

For a “Fit for 55” EPBD recast

Position & recommendations on the proposed recast of the Energy Performance of Buildings Directive (EPBD)

February 2022

The proposed EPBD recast is a steppingstone for buildings’ decarbonisation and European Copper Institute (ECI) recommends considering several improvements to grasp the full potential.

- **Minimum Energy Performance Standards (MEPS) are welcomed, and their ambition must be “fit for 55”:** lock-in effect and sub-optimal choices must be avoided to address the large untapped energy efficiency and decarbonisation potential in the building stock and to secure the contribution of buildings to EU’s carbon neutrality, energy efficiency and renewable energy objectives.
- **Mainstreaming the Energy Efficiency First principle requires addressing untapped potential:** particularly with heat recovery on domestic hot water (potential of 4.5 Mtoe yearly savings by 2030) and efficient design of non-residential electrical installations (potential of 2.4 Mtoe yearly savings by 2050). We call **for considering electrical installations as Technical Building Systems, and for including hot water heat recovery into the calculation framework** (Annex 1).
- **Improved templates for National Building Renovation Plans (NBRP) and Energy Performance Certificates (EPC)** are an excellent opportunity to capture the multiple benefits of holistic renovation. We recommend safeguarding that **electrical installations** are considered by ensuring their inspection and by linking information about their safety and readiness into EPCs.
- Strengthened e-mobility requirements, with smart charging and right-to-plug are welcomed. Existing residential and small buildings including single family houses are not covered by the proposal it is therefore important to ask **all new charging points to be smart and to provide via EPCs information about the readiness of any building to safely install an EV charging point.**
- The calculation of whole life-cycle greenhouse gas emissions must take into account the **recyclability and reusability** of materials to ensure products used today will not be the waste of tomorrow.

Minimum Energy Performance Standards must be “fit for 55”

We welcome the introduction of Minimum Energy Performance Standards (MEPS) for the entire buildings stock as an effective tool to address persistent barriers to energy renovation, incentivise private investments, and unlock the innovation potential in the buildings sector.

The first step of a staged deep renovation is a better measure towards a zero-emission building than a complete renovation to lower standards. In order to avoid lock-ins and suboptimal choices every renovation triggered by MEPS must be accompanied by a Renovation Passport outlining the steps towards achieving the energy class “A” within a set timeframe.

Providing this long-term perspective will be essential to pave the way for the relevant financing schemes and the necessary support measures, and it is also needed to train and upskill construction workers on the ground. The Renovation Passport must ensure that any renovation plan considers all elements of a building, particularly the electrical installation and the domestic hot water system that are often overlooked, with the view of achieving maximum energy efficiency and a zero-emission target.

ECI ask: Every renovation triggered by MEPS must be accompanied by a Renovation Passport outlining the steps towards achieving the energy class “A” within a set timeframe. (Article 9)

Mainstreaming the Energy Efficiency First principle to address untapped systems savings potential of hot water systems and electrical installations

The Energy Efficiency First principle in the building sector is paramount, particularly with the current energy prices crisis which makes this revision very timely and crucial to sustainably reduce energy bills and alleviate energy poverty.

As rightly stated in recital (15): “**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...” and considering the Energy Efficiency First principle we recommend unlocking full energy saving potential of (1) wastewater heat recovery in buildings and (2) economic sizing of electrical installations.

1. **Wastewater heat recovery (WWHR) systems** –available and effective energy efficiency solutions reduce the energy demand for domestic hot water via the direct heat recovery from shower drains. **It can save around 40 percent of energy and related CO₂ emissions from hot water production.** Requiring Member States to **integrate the heat recovery characteristics of the hot water system into their calculation method (EPBD Annex 1)** can unlock a potential of 4.5 Mtoe final energy by 2030 according to a study of the European Commission¹. The presence of heat recovery system should also be considered into Energy

¹ Technical assistance services to assess the energy savings potentials at national and European level: [Summary of EU results](#) and [Member state annex report](#)

Performance Certificates (EPC) and Renovation Passports (RP). More details in attached *Infographic 4*.

2. **Economic sizing of in-building electrical installations** - 2% of the electricity generated in the EU (64 TWh/year) is lost in behind-the-meter networks² and roughly half of it could be avoided by optimisation of electrical installations of buildings. **Including electrical installations in the definition of Technical Building Systems (TBS) and pointing to the relevant economic optimisation standards³ for their dimensioning and inspection can save 1% of electricity generated in the EU.** Final energy saving potential according to the Ecodesign Preparatory Study Scenario⁴ reaches 7.6 TWh/y (0.65 Mtoe/y) by 2025 and 28 TWh/y (2.4 Mtoe/y) by 2050. Given the rising importance of electricity use in the future European economy such savings will have even greater impact. More details in attached *Infographic 2*.

ECI ask: (1) Amend Annex 1 to include heat recovery into calculation methods
(2) Include electrical installations in the definition of Technical Building Systems (Article 2.6) and point to the relevant economic optimisation standards for their dimensioning (Article 11 and Article 20).

Improved templates for National Building Renovation Plans (NBRP) and Energy Performance Certificates (EPC)

It is essential that all buildings are made ready for clean heating and transport, as well as on-site renewable generation and storage. As electrical installations are the backbone of zero-emission buildings we recommend addressing their safety, readiness and smartness (see *Infographic 1* attached). Information about the status of electrical installations should be integrated into tools such as NBRPs, EPCs, Renovation Passports, Smart Readiness, in digital format.

- **Electrical/fire safety:** the fire safety objective is included in the EPBD, and the inspection of electrical installations should be a priority for this aspect. **30% of all domestic fires and 50% of all domestic accidental fires have an electrical source⁵.** Considering also that vulnerable communities including citizens suffering from energy poverty are more sensitive to electrical safety concerns, it is crucial to improve electrical safety in domestic buildings. Only a few Member States have an electrical inspection regime and safety checks in place. While recommended by the Commission recommendations on building renovation and recently by European Parliament's EPBD Implementation Report, only a few Member States have included this aspect into their LTRS.
- **Readiness of electrical installations:** it is estimated that a minimum of 130 million dwellings, built before 1990, have not undergone an electrical system upgrade⁶. While the energy transition, decarbonisation and energy efficiency will drive further electrification of buildings the integration of highly efficient equipment or on-site renewable generation & storage requires up to date electrical installations. Building owners should be informed about the

² [White paper economic conductor size optimisation in buildings](#), ECI, December 2020

³ Measures to reduce losses are defined into International Standard IEC 60364-8-1:2019 "Low-voltage electrical installations – Part 8-1: Functional aspects – Energy efficiency"

⁴ Preparatory Studies for Product Group in the Ecodesign Working Plan 2012-2014: [Lot 8 - Power Cables, Task 1-7 report](#)

⁵ Forum for European Electrical Domestic Safety ([FEEDS](#))

⁶ source: <https://www.feedsnet.org/>

status and readiness of the electrical installations particularly in the view of electrification of heating and transport. For details on safety and readiness see attached *Infographic 3*.

Therefore, the EPBD recast is an opportunity to take the following necessary actions:

- **National Building Renovation Plan (NBRP)** as proposed provide an improved framework to current LTRS, with harmonised requirements, national targets and measurable progress indicators. It is welcomed for the transformation of existing buildings into zero-emission buildings by 2050 and will be an excellent opportunity to capture multiple benefits of holistic renovation. Because electrical installations are not explicitly covered, **we recommend integrating the deployment of national electrical inspection regimes and upgrades into NBRPs.**
- The proposed Energy Performance Certificate (EPC) framework improves the reliability, comparability, and quality of the information provided to building owners and occupants. **We recommend integrating into EPCs information about the status (safety & readiness) of electrical installations.**
- Renovation Passports and the Smart Readiness indicator should also cover electrical installations.

ECI asks: (1) Integrate the deployment of national electrical inspection regimes and upgrades into NBRPs (Annex II),
(2) integrate into EPCs information about the status (safety & readiness) of electrical installations (Annex V),
(3) cover electrical installations in the Renovation Passport Scheme and the Smart Readiness Indicator.

Infrastructure for sustainable mobility and smart charging

The proposed strengthening of the e-mobility requirements for buildings with several parking places (pre-cablings, smart charging and right-to-plug) will support the deployment of electric vehicles (EVs).

The installation of smart chargers is of key importance to control demand from EVs in buildings and to minimize congestion, the consequent upgrade investments, and potential delays of the e-mobility transition. Existing residential and small buildings including single family houses are not covered by the proposal and we therefore recommend:

- that in coherence with RED Proposal Article 20a point 3 and AFIR proposal Article 5 point 8, **all new charging points in and adjacent to buildings should be capable of smart charging and, where appropriate, bidirectional charging.**
- that **information about the readiness of any building to safely install an EV charging point shall be provided into the EPCs.**

ECI asks: (1) all new charging points in and adjacent to buildings should be capable of smart charging and, where appropriate, bidirectional charging (Article 12),
(2) information about the readiness of any building to safely install an EV charging point shall be provided into the EPCs (Annex V).

Whole life-cycle greenhouse gas emissions and circularity

The calculation of whole life-cycle greenhouse gas emissions must take into account the recyclability and reusability of materials to ensure products used today will not be the waste of tomorrow.

The construction sector accounts for nearly half of all waste generated in the EU, and this will not change unless circularity at the end-of-life is taken into consideration and not just in product manufacturing. For metals, reusability and recyclability aspects are only partly reflected at the production stage and should be complemented from a whole life cycle perspective through the additional benefits resulting from the end-of-life stage (reported under Module D).

ECI ask: The calculation of whole life-cycle greenhouse gas emissions must include the recyclability and reusability of materials at end-of-life. This must be specified into the definition of "whole life cycle greenhouse gas emission" (Article 2.23) and in the calculation method (Annex III)

ANNEXES:

- INFOGRAPHIC 1: **Electrical installations are the backbone of zero-emission buildings**
The EPBD must make them safe, ready, efficient and smart
- INFOGRAPHIC 2: **Efficient in-building electrical installations can save 1% of the electricity generated in the EU**
- INFOGRAPHIC 3: **Electrical safety: time for action**
- INFOGRAPHIC 4: **Waste Water Heat Recovery (WWHR) systems**
Low hanging fruit for energy efficiency and decarbonisation of buildings

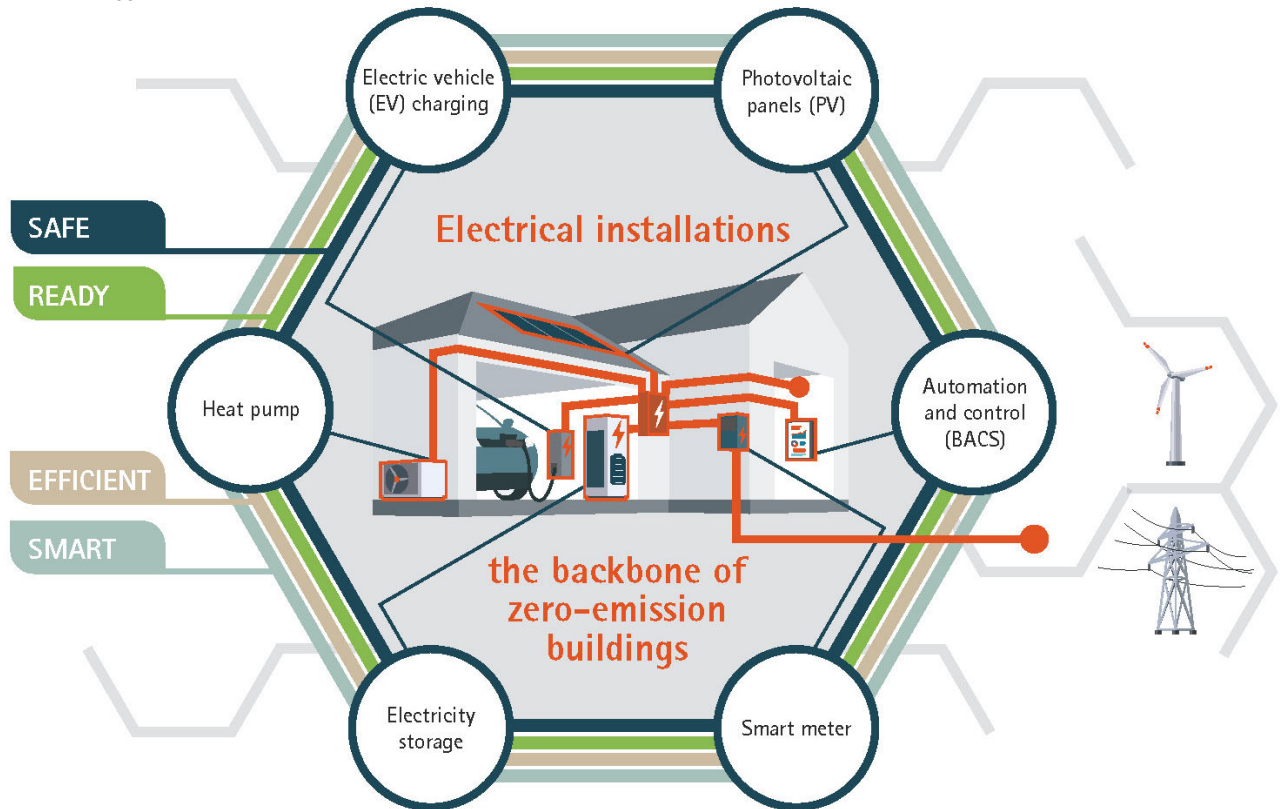
About the European Copper Institute

The European Copper Institute (ECI) is the leading advocate for the copper industry in Europe and the European arm of the International Copper Association (ICA). Our members mine, smelt, refine and recycle copper for use across the economy, in the electricity system, buildings, transport and industry.

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Electrical installations are the backbone of zero-emission buildings The EPBD must make them safe, ready, efficient and smart

THE ISSUES

OUR PROPOSALS

SAFE	30% of domestic and 50% of domestic accidental fires have an electrical source.	Deploy national electrical inspection regimes and electrical safety checks in dwellings according to national wiring rules.
READY	132 million domestic electrical installations are obsolete. Renovation must anticipate electrification of heating and cooling, EV charging, storage and on-site renewables.	Incorporate requirements and indicator of readiness of electrical installations for full (staged) decarbonisation.
EFFICIENT	64 TWh energy (2% of electricity generated in the EU) is lost in behind-the-meter networks (in-building electrical installations).	Include electrical installations in the definition of Technical Building Systems (TBS) and point to the relevant economic optimisation standards for their dimensioning.
SMART	Smart integration of highly efficient heat pumps, EV charging infrastructure, storage and renewable generation can contribute to an efficient and stable electrical grid via demand side flexibility.	Mainstream Building Automation and Control Systems (BACS), smart EV charging, real-time energy monitoring and smart meters. Introduce a metric to quantify the demand side flexibility at building and/or district level.

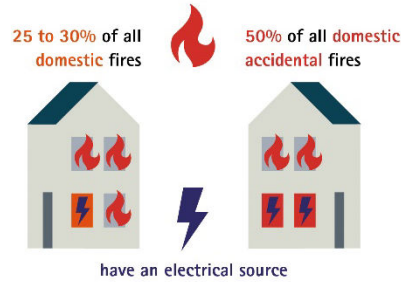
TOOLS

- Long Term Renovation Strategy (LTRS)
- Energy Performance Certificate (EPC)
- Smart Readiness Indicator (SRI)
- Building Renovation Passport (BRP)
- Inspections (EPBD Art 14 and 15)
- Minimum Energy Performance Standards (MEPS)
- Deep Energy Renovation Standard

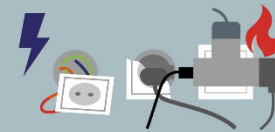


EU data:

Domestic fires of electrical source = 273,000/year



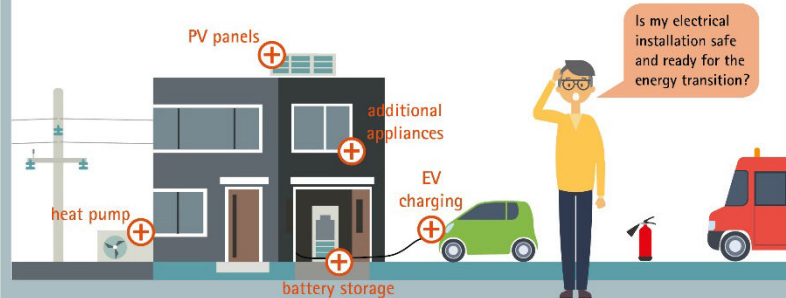
130 millions of obsolete electrical installations (half of the EU building stock)



- aging of components
- lack of maintenance
- evolution of uses
- low renovation rate

Sources: Forum for European Electrical Domestic Safety - FEEDS - <https://www.feedsnet.org/>

Electrical installations are the backbone of zero-emission buildings

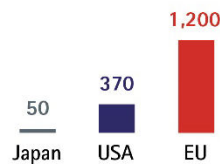


Safe and decent housing is a must of the energy transition



World data:

Number of domestic electrical fires per 1,000,000 dwellings



- Japan: mandatory inspections of electrical installations every 4 years
- USA: inspection every 10 years (differs among states) + awareness campaign

The European Parliament (resolution of 15 December 2021 on the implementation of the EPBD):

- "... calls on Member States to develop an electrical inspection regime..."
- "... believes that the European building stock renovation should integrate electrical safety checks and upgrades..."

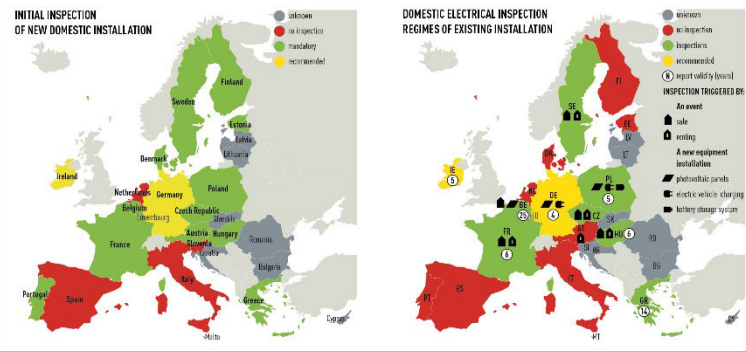
Source: https://www.europarl.europa.eu/doceo/document/TA-9-2021-0503_EN.pdf



DEPLOY NATIONAL INSPECTIONS REGIMES ACCORDING TO NATIONAL WIRING RULES

EU: inspections regimes vary strongly among Member States

EU deployment of inspection regimes is limited and mainly voluntary



Further information:

RESIDENTIAL ELECTRICAL SAFETY - HOW TO ENSURE PROGRESS, White Paper, FEEDS, February 2020

ACCIDENTAL ELECTRICAL DOMESTIC FIRES, White Paper, FEEDS, April 2021

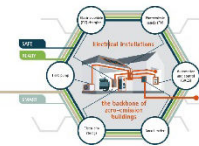
Electrical installations are the backbone of zero-emission buildings

The EPBD must make them safe, ready, efficient and smart - Infographic, ECI, December 2020

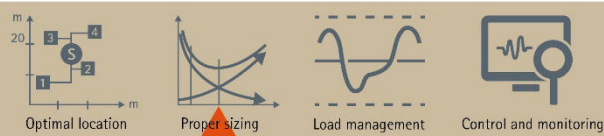


Efficient in-building electrical installations can save 1% of the electricity generated in Europe

EFFICIENT



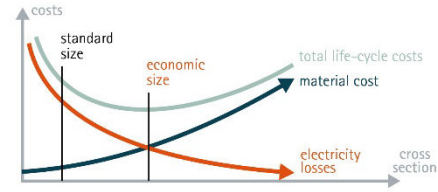
Basic principles



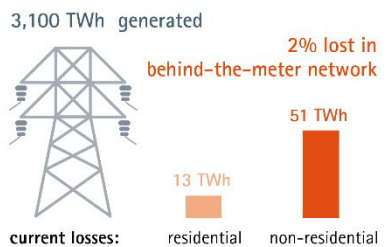
Proper sizing

● ● ● cross section
 ≡ ≡ ≡ resistance
 Increasing the conductor cross section reduces the energy losses.

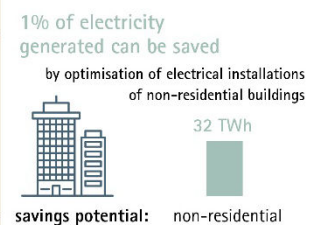
The optimal size to achieve minimum life-cycle cost is in most cases larger than the standard size.



Electricity generation and losses in the EU in 2017



Electricity savings potential (annual)



63% of losses in non-residential buildings can be avoided

By applying economic optimisation standards to new and renovated non-residential buildings

Additional advantages ...

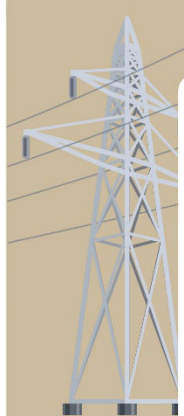
Savings in ENERGY and ELECTRICITY COST



- Improved power quality
- Improved fire safety
- Higher overload capacity

Payback time from 2.5 years with expected installation lifetime of 25 years

... making buildings future ready



OUR PROPOSAL FOR EPBD:

Include electrical installations in the definition of Technical Building Systems (EPBD Article 2.6) and point to the relevant economic optimisation standards* for their dimensioning to save 1% of electricity generated in the EU.

* IEC 60364-8-1:2019

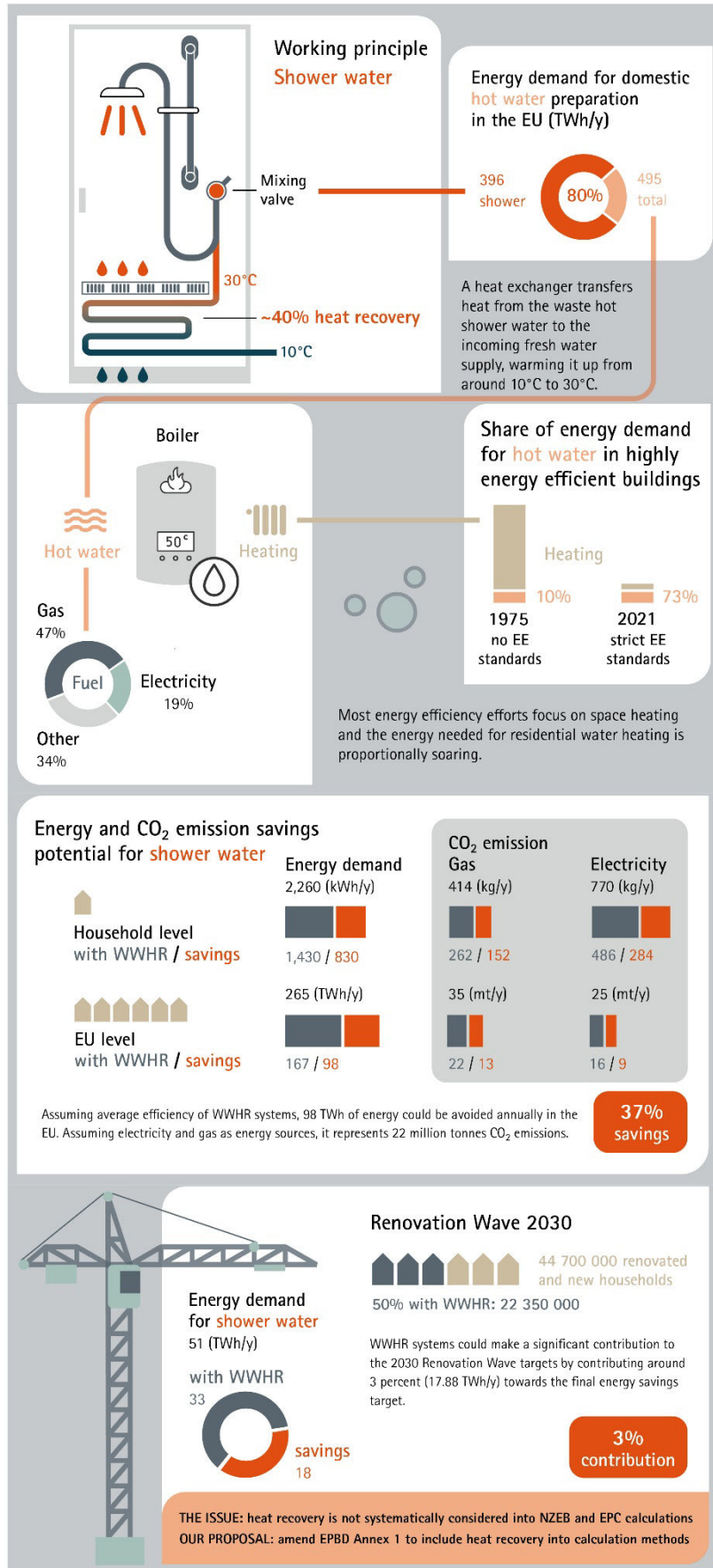
Further information:

ECONOMIC CONDUCTOR SIZE OPTIMISATION IN BUILDINGS - White Paper, ECI, December 2020



Electrical installations are the backbone of zero-emission buildings
 The EPBD must make them safe, ready, efficient and smart - Infographic, ECI, December 2020

Waste Water Heat Recovery (WWHR) systems
Low hanging fruit for energy efficiency and decarbonisation of buildings



Further information: [ROLE OF WASTE WATER HEAT RECOVERY IN DECARBONISING EUROPEAN BUILDINGS White Paper, ECI, November 2020](#)