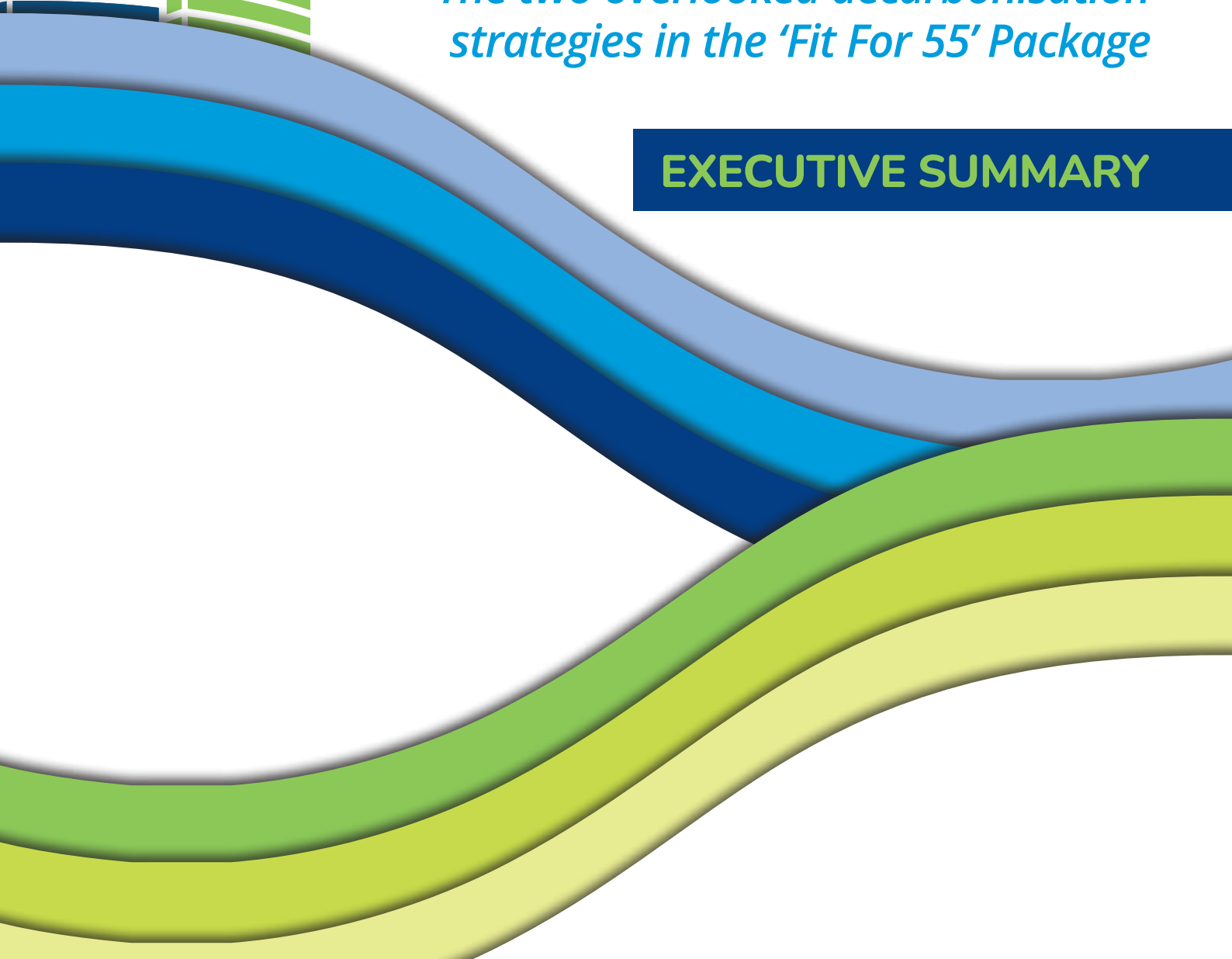




SUFFICIENCY and **CIRCULARITY**

*The two overlooked decarbonisation
strategies in the 'Fit For 55' Package*



EXECUTIVE SUMMARY

Highlights

- **Sufficiency policies** are a set of measures and daily practices that **avoid the demand for energy, materials, land, water, and other natural resources over the lifecycle of buildings and goods while delivering wellbeing for all within planetary boundaries**. Targets to reduce land take, like those set in Luxembourg and Germany, have led municipalities to prioritise multifamily buildings over single-family homes. Thus, reducing the floor area per capita in new buildings. Swiss cities, who have adopted the 2 000 watts society target, have succeeded in reducing energy demand of their buildings by adapting the floor area per capita to the size of the households. Requirements on bioclimatic design in the French building energy code have reduced energy demand by providing thermal comfort through passive solutions. Co-working and co-living buildings are also reducing the floor area per capita, while combatting loneliness, by increasing the shared areas while offering enough space for privacy and without reducing the comfort level.
- **Circularity principles** avoid the linear use of materials and goods by **applying some of the sufficiency principles at the product and construction materials levels**. Circularity aims at reducing the extraction of virgin materials by reusing, repurposing, and recycling used materials and by extending the life time of products. The implementation of circularity principles reduces embodied emissions as shown by the BedZed project where embodied emissions were reduced by 30% compared to a standard construction of a new settlement in the UK. Measures to avoid planned obsolescence by introducing reparability requirements, French law, to extend the lifetime of appliances and consumer electronics is also expected to reduce embodied emissions.
- Over the period 1990-2018, efficiency improvements and the increased penetration of renewables have reduced CO₂ emissions (in the use phase) from residential buildings by 29%. **Emissions reduction could have been much higher if sufficiency policies were included in the EU policies** targeting the decarbonisation of the building stock. The lack of sufficiency policies has increased emissions driven by the increase of the floor area per capita (i.e. heating).
- Member States with GDP per capita above the EU average are those with the highest floor area per capita. Consequently, the wealthiest countries have high shares of under occupied dwellings while EU countries with GDP per capita lower than the EU average have high shares of over-crowded dwellings. In 2018, floor area per capita in Denmark reached 58m² per person against 28m² per person in the Slovak republic, while it was below 20m² per person in Romania and the EU average was at 38m² per person. Importantly, **average floor area per capita in global scenarios, aiming at 1.5°C temperature target and a fully decarbonised global building stock by 2050, is at 35m² per person in scenarios with negative emissions (IEA-NZE, 2021) and at 30m² per person in scenarios without negative emissions (Grubler et al. 2018)**.
- Over the same period, cumulative embodied emissions from the use of cement and steel for the construction and the renovation of residential and non-residential buildings were equivalent to 82% of the 2018 emissions in the use phase of residential buildings. The lack of requirements in EU policies to implement circularity principles in the construction sector combined to the lack of sufficiency measures have led to an extensive use of virgin materials and to an increase of mineral waste. Based on the data available, per capita **mineral waste from the construction and the demolition of buildings is above the EU average in most of the wealthiest EU countries where the construction rates were high**.
- 'Fit For 55' is the policy package that will either lock Europe's buildings in carbon for ever or unleash the metamorphosis needed to decarbonise the EU built environment as buildings renovated and those constructed during the 2020-2030 decade are unlikely to be (re)-renovated before 2050. **Global scenarios aiming at 1.5°C target, without negative emissions, are sufficiency and circularity driven**. By 2050, emissions in the use phase of residential buildings could be five times lower if sufficiency policies are considered and floor area per capita adjusted to households' size. The same year, embodied emissions could be almost close to zero if sufficiency policies and circularity principles are combined. Thus, making Europe's building stock climate neutral, by 2050, is unlikely to occur if emissions reduction driven by sufficiency and circularity are left untapped.

Policy recommendations

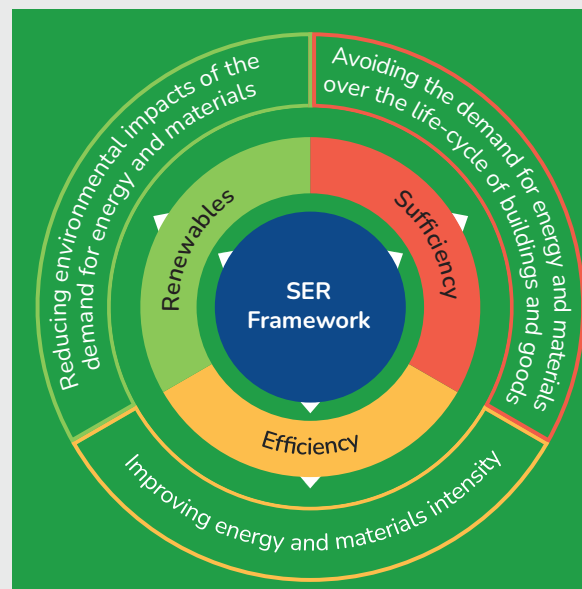
A **full decarbonisation** of the EU building stock requires ensuring emissions reduction driven by **sufficiency and circularity** will not remain untapped. This can be done by:

1. Expanding the framework of 'Fit For 55' policy package from efficiency and renewable to the **SER (sufficiency, efficiency, and renewables) framework** (Figure 1).
2. Requiring through the EPBD **all new and existing buildings to be carbon neutral without further delay**. This requirement should include, i) scope 1 emissions which result from direct emissions from buildings, ii) scope 2 emissions which are due to electricity and heat production and iii) scope 3 emissions which relates to embodied emissions in construction materials.
3. Considering in the European Commission's modelling **the three scopes of emissions** listed above.
4. Requiring Member States to include in their renovation roadmaps:
 - a. Measures **to reduce the floor area per capita**. Global scenarios aiming at 1.5°C, without negative emissions, suggest **30m² per capita** to reduce energy demand of dwellings and fully decarbonise the global building stock by 2050 (Grubler et al. 2018).
 - b. Measures to **prioritise the use of empty buildings over the construction of new ones**.
 - c. Measures to allow for **adaptability of existing buildings** (i.e co-living, co-working...)
 - d. Measures to allow shifting status **from ownership to usership** and to ease dwellings changes, specially in the social housing sector.
5. Introducing in the **taxation directive** requirements to **adjust property taxes to the floor area per capita**. The aim is to discourage, through higher taxation, the increase of floor area per capita above the one leading to a full decarbonisation of the EU building stock.
6. Introducing in **Ecodesign and the labelling directives** circularity requirements such as **durability and reparability requirements**

to reduce embodied emissions of appliances and consumer electronics by extending their lifetime.

7. Revising the **Ecodesign methodology** to ensure **embodied emissions** are better considered when setting minimum energy performance requirements.
8. Introducing in the Construction Products Regulation **requirements on embodied emissions** and the no-data, no-market principle to remove from the EU market products for which embodied emissions are not made publicly available.
9. Including in the **European Building Observatory indicators** to assess progress in the implementation of **sufficiency and circularity** principles (i.e. floor area per capita, kg virgin materials per square meter...)
10. Making the indicative **land take goals**, included in the **EU land take framework**, **binding** at national level to avoid urban sprawl while limiting biodiversity losses.

FIGURE 1 SER Framework



Source: Beyond efficiency, sufficiency matters and should be first. Y. Saheb, Buildings and Cities Journal, 2021.

KEY POINT

The decarbonisation of the EU building stock requires combining sufficiency, efficiency, and renewable policies

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