Workshop on Evaluation of Energy Efficiency Policies Brussels 12 September 2019

Session 2: Different evaluation approaches for energy efficiency policies and specific factors to be considered

Bottom-up evaluation approach

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What do we mean when we talk about the bottom-up evaluation of policies?

- Ex-ante evaluation
  - Answer to the question which policy should be undertaken and how much they contribute to target achievement
- Monitoring
  - Look at the concrete implementation of policies (e.g. subsidy levels spent compared to original planning; barriers to implementation. Frequently based in indicators
- Ex-post evaluation
  - Answer to the question how much impacts policies really had

Evaluation is not necessarily only quantitative...

- Quantitative Evaluation
  - Frequently based on energy system models
- Semi-quantitative Evaluation
  - Frequently-based on semi-quantitative scales and expert estimates
- Qualitative Evaluation/Multi-criteria Analysis
  - Frequently based on a mixture of qualitative and quantitative criteria (see example of the definition of “Successful Measures” under the MURE database on energy efficiency policies (www.odyssee-mure.de)
  - Extension: Taking into account “multiple benefits of energy efficiency in the evaluation” (Multiple Benefits include also impacts beyond energy savings, e.g. impacts on the economy or employment)

Advantages and disadvantages of bottom-up evaluation approaches

- understanding impacts and importance of individual measures or measure packages (better steering of measures)
- Separation of policy-induced and autonomous progress possible
- Separation of measure impacts and (indirect) rebounds possible
- Priorisation of evaluations by focussing on important measures

- Measure interaction is explicitly to be considered
- Only direct rebounds can be integrated; general economic rebounds cannot be reflected in bottom up
- Cost/administrative burden/timing/complexity: Cost usually perceived has high, burden for applicants..., but are overestimated; costly programmes of billions of Euro anyhow need individual evaluation; bottom-up evaluation as part of the measure: benchmarking...

Prerequisites and challenges related to data collection

- Activities (number of interventions; easy) + Savings (more difficult) + Cost (see later)
- For **Activities**:
  - Free-rider effects: participation in programmes while investment would have occured anyhow
  - Multiplier/Spillover effects (impacts of measures beyond the programmes)
  - Role of comparison groups/surveys in evaluation (cost factor)
- **For Savings:**
  - Reference for the savings: e.g. existing standards and their dynamic evalution, market average, stock average, before/after…
  - Transparency in assumptions partly lacking in evaluations (e.g. in NECPs)
  - Role of surveys

Aggregation of impacts (in particular at EU level)

- Rebound effects:
  - direct
  - indirect
- Overlaps between the policies: tools to make interactions transparent
  - Policy mapping (see Odyssee-MURE) > Identifying policies which act upon the same target
  - Policy interaction matrix
- Modelling in support of bottom-up evaluations (e.g. building models)

Examples for Interactions among different policy instruments at EU level

- Labelling policies and minimum standards: minimum standards for reefrigerators in the 1990s came so late that labelling policies had made them superfluous -> dynamic aspects of policies
- Energy saving obligations and minimum standards for electric motors (discussions about baselines and measuring of savings). Requires to dynamically adjust policies (IE2 motors not accepted for obligation schemes when they became standard)
- Taxation policies and standards (but interaction weak due to low general minimum taxation at EU level)

Examples for Interactions of EU and national policies

- Energy saving obligations and fiscal reductions for EE measures (France)
- Mandatory standards (ecodesign for motors) and voluntary/negotiated agreements (Germany, Netherlands)

Costs and benefits of selected measures in the IECP in Germany in the year 2020 > Overlaps

IECP measure	Title of the measure	Average annual differential investments (10) (billion Euro), not discounted	Average annual Programme Costs I (billion Euro), not discounted	Average annual Programme Costs II (billion Euro), not discounted	Average annual saved energy costs (billion Euro), not discounted	Average annual net present value (11) of the measure (billion Euro)	Specific net present value (Euro/t CO_2)	Cumulated CO_2-reduction (Mt)
1	Combined Heat and Power Act (12)	0.0	0.0	0.5	-0.1	-0.05	-6	123
2	Renewables in the power sector	5.3	0	1.1	2.0	-0.73	-27	355
6+7	Energy management systems; Support programmes for climate protection and energy efficiency (energy efficiency fund) (13)	1.7	0.0	0.3	1.6	0.02	4	67
8	Energy-efficient products (in households and industry)	0.12	0.004	0	2.1	1.3	195	89
10A	Energy Saving Ordinance	10.4	no data	0.0	4.5	0.87	50	243
	(excluding overlaps) (14)	*4.2*	*no data*	*0.0*	*1.9*	*0.85*	*432*	*28*
10B	Substitution of electric night storage heating in households	0.4	no data		0.5	0.28	80	46
12	Modernisation programme to reduce CO_2 emissions from buildings	3.1	no data	0.6	1.7	0.34	47	100
13	Energy-efficient modernisation of social infrastructure	0.7	no data	0.04	0.16	-0.06	-82	10
14	Renewable Energies Heat Act (EEWärmeG)	3.4	0.01	0.0	0.6	-0.6	-67	123
15	Programme for the energy-efficient modernisation of federal buildings	0.1	no data	no data	0.05	0.01	54	3
	Sum building measures 10A,10B, 12,13,14,15 (excl. overlap)	**11.8**	**no data**	**0.7**	**4.9**	**0.8**	**36**	**308**
16	CO_2 strategy for passenger cars	3.4	0.0	0.0	6.1	1.2	100	159
17	Expansion of biofuels (15)	0.0	0.0	0.0	-1.2	-0.6	-100	84
20	Improved steering effect of the toll on Heavy Goods Vehicles (HGVs) (Variant 20a)	0.01	0.00	0.00	0.02	0.00	71	1
	Sum (with overlaps for building measures)	**28.7**	**0.01**	**2.5**	**17.9**	**1.9**	**19**	**1400**
	Sum (excluding overlaps for building measures)	**22.4**	**0.01**	**2.5**	**15.3**	**1.9**	**22**	**1185**

Source: IEKP Germany (Integrated Energy and Climate Plan)

Aggregating EE Policy Impacts, Trends and Levels into the ODYSSEE-MURE Scoreboard:

COMBINED INDICATOR AND POLICY SCOREBOARD

View: Overview

Sector: Overall

Score: Combined

METHODOLOGY

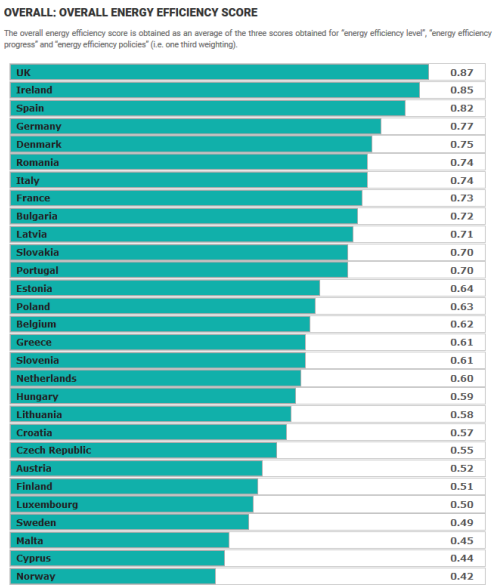
SUMMARY

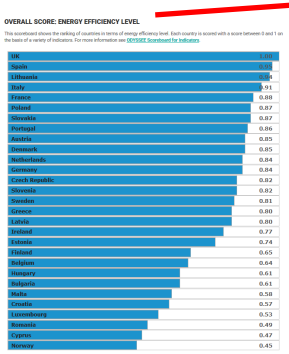
The objective of the ODYSSEE-MURE scoreboard on energy efficiency indicators and policies is to score EU countries on different energy efficiency criteria:

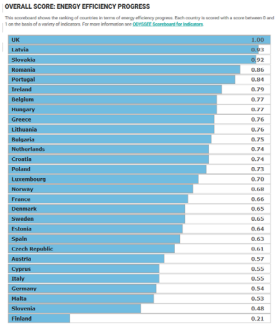
- the energy efficiency level,
- the energy efficiency progress,
- the energy efficiency policies,
- a combination of all these criteria.

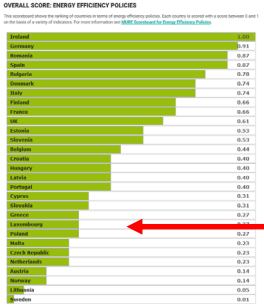
For each criterium each country is scored with a score between 0 and 1 on the basis of detail in two complementary scoreboards: the first one on energy efficiency progress an the other one on policies (MURE Scoreboard for Energy Efficiency Policies).

The scoreboard can be viewed, either by criterion or by country; in the later case, the sco









- **NEEAP/NECP + national evaluations (42% *)**
- **Semi-quantitative estimates**

***) in number of measures (50-60% in impacts**

What policies it suits best?

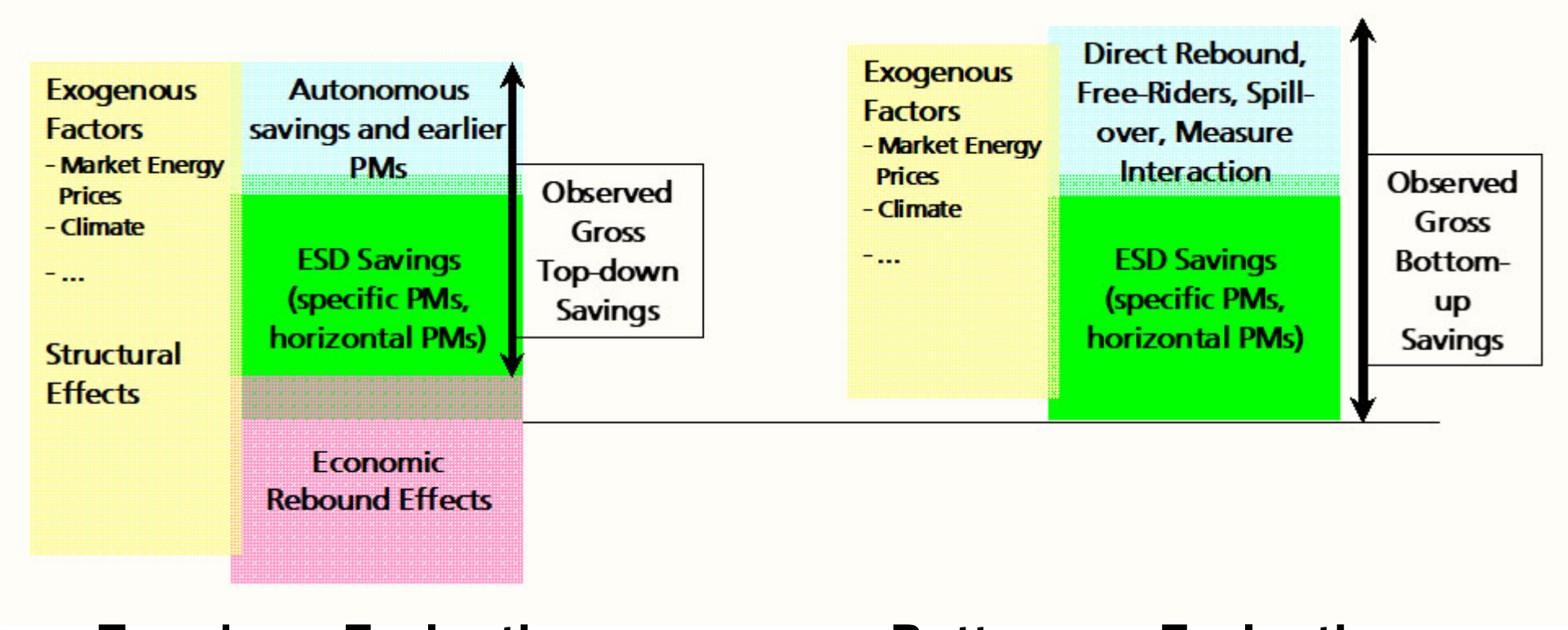
- Regulation (e.g. performance regulation of buildings)
- Subsidy schemes (knowledge on technology split necessary)
- Fiscal measures (knowledge on technology split necessary)
- Energy Saving Obligations/White Certificates
- **More general: all measures with well defined activity levels**

- General taxation measures (CO2 tax; energy tax (technology split generally unknown; link between investment decision and taxation measure difficult to establish
- Informational programmes (surveys required; spill-over effects difficult to assess)
- **More general: all cross-cutting measures where the activity level is not set directly by the measure or the link from measure to savings is weak**

Key parameters to assess the cost-effectiveness

- Reference against which to assess the cost („what is happening in the absence of the measure“). Reference for the savings: e.g. existing standards and their dynamic evalution, market average, stock average, before/after…
- Overall cost versus differential cost
- Differential cost in case of industrial sector quite difficult to establish (add-on versus integrated energy efficiency solution) > ETS Innovation Fund

The Holy Grale of
Linking Top-down and Bottom-up Evaluations



Top-down Evaluations

Bottom-up Evaluations

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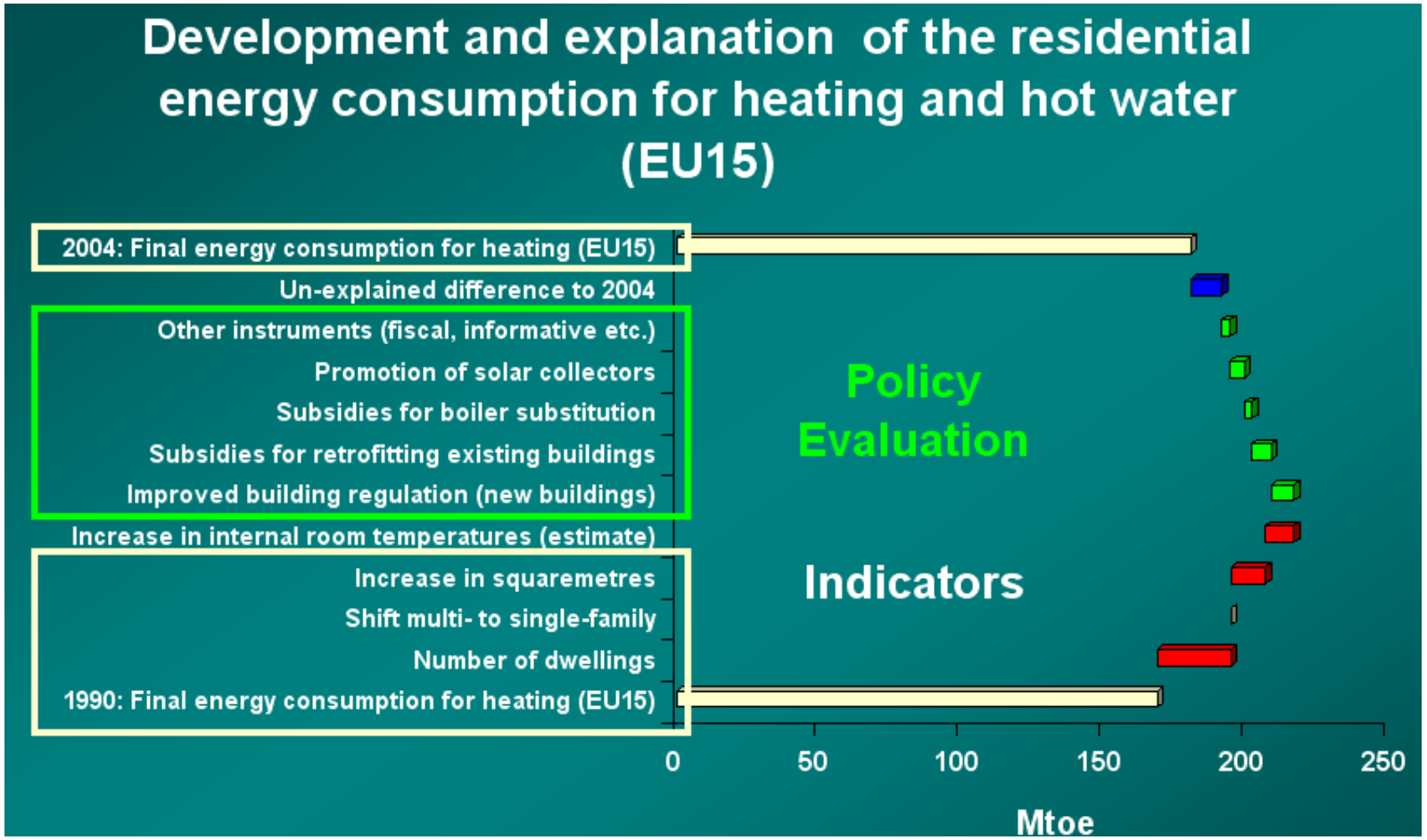
Linking Top-down and Bottom-up Evaluations Example



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