European
Copper Institute
Copper Alliance

Energy efficiency at technical system level

EP INTERGROUP EVENT ON ENERGY EFFICIENCY

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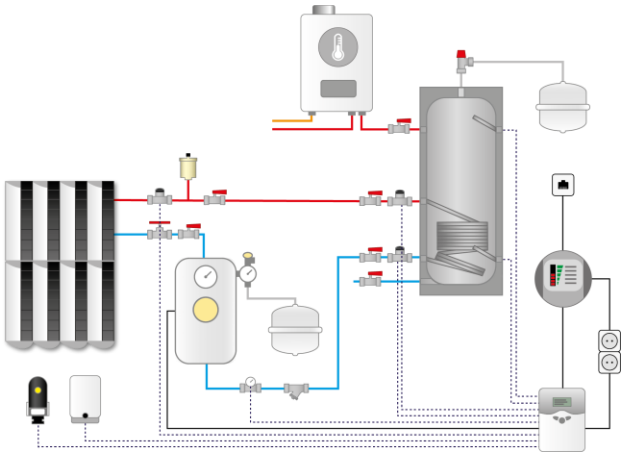
Energy efficiency : from products to systems to buildings
Potential at all levels

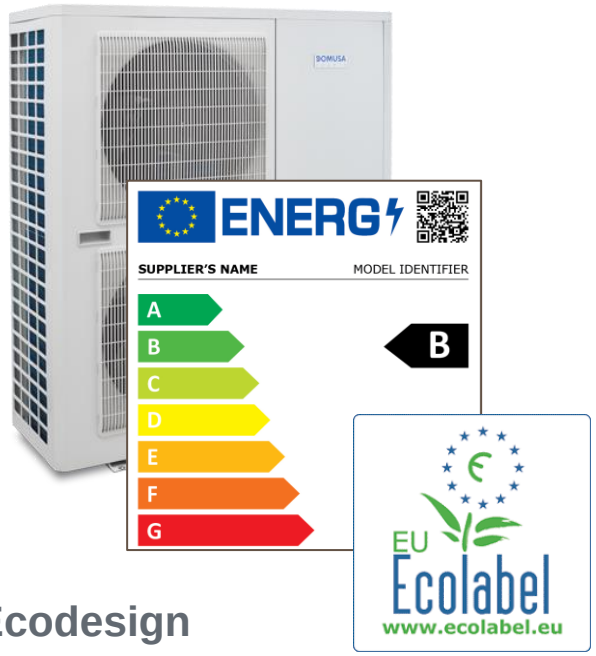


Product performance,
responsibility of **manufacturers**

System performance
responsibility of **installer / designer**

Building performance
responsibility of
designer/owner/occupant

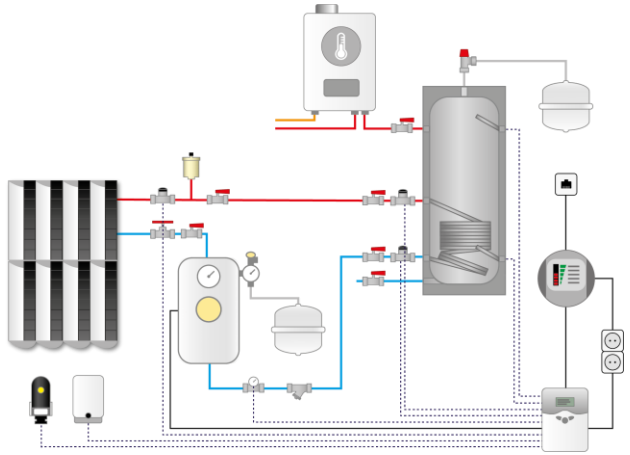
Defined policies to capture the energy efficiency potential: Systems fall between product and building policies



Ecodesign

Energy label

Ecolabel



Technical Building System (in **EPBD**) :
space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site generation and storage

Energy Management System (in **EED**)

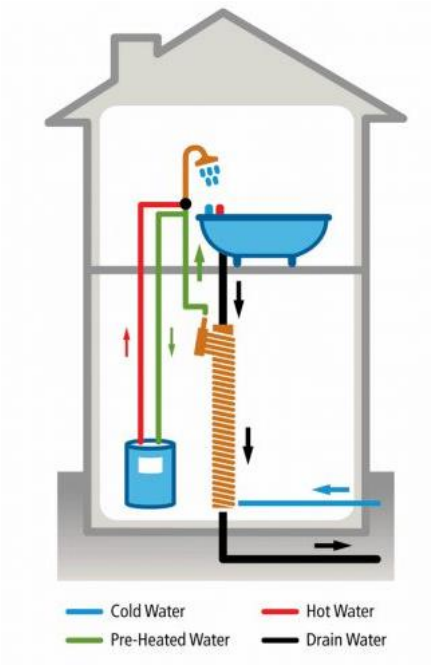
Energy Performance of Buildings Directive (EPBD)

Energy Efficiency Directive (EED)

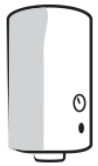
1

Example 1 : domestic hot water

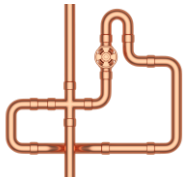
The energy consumption for domestic hot water is influenced by



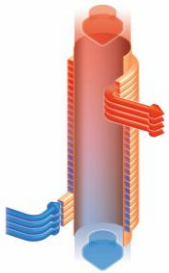
Showerhead : product performance covered by ecolabel
(flow shall not exceed 8 liters/min)



Water heater : product performance covered by energy label,
System level also relevant

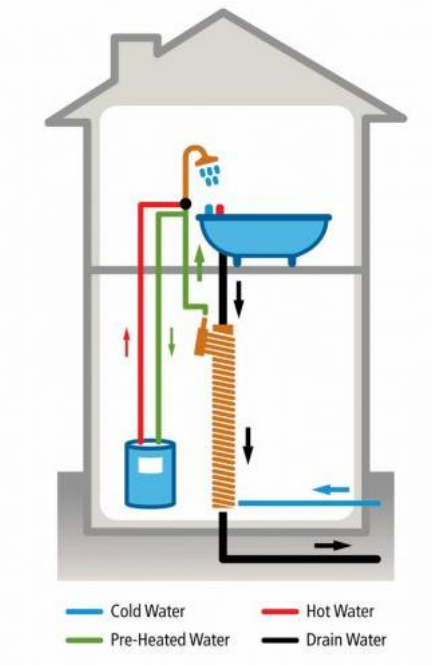


Piping system (length and insulation) : can only be addressed at system level

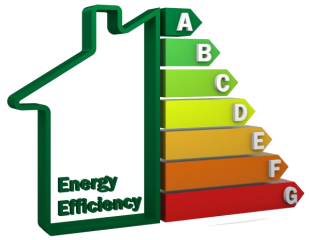


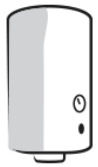
Heat recovery : can only be addressed at system level
up to 40% savings on domestic hot water

Domestic hot water in EPBD : heat recovery not considered

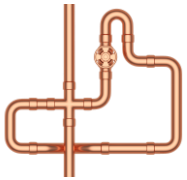


Annex 1 and EN standards define how to establish performance

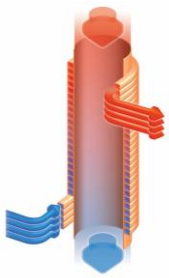




Water heater ✓



Piping system ✓



Heat recovery ✗

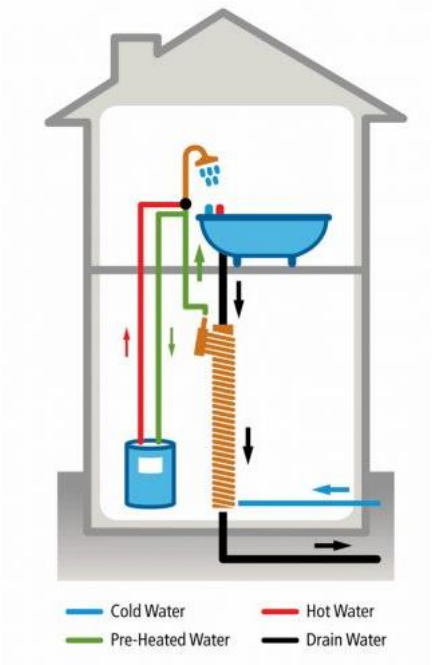
"4. The methodology shall be laid down taking into consideration at least the following aspects:

(b) heating installation and hot water supply, including their insulation characteristics;"

4.5 Mtoe energy saving potential by 2030 according to Commission's study

European Commission, Directorate-General for Energy, Strug, K., Hoen, M., Chan, Y., et al., *Technical assistance services to assess the energy savings potentials at national and European level : summary of EU results*, Publications Office, 2021, **https://data.europa.eu/doi/10.2833/10965**

Domestic hot water in EPBD : heat recovery not considered



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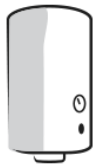
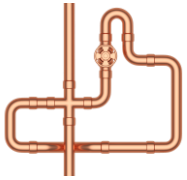
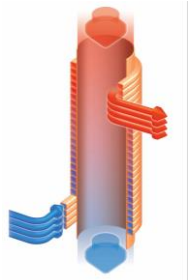


Water heater



Piping system



Heat recovery

"4. The methodology shall be laid down taking into consideration at least the following aspects:

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Proposal of amendment

4.5 Mtoe energy saving potential by 2030 according to Commission's study

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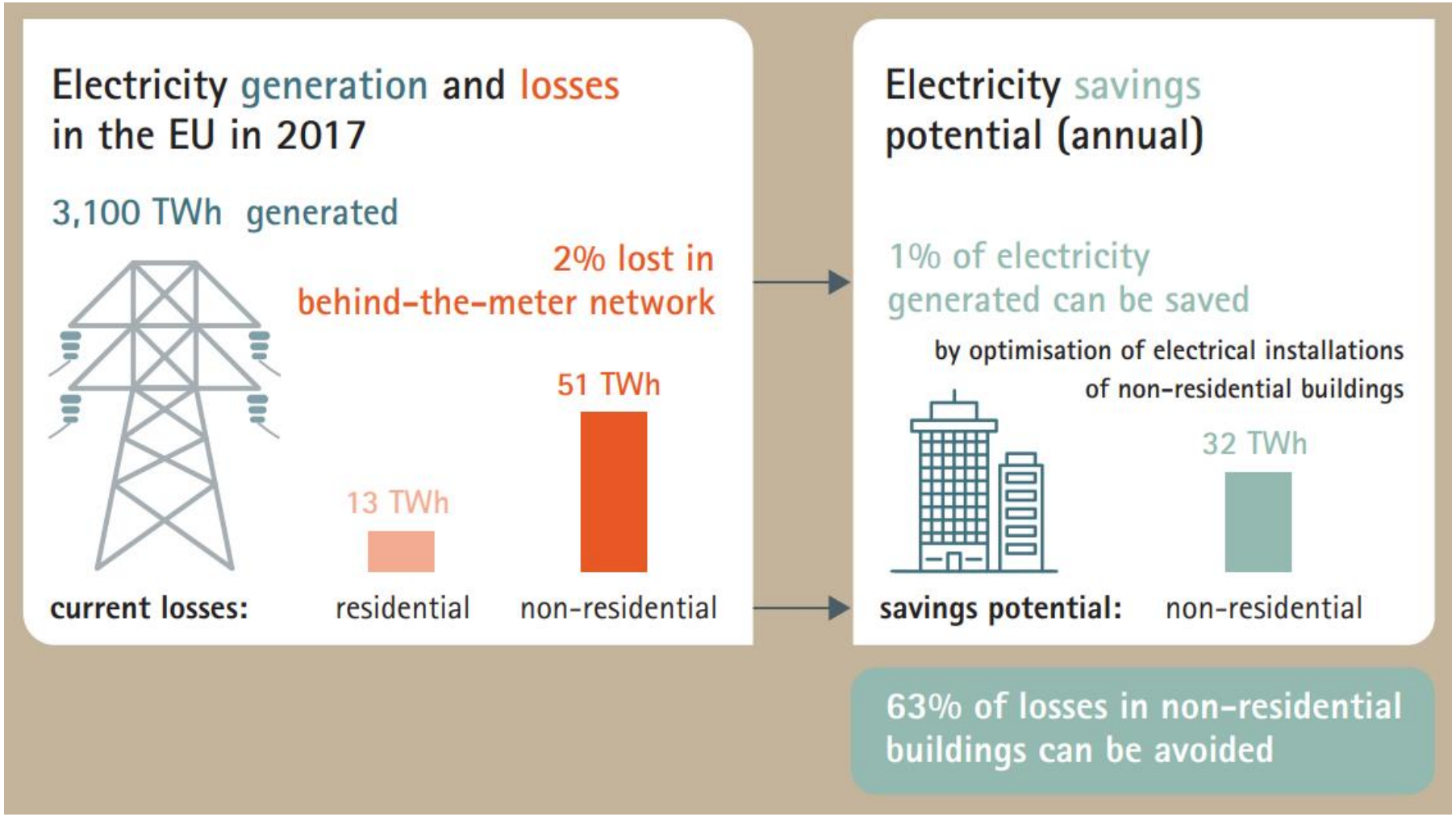
Example 2 : electrical installations

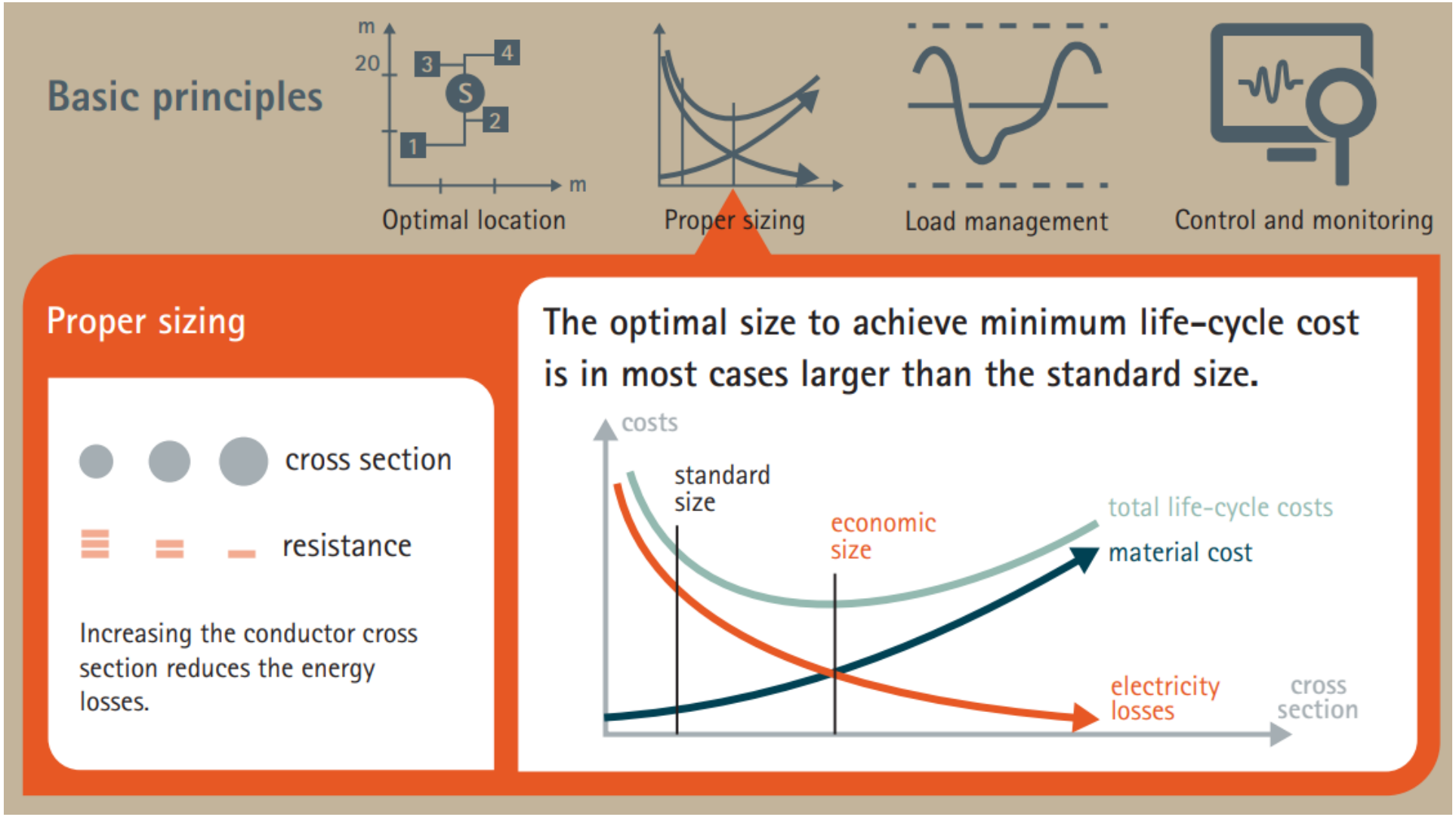
‘electrical installation’ means the system composed of all the fixed components (such as switchboards, cables, earthing systems, sockets, switches and light fittings) aiming to distribute electrical power within a building to all points of use or transmit electricity generated on-site

2% of electricity generated in EU is lost within behind-the-meter electrical installations



More info : White paper economic conductor size optimisation in buildings, ECI, December 2020: https://help.leonardo-energy.org/hc/en-us/article_attachments/360023760519/Cu0268_WP_Cable_Sizing_Buildings_v1_bis.pdf

Efficient in-building electrical installations can save 1% of the electricity generated in the EU



The EPBD must consider electrical installations as Technical Building Systems (TBS)

Where to address efficiency of electrical installations?

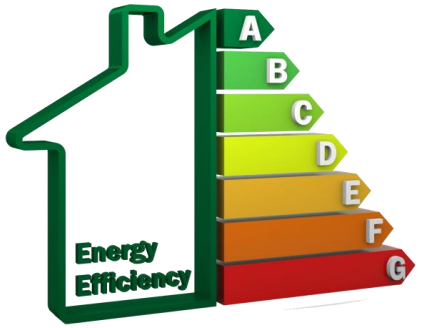
- Ecodesign : potential recognized for efficient cables but can't be addressed by product requirements (The ecodesign preparatory study for Power Cables in Indoor Electrical Installations estimated a potential of 28TWh/y by 2050)

- Guidance exists : IEC 60364-8-1:2019 "Low-voltage electrical installations –Part 8-1: Functional aspects – Energy efficiency"

- Solution : TBS within EPBD : include electrical installations as Technical Building System (TBS) within the Energy Performance of Buildings Directive (EPBD) and point to the relevant standard for their dimensioning

Ecodesign Preparatory Study on Power Cables : https://erp4cables.net/index.html

The EPBD must consider electrical installations as Technical Building Systems (TBS)

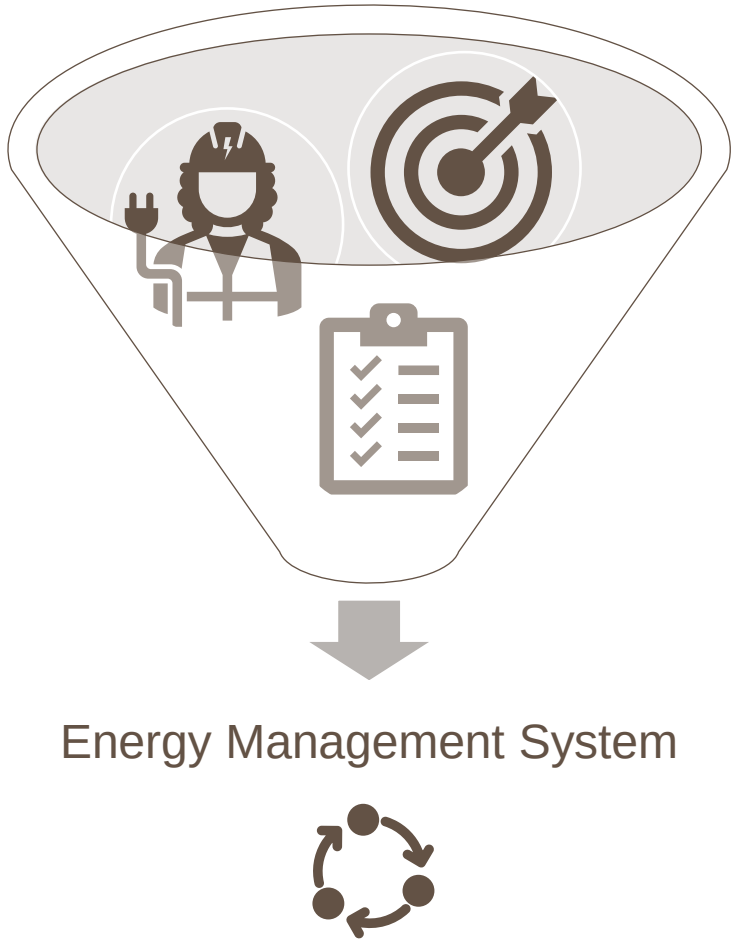


Proposal of amendment

Article 2 : definitions

6. ‘technical building system’ means technical equipment for space heating, space cooling, ventilation, domestic hot water, ***electrical installations***, built-in lighting, building automation and control, on-site renewable energy generation and storage, or a combination thereof, including those systems using energy from renewable sources, of a building or building unit;

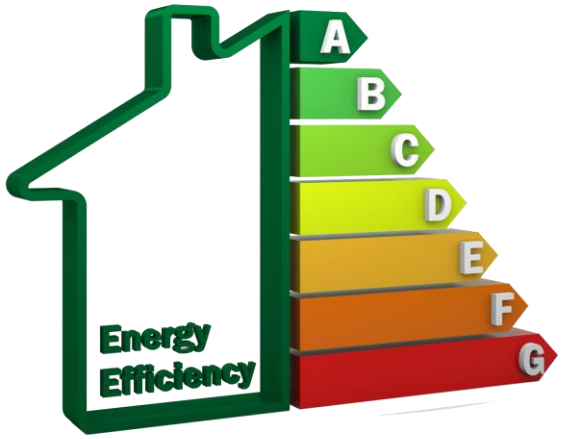
How to maximise energy efficiency of technical systems? A set of specific elements or an energy management system



Conclusion : the untapped energy efficiency potential at technical system level can be addressed

for buildings : within the EPBD

- **Domestic hot water** : consider heat recovery within calculation method
- **Electrical installations** : include as Technical Building System



Energy performance requirements for technical building systems should apply to whole systems, as installed in buildings, and not to the performance of standalone components, which fall under the scope of product-specific regulations under Directive 2009/125/EC (Ecodesign).

EPBD recast proposal, recital 15

for industry, via Energy Management Systems requirements within the EED

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Thank you

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