International Energy Agency
1974•2014

Secure • Sustainable • Together

Energy efficiency indicators

Key recommendations on statistics and policymaking

www.iea.org

Overview of IEA's 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 CO_2 emissions
  - Energy efficiency opportunities and progress
  - Policy effectiveness

Basics of data collection

- **1. Basic principles**
  - Do not collect statistics for the sake of collecting statistics; collect only what is necessary.
  - Identify which data already exist before embarking on a costly collection programme.
  - Learn from the experience of other countries

- **2. What sectors and end uses to consider?**
  - First decide which policy questions should be answered
  - Make use of energy balances for an overview of the country's consumption
  - Disaggregate data further, to understand which sub-sectors or end uses drive energy consumption within each of the sectors.

How to collect data

Administrative sources

Pros	Cons
• Avoid cost of a new data collection process • Relatively quick availability • Increased synergy between institutions • Raise profile and interest of energy efficiency among various services	• Boundary issues: potential mismatch between definitions and target populations of existing data and data needed • Challenges in establishing and maintaining communication with the source organisation • Potential costs (direct and indirect, such as purchase data, or establish agreements, change data formats, etc.) • Time investment in search for data sources

Measuring

Pros	Cons
• Provides actual energy consumption at end-use or equipment level • High accuracy of data collected • Can shed light on actual behavioural patterns • Can be a key complement to other methodologies	• High cost of equipment • Small sample of population and time/lack of representativeness • Possible malfunctioning of equipment • Difficulties in finding volunteers

Surveying

Pros	Cons
• Relatively cost-effective, given extensive information collected • Ad hoc design of items collected based on purpose • Representativeness/statistical significance • Overall, comprehensive and good quality information	• Potentially high absolute cost • Time consuming • Need for further estimation work (e.g. extrapolation between years) • Risk of incomplete responses, biases, sampling errors • Requirement of staff training

Modelling

Pros	Cons
• Cost-effective • Designed based on purpose • Can consolidate data from multiple sources • Can provide estimates of variables that cannot be measured • Allows validation of bottom-up estimates against national energy statistics	• Relies on availability of input data • Depends on quality of input data • Depends on assumptions made • Transparency may be an issue

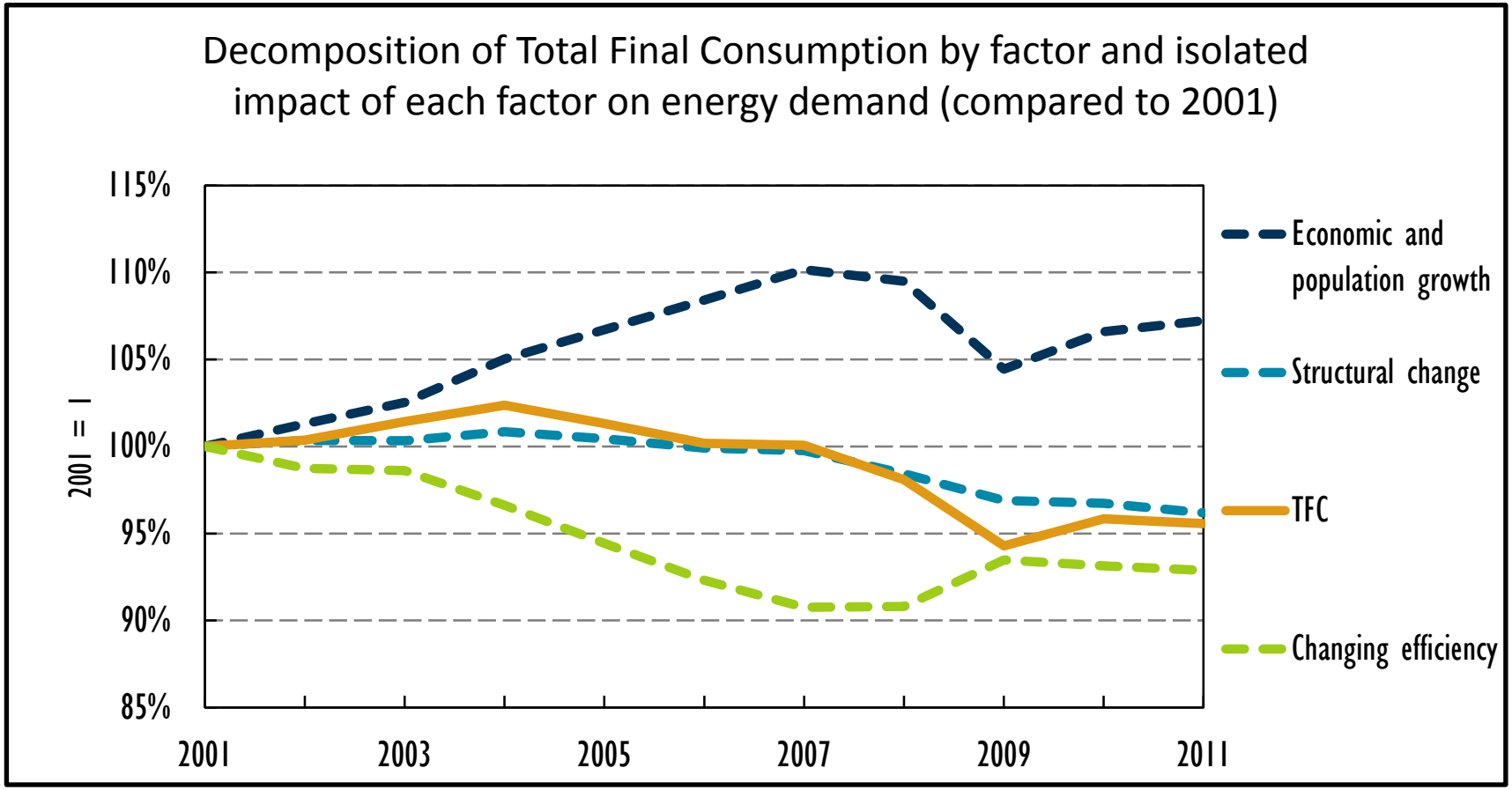
Source: IEA (2014), Energy Efficiency Indicators: Fundamentals on Statistics, Paris, 28-34.

Indicators as a basis for policy

- **Understand the context and policy options: The driving forces-state-response framework**
  - Information about why the end users use energy the way they do: the driving forces of energy demand
  - Information about what currently exists and how it performs: the state of energy consumption
  - Information about policy options and potential impact: the response that policies should enable.
- **Let policy be guided by indicators analysis**
  - Evaluate the impact of each of the elements on energy consumption
  - Determine which elements have the largest potential to reduce energy consumption
  - Prioritise programmes for the development of energy efficiency policies accordingly.
- **What can the energy efficiency indicators be used for?**
  - Identifying energy efficiency potentials and targets
  - Monitoring progress and evaluating impacts of energy efficiency policies
  - Modelling future energy consumption trends and scenario development

Indicators at work: How different factors are affecting energy demand over time

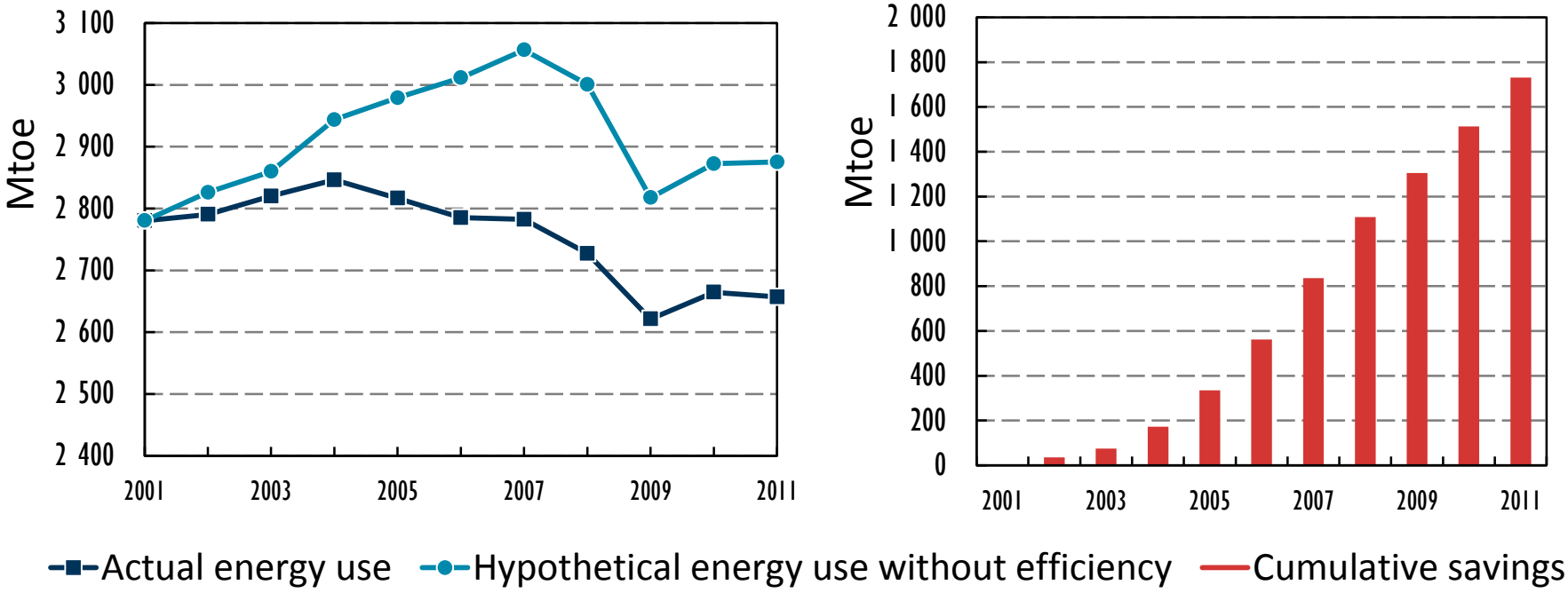
Isolating the role of economy, structure and energy efficiency impacts on TFC



Indicators at work (II): Using indicators to estimate energy savings

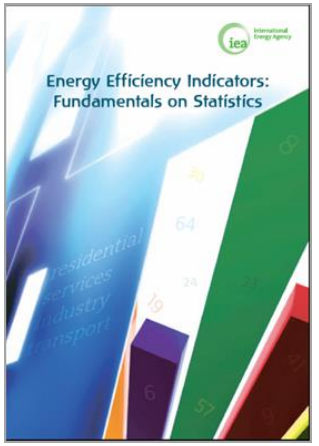
Since 2001 energy efficiency investments saved more cumulative energy (1700 Mtoe) than the annual TFC of the United States and Germany

TFC and hypothetical energy use without energy efficiency improvements since 2001

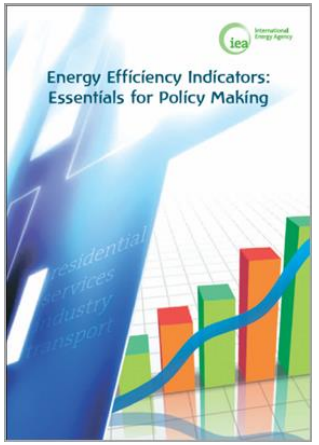


IEA resources on indicators (free download)

- **Fundamentals on statistics**
  - to provide guidance on how to collect the data needed for indicators
  - includes a compilation of existing practices from across the world
  - Download: http://bit.ly/eei-statistics



- **Essentials for policy makers**
  - to provide guidance to develop and interpret energy efficiency indicators
  - Download: http://bit.ly/eei-policy



- **Energy Efficiency Indicators Statistics: Country Practices Database**
  - http://www.iea.org/eeindicatorsmanual