Energy Performance Certificates

Energy Audits

HI-SMART

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MŰEGYETEM 1782

STU SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA

TECHNISCHE UNIVERSITÄT KAISERSLAUTERN

ENERGIAKLUB CLIMATE POLICY INSTITUTE APPLIED COMMUNICATIONS

Differerences between EPCs and audits

Main differences between EPCs vs Energy Audits

Energy Performance Certificates	VS	Energy Audits
- Evaluates building only without occupant - Focuses on all building types (with some exceptions) - When a new builiding is being built or an old one is sold and public buildings - Information about the energy use and energy consumption of the building in primary energy [kWh/(m2,a)], assumes general occupant behavior.		- Evaluates building and occupant together - Focuses on industrial and large buildings, corporations - Every 4 years

EPCs - Energy Performance Certificates

Main idea behind the system of EPCs

- The ultimate goal of EPCs is to **create a demand-driven market for energy efficiency** in the building sector.
- Providing owners and occupiers with **objective information** to assess, compare and improve their properties' energy performance may not only add a new dimension to the decision-making process, it might also transform the real estate market.
- EPCs can potentially **influence builders and real estate owners** to invest in greater energy performance, both in new buildings and renovation works.

Mandatory use of Energy Performance Certificates

All EU member states are required by the EPBD to set up certification and disclosure schemes for the following buildings:

- Every new buildings
- Buildings or building units that are sold or rented to a new tenant
- Every public building (or part of a building which is designed or altered to be used separately) with a total useful floor area of over 250 m2 (Public authorities should lead by example; display of EPCs)

The **validity** of the energy performance certificate shall not exceed **10 years**!

General content of an EPC

The EPBD defines the content of an EPC:

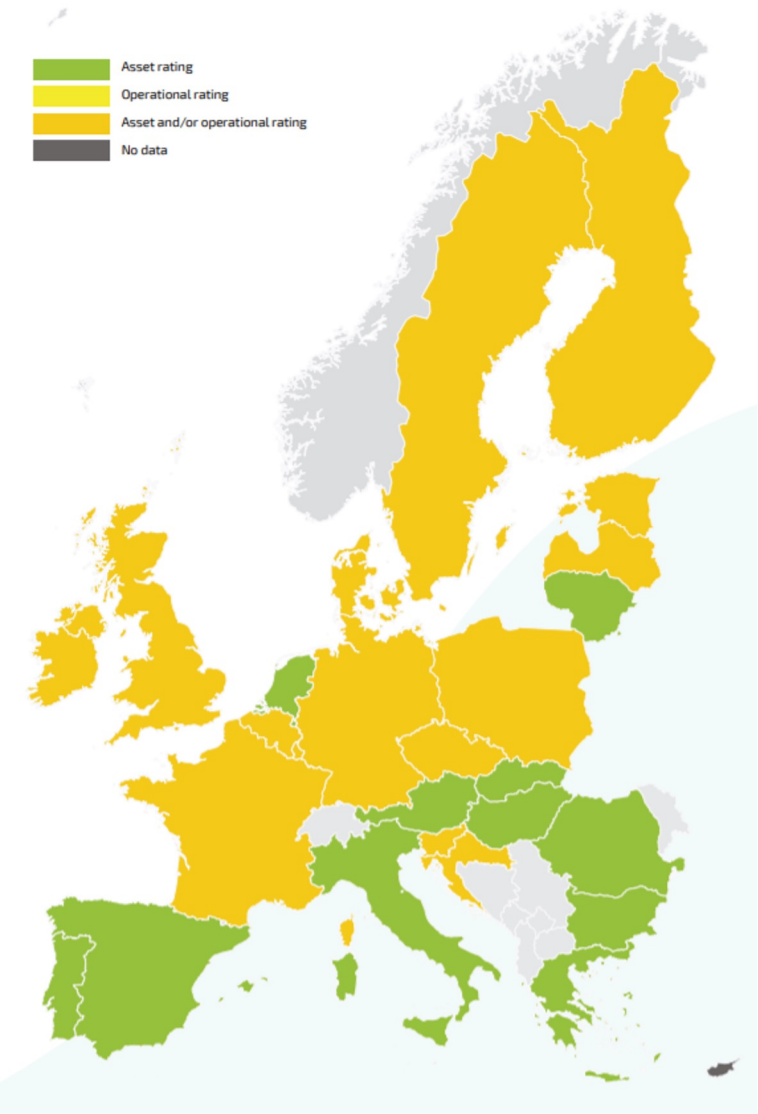
- the **energy performance** of a building
- **reference values** such as minimum energy performance requirements
- **recommendations** for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit
- an indication as to where the owner or tenant can receive **more detailed information**

Rating methodologies in the EU

An asset rating is: a calculated rating based on standard weather and building use similar in principle to "typical use" consumption figures for cars useful when comparing two buildings with different users, i.e. provides like-for-like figures

An operational rating is: based on measured energy use takes how the building is used and managed
useful for energy managers and potential users of the building because it includes factors they control.

Figure 10 - Asset and operational rating methodologies. *Data provided by X-tendo partners [8] and gathered from CA EPBD [5]. Map design: Showeet.*



Recommendations of EPCs

For a cost-optimal or cost-effective improvement it should cover:

- measures carried out in connection with a **major renovation** of the building envelope or technical building system(s); and
- measures for **individual building elements** independent of a major renovation of the building envelope or technical building system(s).

The recommendations included in the energy performance certificate shall be technically feasible for the specific building and may provide an estimate for the range of payback periods or cost-benefits over its economic lifecycle.

Information and tips for the owners and tenants

The energy performance certificate should add more information:

- where the owner or tenant can receive more detailed information, including as regards the cost-effectiveness of the recommendations made in the energy performance certificate
- The cost-effective evaluation should based on a set of standard conditions, such as
  - the assessment of energy savings
  - underlying energy prices
  - preliminary cost forecast and about on the steps to be taken to implement the recommendations.
- Other information on related topics, such as energy audits or incentives of a financial or other nature and financing possibilities may also be provided to the owner or tenant.

Independent control system should be established by the Member States

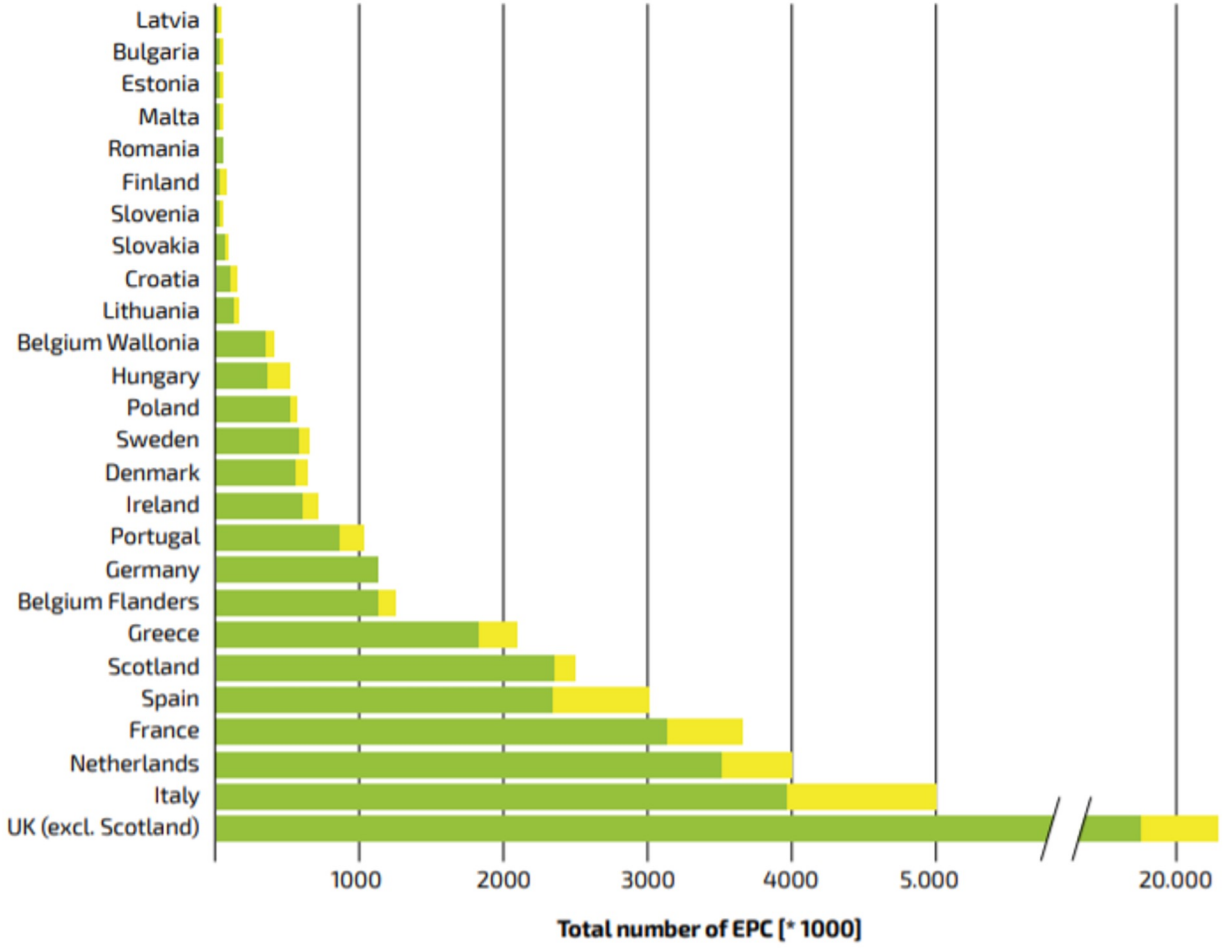
- **System of experts:** the energy performance certification of buildings and the inspection of heating systems and air-conditioning systems are carried out in an independent manner by qualified and/or accredited experts.
- **Transparency of the system:** information should be publicly available on training and accreditations, and it needs a regularly updated lists of qualified and/or accredited experts or regularly updated lists of accredited companies which offer the services of such experts are made available to the public.
- **Control system of the EPCs:** Furthermore, the competent authorities shall make a random selection of at least a statistically significant percentage of all the energy performance certificates issued annually and subject those certificates to verification.

EPC schemes in Hungary, Slovakia and Germany

	Hungary	Slovakia	Germany
Bodies in charge of qualified experts' accreditation	Professional association	Governmental body	No accreditation scheme
Registers of qualified and/or accredited experts	Mandatory register	Mandatory register	Voluntary registers
Type of software used to calculate energy performance certificates	Private software	Private software	Private software
On-site visit or inspection requirements to issue an EPC in the case of existing residential buildings	Required	Required	Not required
Bodies responsible for performing quality checks on energy performance certificates	Professional association	Central governmental body	Central / regional governmental bodies
Calculated (asset rating) or actual energy consumption (operational rating)	Asset rating	Operational rating	Operational rating
Penalty system for qualified experts and/or companies for poor quality of EPC issued	Administrative and monetary penalty	Monetary penalty	Monetary penalty
EPC registers	Central EPC register	Central EPC register	Central EPC register
Public access to EPC databases	Limited public access	Public access with protected privacy	No public access
Performance indicator	kWh/m2a	kWh/m2a	kWh/m2a
Recommendations for improvement the energy performance	Yes	Yes	Yes

Number of EPCs in the EU

Figure 4 - Number of EPCs registered per country/region. The yellow part of the bars indicates the share that was issued per year during the most recent years (2016-2019). *Source: EPBD CA Key Implementation Decisions 2016-2017 [4], and information provided by X-tendo partners. No data on registered EPCs was found for Austria, Czechia, Cyprus and Luxembourg.*



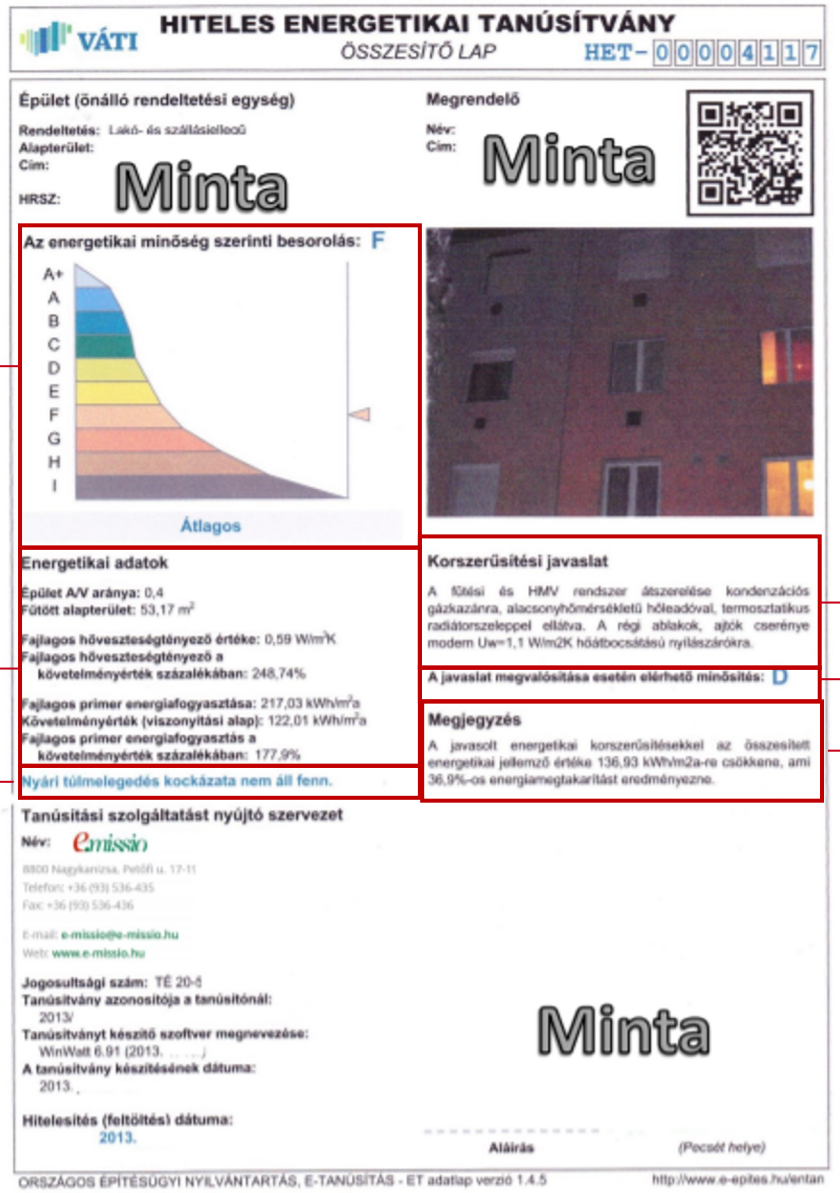
An example - A Hungarian EPC for a flat

Summary of an EPC in Hungary

Energy efficiency rating. It's F now.
(The rating system has always changing)

Summarized energy efficiency parameters, such as primary energy usage or heated floorspace and reference primary energy usage

Possible summer overheating?



VÁTI

HITELES ENERGETIKAI TANÚSÍTVÁNY

ÖSSZESÍTŐ LAP

HET-00004117

Épület (önálló rendeltetési egység)

Rendeltetés: Lakó- és szállásjellegű

Alapterület:

Cím:

HRSZ:

Minta

Megrendelő

Név:

Cím:

Minta

Az energetikai minőség szerinti besorolás: F

A+ A B C D E F G H I

Átlagos

Energetikai adatok

Épület A/V aránya: 0,4

Fűtött alapterület: 53,17 m²

Fajlagos hőveszteségtényező értéke: 0,59 W/m²K

Fajlagos hőveszteségtényező a követelményérték százalékában: 248,74%

Fajlagos primer energiafogyasztása: 217,03 kWh/m²a

Követelményérték (viszonyítási alap): 122,01 kWh/m²a

Fajlagos primer energiafogyasztás a követelményérték százalékában: 177,9%

Nyári túlmelegedés kockázata nem áll fenn.

Korszerűsítési javaslat

A fűtési és HMV rendszer átszerelése kondenzációs gázkazánra, alacsonyhőmérsékletű hőleadóval, termosztatikus radiátorszeleppel ellátva. A régi ablakok, ajtók cserénye modern Uw=1,1 W/m2K hőátbocsátású nyílászárókra.

A javaslat megvalósítása esetén elérhető minősítés: D

Megjegyzés

A javasolt energetikai korszerűsítésekkel az összesített energetikai jellemző értéke 136,93 kWh/m2a-re csökkene, ami 36,9%-os energiamegtakarítást eredményezne.

Tanúsítási szolgáltatást nyújtó szervezet

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E-mail: e-missio@e-missio.hu

Web: www.e-missio.hu

Jogosultsági szám: TÉ 20-6

Tanúsítvány azonosítója a tanúsítónál: 2013/

Tanúsítványt készítő szoftver megnevezése: WinWatt 6.91 (2013. . . . .)

A tanúsítvány készítésének dátuma: 2013. .

Hitelesítés (feltöltés) dátuma: 2013.

Minta

Aláírás

(Pecsét helye)

ORSZÁGOS ÉPÍTÉSÜGYI NYILVÁNTARTÁS, É-TANÚSÍTÁS - ET adatlap verzió 1.4.5

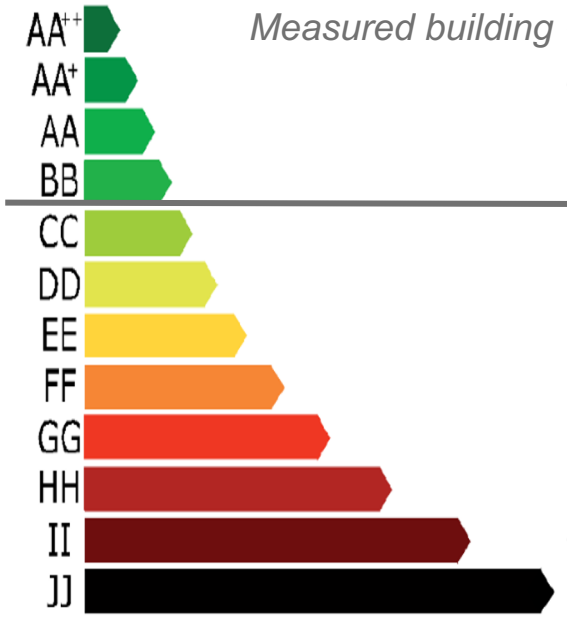
http://www.e-epites.hu/entan

Renovation recommendation, such as changing heating system and new doors/windows

Achieveable energy efficiency rating: D

Primary energy savings by the renovation in kWh/m2a

Current Hungarian energy efficiency rating system

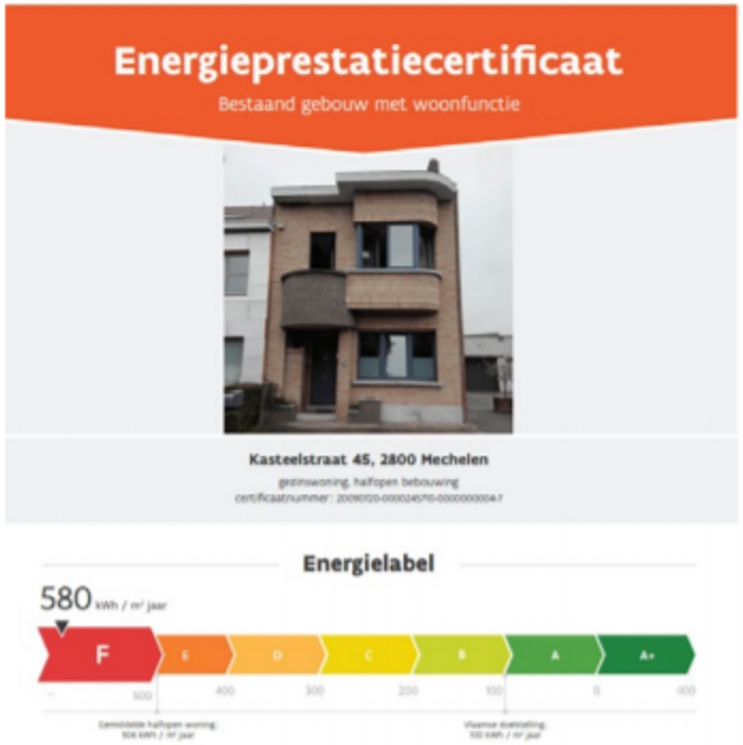


			Reference												
			AA++	AA+	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	
Measured building	<40%(20%)	AA++	0%	20%	41%	61%	81%	111%	141%	181%	231%	291%	381%	480%	
	40-60%	AA+	-20%	0%	21%	41%	61%	91%	121%	161%	211%	271%	361%	460%	
	61-80%	AA	-41%	-21%	0%	20%	40%	70%	100%	140%	190%	250%	340%	439%	nZEB
	81-100%	BB	-61%	-41%	-20%	0%	20%	40%	80%	120%	170%	230%	320%	419%	level
	101-130%	CC	-81%	-61%	-40%	-20%	0%	20%	60%	100%	150%	210%	300%	399%	
	131-160%	DD	-111%	-91%	-70%	-50%	-30%	0%	30%	70%	120%	180%	270%	369%	
	161-200%	EE	-141%	-121%	-100%	-80%	-60%	-30%	0%	40%	90%	150%	240%	339%	
	201-250%	FF	-181%	-161%	-140%	-120%	-100%	-70%	-40%	0%	50%	110%	200%	299%	
	251-310%	GG	-231%	-211%	-190%	-170%	-150%	-120%	-90%	-50%	0%	60%	150%	249%	
	311-400%	HH	-291%	-271%	-250%	-230%	-211%	-180%	-150%	-110%	-60%	0%	90%	189%	
	401-500%	II	-381%	-361%	-340%	-320%	-300%	-270%	-240%	-200%	-150%	-90%	0%	99%	
	>500%	JJ	-480%	-460%	-439%	-419%	-399%	-369%	-339%	-299%	-249%	-189%	-99%	0%	

Different designs of EPCs

Figure 12 - Estonia's new EPC design

Figure 13 - Flander's new EPC design



Energy Audits

What are the energy audits in general?

Detailed review of the buildings energy consumption based on historical data (load profiles) – including industry processes and logistics as well

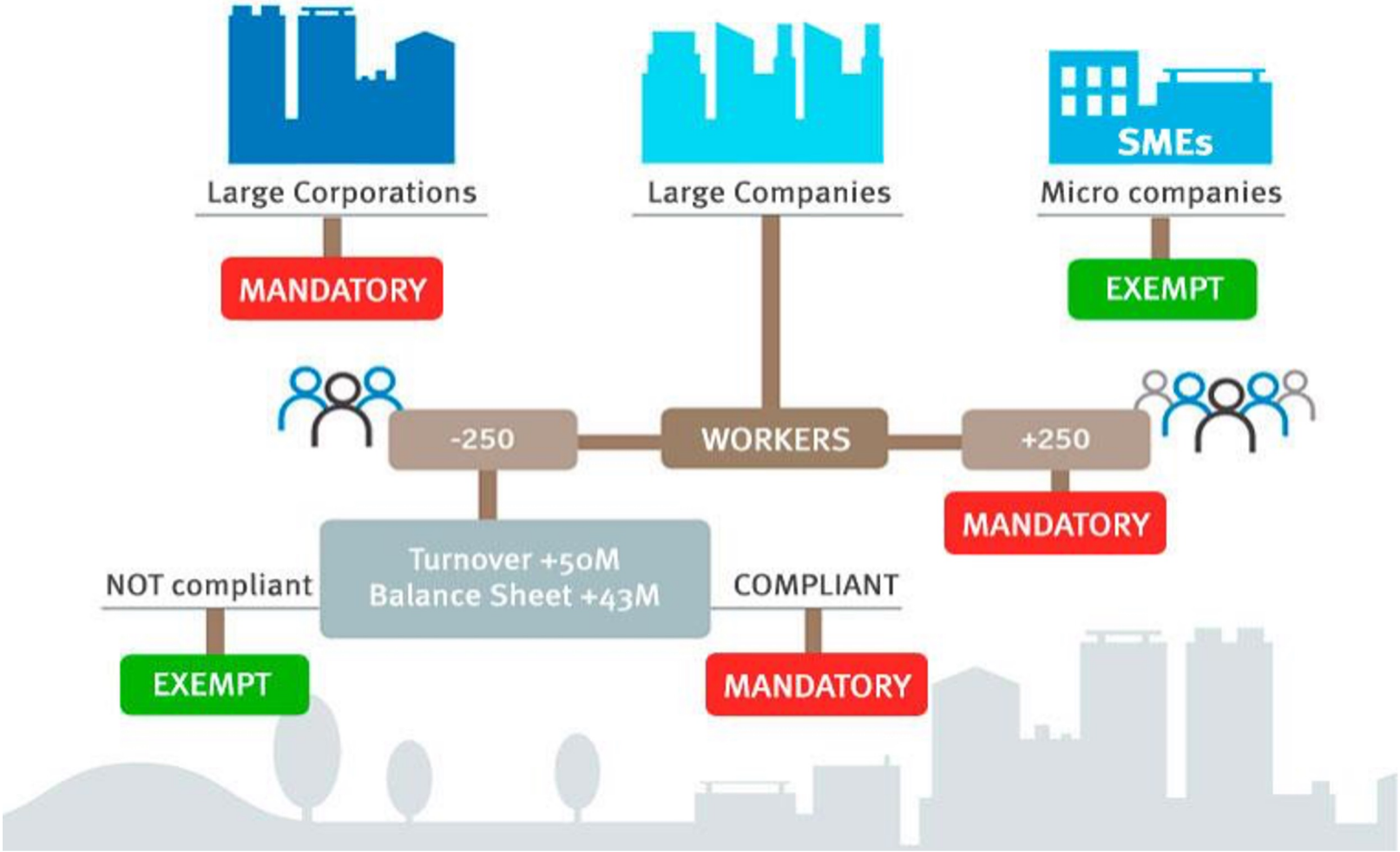
Tools and actions:

- Give advices to boost the energy performance
- Concrete advices based on financial calculations and payback period
- Tips for co-sponsors, loans and grants for the investments

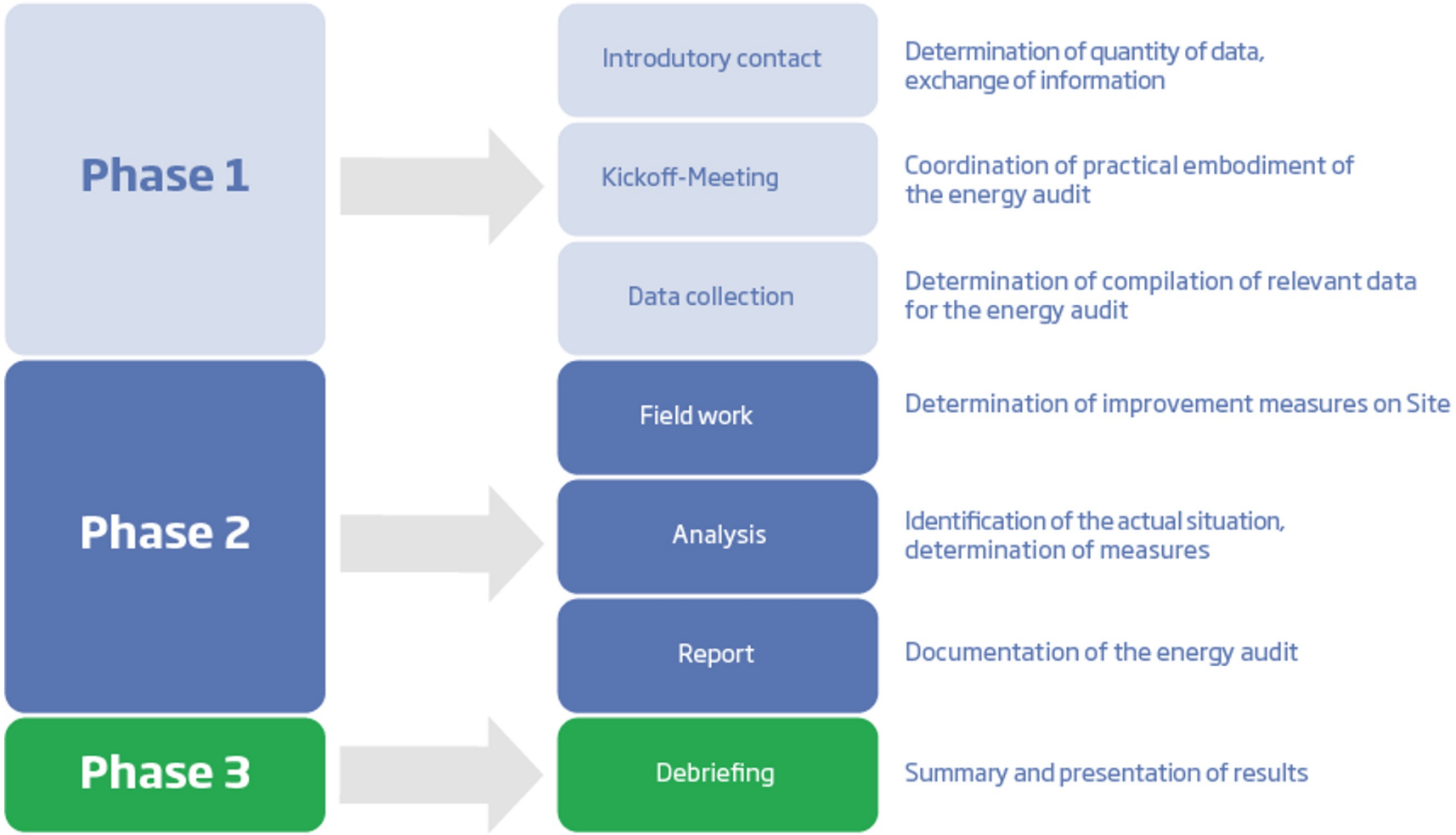
Requirements of an energy audit by the EED (Article 8)

1. Energy audits are of high-quality
   - Based on transparent and non-discriminatory criteria (according to Annex VI)
   - The quality of energy audits and similar measures is supervised
2. Energy audits are cost-effective
3. Energy audits are undertaken in an independent manner
4. The findings of energy audits are transferrable

Who needs to do an energy audit?



Standard workflow of an energy audit



Three level of actions based on energy audit

1. **Free measures** - Simple actions which no need money
   - Hydronic and air balancing
   - Reduce the temperature at night and weekend
   - Set the pump working point
2. **Cost effective measures** - actions with calculated payback time
   - New lighting system
   - New heating system
3. **Costly measures** – actions that need grants
   - Building envelope insulation

Standards at energy audits

Member States national minimum criteria for energy audits are not required to be more far reaching than the requirements of applicable European and international standards on energy management or energy auditing.

However, such **standards can provide a useful basis for the development of national minimum criteria** in line with Annex VI. Member States may therefore wish to refer to these in developing their national minimum criteria.

Relevant European or international standards include:

- EN ISO 50001 (Energy management) – For energy audits carried out as part of an energy management system
- EN 16247-1 (Energy audits)
- EN ISO 14001 (Environmental management) – Where the management system includes an energy audit

Thank you for your attention!

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