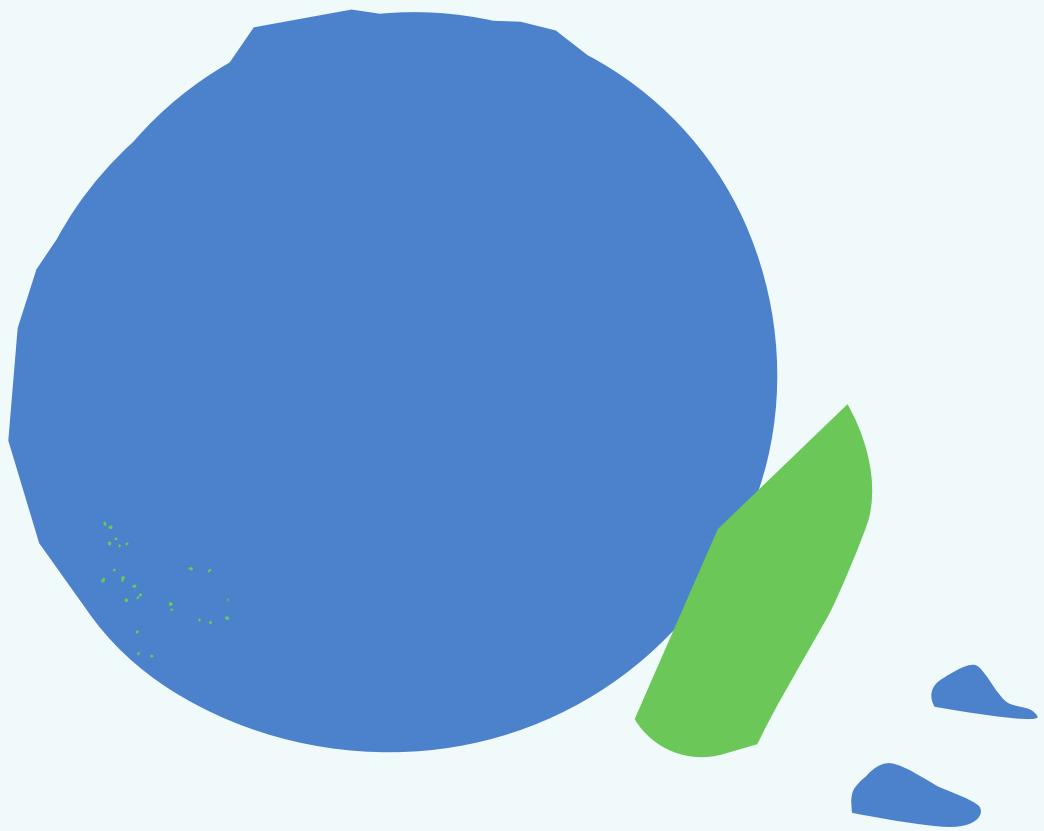


# **Empirical basis of Social Impacts**

## **Energy Poverty Alleviation**





Energy poverty has gradually emerged as a central policy issue within the EU, which is reflected in both its legislation as well as research agenda. Against the background of the four strategic pillars of the EU energy transition 1) phasing out of fossil fuel-based energy supported by CO<sub>2</sub>-pricing, 2) investing in renewable energy sources and associated infrastructure and 3) reducing energy demand via energy efficiency investments and 4) electrification, the equitable distribution of costs and benefits is a central criterion to assess its socially just implementation. Energy poverty levels represent an indication of how well energy policies achieve to fulfil the promise of a just transition that is leaving no one behind.

Within MICAT, energy poverty is defined as a state in which a household uses a disproportionately low level of energy services due to financial hardship, indicated by a low absolute energy expenditure in comparison to a defined national threshold (M/2 indicator) or experience a disproportionately high financial burden related to their energy consumption, indicated by a high share of energy expenditure in income in comparison to a defined national threshold (2M indicator).

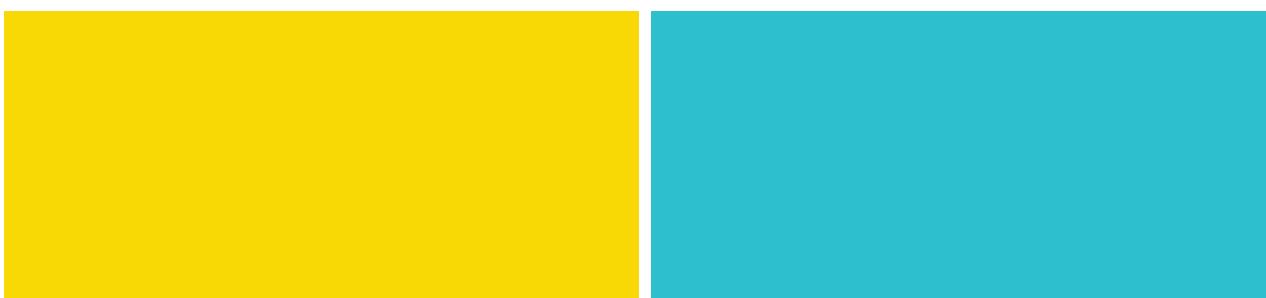
The energy poverty alleviation indicator as proposed and defined in MICAT quantifies the impact of policy induced energy cost savings in

the residential building sector in terms of the number of persons financially enabled to access a level of energy services above the M/2 energy poverty threshold or decrease their share of expenditure in income below the 2M energy poverty threshold and thus escape the state of energy poverty and its negative consequences.

The calculation of the energy poverty alleviation impact follows a four-step approach, which slightly differs depending on whether building or household targeted energy efficiency improvement (EEI) actions are modelled:

- 1) Determine the number and type of EEI actions and the corresponding energy cost savings per household and year, 2) define the share/number of EEI actions implemented in energy poor households (Policy Target Factor), 3) define the share/number of energy poor households, for which energy cost savings enable increased access to energy services or decrease their financial burden beyond the threshold (Impact Factor) and 4) multiply the number of these households with the average household size of energy poor households.

The functional relationship to determine the energy poverty alleviation impact in terms of number of persons lifted from energy poverty ( $\Delta EP$ ) is as follows:





Multiple Impacts Calculation Tool





Secondly, the share/number of EEI actions implemented in energy poor households is determined. To this end, tool users may insert a political target (here defined as Policy Target Factor (PTF)) as a percentage of EEI actions to be implemented in energy poor households (i.e., taking on values between 0 and 1). In case no political target is explicitly defined, as a default the share of energy poor households in the population in the respective country or region is used, following the provisions of the latest draft of the 2022 recast of the EU Energy Efficiency Directive[4].

Third, to calculate the number of households/persons that have been or will be actually lifted from energy poverty due to the EEI action, the number of energy poor households in which EEI actions have been or will be implemented is then multiplied with a weighted Impact Factor (IF) taking on values between 0 and 1. This factor is defined with view to the relationship between the net yearly energy cost savings from the EEI actions and the level and distribution of the Energy Poverty Gap[5] among energy poor owner occupiers and tenants and weighted with view to their respective share in the energy poor population. To define the reference values against which energy cost savings are compared, deciles of the Energy Poverty Gap are formed, with the least severely affected in the first decile and the most severely affected households in the 10th decile. As an example, using the Energy Poverty Gap of the M/2 indicator in Italy, the most severely affected households in the 9th and 10th deciles are underspending more than 700 € (cf. Figure 3).



Multiple Impacts Calculation Tool





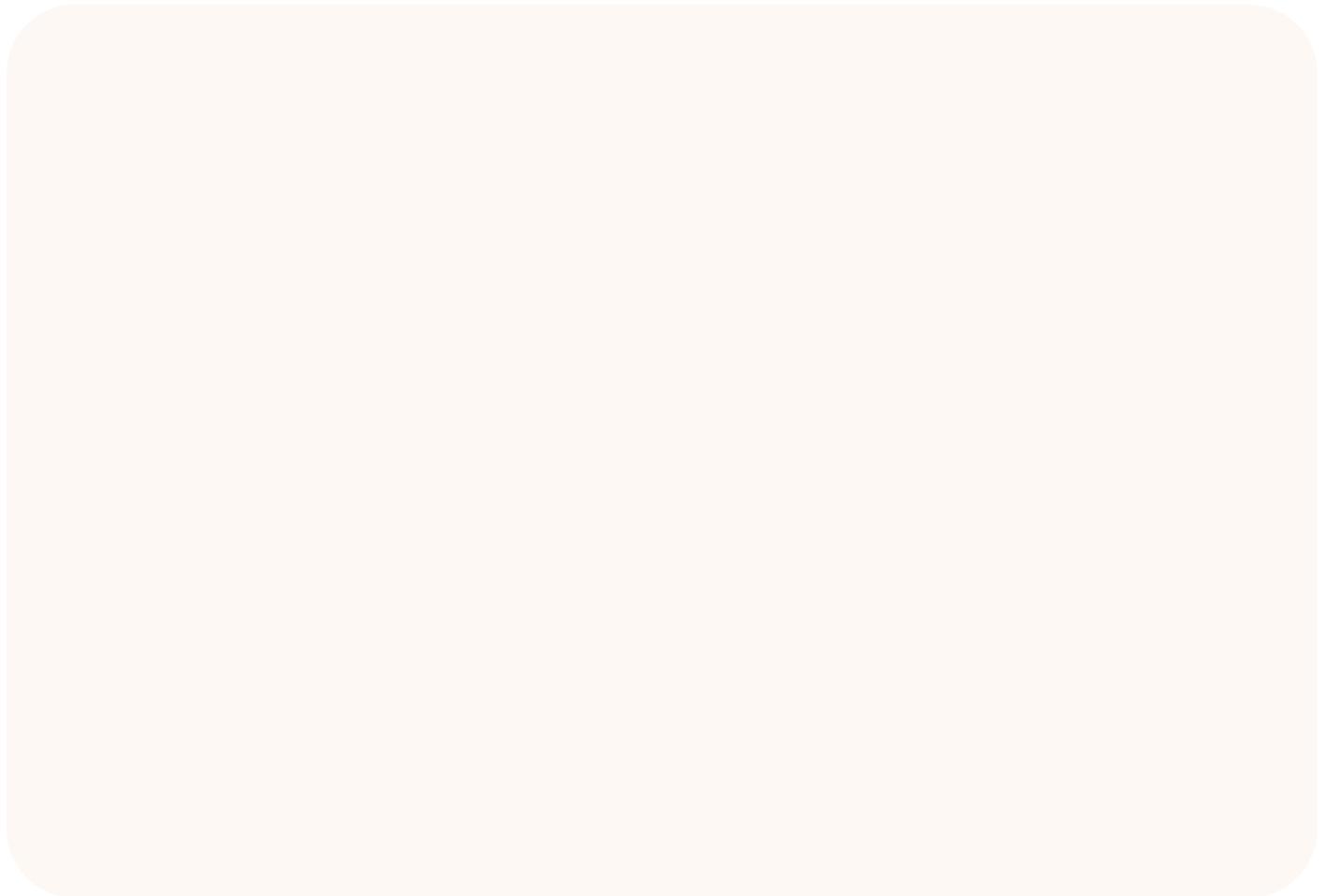
Multiple Impacts Calculation Tool





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Multiple Impacts Calculation Tool



# MICAT

Multi-criteria Impacts Calculation Tool

