

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

Proposal for a reporting checklist for bottom-up evaluations

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evaluate
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The Project in brief

The objective of this project is to assist the European Commission in developing harmonised evaluation methods. It aims to design methods to evaluate the measures implemented to achieve the 9% energy savings target set out in the EU Directive (2006/32/EC) (ESD) on energy end-use efficiency and energy services. The assistance by the project and its partners is delivered through practical advice, technical support and results. It includes the development of concrete methods for the evaluation of single programmes, services and measures (mostly bottom-up), as well as schemes for monitoring the overall impact of all measures implemented in a Member State (combination of bottom-up and top-down).

Consortium

The project is co-ordinated by the Wuppertal Institute. The 21 project partners are:

Project Partner	Country
Wuppertal Institute for Climate, Environment and 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 sas	FR
Fraunhofer-Institut für System- und Innovationsforschung (FhG-ISI)	DE
SRC International A/S (SRCI)	DK
Politecnico di Milano, Dipartimento di Energetica, eERG	IT
AGH University of Science and Technology (AGH-UST)	PL
Österreichische Energieagentur – Austrian Energy Agency (A.E.A.)	AT
Ekodoma	LV
Istituto di Studi per l'Integrazione dei Sistemi (ISIS)	IT
Swedish Energy Agency (STEM)	SE
Association pour la Recherche et le Développement des Méthodes et Processus Industriels (ARMINES)	FR
Electricité de France (EdF)	FR
Enova SF	NO
Motiva Oy	FI
Department for Environment, Food and Rural Affairs (DEFRA)	UK
ISR – University of Coimbra (ISR-UC)	PT
DONG Energy (DONG)	DK
Centre for Renewable Energy Sources (CRES)	EL

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Proposal for a reporting checklist for bottom-up evaluations

► Measure(s) and evaluation details

Name of the measure (or group of measures):

Contact person(s) for the measure(s):

Organisations involved in the measure(s) implementation:

Contact person(s) for the evaluation:

Organisations involved in the evaluation:

► Short description of the measure(s)

Target group:

Targeted type of final energy (fuel) and end use:

Concrete end-use actions facilitated (please list)¹

Period for which the measure has been evaluated:

Short description of the measure(s) (including eligibility requirements for participation/actions, level of financial incentives, if any, and role of actors)²:

► Main results

It is possible to present values for *all* energy savings (compared to the status quo without any of the targeted end-use actions) and for energy savings *additional* to the end-use actions taken autonomously by final consumers or other actors.

All annual energy savings in 2016 (or 2010) (in GWh):

Additional annual energy savings in 2016 (or 2010) (in GWh):

Other important results:

¹ ESD Annex III provides examples (a) to (o) of end-use actions, which are not exhaustive

² The Appendix to this checklist provides a non-exhaustive list of types of measures

► **Calculation process, STEP 1: Unitary gross annual energy savings**

- **Is an average or a participant-specific value used** (in kWh per unit, per action or per participant):

is it :

- a level 1 default average value ? Please provide the value:
- a level 2 national average value? Please provide the value:
- a level 3 measure-specific average value? Please provide the value:
- a level 3 participant-specific value ?

- **calculation method(s) used:**

- direct measurement
- billing analysis
- enhanced engineering estimates
- mix of ex-ante and ex-post data
- deemed savings
- other:

- **definition of the baseline:**

for the calculation of the unitary gross annual energy savings:

- level 1: implicit baseline in the default value ?
- level 2: average energy consumption based on national statistics or samples ?
- level 3 (measure-specific): average energy consumption based on measure-specific definition/eligibility requirements of energy-efficient end-use actions, regional statistics or samples ?

In these cases, is the baseline based on

- the stock (before action) situation?
- the inefficient market (without measure) situation?
- another reference situation for new buildings or equipment? If yes which?

Or is the baseline a

- level 3 (individual) baseline: before action energy consumption specific to the participants, based on measurements, metered data or energy bills ? Or energy consumption of the participants if they would not have taken advantage of the evaluated measure ?

- **definition of the value of specific energy consumption for the energy-efficient solution:**

for the calculation of the unitary gross annual energy savings:

- level 1: implicit average value in the default value ?
- level 2: average energy consumption based on national statistics or samples ? How has the energy-efficient solution been defined (e.g., threshold value for specific energy consumption or specific technology parameter or choice):
- level 3 (measure-specific): average energy consumption based on measure-specific definition/eligibility requirements of energy-efficient end-use actions, regional statistics or samples ?

- **main data used:**
Level 1 (European) data (and vintage):
Level 2 (national) data (and vintage):
Level 3 (measure-specific) data:
- **normalisation factors:**
→ What normalisation factors (see ESD Annex IV(1.2)) were taken into account?
How were they applied:
- **conversion factors:**
→ Was it necessary to use conversion factors (see ESD Annex II + caution: for the ESD, Net Calorific Values shall be used)?
If yes, specify the factors used:
- *rebound effect (optional):*
→ Was a possible rebound effect considered:
If yes, how:

► **Calculation process, STEP 2: Total gross annual energy savings**

- **accounting method:**
 - national (or specific) register or database of final consumers or other actors benefiting from the measure
 - other direct accounting (e.g. by vouchers or applications):
 - market analysis
 - survey among participants (all or sample?)
 - survey among a sample of the whole population
- Was the accounting completed by ex-post verifications (e.g. on-site inspections):
- **main data used:**
Level 2 (national) data (and vintage):
Level 3 (measure-specific) data:

► **Calculation process, STEP 3: Total ESD annual energy savings**

- **double counting**³ (see ESD Annex IV(5)):
→ are other measures targeting the same end-users' group or the same energy end-uses and/or end-use actions?
If yes, how were double counting risks managed:

³ Double counting may occur when two measures overlap (e.g. grants and energy audits schemes for industrial companies).

→ is there any risk of overlap between national and regional or local measures?
If yes, how was it addressed:

- technical interaction⁴ :

→ is there any possibility of overlap between actions?

If yes, how was it considered:

- **multiplier effects** (see ESD Annex IV(5)):

→ was the evaluated measure (or group of measures) designed to have multiplier effects?

→ what multiplier effects were expected?

→ how were these multiplier effects monitored over time:

→ what was the result (in GWh/year of the *all* or *additional* annual energy savings reported above)?

- free-rider effects (only if *additional* energy savings have been calculated):

→ were possible free-rider effects considered?

If yes, how were they taken into account:

→ what was the result (in GWh/year of the *all* annual energy savings reported above)?

- *time lag (if relevant):*

→ *was there any risk of time lag in the measure implementation?*

If yes, how was it addressed:

→ *does the evaluated measure (or group of measures) include energy efficiency requirements?*

If yes, how was the compliance ensured / monitored:

► Calculation process, STEP 4: Total ESD annual energy savings in 2016 (or 2010)

- **lifetime of energy savings:**

○ a level 1 European value ? if yes, harmonised or default value?

○ a level 2 national value ?

○ a level 3 measure-specific value ?

○ a level 3 participant-specific value ?

- *persistence effect (optional):*

→ *were the results monitored / controlled over time?*

If yes how (and what reasons of changes in the results were considered):

⁴ Technical interaction may occur when two actions overlap (e.g. improving both the insulation and the heating system of a building). This is considered a special form of the double-counting issue.

- **early energy savings** (see ESD Annex I(3)):
 - were energy savings from end-use actions taken before 2008 but after 1995 (in special cases 1991) reported?
 - If yes,
 - how much savings do they represent (*in GWh/year of the all and additional annual energy savings reported above*)?
 - were special calculation rules applied (e.g., a different baseline)?
 - how is it ensured that they will be still effective in 2016?

► **Evaluation quality and uncertainties**

- what are the specifications / guidelines used to ensure the evaluation quality?
- how are missing data handled?
- can the uncertainties on the results be assessed or qualified? If yes, please provide the results

► **Monitoring and evaluation costs**

- What types of costs are related to the monitoring and evaluation of the measure (or group of measures)?
- Can these costs be assessed (e.g. in € for the whole evaluation, or in €/kWh saved)?

► **References**

(mention here the reports produced and any document used for the evaluation)

Appendix to the Bottom-up Reporting Checklist: Non-exhaustive list of energy efficiency improvement measures and mechanisms

Category	Subcategories
1 Regulation	Standards and norms: 1.1 Building Codes and Enforcement 1.2 Minimum Equipment Energy Performance Standards
2 Information and legislative-informative measures (e.g. mandatory labelling)	2.1 Focused information campaigns 2.2 Energy labelling schemes 2.3 Information Centres 2.4 Energy Audits 2.5 Training and education 2.6 Demonstration* 2.7 Exemplary role of the public sector 2.8 Metering and informative billing*
3 Financial instruments	3.1 Subsidies (Grants) 3.2 Tax rebates and other taxes reducing energy end-use consumption 3.3 Loans (soft and/or subsidised)
4 Voluntary agreements and Co-operative instruments	4.1 Industrial Companies 4.2 Commercial or Institutional Organisations 4.3 energy efficiency public procurement 4.4 Bulk Purchasing 4.5 Technology procurement
5 Energy services for energy savings	5.1 Guarantee of energy savings contracts 5.2 Third-party Financing 5.3 Energy performance contracting 5.4 Energy outsourcing
6 EEl mechanisms and other combinations of previous (sub)categories	6.1 Public service obligation for energy companies on energy savings + "White certificates" 6.2 Voluntary agreements with energy production, transmission and distribution companies 6.3 Energy efficiency funds and trusts

* Energy savings can be allocated to these subcategories only if a direct or multiplier effect can be proven. Otherwise they must be evaluated as part of a package.