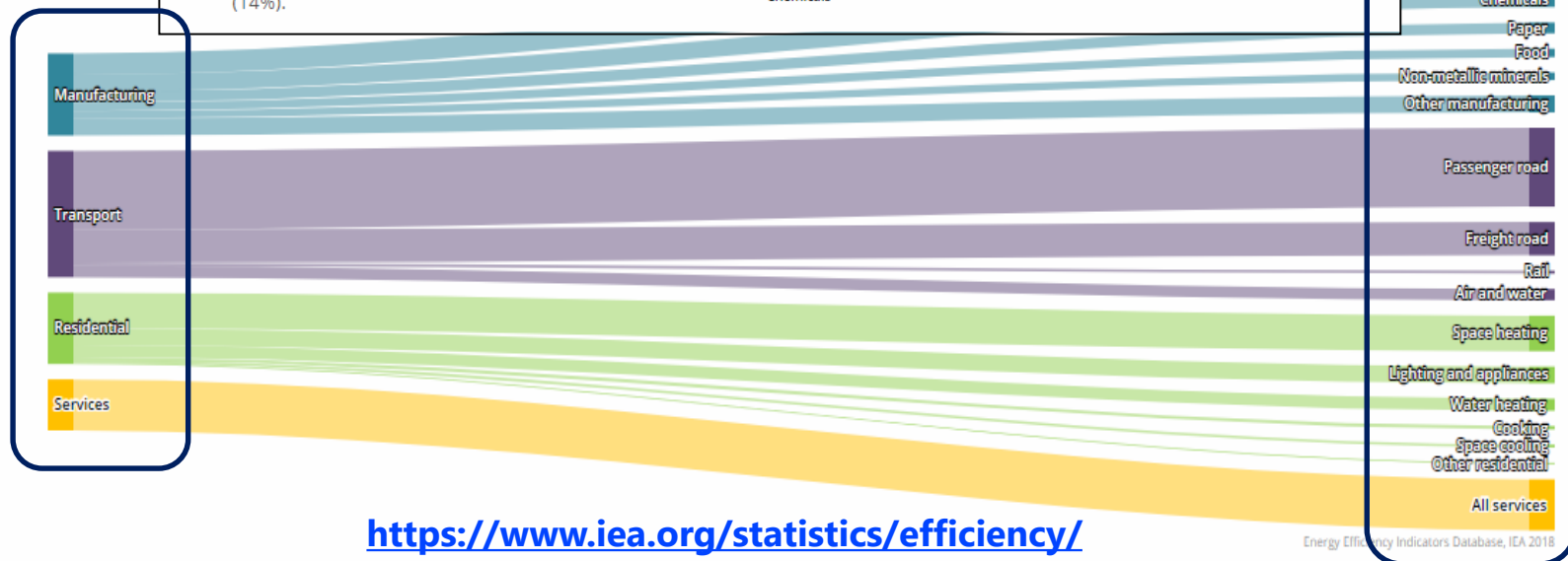
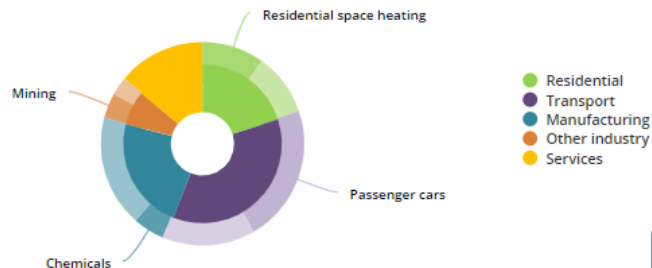
Paris, November 21st

IEA energy efficiency indicators work: focus on energy demand

The key sectors for tracking energy efficiency progress are transport, services, manufacturing and the residential sector.

Across IEA countries, the transport sector accounted for the highest share of final energy consumption in 2016 (36%), followed by manufacturing industry (23%), the residential sector (20%) and finally the services sector (14%).

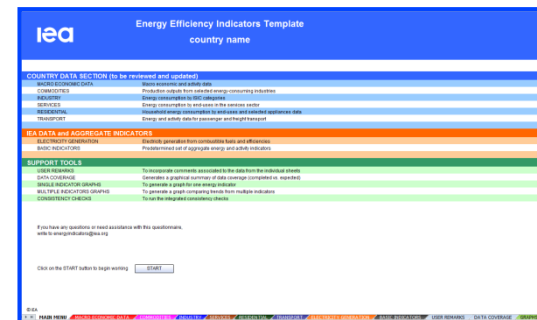
Largest energy end-uses in IEA countries, 2016



IEA Members recognize the value of end-use data

- Data collection agreed by member countries in 2009 (**IEA Ministerial**)
- **Developed with international community of experts**, (Odyssee, LBNL, etc.)
- A user-friendly **Excel questionnaire** (available online)
- Collects **energy consumption** and **activity** data
- Covers **four sectors**: residential, services, industry, transport
- **Publication** and **database** : ***IEA Energy efficiency indicators highlights & Database***

→ <https://www.iea.org/statistics/efficiency/>



The screenshot shows the 'Energy Efficiency Indicators Template' for a specific country. It features a blue header with the IEA logo and the title. Below the header, there is a table of contents with sections: 'COUNTRY DATA SECTION (to be reviewed and updated)', 'IEA DATA and AGGREGATE INDICATORS', and 'SUPPORT TOOLS'. The 'COUNTRY DATA SECTION' includes sub-sections for 'INDUSTRY', 'RESIDENTIAL', 'SERVICES', and 'TRANSPORT'. The 'IEA DATA and AGGREGATE INDICATORS' section includes 'ENERGY CONSUMPTION', 'ENERGY EFFICIENCY', and 'ENERGY INTENSITY'. The 'SUPPORT TOOLS' section includes 'DATA CHECKING', 'DATA AGGREGATION', 'DATA AGGREGATION', and 'DATA AGGREGATION'. At the bottom, there is a 'START' button and a 'STOP' button.



The end-use data collected and published by the IEA

Country	Sector	End use	Energy product	Energy indicator
Country	Residential	Space heating	Oil	Per capita energy intensity (GJ/cap)
		Space cooling	Natural Gas	Per dwelling energy intensity (GJ/dw)
		Water heating	Renew. & waste	Per floor area energy intensity (GJ/m2)
		Cooking	Heat	Per unit equipment energy intensity (GJ/unit)
		Lighting	Electricity	Per services employee energy intensity (GJ/employee)
		Appliances	Other	Per VA energy intensity (GJ/USD PPP 2010)
		Other		Per physical output energy intensity (GJ/t)
				Fuel intensity (liters/100 vkm)
	Services	Space heating		Passenger-kilometer energy intensity (MJ/pkm)
		Space cooling	(...)	Tonne-kilometer energy intensity (MJ/pkm)
		Lighting		Vehicle-kilometer energy intensity (MJ/pkm)
		Other		Other
	Industry	Textiles		
		Chemicals		
		Paper		
		Minerals		
		Basic metals		
		Other		
		Passenger cars		
		Buses		
Transport	Passeng. trains			
	Trucks			
	Passeng. trains			
	Other			

Residential end-use data: proposing voluntary updates for 2019/2020

- Why **RESIDENTIAL**?

- **Residential** energy use has been increasing as activity continuously increased
- Demand for **cooling** is increasing from rising global temperature and demand for comfort
- **Appliances** are expected to be a key role to reduce energy consumption in the future



- What will be updated?

- Information for **refurbished/ new dwellings**
- Information for share of **heating/ cooling systems**
- New **appliances stocks**: Air conditioners, heat pumps, boilers
- Additional information for **Solar thermal and solar photovoltaic panels**

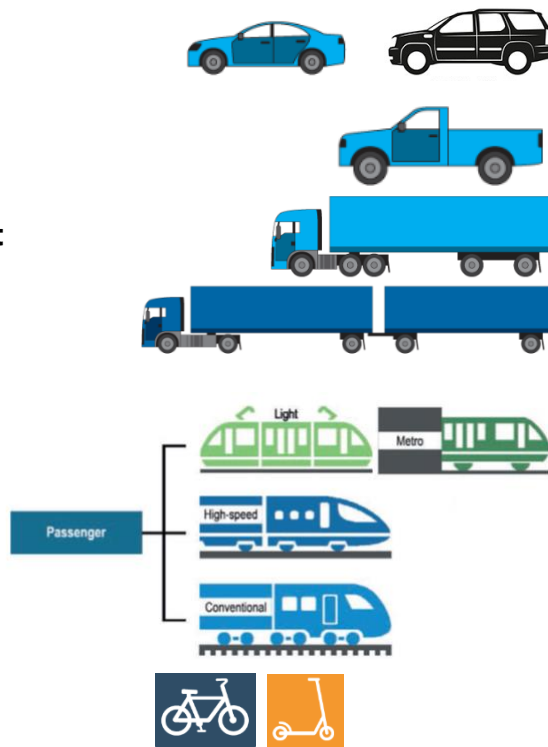


- **Summary of changes shared with data providers for comments– feedback welcome**

Transport end-use data: proposing voluntary updates for 2019/2020

- What will be updated?

- Added two subcategories to **Cars, SUV and personal light trucks**
 - Of which cars
 - Of which SUV and personal light trucks
- Added **battery and plug-in hybrid electric** to passenger cars
- Added three subcategories to **Freight & Commercial road transport**
 - Of which Light Commercial Vehicle (<3.5 t)
 - Of which Medium Freight Trucks (3.5-12 t)
 - Of which Heavy Freight Trucks (> 12 t)
- Hidden **Freight transport tonnes** . **Considered uninformative.**
- Hidden **Power train for freight transport**
- Added three subcategories to **Passenger Trains**
 - Of which metro and light rail
 - Of which conventional rail
 - Of which high-speed
- Added electric **bikes and other micromobility** only for **pkm**



- Summary of changes shared with data providers for comments– feedback welcome**

IEA resources : methodologies on indicators and data collection

➤ Fundamentals on statistics:

- Conceptual indicators framework and data collection methods

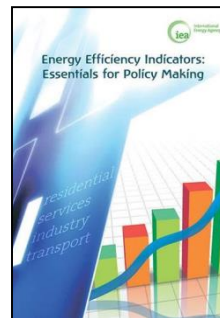
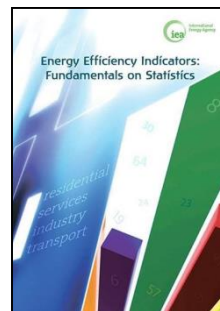
<https://webstore.iea.org/energy-efficiency-indicators-fundamentals-on-statistics>

➤ Essentials for policy making:

- Guidance to develop and interpret indicators

<https://webstore.iea.org/energy-efficiency-indicators-essentials-for-policy-making>

- Downloadable online as pdf
- Both translated into several languages (Spanish, Chinese, Russian, French - soon)
- Also available as online training platform



International guidelines are key to ensure comparability of data and indicators across countries

Methods used to collect data for indicators

➤ Administrative sources

- before starting new data collection

➤ Surveys

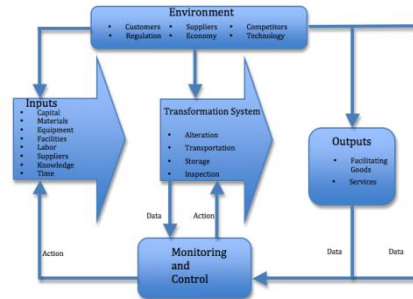
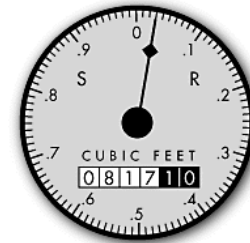
- representative sample
- possibly expanding existing surveys

➤ Metering and measuring

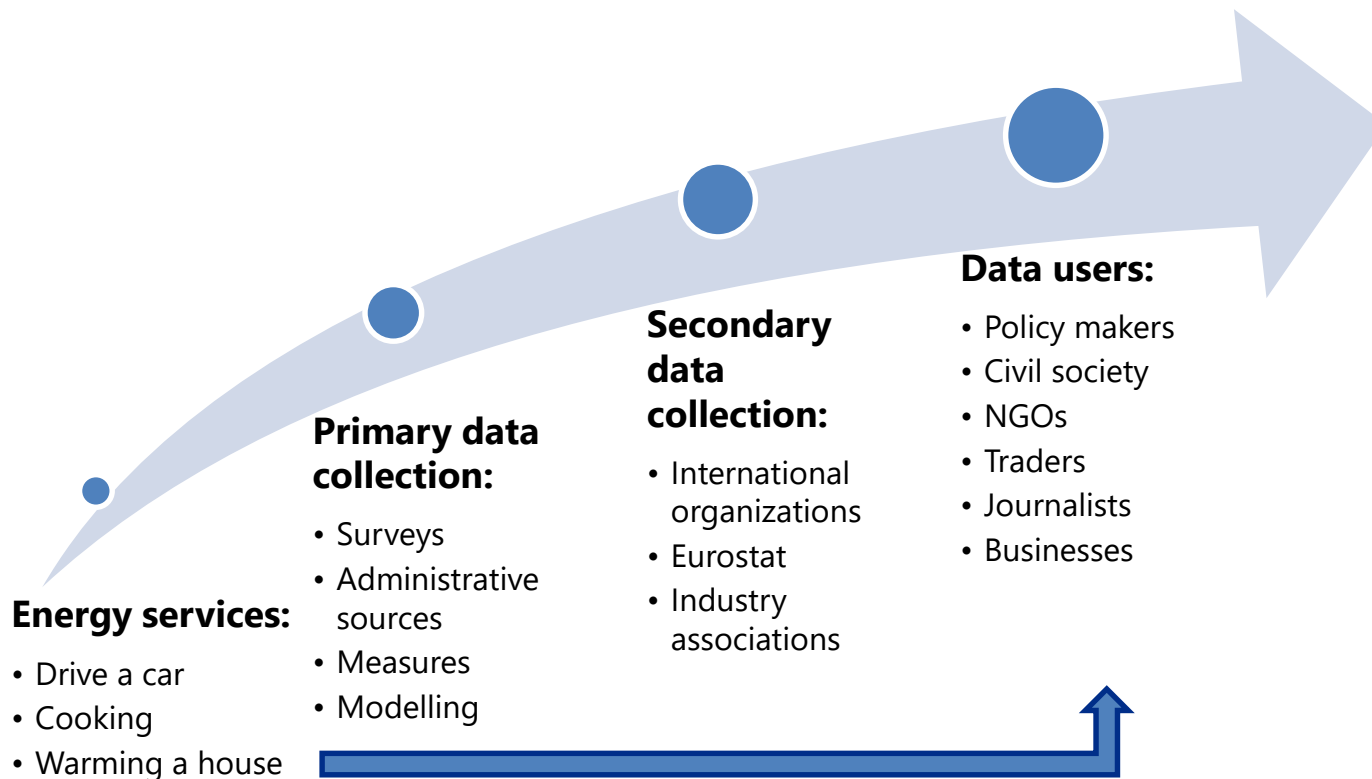
- costly but very effective for monitoring specific equipment efficiency

➤ Modelling

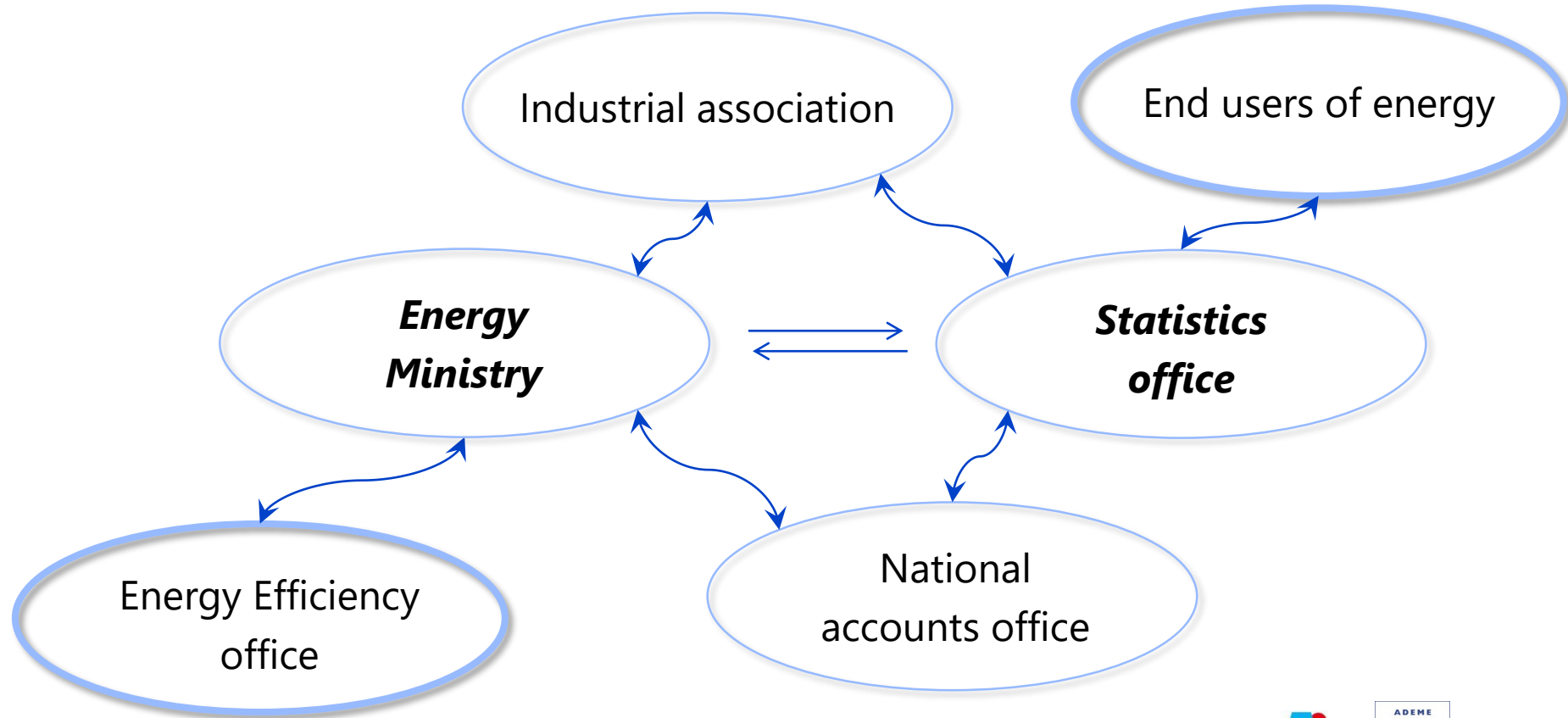
- complementary to surveys or stand alone



Data chain



Collaboration is key



Country Practices Database

Energy Efficiency Indicators Statistics: Country Practices Database

A supplement to the publication *Energy Efficiency Indicators: Fundamentals on Statistics*, this database presents indicators from a variety of OECD Members and non-Members.

Practices are searchable by country and territory, sector, methodology and type of available documentation; organisations to develop their own energy efficiency indicators programmes.

Countries, territories and economies	Sector	Methodology	Available content
☐ Albania ☐ Australia ☐ Austria ☐ Belarus ☐ Belgium ☐ Bosnia and Herzegovina ☐ Brazil ☐ Bulgaria ☐ Canada	☐ Industry ☒ Residential ☐ Services ☐ Transport	☐ Administrative sources ☐ Measuring ☒ Modelling ☒ Surveying	☐ methodology ☐ project web site ☐ questionnaire ☐ report ☐ results

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

Energy Efficiency Indicators Statistics: Country Practices Database

36 results found
(Tip: sort columns by clicking on the column header)
Perform another search

Filter:

Practice	Countries and territories
8/Su/01	Albania
8/Su/02	Austria
8/Su/03	Belgium
8/Su/04	Portugal, Belgium, Bulgaria, Czech Republic
8/Su/05	Canada
8/Su/06	China
8/Su/07	China
8/Su/08	Croatia
8/Su/09	Croatia
8/Su/10	Czech Republic

Information for country practice (R/Su/05)

Background	
Country	Canada
Sector	Residential

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

Contact us and share your practice!

<https://www.iea.org/eeindicatorsmanual/>

Sample/Population size	21 699/712 952 250
Response rate	43%
Time to complete	60 minutes
Mandatory	No
Incentive	None

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www.nrcan.gc.ca

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Energy Use - Supplemental

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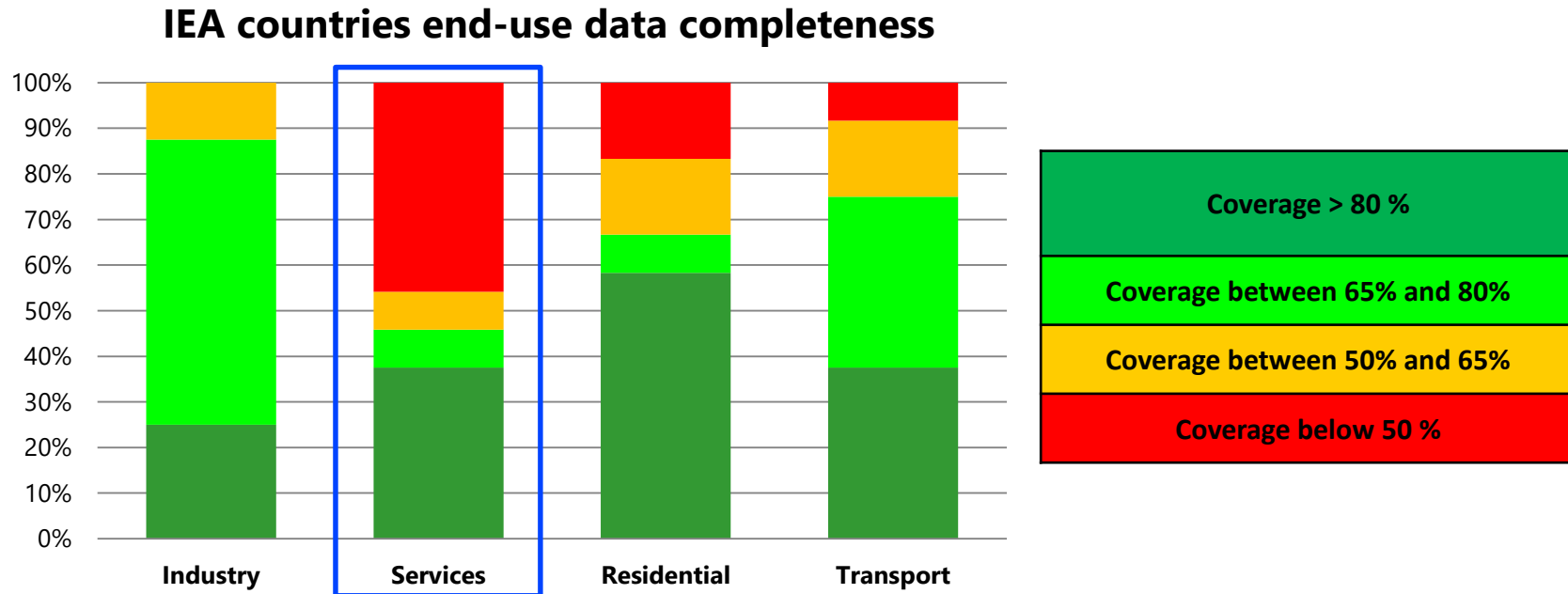
Section: Sport recreation vehicles / Outdoor equipment

Have you / Has anyone in your household owned any of the following recreational vehicles in the last 12 months?

FAQ
All-terrain vehicle (ATV)
Snowmobile
Dirt bike or motocross motorcycle
Snowmobile, watercraft, etc. - a vehicle or jet-ski

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

Current status



The services sector is the one with lowest coverage among IEA member countries

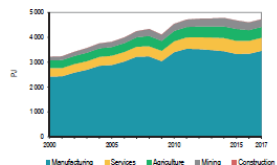
Expanding energy efficiency indicators beyond IEA

BRAZIL

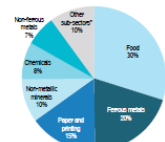
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	2 425	343	450	1 953	424	1 942
2017	3 459	487	743	2 892	502	1 892

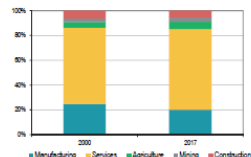
Industry and services energy consumption



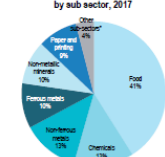
Manufacturing energy consumption by sub sector, 2017



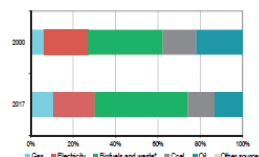
Value added** by sector



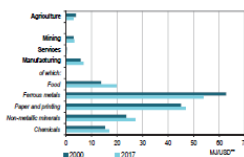
Manufacturing value added** by sub sector, 2017



Manufacturing energy consumption by source



Selected energy intensities

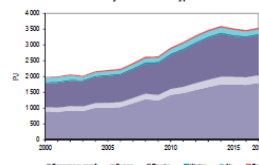


BRAZIL

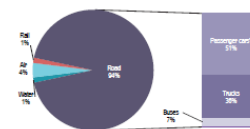
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion passenger km)	Freight transport (billion tonne km)	Load of trucks* (tonnes/truck)
2000	1 139	542	574	375	NA
2017	2 171	1 374	1 909	1 394	NA

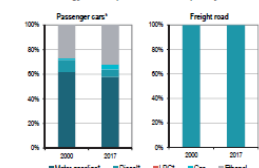
Transport energy consumption by mode/vehicle type



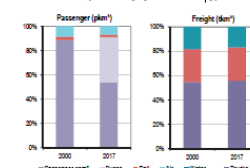
Transport energy consumption by mode/vehicle type, 2017



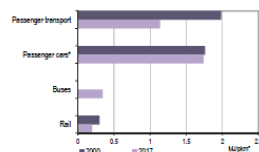
Energy consumption in road transport by source



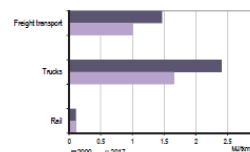
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport



This edition of the Energy Efficiency indicators database includes for the first time data for Brazil



Remarks and discussion

- Detailed end-use and activity data are vital for energy demand policy and planning, across sectors and end uses, and collaboration is key
 - **How is the data collection system implemented in your country ?**
 - **What are the biggest challenges and barriers that you face ?**
 - **How can the G20 initiative help overcome those barriers ?**

The IEA is keen in developing a closer collaboration across G20, including establishing new work with non-member countries.

