Comparison tool

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European Energy Network

ADEME
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ODYSSEE-MURE

Comparison tool: main principles

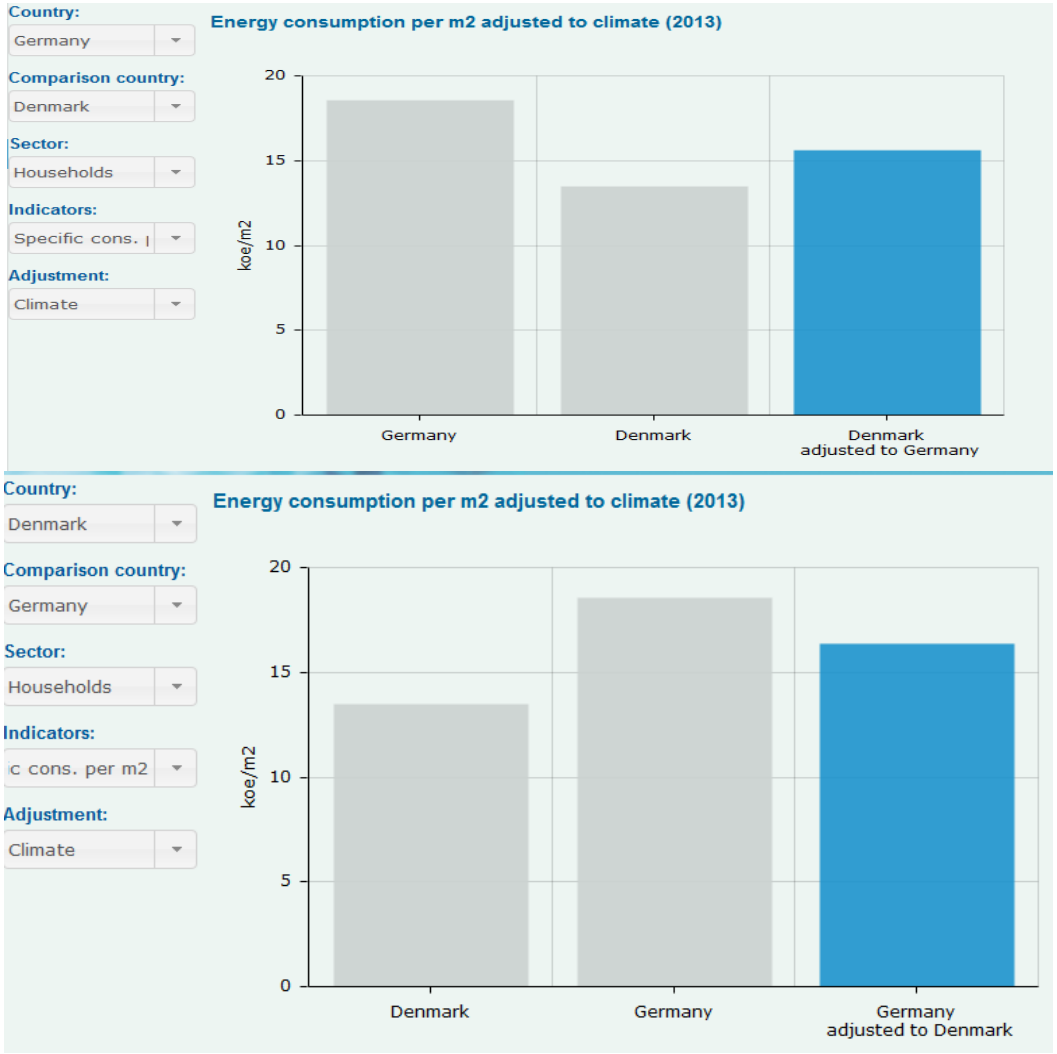
- The objective of this tool is to enable country X to compare with the country(ies) of its choice by adjusting the different indicators to its own characteristics.

- The tool shows for the last year available a graph showing the actual indicator values and the indicator after adjustment to the characteristics of country X.

- The user selects:

1. the country to benchmark (X),
2. the countries to which country X will be compared ("comparison countries") (multi-selection available),
3. the sector,
4. the indicator for which the adjustment will be made (selection proposed),
5. the type of adjustment (among a selection proposed).

The benchmarking tool: example



The first graph shows what would be the energy consumption per m2 scaling the household consumption of Denmark to the average climate of Germany.

The second graph shows what would be the energy consumption per m2 scaling the energy consumption of Germany to the climate of Denmark.

Adjustments made for sectoral indicators in the comparison tool

- The adjustments made in ODYSSEE take into the following quantifiable differences between countries:
  1. Price difference
  2. Climate
  3. Fuel mix
  4. Industry structure
  5. Economic structure

- A data tool enables to benchmark the countries by doing these adjustments (“ benchmarking tool”) and by showing the impact of each of them individually.

Adjustment for price differences: use of Purchasing Power Parities (PPP)

- For countries' comparison, energy intensities are measured in the same monetary unit (€, $) by converting national currencies in €,$.

- Conversion with market exchange rates raises two problems:
  - Market exchange rates can vary quite a lot independently of the economic performance of countries which affect the relative energy intensity values between countries (their "ranking") ;
  - The conversion does not reflect the fact that in less developed countries consumer prices are on average much lower than in more developed countries

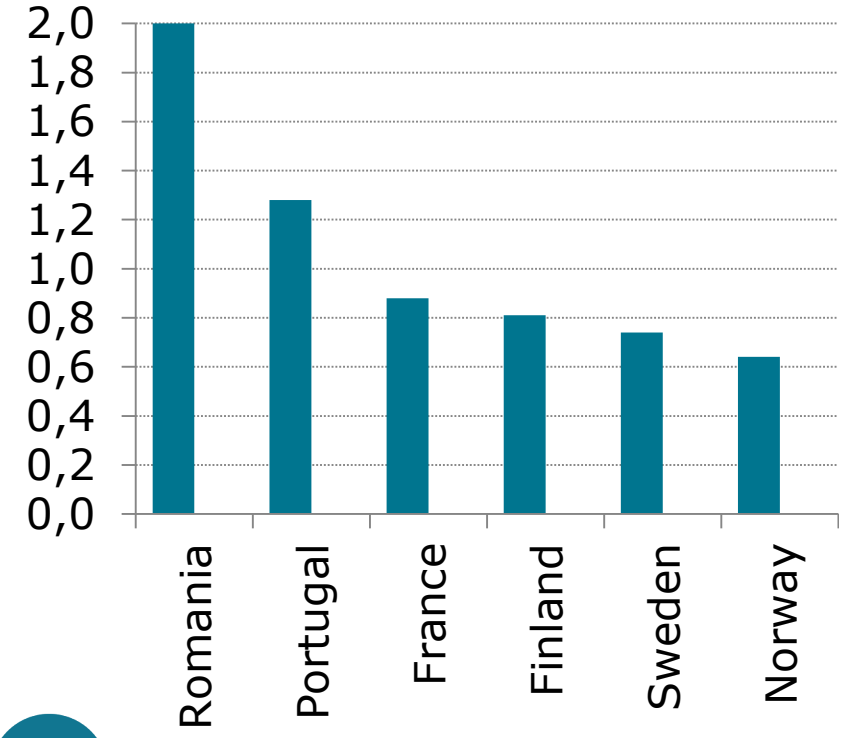
- The use of Purchasing Power Parities (PPP) improve the comparison as it does not fluctuate and accounts for the real purchasing power of incomes.

- PPP are provided by Eurostat.

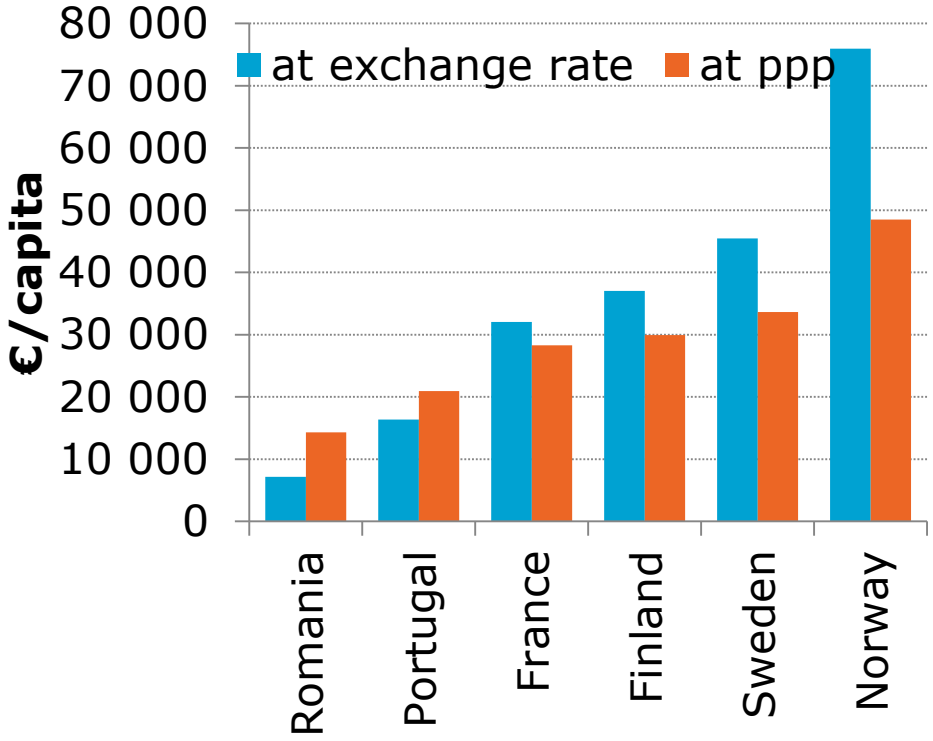
Use of PPP

In Romania the exchange rate in 2013 was 4,4 lei/€; at ppp it was twice lower (2,2 lei/€) ➔ the GDP is twice higher in ppp than based on exchange rates; for France, Finland, Sweden and Norway, this goes the other way around, the GDP at ppp is lower than at exchange rate. Conversion of GDP at ppp increases the GDP of countries with low cost of living

Ratio exchange rates over purchasing power parities (2013)



GDP per capita (2013)



Source: Enerdata from World Bank

Why using PPP for comparison of energy performance in industry ?

- Let us take 2 factories producing cars : one in France and one in Romania, with the same technical performance, i.e. the same energy input by car produced (in toe or GJ per car).

- The value added of each car is mainly made from salaries (capital costs and profits also included), whose relative level across countries are mainly influenced by the average difference in the cost of living (2 times lower for Romania*)

➔ With the same technical performance, the energy used per unit of value added (« energy intensity ») for the car industry will be twice higher in Romania than in France with exchange rates but the same at ppp.

➔ Energy intensities differences at ppp are closer to differences in technical performance.

** Based on ppp published by Eurostat for 2014*

Adjustment to the same climate

- **Climatic differences** are taken into account by calculating an indicator "adjusted" or "scaled" to the climate of the reference country. The adjustment is done on the heating part of the consumption of the basis of heating degree days.

- This adjustment is done for:
  - Household consumption per dwelling and per m2
  - Household space heating consumption per dwelling and per m2
  - Service sector energy intensity
  - Final energy intensity adjusted at EU climate: actual and at constant structure

- Adjustements can be done in the same way for air conditioning .

Adjustment to the same fuel mix

- The main sector for which differences in fuel mix have a significant impact on the indicators are the household and power sectors.

- For the household sector, the adjustment is done by calculating a consumption in useful energy and assuming the same fuel mix for each country (that of a reference country).

- For the primary intensity, the adjustment is done by assuming the same power mix for each country (that of a reference country).

Adjustment to the same industry structure

- Differences in **industry** structure are taken into account by calculating an average industrial intensity with the actual intensity by sub-sector of each country and the same industry structure , that of the reference country* (i.e. share of each industrial branch in total value added).

- The calculation is done for:
  - Industry intensity
  - Manufacturing intensity

Adjustment to the same GDP structure

- Differences in GDP structure are taken into account by calculating a final energy intensity with the actual sectorial intensities of each country and the same GDP structure, that of the reference* country (i.e. share of agriculture, industry, services and private consumption in total GDP);

- For industry the industrial intensity used is the adjusted one to also capture the differences in industry structure;

- The calculation is done for:
  - Final energy intensity in ppp
  - Final energy intensity in ppp adjusted at EU climate (to combine several adjustments)