# Impact assessment of the MEPS under discussion in the context of the EPBD revision

Factsheet[1]

**Meeting the targets set by Fitfor55 requires a comprehensive set of policy measures, of which MEPS are a key component. Together with appropriate accompanying policy measures, an ambitious design of the MEPS could contribute to achieving 1/3 of the building sector target for 2030.**

## Context

Minimum Energy Performance Standards (MEPS) are under discussion in the frame of the revision of the Energy Performance of Buildings Directive (EPBD) as a tool to trigger renovation of buildings in the European Union and reduce GHG emissions. To inform this discussion, Climact and BPIE modelled the impacts of MEPS schemes on the European building stock. This allows comparing the ambition of MEPS as originally proposed by the European Commission with two other scenarios: the REPowerEU plan and a scenario aligned with the EU climate and energy consumption reduction targets set by Fitfor55[2]. The modelling was done in June 2022 and mainly accounts for the proposals from the EU Commission, REPowerEU and the EP rapporteur for the EPBD revision, Ciáran Cuffe.

## Modelling staged EPC level improvements on the EU buildings stock

**As the starting point of the analysis, the distribution of European buildings across EPC categories** was gathered based on national or regional EPC databases or computed based on proxies when data were not available. Energy consumption data resulting from EPC levels have then been calibrated with the national energy balances. Details of the methodology are available in the Annex.

**In order to define the EPC classes for the EU, the analysis followed the European Commission Proposal from December 2021 to define the G category as '*the 15% worst-performing buildings*'**. The resulting classes are shown in Figure 1a, while figure 1b shows the calibrated average final energy consumption per EPC label at EU level and the energy consumption reductions corresponding to EPC level improvements.

**Scenarios then consisted in progressive improvements of EPC levels**, starting with the worst performing buildings, with varying timing and level of ambition as illustrated in Table 1.

## Scenarios

Three main scenarios are considered and summarised in Table 1:

- **EPBD-baseline** is the MEPS design suggested by the Commission in its EPBD revision proposal,
- **RePower EU**: is the one proposed in the Repower EU plan,
- **Comprehensive**: is a MEPS designed to trigger deeper renovations of the worst-performing buildings.

[1] This work was funded by the European Climate Foundation.

[2] The 'fit for 55' aims at cutting GHG emissions in the building sector by 60% by 2030 compared to 2015 levels.

For each scenario the impact of including private residential buildings and non-residential buildings has been calculated, as shown in figure 3. A more detailed version of the scenarios is available in Annex.

*Figure 1 – (a) EPC scale definition used, and (b) the resulting final energy consumption per label calibrated on national energy balance.*

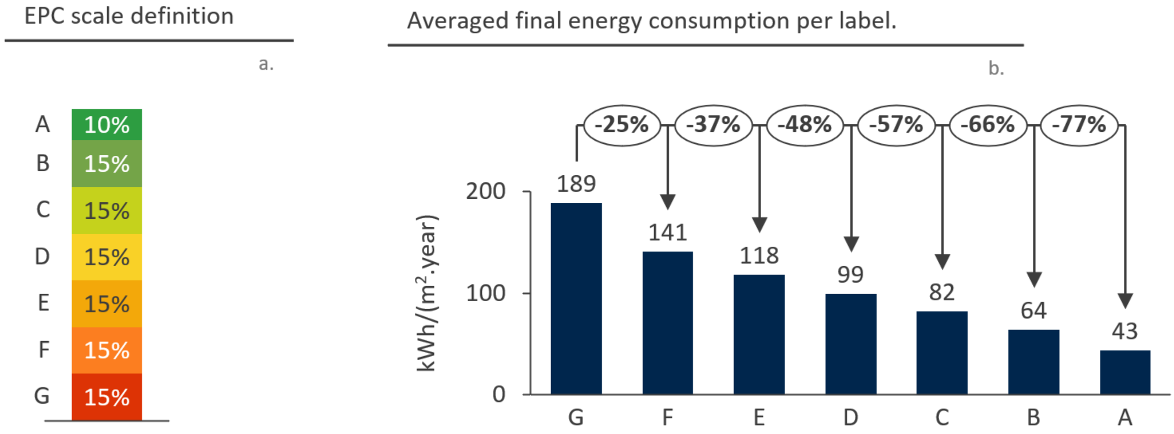


*Table 1. Key milestones modelled for the three scenarios*

| | | G* | F | E | D |
|---|---|---|---|---|---|
| **EPBD-baseline** | Commission Proposal | To F by 2030 | To E by 2033 | | |
| **Repower EU** | Stricter MEPS in terms of renovation depth and milestone for F-buildings | To D by 2030 | To D by 2030 | | |
| **Comprehensive** | Comprehensive renovations are triggered by stricter MEPS | To C by 2030 | To C by 2030 | To C by 2033 | To C by 2033 |

**** These classes represent current EPC classes***
***Milestones for public buildings and non-residential buildings are three years ahead (see Annex).*

## Results

Gas consumption and GHG emission reductions for the three scenarios are illustrated in Figure 2 and compared with the 2030 targets set by the Fitfor55. It shows that (results by 2030 are compared to 2015 level):

- The MEPS proposed by the Commission in the EPBD revision proposal (EPBD-baseline) would reduce GHG emissions by 9%. In the absence of long-term objectives, it would not prepare the building stock for the phase-out of fossil fuels. This would not be sufficient to ensure the building sector brings the foreseen contribution to the Fitfor55 targets.
- Repower EU's MEPS proposal can have a higher impact, reducing GHG emissions by 17%.
- A more ambitious design of the MEPS could reduce GHG emissions by 21%, contributing to achieving 1/3 of the building sector target for 2030.

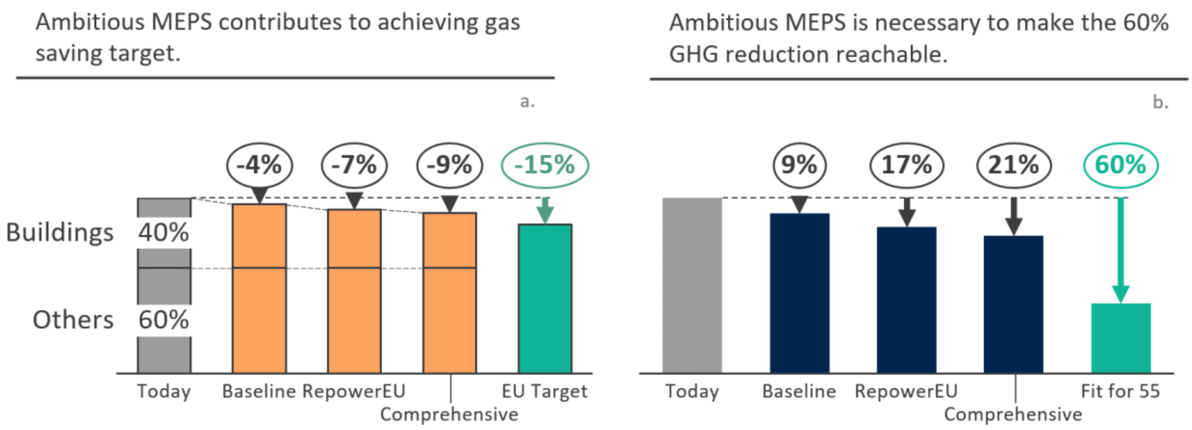


*Figure 2 – (a) Total EU gas consumption, and (b) GHG emissions from EU buildings under various scenarios in 2030.*

In August 2022, the EU Commission launched a "Save Gas for a Safe Winter" Plan setting out the measures via which the EU can tackle potential further disruptions in gas supplies due to the current war in Ukraine, in view of the upcoming winter season.[3] An ambitious MEPS framework could support this objective by decreasing EU gas demand by about 9%, while the Commission's proposal in the EPBD for MEPS would decrease gas consumption by only around 4% (see Figure 2a).

Figure 3 shows that MEPS applied on private residential buildings contribute to the majority of the GHG emission reductions of each scenario (6% in the baseline scenario, 13% in the REPowerEU and 16% in the ambitious scenario). Excluding private residential buildings from MEPS requirements would significantly lower the potential of this policy instrument to contribute to the Fitfor55targets.

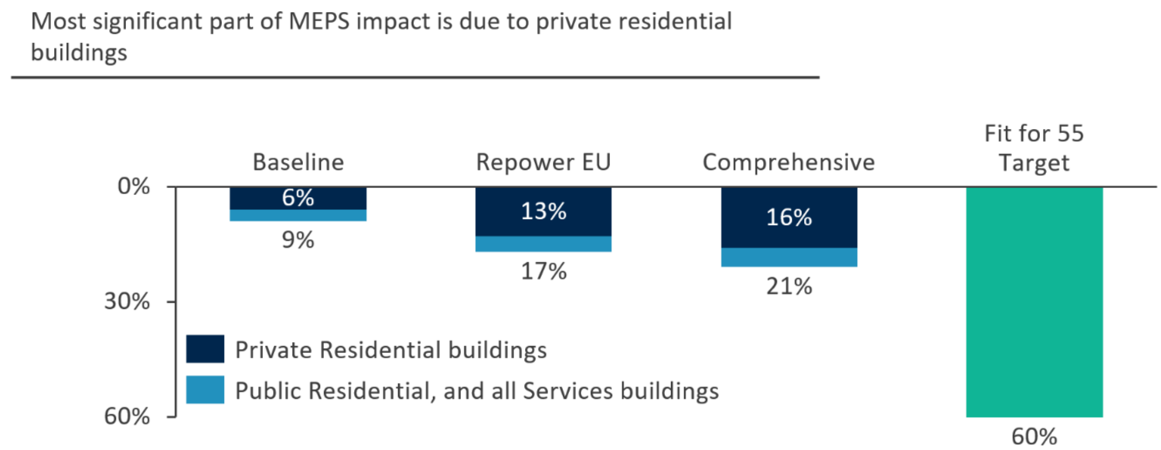


*Figure 3 - GHG emission reduction compared to 2015 under various scenarios in 2030.*

[3] The Plan proposes a voluntary gas demand reduction target of 15% of the total EU gas consumption, starting from August 2022 and March 2023 (source: COUNCIL REGULATION on coordinated demand-reduction measures for gas )

# Annex

## Method

i. Raw data

The energy consumption data in the building sector has been collected for each MS based on the national and regional EPC databases. The data collected allow to differentiate between public and private buildings, and between residential and service buildings. Proxies were used to complete missing data. 16 countries do not have any EPC data, or the data obtained is not granular enough to generate proper distributions. Proxy countries have been used as shown in Table A1, and have been selected based on geography, share of building stock per age group, and climate. Furthermore 13 countries (listed in Table A2) do not have accurate data to distinguish the energy performance of public and private buildings. For those countries, averaged EU values have been considered.

*Table A1*

| Country lacking EPC data | Proxy country assigned |
|---|---|
| Austria | Slovakia |
| Belgium | France |
| Bulgaria | Slovakia |
| Croatia | France |
| Cyprus | Greece |
| Czechia | Hungary |
| Estonia | Finland |
| Latvia | Hungary |
| Lithuania | Hungary |
| Luxembourg | France |
| Malta | Italy |
| Netherlands | France |
| Poland | Germany |
| Romania | Hungary |
| Slovenia | Germany |
| Spain | Portugal |

*Table A2*

| Country lacking private *vs* public distribution |
|---|
| Belgium |
| Germany |
| Ireland |
| Spain |
| Croatia |
| Italy |
| Cyprus |
| Luxembourg |
| Malta |
| Netherlands |
| Poland |
| Portugal |
| Sweden |

ii. Energy consumption correction

As it has been shown by the Tabula project[4], energy consumption data corresponding to EPC levels is often biased because of the normative aspect of the assessment methods. Therefore, a correction function has been applied to all distributions following the same methodologies as in Tabula.

iii. Energy consumption calibration

The total energy consumptions of the building stocks in each MS are then calibrated with JRC-idees data[5] to reflect energy consumption at the MS level. The energy consumptions are then aggregated at the EU level. A new EPC scale is used (see Figure 1).

[4] Tabula project Team, October 2012. "Typology Approach for Building Stock Energy Assessment. Main Results of the TABULA project – Final Project Report: Appendix Volume"
[5] https://data.jrc.ec.europa.eu/dataset/jrc-10110-10001

iv. Connex variables

Based on the energy consumption of the building stock, GHG emission and gas consumption are estimated. Each energy saving trigger by renovation allows to reduce GHG emission and gas consumption by a similar fraction in the building sector.

## Scenarios

The phase-out timing is presented in Table A3 and highlights the different schedules for private residential and others type of buildings, as proposed by the Commission.

*Table A3 – Scenarios details*

| MEPS in EPBD-baseline | | |
|---|---|---|
| *Label phase out* | *For Residential Private* | *For others* |
| G | To F by 2030 | To F by 2027 |
| F | To E by 2033 | To E by 2030 |
| MEPS in RepowerEU | | |
| *Label phase out* | *For Residential Private* | *For others* |
| G | To D by 2030 | To D by 2027 |
| F | To D by 2033 | To D by 2030 |
| MEPS in the "Comprehensive" scenario | | |
| *Label phase out* | *For Residential Private* | *For others* |
| G | To C by 2030 | To C by 2027 |
| F | To C by 2030 | To C by 2027 |
| E | To C by 2033 | To C by 2030 |
| D | To C by 2033 | To C by 2030 |

## Retrofitting Assumptions

A base load renovation is assumed, which improves the quality of the building stock each year. The renovation matrix is shown below. This is consistent with the number given in the Comprehensive Study prepared for the European Commission[6] and is in line with the Impact Assessment accompanying the document 'COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS' (page 63, "*The annual renovation rate is defined as the percentage of the building stock that is renovated. The bulk of the existing building stock was built without serious energy performance requirements, while the current renovation rate is only about 1% annually. The rate of deep renovation is only around 0,2%.")*

*Table A4 – Base load renovation matrix*

| Start label | End label | | | | | |
|---|---|---|---|---|---|---|
| | F | E | D | C | B | A |
| G | 1,1% | | 0,2% | | | |
| F | | 1,1% | | 0,2% | | |
| E | | | 1,1% | | 0,2% | |
| D | | | | 1,1% | | 0,2% |

[6] Considering '*Medium*' and '*Deep*' page 15 renovation from **European Commission**, 2019, *Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU.*

When a building is retrofitted to reach a new EPC category, it is assumed that it consumes the ceiling value of its new EPC category. The renovation matrices are shown in Tables A5.

*Table A5.1 – Final consumption [kWh/m²/year] after renovation for public service buildings.*

| End \ Start | G | F | E | D |
|---|---|---|---|---|
| G | 180 | | | |
| F | 160 | 143 | | |
| E | 140 | 140 | 128 | |
| D | 120 | 120 | 120 | 114 |
| C | 100 | 100 | 100 | 100 |

*Table A5.2 – Final consumption [kWh/m²/year] after renovation for private service buildings.*

| End \ Start | G | F | E | D |
|---|---|---|---|---|
| G | 195 | | | |
| F | 160 | 140 | | |
| E | 130 | 130 | 116 | |
| D | 110 | 110 | 110 | 97 |
| C | 100 | 100 | 100 | 97 |

*Table A5.3 – Final consumption [kWh/m²/year] after renovation for public residential buildings.*

| End \ Start | G | F | E | D |
|---|---|---|---|---|
| G | 177 | | | |
| F | 160 | 143 | | |
| E | 140 | 140 | 128 | |
| D | 120 | 120 | 120 | 114 |
| C | 100 | 100 | 100 | 100 |

*Table A5.4 – Final consumption [kWh/m²/year] after renovation for private residential buildings.*

| End \ Start | G | F | E | D |
|---|---|---|---|---|
| G | 190 | | | |
| F | 160 | 140 | | |
| E | 130 | 130 | 116 | |
| D | 110 | 110 | 110 | 97 |
| C | 100 | 100 | 100 | 97 |