MB:EE

A comprehensive indicator set for measuring multiple benefits of energy efficiency







AGENDA

- The multiple benefits approach
- Indicators in ODYSSEE-MURE
 - Energy savings
 - Avoided emissions of CO₂
 - Reduction of import dependency
 - Employment effects of energy efficiency
 - Impact on disposable income
- Web facility
- Next steps / Outlook



MULTIPLE BENEFITS OF ENERGY EFFICIENCY

Why?

- Most investment in energy efficiency are not considered cost-effective if only energy savings are taken into account (e.g. in Life Cycles Costing approach)
- Non-energy benefits are often ignored in investment decisions
- A more holistic view on the benefits of those investments is necessary to make them more attractive
- Policy making should consider all benefits of energy efficiency programmes



MULTIPLE BENEFITS IN ODYSSEE-MURE

- Aim: improve capacity building on multiple benefits of EE
- Set of 19 Indicators
 - 3 main groups: *environmental, economic, social*
 - 8 sub groups
- Aim: Application for 31 countries (EU28 plus Norway, Switzerland and Serbia) if possible
- For both bottum-up (MURE) and top-down (ODYSSEE) savings



List of indicators in ODYSSEE-MURE

Category	Sub-category		Indicator
	Energy and Resource Management		
Environmental		Energy savings	Annual energy savings
Environmental		Saving of fossil fuels	Saving on fossil fuels; extension of range of fossil fuels
Environmental		Impacts on RES targets	Lowering of RES target; replacement of RES capacity; reduced need for interconnectors
	Global and Local Pollutants		
Environmental		GHG savings	Annual CO ₂ savings linked to energy savings
Environmental		Local air pollution	Emission factors for avoided local pollutants (incl. electricity)
	Energy poverty		
Social		Alleviation of energy poverty	Impact of savings on energy cost shares in household income
	Living comfort		
Social		Health and well-being	Externalities linked to health impacts
Social		Disposable household income	Shares of energy costs in household income
	Innovation and Competitiveness		
Economic		Innovation impacts	Patent indicators
Economic		Competitiveness	Indicators on foreign trade with EE products
Economic		Turnover of energy efficiency goods	Production statistics
	Economy (Macro)		
Economic		Impact on GDP	Impact of energy savings on GDP growth
Economic		Employment effects	Input-Output (I/O) analysis
Economic		Impact on energy prices	Price elasticities
Economic		Public budgets	State income from employment based on energy savings
	Economy (Micro)		
Economic		Industrial productivity	Semi-quantitative classification of impacts
Economic		Asset value	Valuation of buildings and companies for different end-uses according to energy efficiency benefits
	Energy Security and Energy Delivery		
Economic		Energy security (A)	Import dependency (conversion to primary energy necessary)
Economic		Energy security (B)	Impact on supplier diversity (Herfindahl-Hirschman-Index)
Economic		Impact on integration of renewables	Demand-response potentials by country



Energy and Resource Management: Energy savings

- Basis for several other indicators (besides Bottom-up savings)
- Based on ODEX calculated
- Available for whole FU28 and MS



Around 230 Mtoe energy savings in 2015 compared to 2000 (i.e. 20% of final energy consumption). In other words without energy savings the final energy consumption would have been 20% higher in 2015.

Most of the savings are registered in households (44%) followed by industry (30%), transport (22%) and services (4%).



Global and Local Pollutants: Avoided GHG emissions

- Based on specific emission factors per sector related to the energy mix
- Including emissions from electricity generation 4% Available for whole EU28 and MS 37 % 40 % CO₂ savings in the EU 800 700 600 500 Around 700 Mt of CO2 MtC02 saved in 2015 compared to 400 2000. 300 Almost half of savings come 200 from the building sector 100 (40%), followed by industry 0 (37%) and transport (19%). 2000 2003 2004 2005 2006 2008 2009 2010 2012 2013 2014 2015 2001 2002 2011 2007 Transport Households Industry Tertiary



Energy security (A): Reduction of import dependency

Based on top-down energy savings





- In 2015, the energy dependency rate of the EU reaches 52%: more than half of the EU28's primary energy consumption in 2015 came from imported sources
- Including energy savings, this rate stood below 38% in 2015, i.e. 14 %points below the observed rate.



Economy (Macro): (Gross) Employment effects of energy efficiency

- Based on input-output tables provided by eurostat
- 19 EU countries at the moment





Economy (Macro): (Gross) Employment effects of energy efficiency

Top-down savings





Economy (Macro): (Gross) Employment effects of energy efficiency

Bottom-up savings





Living comfort: Impact on disposable household income

- Shares of energy costs in household income
 - Energy consumption
 - Energy prices
 - Income distribution
- Step 1: Isolate the part of the energy bill related to energy consumption
- Step 2: Get information related to income distribution
- Step 3: Link the two



Isolate the part of the energy bill related to energy consumption





Income distribution and share of energy cost



To link energy expenditure to income, a detailed, large scale data set is needed.

In the graph the total sum of energy expenditure (yellow bars) is shown for different income categories.

The black line shows the share of energy expenditures of the income



- Data on income distribution is available on Eurostat.
- For some member states the link is available between income groups and energy expenditure.
- For MS that do not have this information, the distribution could be based on comparable MS, corrected for the average consumption of households and data on energy prices.
- Unfortunately it is unknown if energy efficiency is equally distributed over income groups.



MB:EE Web facility in ODYSSEE-MURE

The web facility will be part of the ODYSSEE-MURE website (www.odyssee-mure.eu) -> Available in July 2017











Outlook and next steps

Next steps in the development of the MB:EE facility

- Finalization of web facility framework
- **Refinement of IO-Analysis**
- Further development of methodologies for suitable indiactors for all aspects / sub-groups
- Extent coverage of all indicators to EU28 + NO + CH + RS



Thank you very much!

Merci beaucoup!

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Back-up

