

Evaluation and Monitoring for the EU Directive on Energy End-Use Efficiency and Energy Services

How much energy saving is 1 % per year?

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The EMEEES project

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EMEEES – Our Mission

- **support** the implementation of the EU Directive on energy end-use efficiency and energy services (ESD) (2006/32/EC)
- develop harmonised **methods** for evaluation of energy savings
- build trust in methods and hence in savings evaluated
- develop a **template** for energy efficiency action plans
- provide **practical advice and support** for the European Commission
- provide **platform for exchange**:
www.evaluate-energy-savings.eu

Project duration: November 2006 to April 2009

Elements (Work Packages)

- WP1: Management
- WP2: Analysis of good practice
- WP3: Distinction of measures by type of evaluation method
- WP4: Bottom-up evaluation methods
- WP5: Top-down evaluation methods
- WP6: Integration of bottom-up and top-down approaches
- WP7: Planning and reporting requirements
- WP8: Pilot testing
- WP9: Platform for exchange and dissemination
- WP10: Common dissemination activities

First results from working on monitoring and evaluation methods

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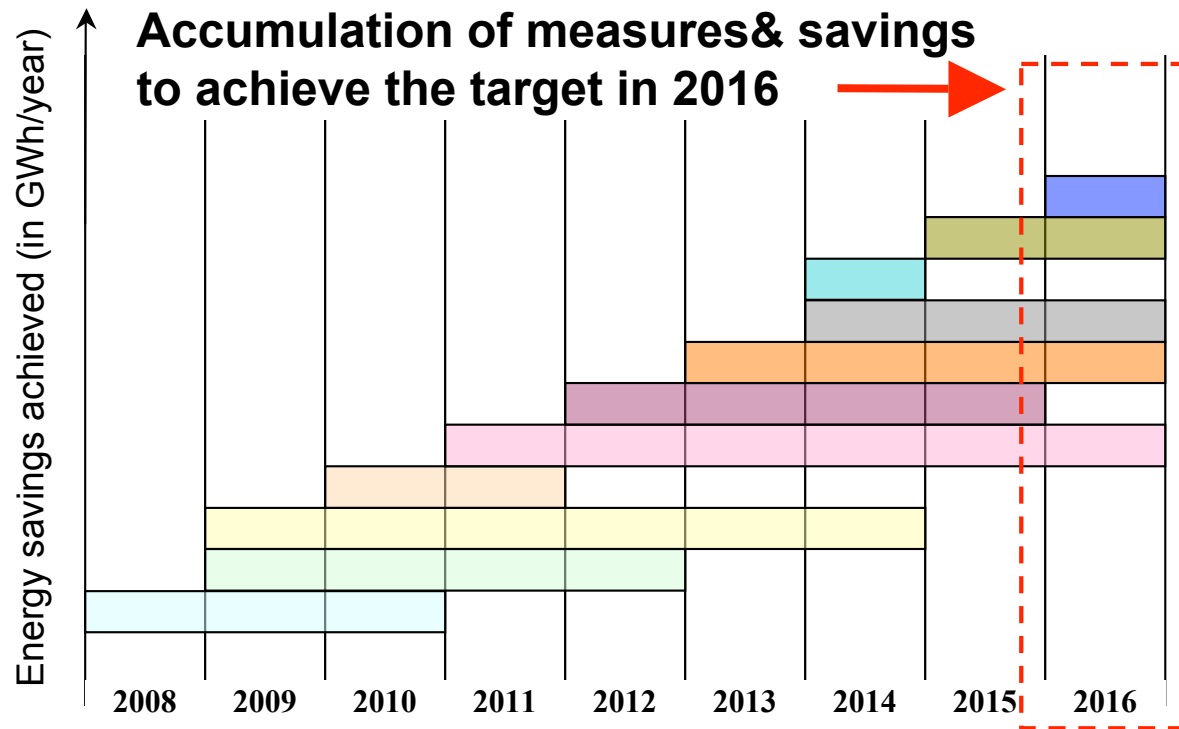
Analytical clarification: subject of monitoring

				EEI (facilitating) measures		
				Example 1: energy performance contracting	Example 2: white certificate schemes	Example 3: energy taxation
End-use EEI actions	Sector	Energy end-use	Efficient Solution			
	Residential	example 1: heating	efficient boilers		B 1	C
			heat pumps		B 2	
			etc.			
	Tertiary	example 2: lighting	CFL		B i	
			etc.			
		example 1: heating	efficient boilers, pumps, etc.	A 1	B j	
			example 2: lighting	CFL		
		efficient ballasts	A 2			
		etc.				

ESD energy savings and targets

What does “*cumulative annual energy savings*” mean?

=> sum of the annual energy savings (kWh/year) from the different EEI measures, but **only in 2010 and 2016** (accumulation of annual energy savings)



General principle for method development

- Be **as thorough as possible** in analysing the relevance of correction factors, and the possibilities to evaluate them.
- But be **as pragmatic as possible** in the methods proposed as a result of the analysis,
- With **as many EU-level average values as possible**

Bottom-up methods (1)

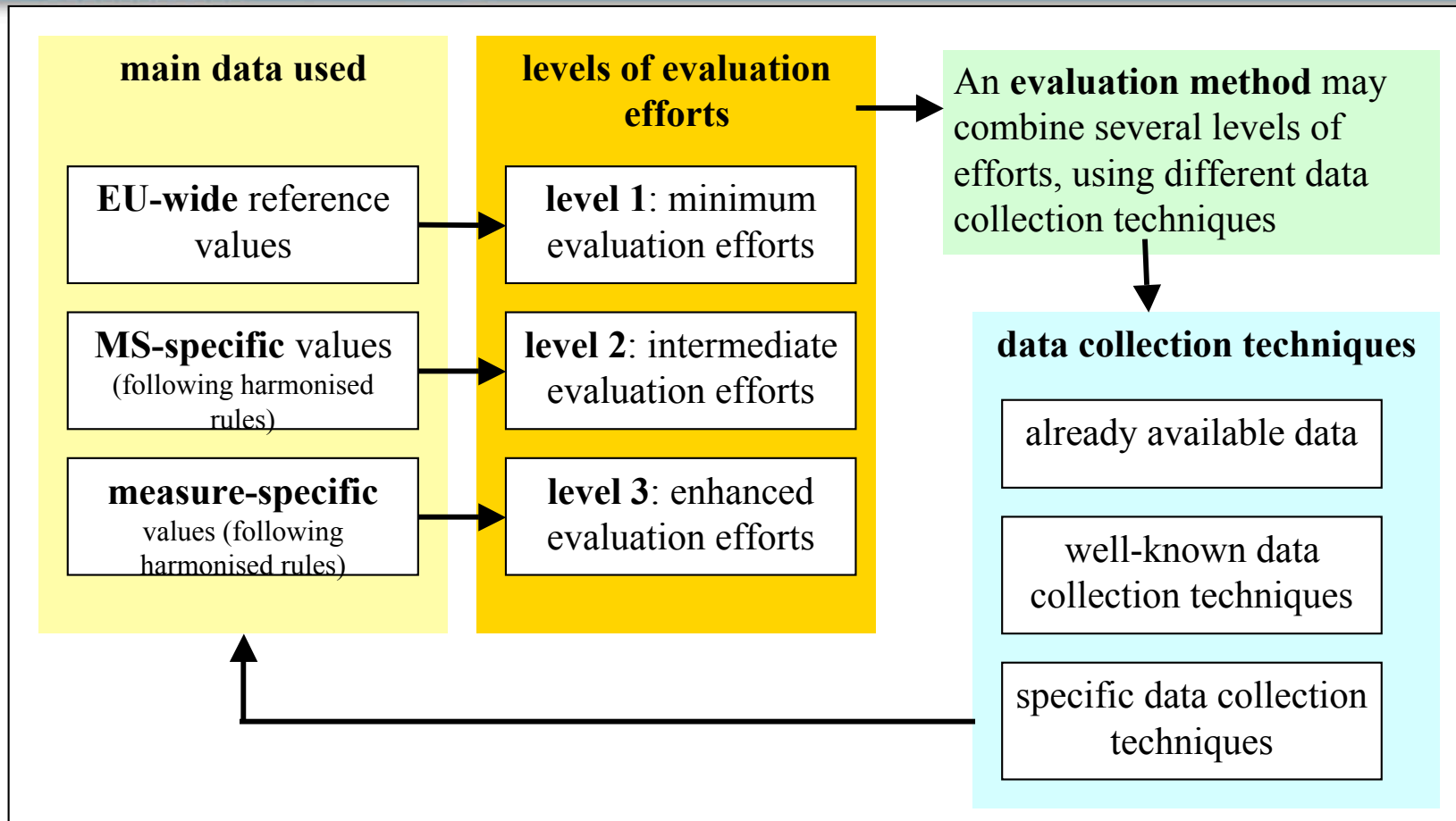
- ESD Annex IV (1)

*“A bottom-up calculation method means that energy savings obtained through the implementation of a **specific** energy efficiency improvement measure are measured in kilowatt-hours (kWh), in Joules (J) or in kilogram oil equivalent (kgoe) and added to energy savings results from other specific energy efficiency improvement measures”.*

Bottom-up methods (2): types of methods

Type of method	Example of existing method
1 Direct measurement	EPS building standards (NL)
2 Analysis of energy bills and energy sales data	Electricity Savings Trust (DK)
3 Enhanced engineering estimates	Energy audit programme (FI)
4 Mixed deemed and ex-post estimate	Energy Efficiency Commitment (UK)
5 Deemed estimate	White certificates activities (FR, IT)
6 Bottom-up modelling based on surveys	Effect of building codes (e.g., DE, NL)

Bottom-up calculation - three levels of efforts



➔ an evaluation method may combine different levels of efforts, according to the parameters needed

Bottom up - Calculation process

+ *number of participants or units*

+ *double counting, multiplier effect, + other gross-to-net correction factors (e.g. free-rider effect)?*

+ *timing and lifetime, + performance degradation (?)*

Step 1: unitary gross annual energy savings (in kWh/year per participant or unit)

Step 2: total gross annual energy savings (taking into account the number of participants or units, in kWh/year)

Step 3: total ESD annual energy savings in the **first year** (taking into account double counting, multiplier effect, and other gross-to-net correction factors (e.g. free-riders) ?, in kWh/year)

Step 4: total ESD annual energy savings achieved in the year 2016 (in kWh/year, taking account of the timing of the end-use EEI action, its lifetime and eventual performance degradation)

Top-Down methods (1)

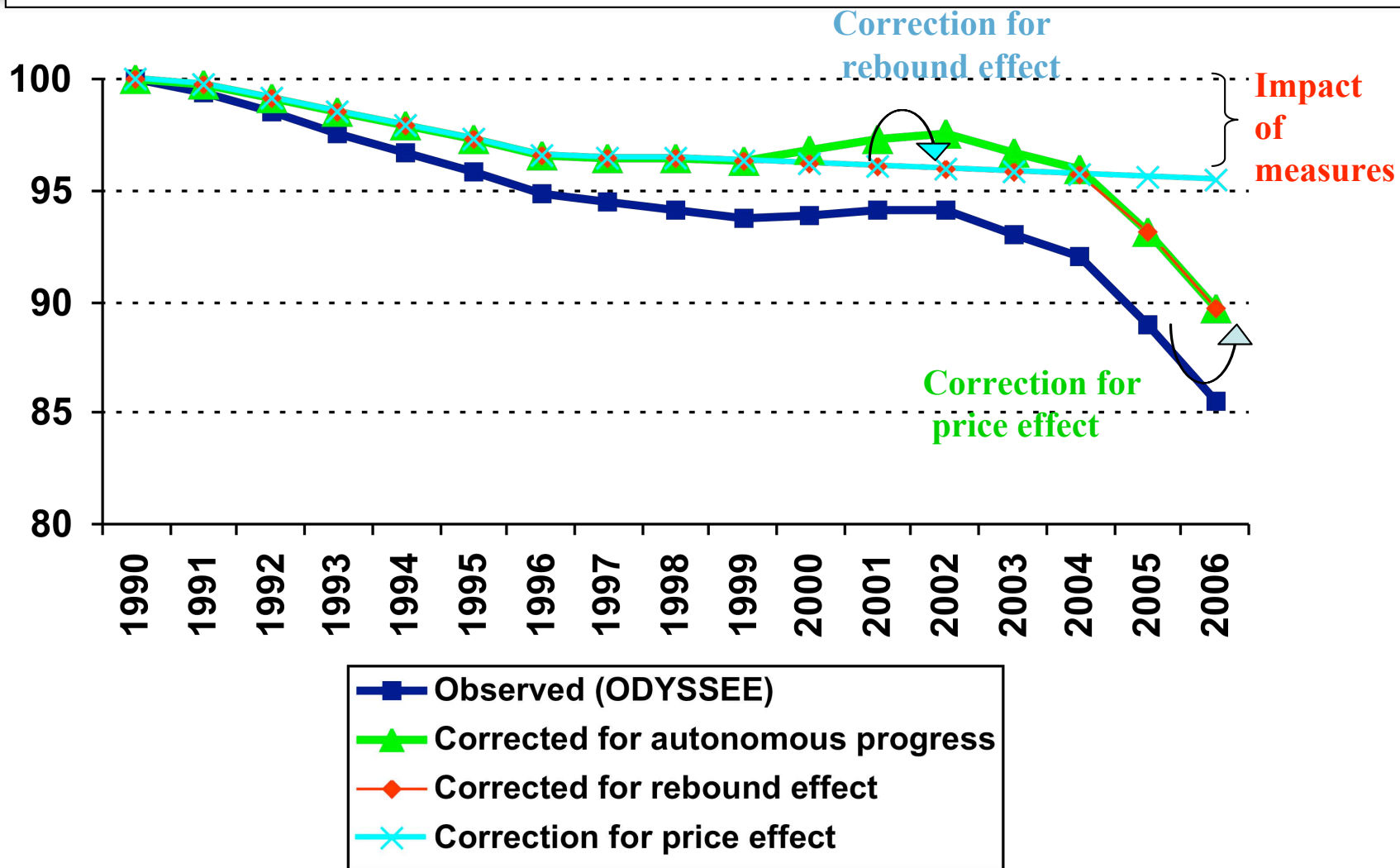
- ESD Annex IV (1)

*“A top-down calculation method means that the amount of energy savings is calculated using the **national or larger-scale aggregated** sectoral levels of energy savings as the starting point”.*

Top-down methods (2): types of methods

Type of method	Example of existing indicator or method
TD 1 Monitoring of diffusion indicators	ODYSSEE indicator on average energy consumption per appliance (kWh/year)
TD 2 Monitoring of specific energy consumption indicators	ODYSSEE index on sectoral energy consumption
TD 3 Econometric modelling	Evaluation of the effects of energy taxation (e.g., DE, SE)

Accounting of **corrections** to clean from different effects not linked to measures



Bottom-up or top-down methods?

Two types of methods can be either-or

Type of method	Example of existing method	Conditions for switching type
BU 6 Bottom-up modelling based on surveys	Effect of building codes (e.g., DE, NL)	If cause for end-use EEI actions taken is not known => top-down
TD 1 Monitoring of diffusion indicators	ODYSSEE indicator on average energy consumption per appliance (kWh/year)	If change in indicator exclusively due to EEI measures => bottom-up

Other results available now or soon

- First analysis of existing evaluation methods - 24 case studies (WP 2 - **overview in paper, extended summary on website soon**)
- Draft overview of methods appropriate for several types of energy efficiency improvement measures (WP 3 - **overview in eceee paper**)
- Selection of 15 to 20 bottom-up and 15 top-down methods to be developed - cover biggest part of energy end use (WP 4 and 5 - **overview in eceee paper**)
- Template for NEEAP 2007 (WP 7, **on website**)
- Advice for presenting information in Template for NEEAP 2007 (WP 7, **on website soon**)
- Presentations and minutes from European Expert Workshop 4 June (**on website soon**)

EMEEES – further activities

- **Summer/autumn 2007:**
draft more bottom-up and top-down methods,
and integrated methods
- **Autumn 2007:** review of methods - national workshops; advice to
Commission on NEEAPs
- **Spring 2008:**
Finalise, publish and present results on methods
(two-day conference, Brussels)
- **Autumn 2007 to early 2009:** pilot cases testing the methods
- **April 2009:** End of project

Preliminary conclusions

- **How much energy saving is 1 % per year?**
Depends on perspective! ESD energy savings a special kind - many political decisions to be taken
- **Covering almost all** measures and actions / high share of energy consumption **both** with bottom-up and top-down **feasible** in principle - how about **data**?
- Often possible to gather necessary data at quite **limited costs**, if monitoring is planned before implementing an EEI measure
- Only need to evaluate energy savings from **whole package** of EEI measures on one end-use (action)
- methods must be **consistent** between Member States (**'harmonisation'**)
=> 3 level approach, integration bottom-up/top-down important
- **Compromise** between accuracy and costs/administrative burden needed

Thank you very much for your attention!

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The EMEEES Consortium

21 partners
well-experienced
in evaluation of
energy savings

Project partner	Country
Wuppertal Institut for Climate, Environment, Energy (WI)	DE
Agence de l'Environnement et de la Maitrise de l'Energie (ADEME)	FR
SenterNovem	NL
Energy research Centre of the Netherlands (ECN)	NL
Enerdata	FR
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Dong Energy	DK
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Integrated methods

