



International
Energy Agency

Development and Use of Energy Efficiency Indicators

The IEA indicator approach

**International Round Table on Energy Efficiency Metrics and
National Energy Efficiency Assessment in Developing
Countries**

3 June 2010, Washington, DC

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Overview of IEA Indicators Work

- **Establish a harmonised framework for data collection and analysis**
 - **Harmonisation => Comparability**
 - **Comparability => Understanding of global trends and drivers**
- **Produce meaningful cross-country analysis to provide guidance to policy-makers on:**
 - **Underlying drivers (economic activity & structure, income, prices...)**
 - **Trends in energy use and CO₂ emissions**
 - **Energy efficiency opportunities and progress**
 - **Policy effectiveness**

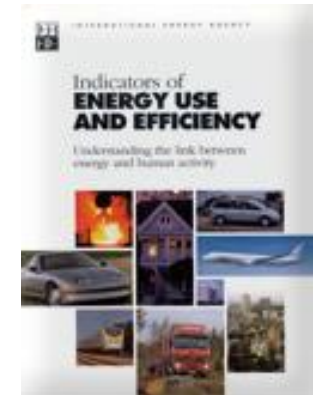
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The Early Days....

- **Data for only 11 IEA countries**
- **Long lags in data availability**
- **Minimal country involvement**
- **Low profile in IEA and non-IEA member countries**
- **Little political support**



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From 2000....Growing interest!

- Increase in countries to 14
- Still long lags in data availability
- Countries more involved, links with ODYSSEE
- 30 years is IEA best-seller
- Growing political interest



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Now....Everyone's a fan

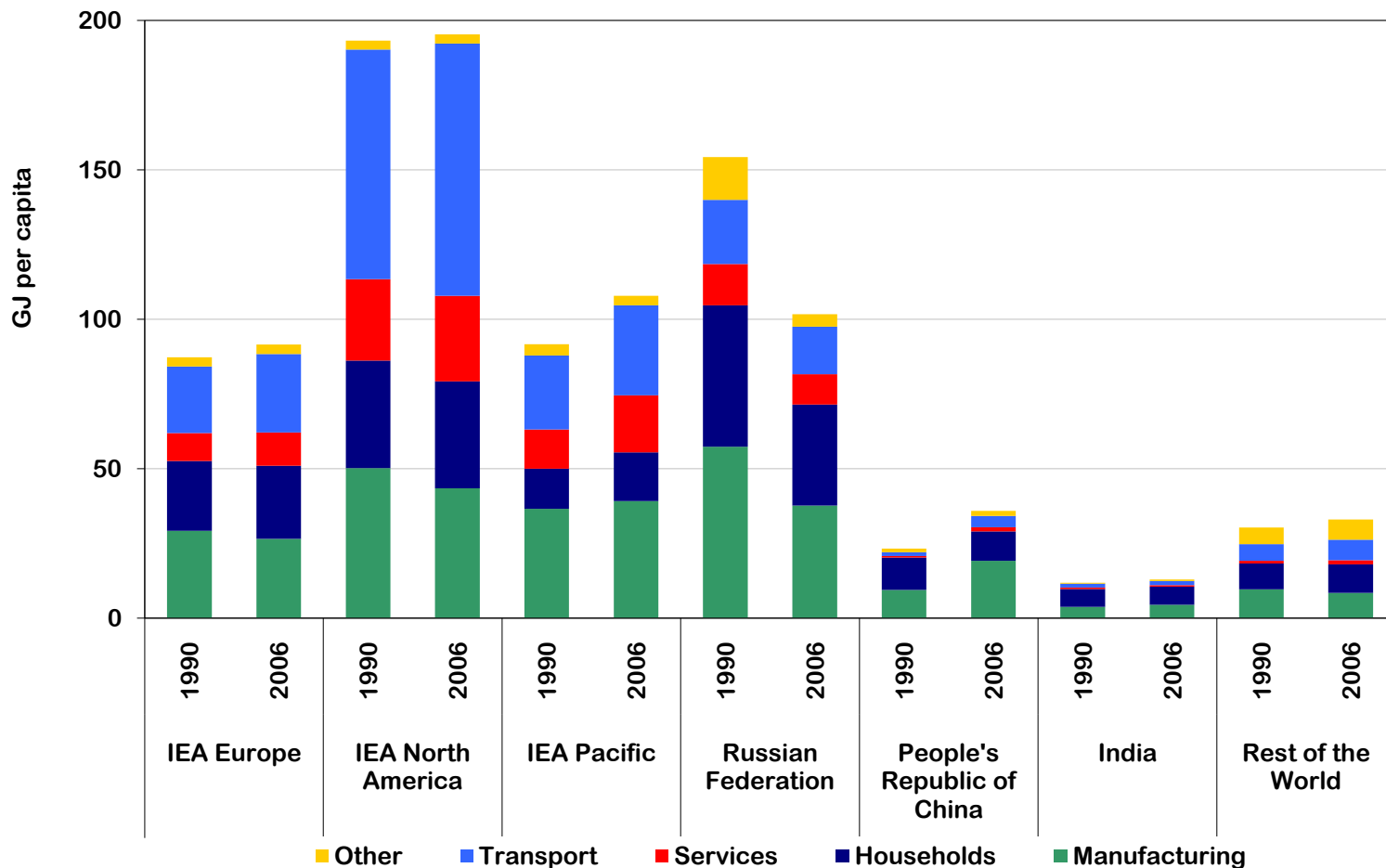
- **Data for 22 IEA countries, start to include others**
- **Lags in data availability reduced**
- **Significant country involvement and strong co-operation with ODYSSEE**
- **Key IEA activity – many reports**
- **Significant political support at highest levels**



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Energy Consumption per Capita



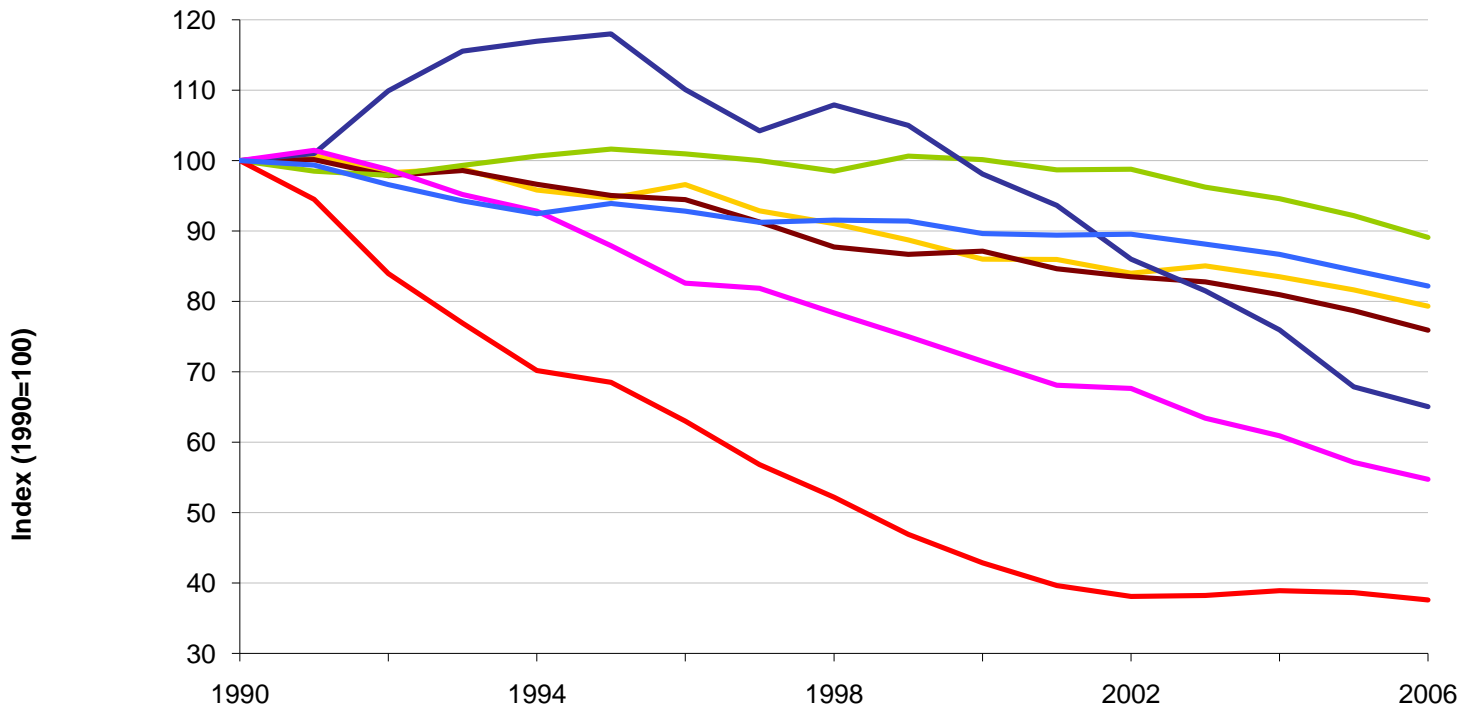
Most countries and regions experienced an increase in their energy use per capita

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Energy Consumption per Unit of GDP

Index for 1990 to 2006



- IEA Europe
- IEA North America
- IEA Pacific
- Russian Federation
- People's Republic of China
- Rest of the world
- India

All countries and regions experienced a decrease in their energy use per GDP

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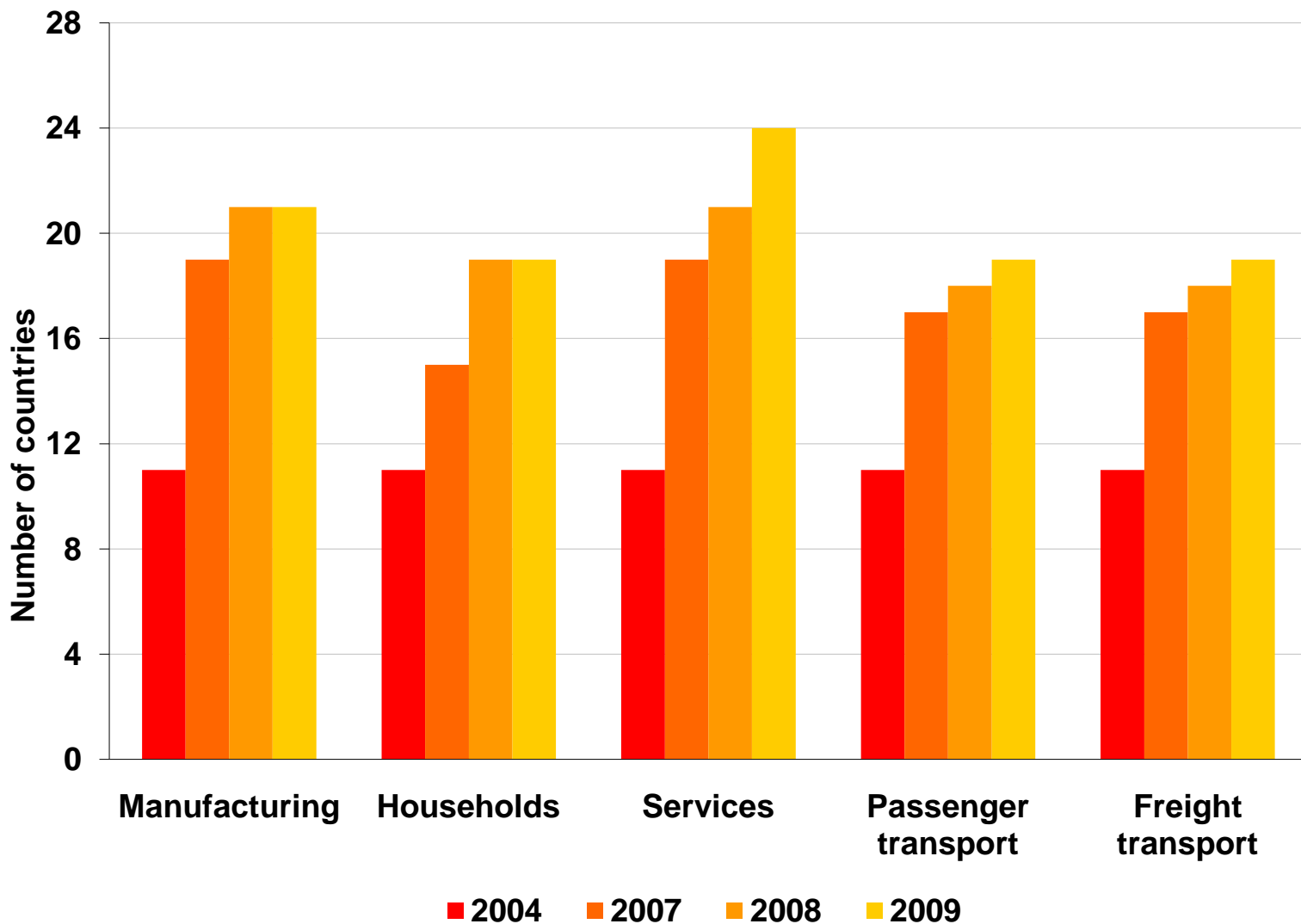
Energy Efficiency Indicators?

- They are tools, based on detailed statistics of end-use energy consumption and activity, to analyse energy use and efficiency trends
- They examine impacts of economic activity and structure, income, prices, policies, etc
- They support national policy-making and are used to shape priorities for future action and to monitor progress
- They can also be used for estimating CO₂ savings, so a key element of environment policy tool

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IEA country coverage by sector and by reporting years



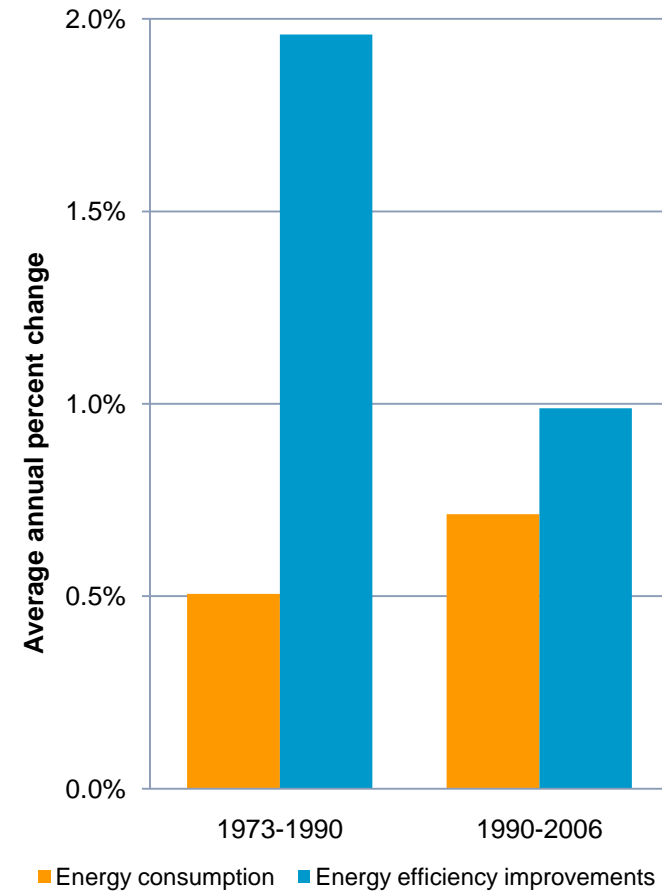
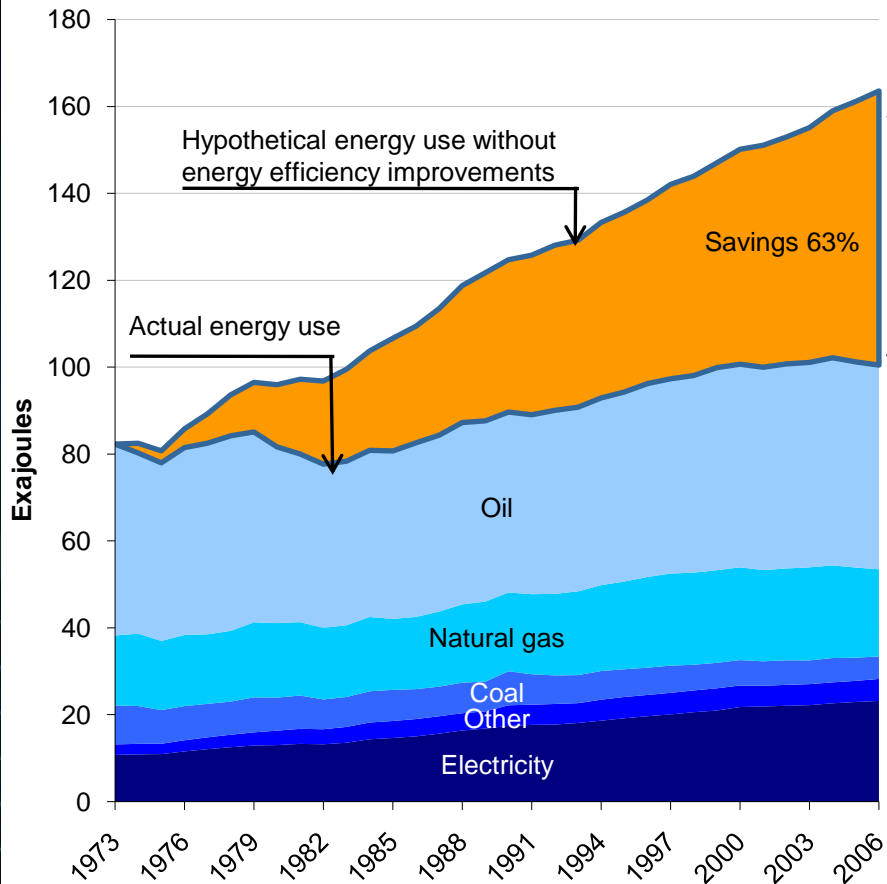
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Highlights energy efficiency and allows progress to be tracked at the country or regional/global level

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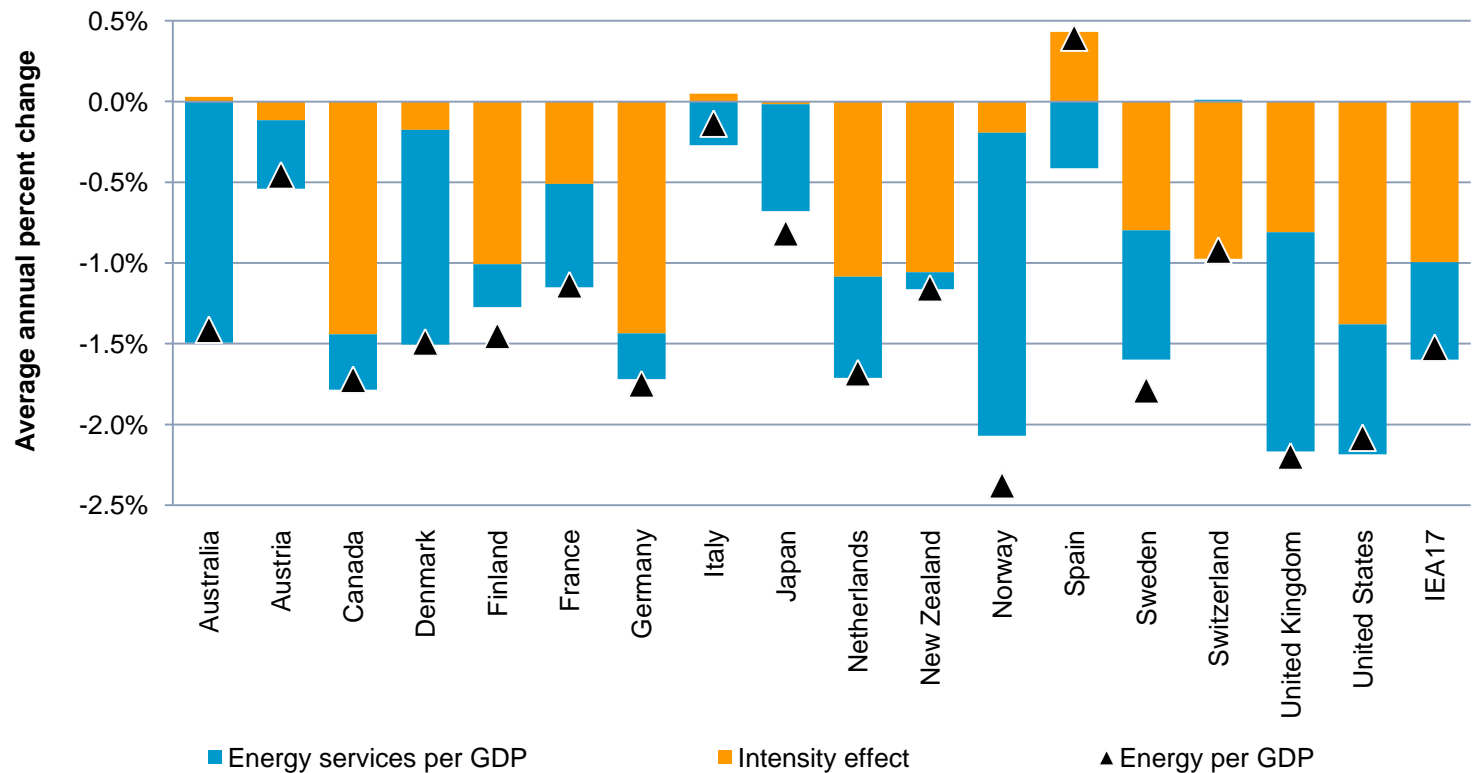
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Policy changes in response to the oil price shocks did more to restrain growth in energy consumption than policies implemented since the 1990s

Explains trends and differences between countries

Contribution of energy efficiency and structural effects to reductions in energy use per unit of GDP



About two-third of the decline in energy per GDP can be attributed to improvement in intensity

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Understanding the Trends in Appliances Energy Consumption

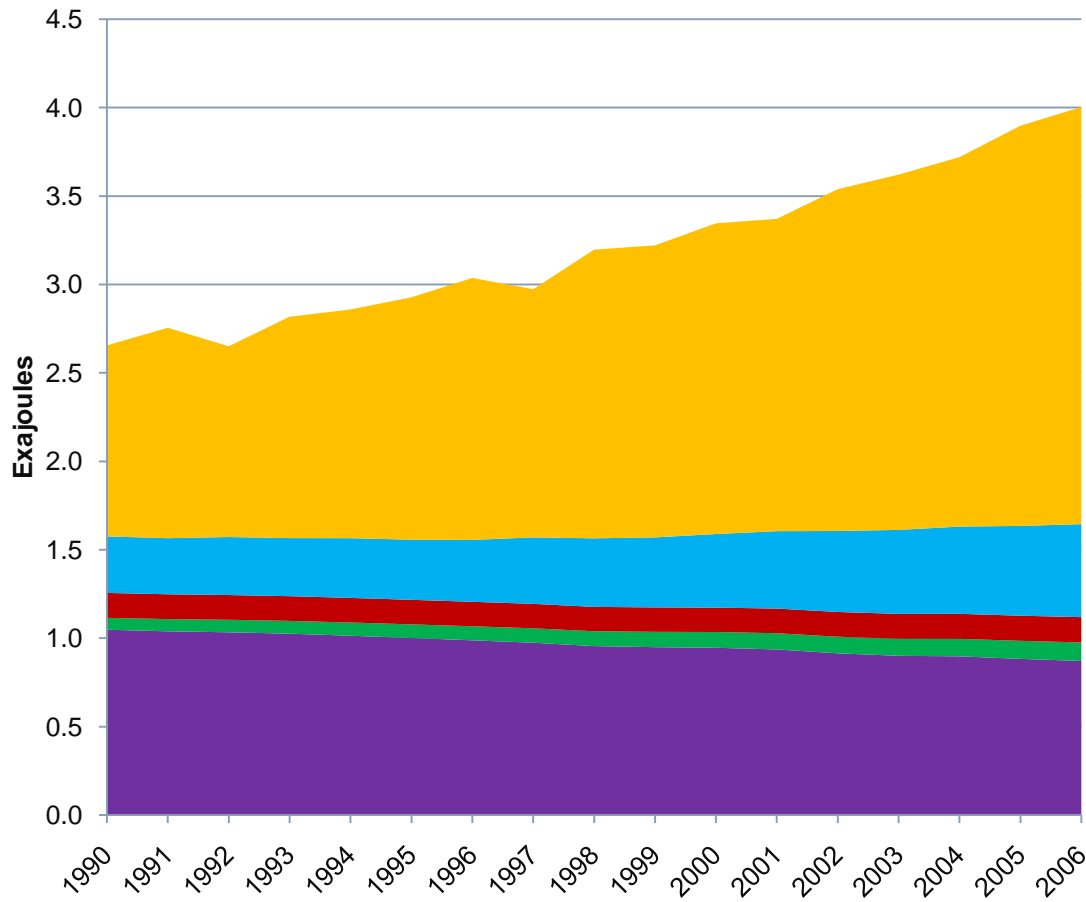
- **Space heating is by far the largest energy consumer, appliances is the fastest growing one**
 - **Appliances has overtaken water heating as the second most important energy-consuming end-use.**
 - **Appliance energy consumption grew by 52% between 1990 and 2006.**
 - **47% of the increase in households energy consumption is attributable to strong growth in appliances.**

Does it means that policies targeting appliances put in place in IEA member countries are not working?

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More detailed information helped understanding major trends in energy consumption



The growth in total appliances energy consumption was entirely due to the increase in small appliances... but little detailed information exists for this category

Energy consumption from large appliances decreased by 11%

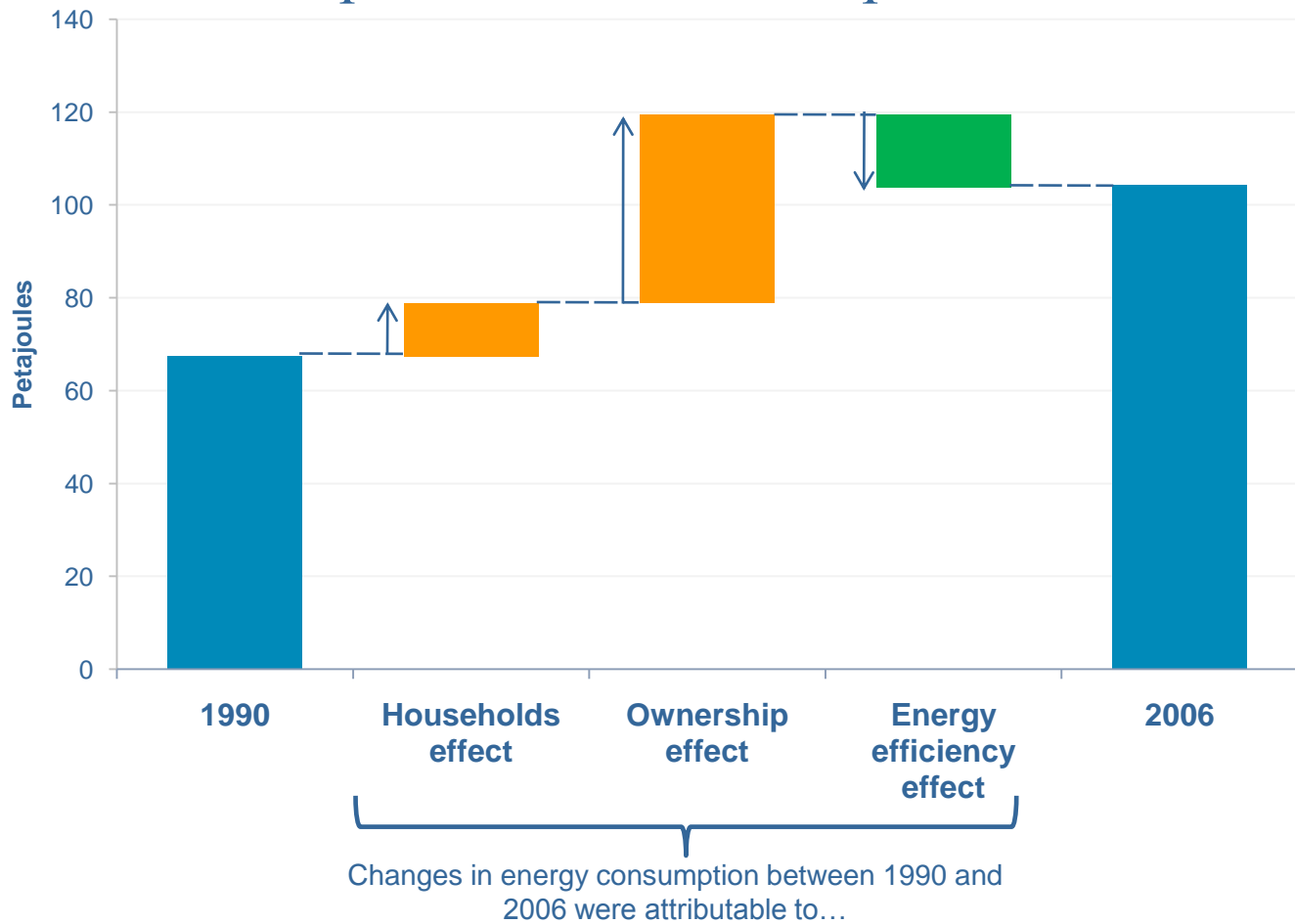
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For large appliances, more information can be obtained by coupling energy consumption data with stock data

For **dishwashers**, the main driver of energy consumption is the ownership effect...

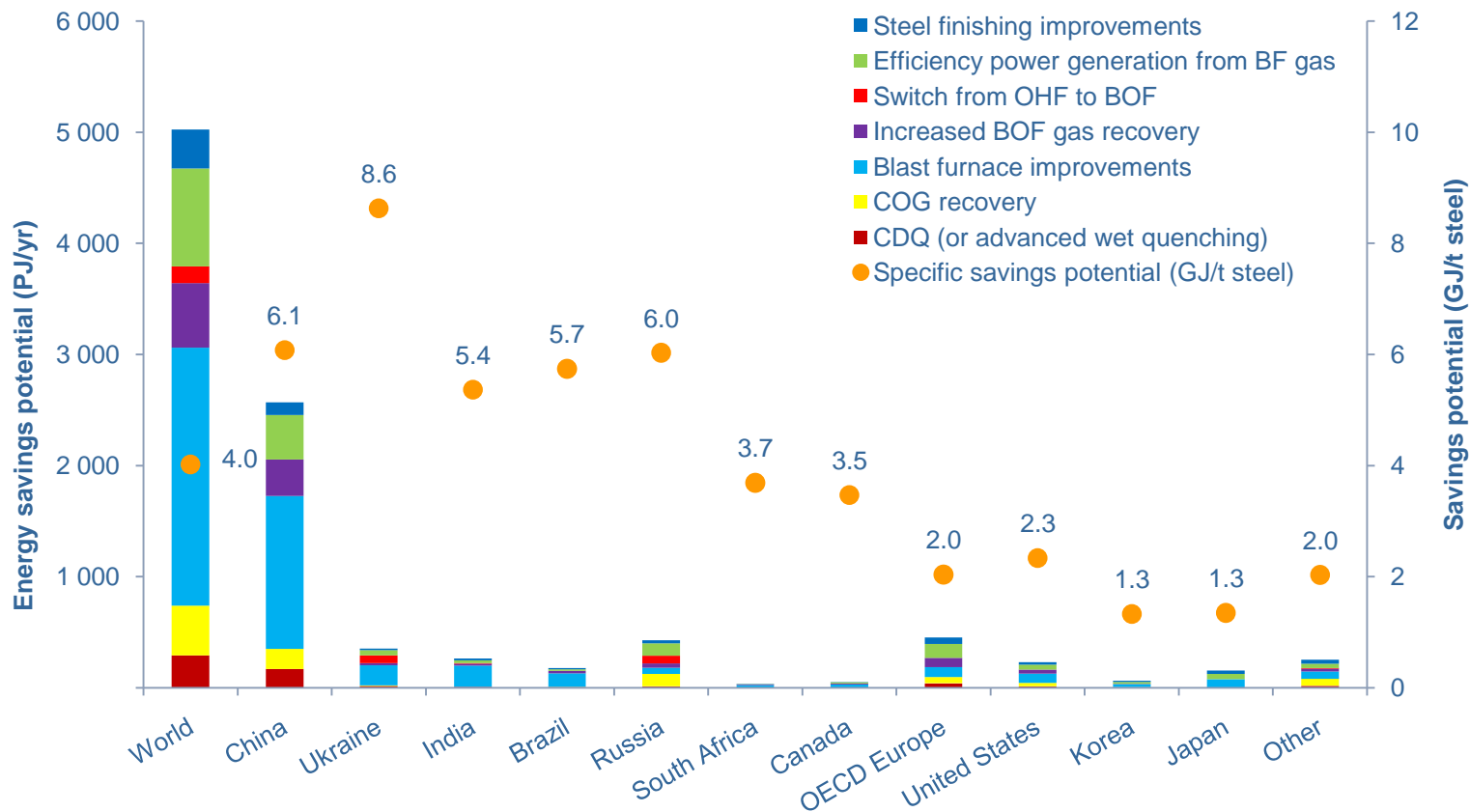


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Identifies potentials for further savings using BAT...

Energy Savings from Introducing Best Available Technology in the Iron and Steel Sector



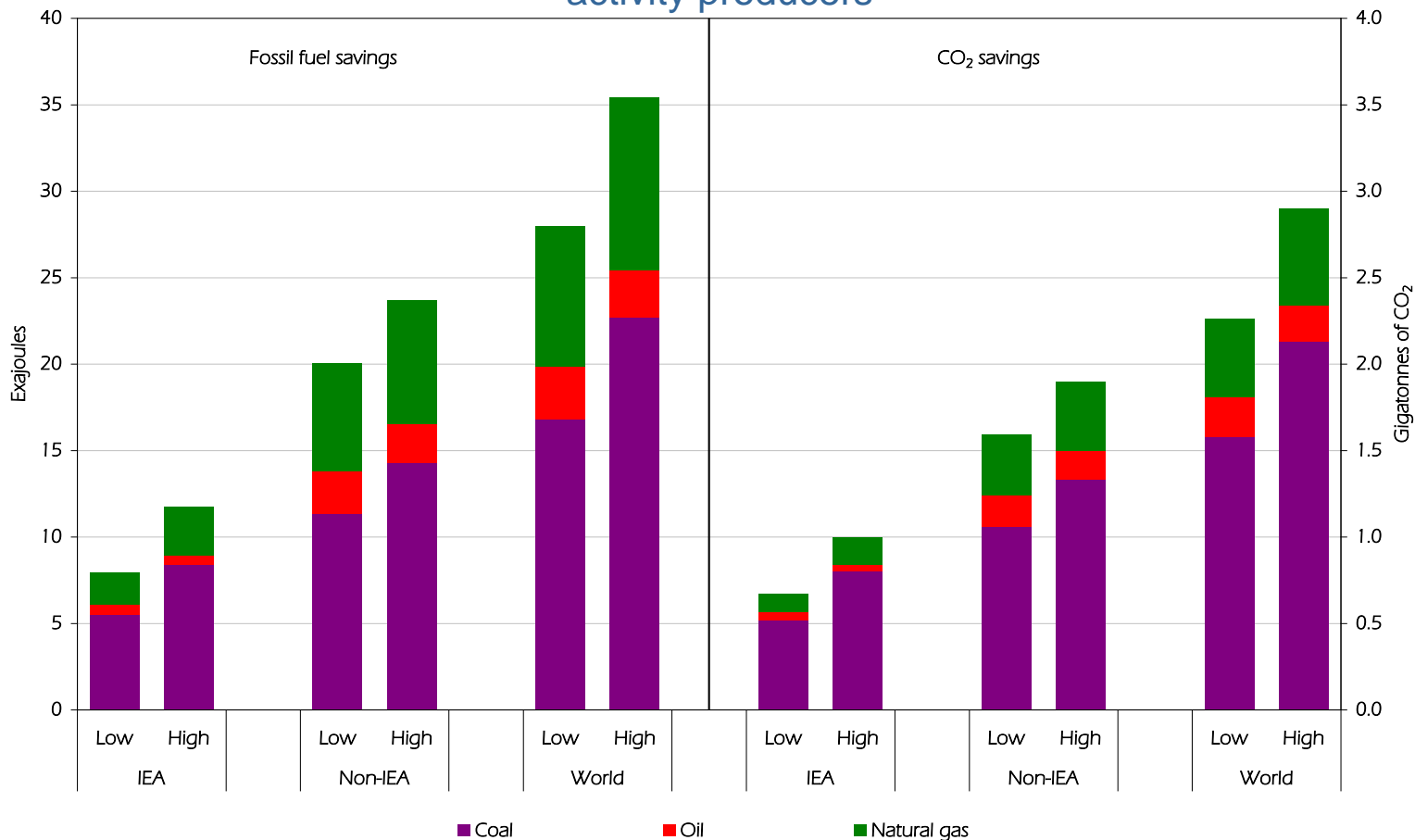
About half the reduction potential is in China, but intensity improvements potential are higher in Ukraine

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...and the technical potential from current best practices

Technical fuel and CO₂ savings potential for main activity producers



Largest potential for improving efficiency is in coal-fired power plants

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Key Conclusions and Policy Messages from Indicators Work

- Indicators are a powerful tool for analysing trends in energy use, and calculating potentials for further savings
- Results show the important role of energy efficiency in shaping patterns of energy use and CO₂ emissions in countries, but gains are often offset by other factors
- Large potential for further energy and CO₂ savings in many industries and power generation (and other sectors)
- Urgent need for governments to enhance framework for monitoring end-use energy consumption and address the gaps in available statistical data

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Progress has been achieved through co-operation

- **Member and non-Member countries**
- **ODYSSEE network**
- **APEC**
- **OLADE**
- **Industrial associations**
- **WBCSD**
- **ISO/IEC**
- **World Bank**
- **United Nations**
- **Asia Pacific Partnership**


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From a concept to a concrete proposal



Discussions with a other key organisations involved with indicators ODYSSEE, APEC, LBNL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	 Draft Energy Efficiency Indicators Template/Questionnaire															
2																
3																
4																
5																
6																
7																
8																
9	COUNTRY DATA															
10	MACRO ECONOMIC DATA															
11	COMMODITIES Outputs of the major energy-consuming industries															
12	INDUSTRY Energy consumption under ISIC categories															
13	SERVICES Energy consumption by services and other services data															
14	RESIDENTIAL Energy consumption by households and other residential data															
15	TRANSPORT Energy consumption in transport and other transport data															
16																
17	IEA DATA															
18	ELECTRICITY GENERATION Electricity generation from combustible fuels and efficiencies															
19	BASIC INDICATORS															
20																
21	SUPPORT SHEETS															
22	USER REMARKS															
23	DATA COVERAGE Completed vs. expected data															
24	SINGLE LINE GRAPHS															
25	MULTILINE GRAPHS															
26	CHECKS															
27																

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Basic Excel spreadsheets

A more elaborated template
(menu driven, built in graphs, ...)

An electronic manual is under development

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Energy Efficiency Indicators

International Energy Agency

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User Guide

The template at a glance

The purpose of the template is to collect energy- and activity-related data in order to build energy efficiency indicators for the different sectors of a country's economy:

- › Industry
- › Services
- › Residential
- › Transport

By dividing the energy consumption of one sector by a measure of this sector's activity, such as the value-added generated or the quantities of physical output produced, one can calculate the intensity of the sector and monitor the trends in energy efficiency.

Structure of the template

The template is divided into three parts:

- › Country data sheets (MACRO ECONOMIC DATA, COMMODITIES, INDUSTRY, RESIDENTIAL, SERVICES, TRANSPORT) that are to be filled
- › Information sheets (ELECTRICITY GENERATION, BASIC INDICATORS) showing data from the IEA used to calculate basic indicators

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Continued Political Support

Support was also expressed by the Ministers at the IEA's Ministerial meeting in October 2009

- **Invited the IEA to strengthen its work on energy efficiency and renewable energy statistics and indicators.**
- **Announced they will provide, annually, end-use data and statistics needed for developing energy efficiency indicators based on the template developed by the IEA in concert with international experts.**

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Future Plans – to be released in 2011-2012

- **Energy efficiency indicators report (March 2011)**
- **Manual on Statistics for Energy Efficiency Indicators**
 - **Similar to the IEA Statistics Manual**
 - **Will provide guidance on what data to collect**
 - **Will try to give guidelines and examples based on real cases on how to collect those data**
 - **Will give to the reader or user a “catalogue of methodologies” for collecting the data necessary to build the desired indicator**
- **Manual on Methodologies for Energy Efficiency Indicators**
 - **Will be a complement of the Energy Efficiency Indicators Statistics Manual**

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Future Plans

- **Improvement of underlying data and information sharing**
- **Formalize the annual data reporting to support indicators**
- **Develop better indicator methodologies**
- **Analyse energy efficiency trends and reduction potentials to support policy-making**
- **Enhance collaboration and outreach**

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Thank you !

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