IEA Energy Efficiency Indicators Workshop
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Defining the potential for improvement in energy efficiency and defining indicators to assess and realise the energy reduction potential

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Topics

- What are the different methods and data required to assess energy efficiency potentials?
- How indicators can be used to track progress toward energy efficiency targets?
- What are the main indicators that can be used to assess energy efficiency potential?

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Why assess energy efficiency potentials?

- Long-term targets often set based on the requirement to respond to problems (e.g. -80% GHG reduction in OECD countries, 50% reduction in energy consumption)

- Short-term/intermediate targets set based on "what can be done" (➔ energy efficiency potentials) or what is "politically salable"

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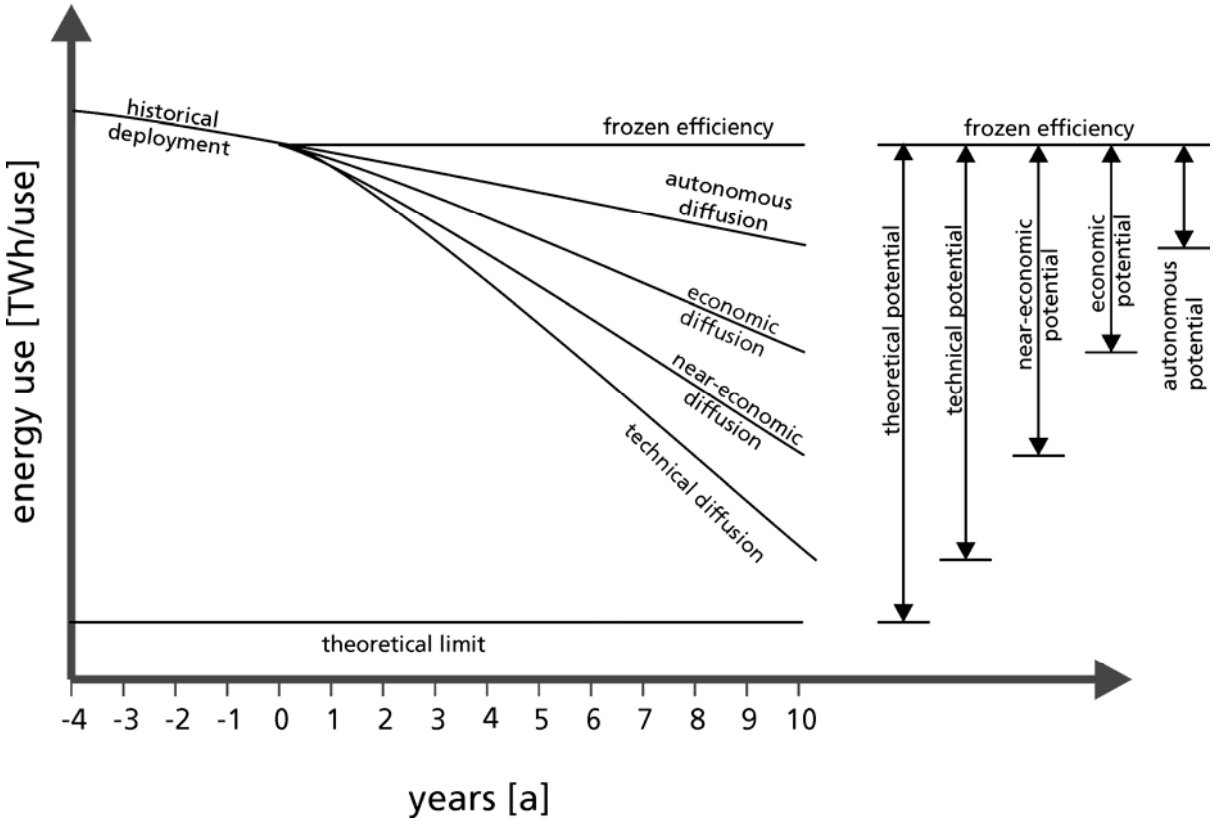
Definition of energy efficiency potentials can be rather complex…

- Market potentials (autonomous progress, impacts of previous policies, impacts of market energy prices)
- Economic/Near economic potential (depending on discount rate)
- Technical potential
- Theoretical limit



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What are the different methods and data required to assess energy efficiency potentials?

- Bottom-up: Scenario approach to the assessment of energy efficiency potentials (investment cycles, cost degression of technologies…):
  Fraunhofer/ENERDATA/ISIS/WI – ESD Potential Study

  ➔ Large need of modelling data

- Top-down-Indicators (Benchmarking indicators)
  - Comparison with (group of) best countries
  - Comparison with Best Available Technology BAT

  ➔ Limited availability and need for data

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How indicators can be used to track progress toward energy efficiency targets

- Main advantages of Benchmarking Indicators to define potentials:
  - Can define targets to be achieved /potentials to be realized
  - Can assess ex-post the progress achieved
  - Can assess distance to target by forecasting indicators

➔**Use the same indicator set for all three purposes: Target setting, ex-post monitoring, forecast of development - coherence of approach!**

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What are the main indicators that can be used to assess energy efficiency potential?

- Examples:
  - Energy Efficiency Potentials Iron/Steel
  - Energy Efficiency Potentials Residential Space Heating
  - Energy Efficiency Potentials Residential Electric Appliances
  - Energy Efficiency Potentials Cars

➔**Most indicator sets can be used to measure potentials. However: very different degrees of detail expressed in indicators**

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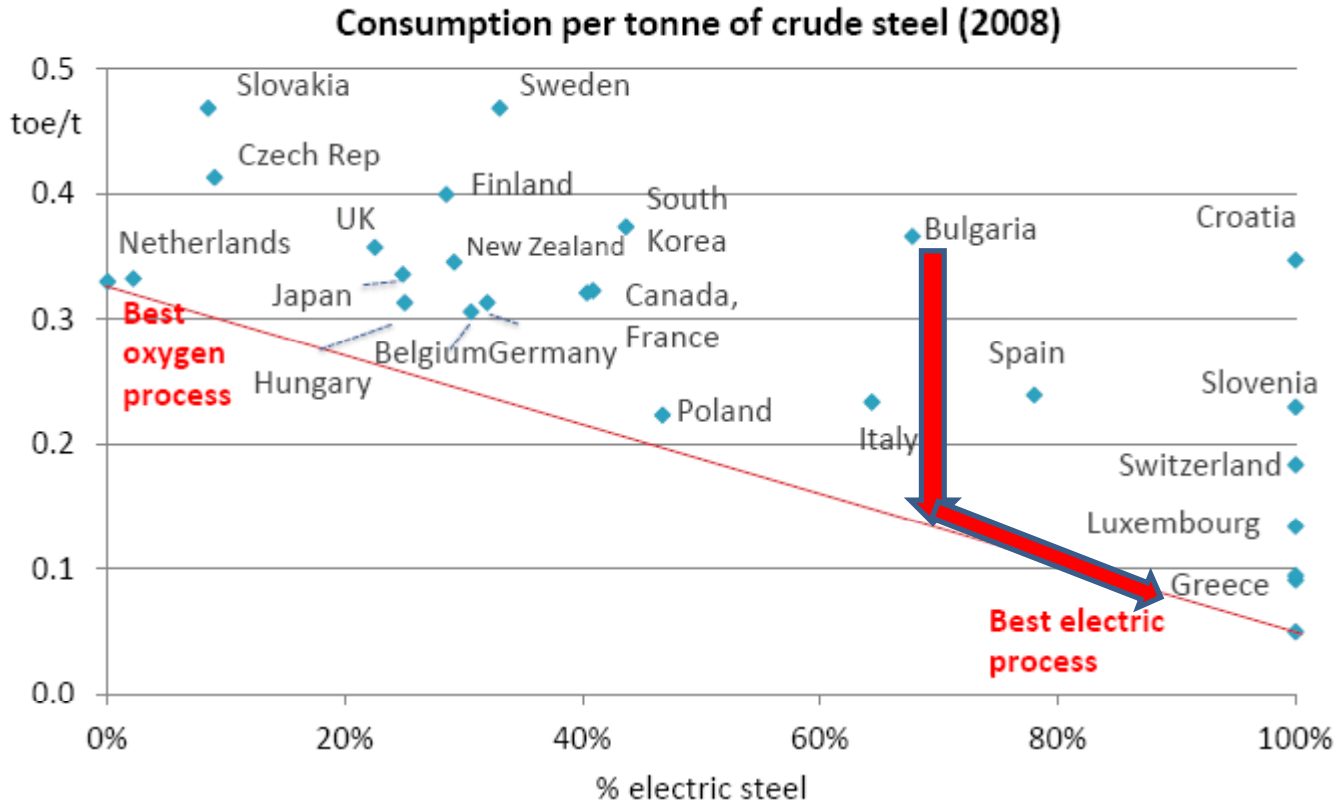
Energy Efficiency Potentials Iron/Steel



Source Odyssee Database 2012

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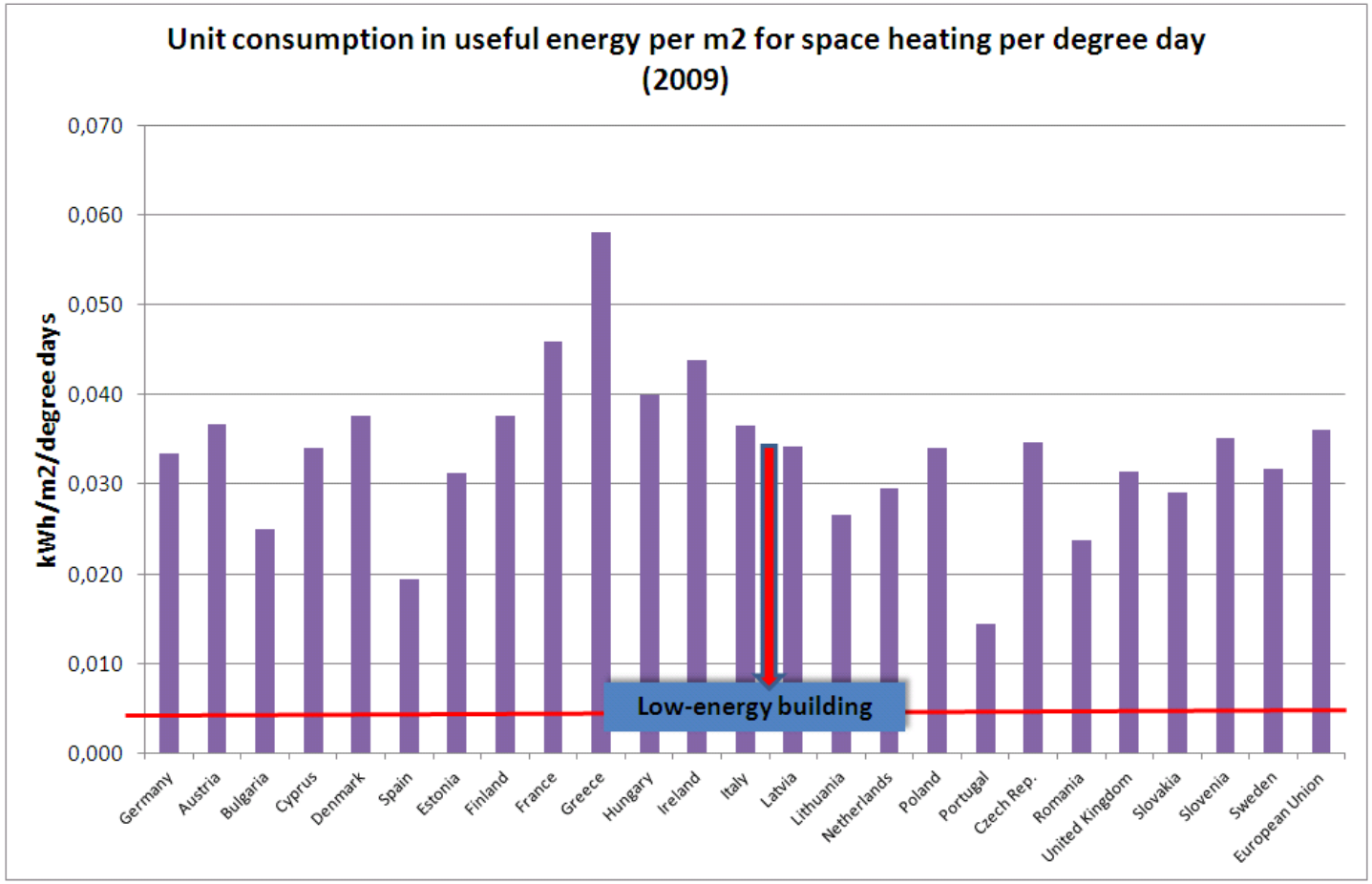
Energy Efficiency Potentials Residential Space Heating



Source Odyssee Database 2012

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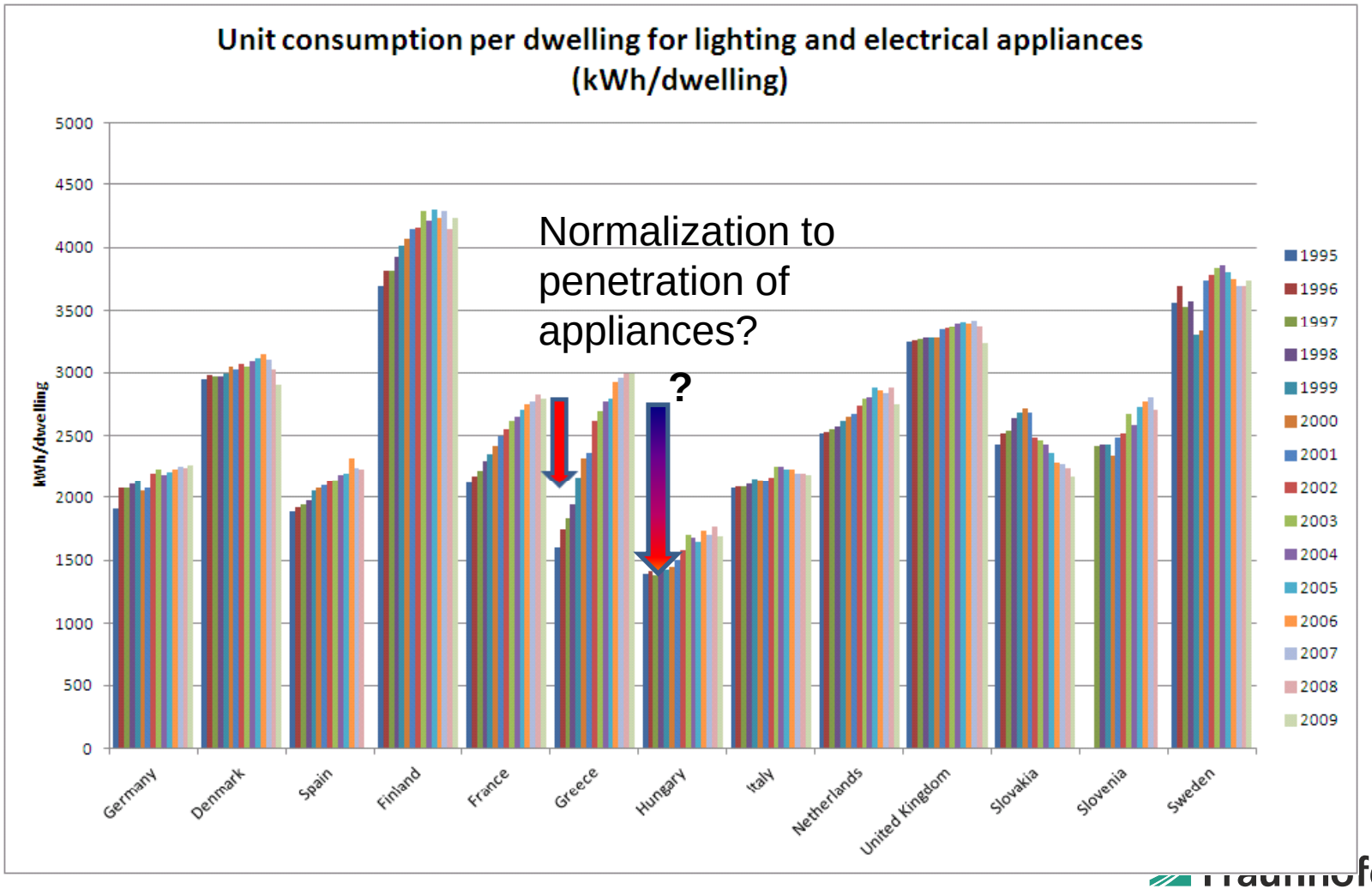
Energy Efficiency Potentials Residential Appliances



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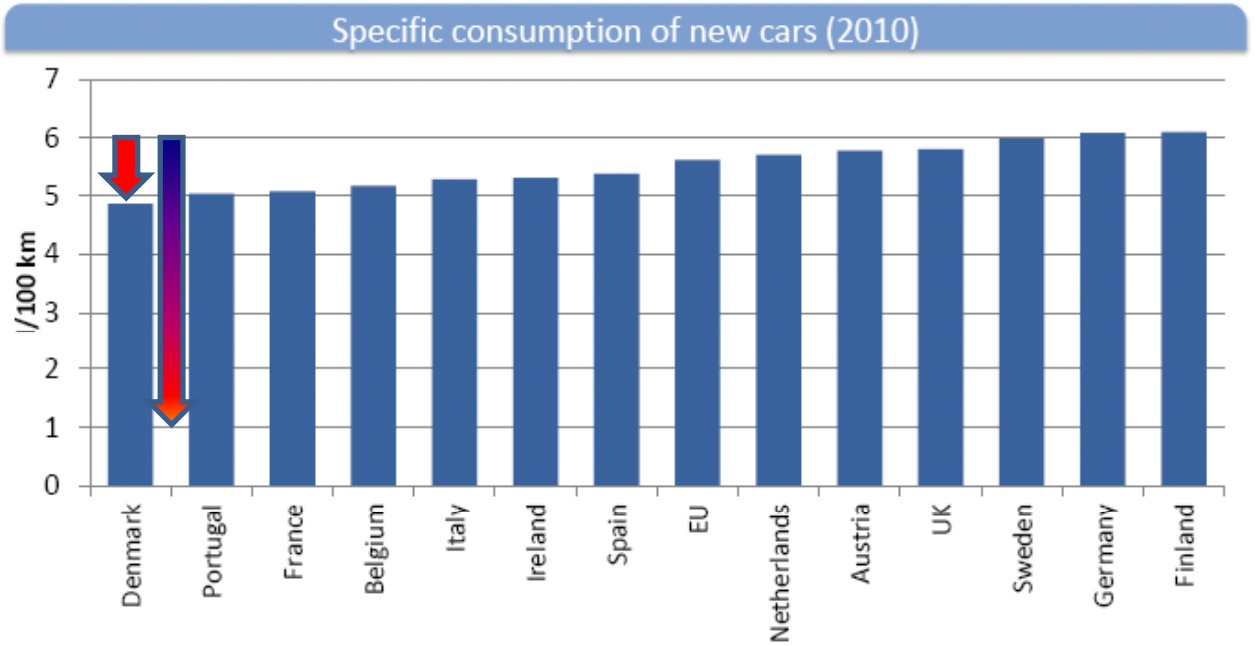
Energy Efficiency Potentials Cars

Large discrepancy in the specific consumption of new cars among countries: difference between extremes values narrowing from 2 l/100 km in 2008 to 1 l/100 km in 2010 : Denmark, France or Portugal in the lower range (~5 l/100km) and Finland, Sweden, or Germany (~6 l/100km) in the upper range



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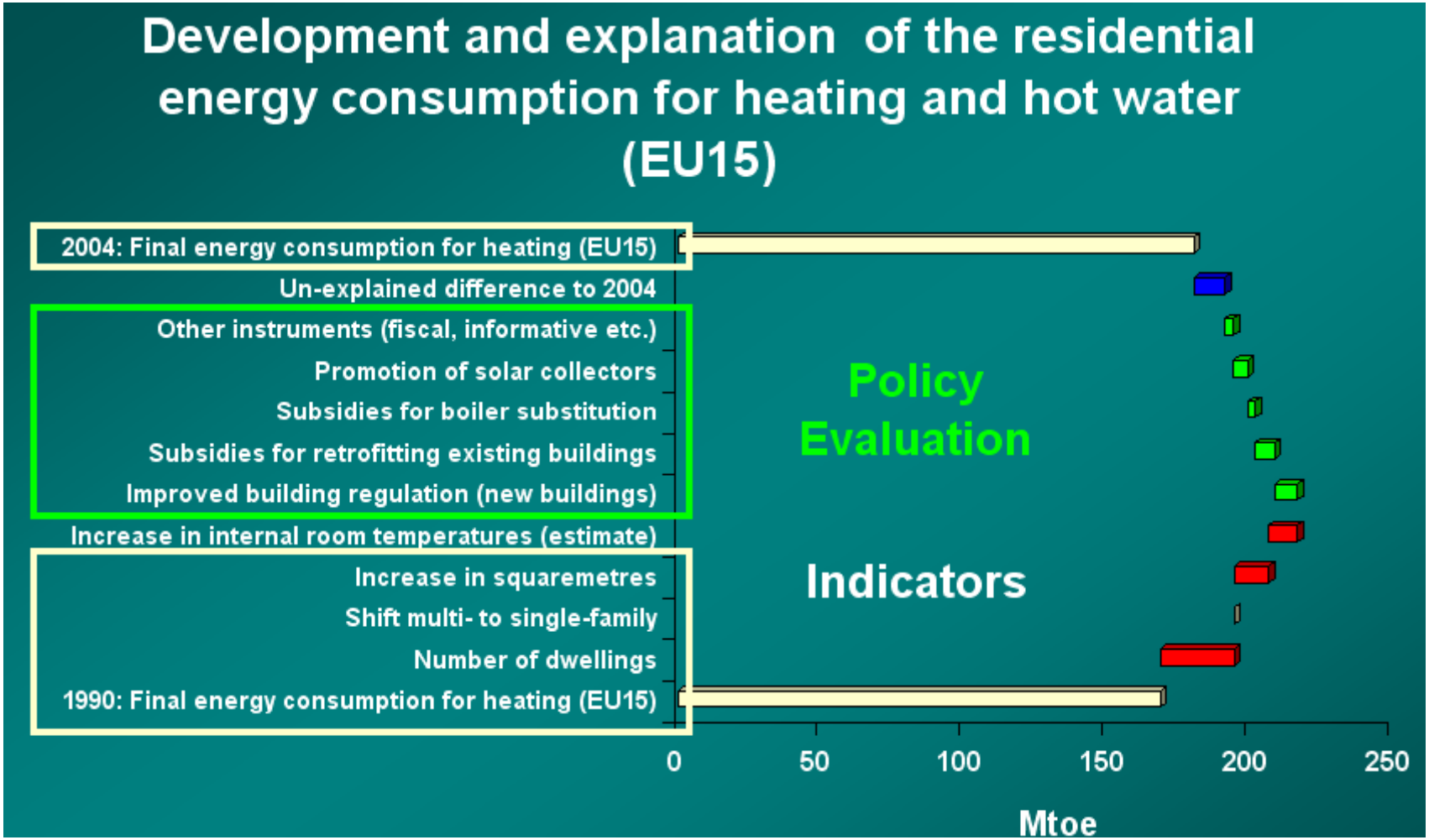

Source: Fraunhofer ISI, Odyssee Database, MURE Database, ADEME (2005)

Example: Linking Energy Efficiency Indicators and Policy Analysis

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Problems in measuring energy efficiency potentials with indicators

- Potentials may be over/understated by ignoring (partly) differences in structure in comparison to the benchmark
- Potentials derived from comparisons with other countries are in general economic (for the comparison country) and are still dominated by barriers (they represent the barriers still active in the comparison country
- Potentials derived from comparisons with Best Available Technology (BAT) may ignore barriers to the introduction of such technologies and may not be fully economic (depending on market penetration)

➔ Need to define carefully what kind of potential is really expressed with the indicator

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