# Update on energy efficiency activities at the IEA

# The Scoreboard

## and other analytical developments

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**Energy Efficiency Indicators Workshop**
Paris, 6-7 June 2012

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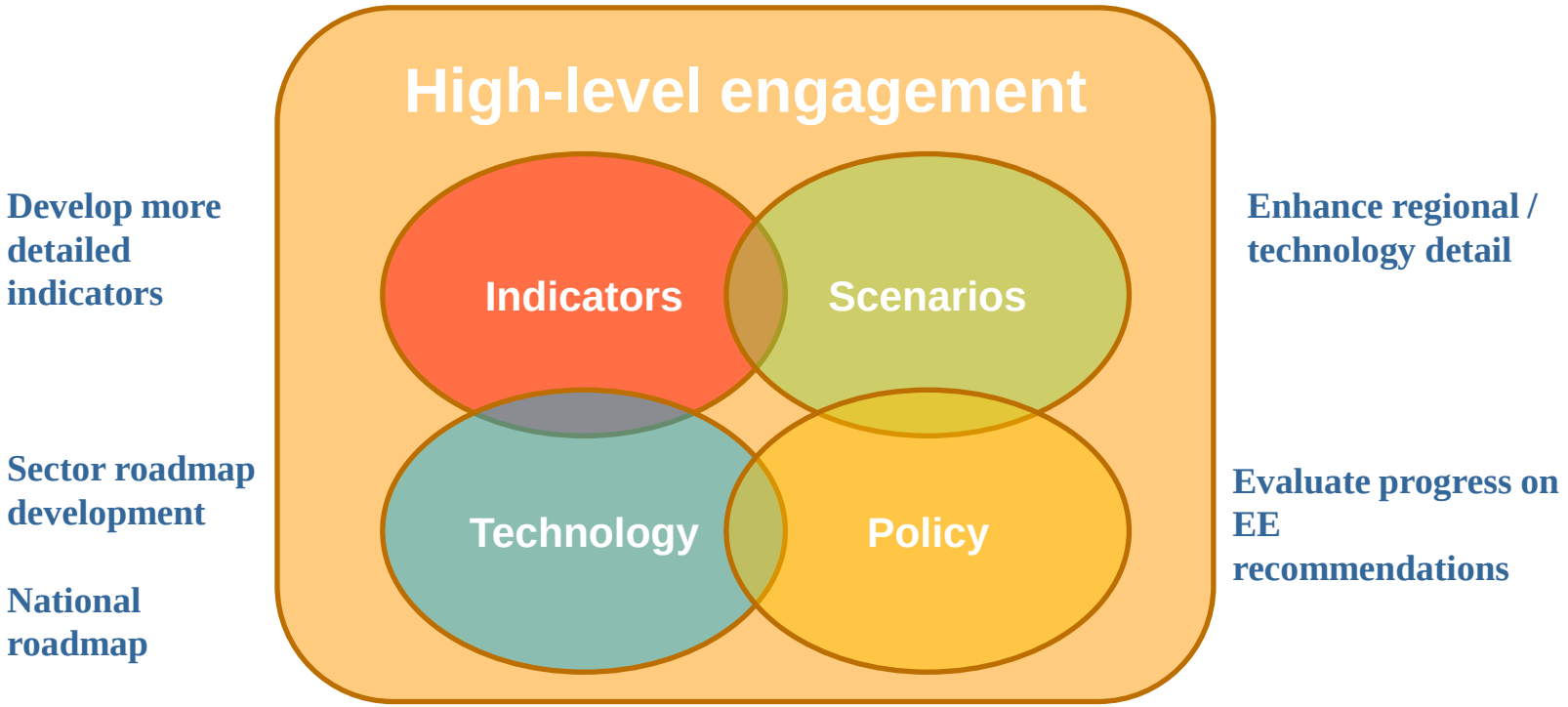
# Development and use of indicators at the IEA




***The IEA has a broad range of activities to help countries exploit cost-effective energy efficiency potentials***

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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 $CO_2$ emissions
  - Energy efficiency opportunities and progress
  - Policy effectiveness

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# The IEA Scoreboard

- Published in October 2011
- The first publication since Minister's endorsement of the template
- Focus largely on energy efficiency in IEA countries
- Provide quantitative indicators
  - General trends
  - Energy intensity in end-use sectors
- Provide qualitative indicators
  - 25 IEA energy efficiency policy recommendations

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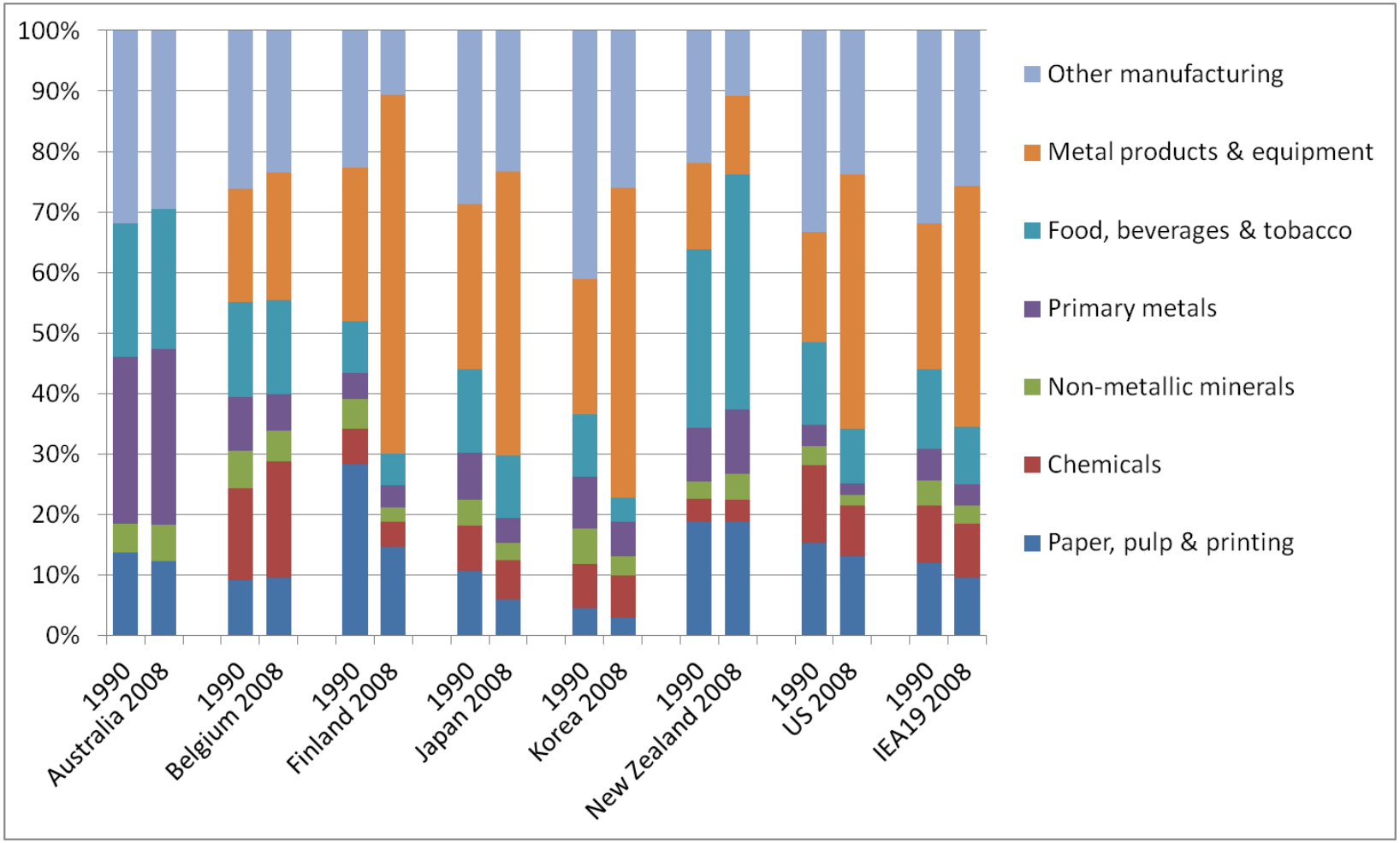
# Key insights from the Scoreboard

## Composition of manufacturing value-added

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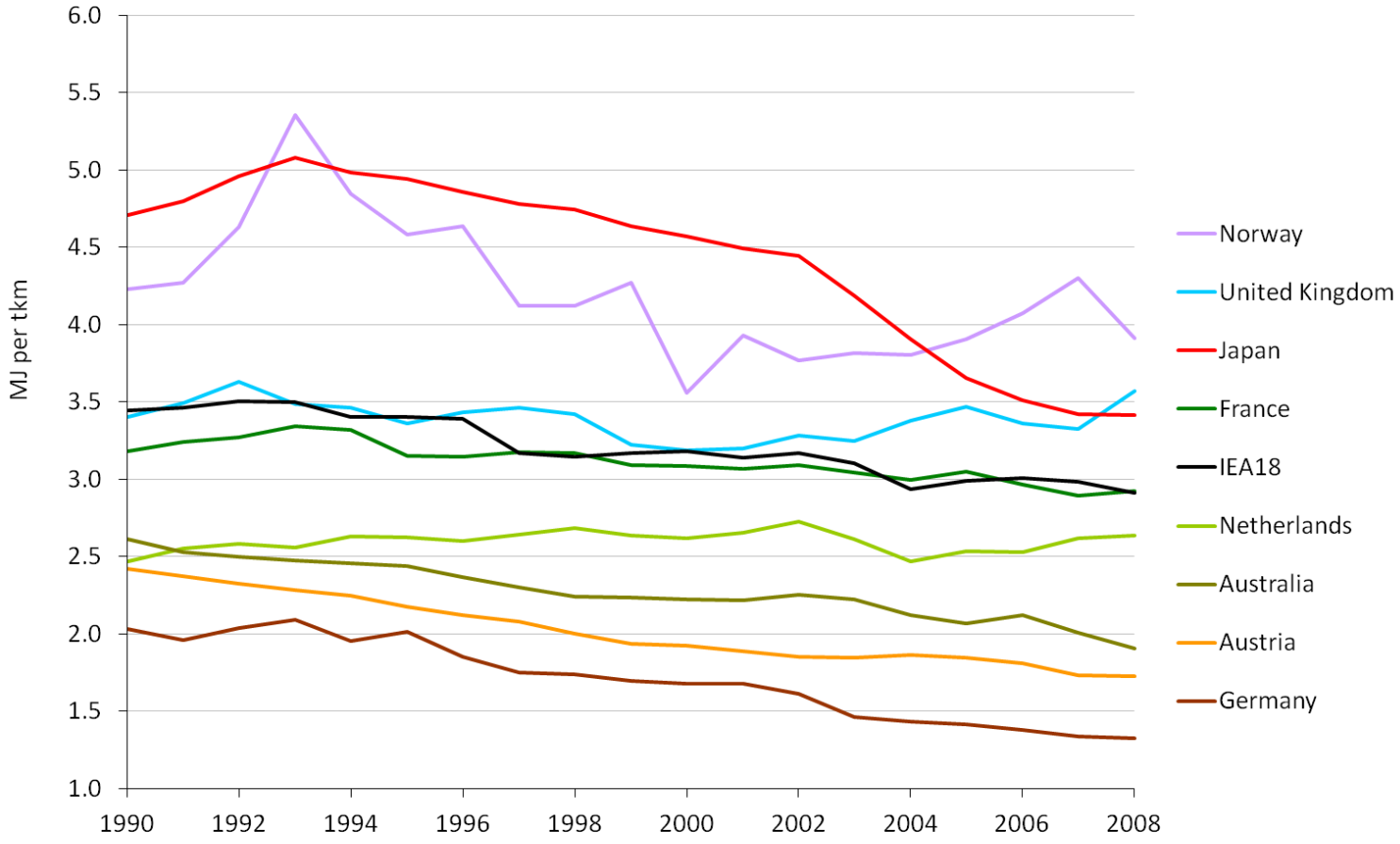
# Key insights from the Scoreboard

## Truck freight intensity

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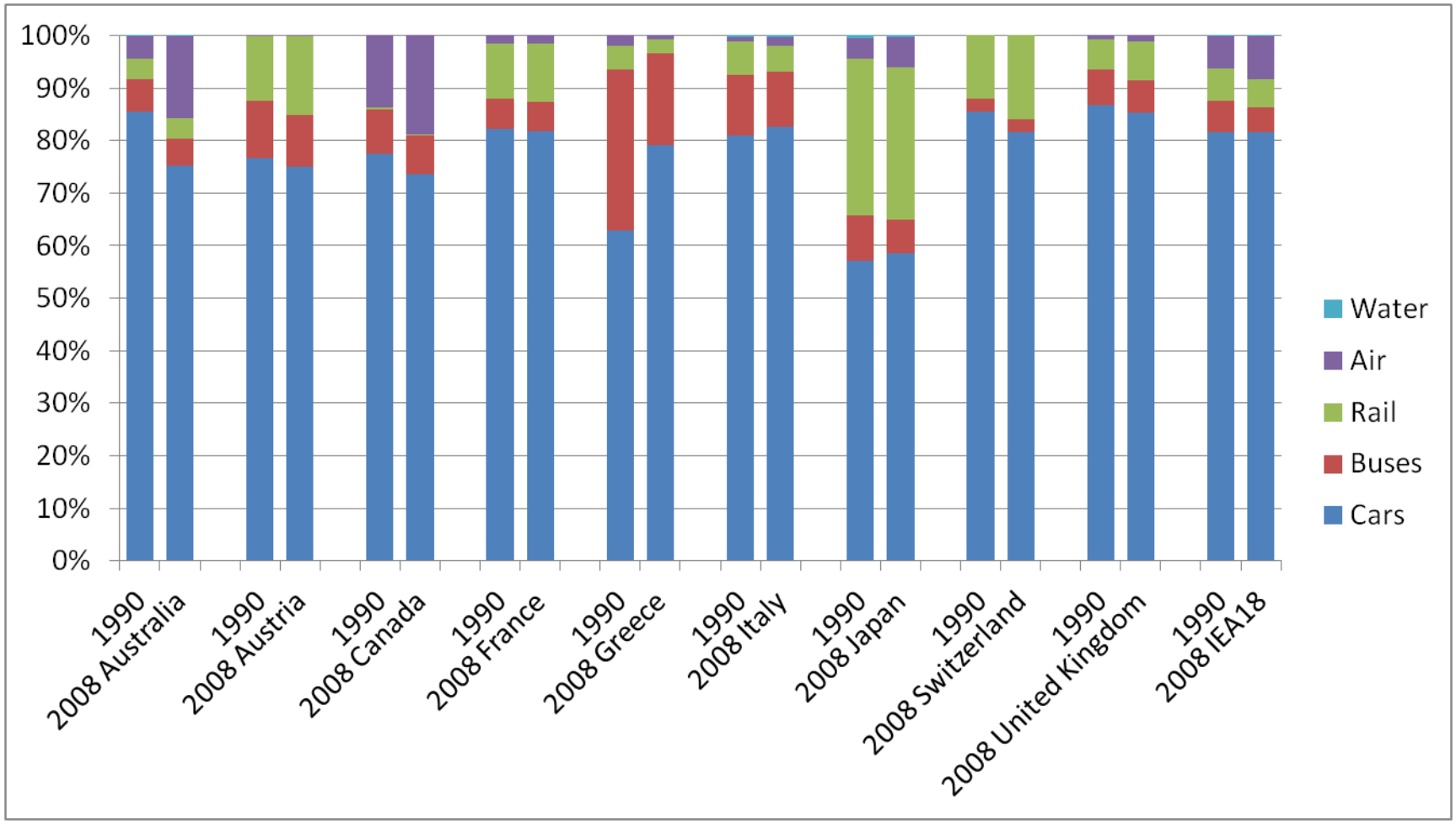
# Key insights from the Scoreboard

## Share of passenger-km per transportation mode

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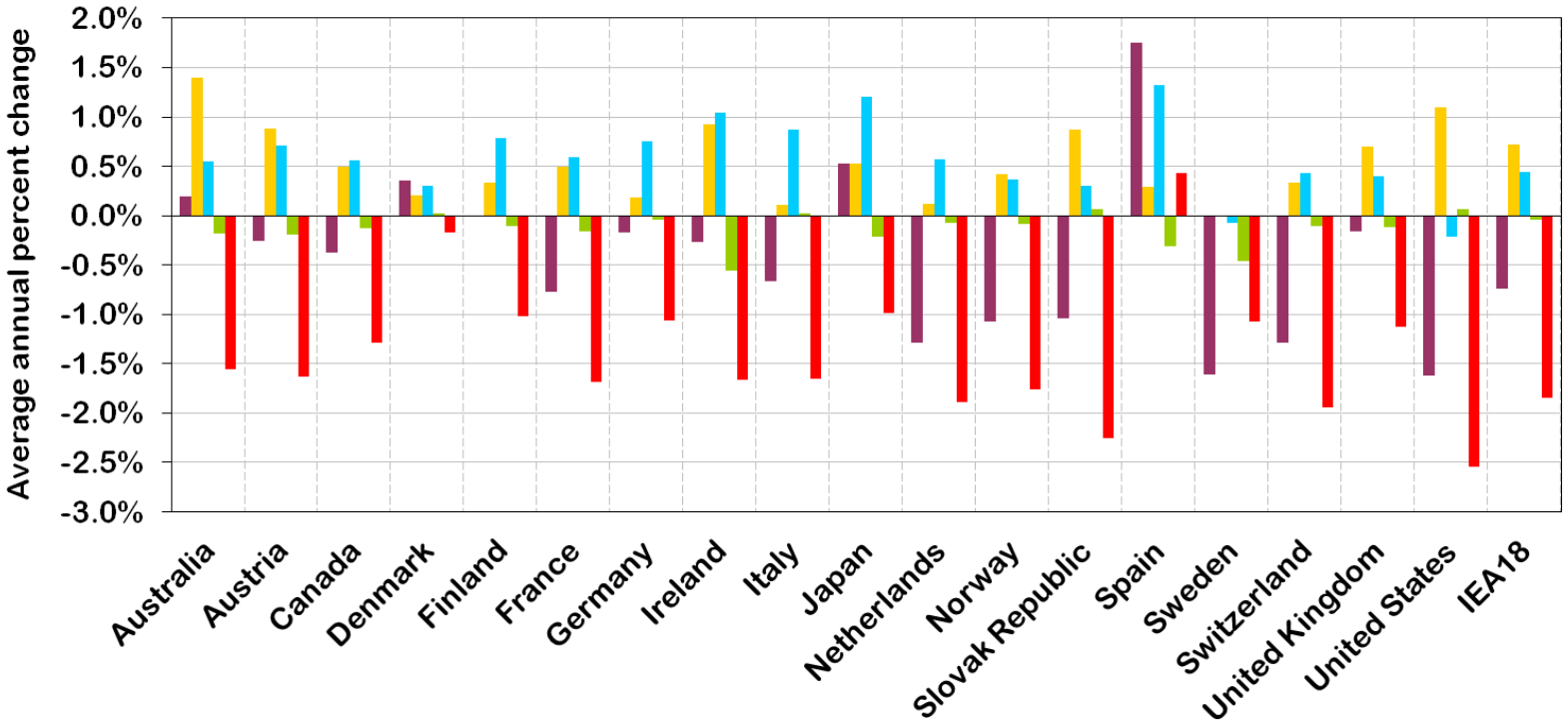
# Key insights from the Scoreboard

## Decomposition of changes in space heating per Capita

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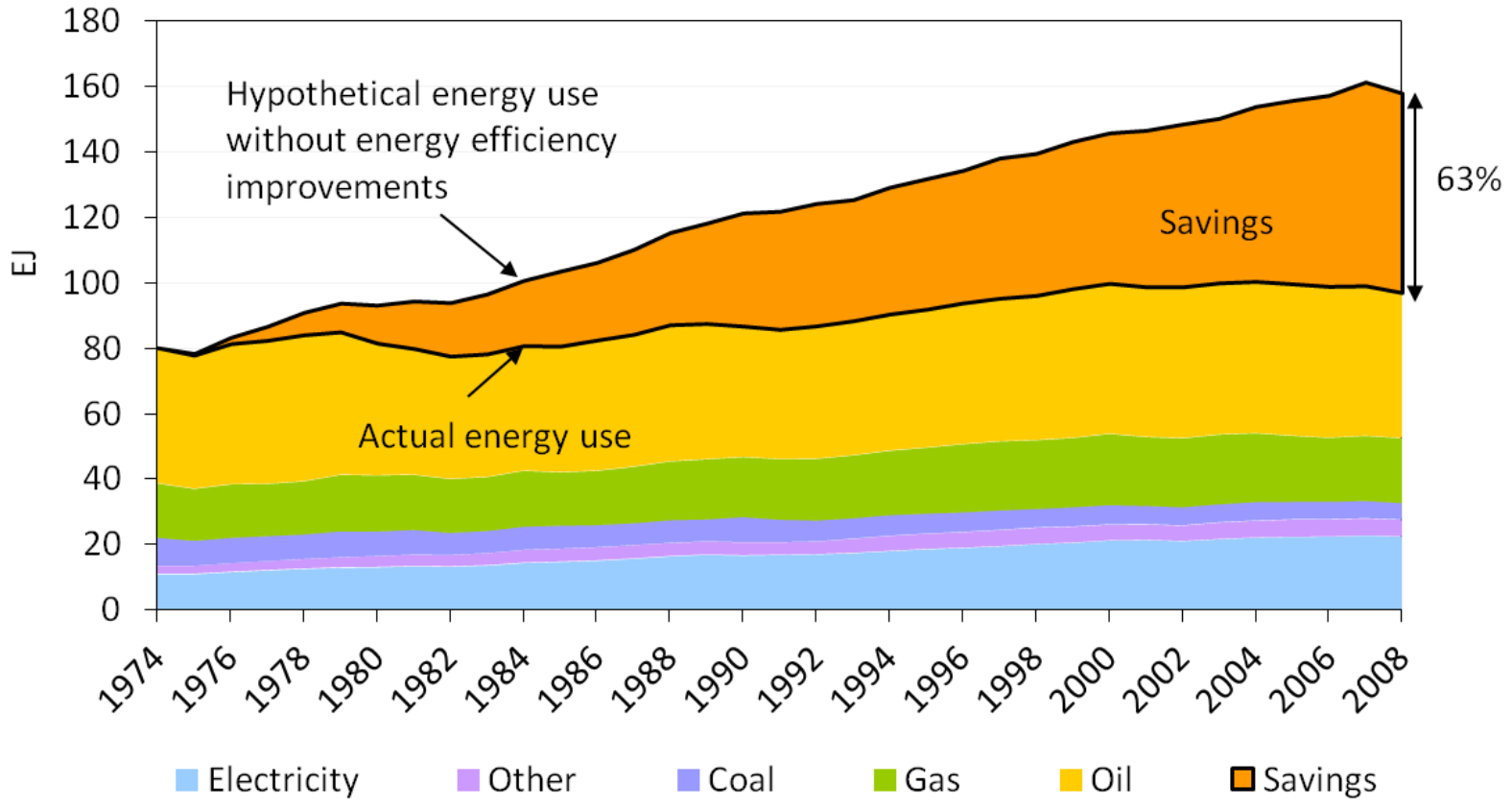
# Key insights from the Scoreboard

## Energy savings from energy efficiency, IEA11

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# Purpose of decomposition

- Quantify relative contributions of the pre-defined factors to the change in energy consumption
  - Most notably energy efficiency
- Track down the origin in energy consumption variations
- Help in measuring effectiveness of energy policy and technology

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# Main components of energy consumption

The changes in energy use within a sector are separated in various components:

$$E = \sum_i^n A \cdot \frac{A_i}{A} \cdot \frac{E_i}{A_i} = A \cdot \sum_i^n (S_i \cdot I_i)$$

i subsector or end-uses within a given sector

- **Aggregate activity A**

  value-added for manufacturing industry and services; population in the household sector; or as passenger-kilometres and tonne-kilometres, respectively, for the passenger and freight transport sectors

- **Sectoral structure S**

  mix of activities within a sector and further divides activity into industry sub-sectors, measures of residential end-use activity or transportation modes

- **Energy intensity I**

  energy use per unit of activity

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# Overview of existing methods

$$\Delta E = E_t - E_0 = \Delta A + \Delta S + \Delta I + \varepsilon$$

- ε is a residual whose magnitude depends on the decomposition method
- Common methods
  - Laspeyres method
  - Paasche index
  - Simple average divisia method (arithmetic mean or Törnqvist formulation)
  - Fischer Ideal
  - Parametric Divisia Method I (PMD I) and II (PMD II)
  - Log Mean Divisia I (LMD I) and II (LMD II)

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# Evaluation of existing methods

| Index | Perfect decomposition | Subsectors additive | Easy to understand |
|---|---|---|---|
| Paasche | No | YES | very easy |
| Simple Laspeyres | No | YES | very easy |
| Refined Laspeyres | YES | YES | moderately |
| Fischer Ideal | YES | No | moderately |
| Simple average/ arithmetic mean/ divisia (Törnqvist) | No | No | moderately |
| Adjusted PMD I and II | No | YES | difficult |
| LMD I | YES | YES | moderately |
| LMD II | YES | No | moderately |

- Laspeyres and LMDI are the preferred methods
  - Laspeyres for its ease of understanding, especially to non-experts, but the the existence of an interaction term is a drawback
  - LMDI for its theoretical soundness

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# Next steps

- **Lots have been accomplished**
  - New analysis based on fist set of data since the 2009 Ministerial
  - Development of training modules
  - New IEA website, more visibility for our indicators
- **More still need to be done… but resources are scarce!**
  - Technical working paper on decomposition methodology
  - New ananlysis based on updated data and decomposition method
  - “Part II” of Manual on energy efficiency statistics
  - Enhance collaboration, visibility and outreach

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# Questions on the Indicators Work Programme?

**Contact the energy efficiency indicators team**

**energyindicators@iea.org**

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