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# The increase in single-person households will force Spain to double its efforts in residential energy savings



Spain has set an ambitious target: to reduce household energy consumption by 1.69% annually until 2030. The research conducted by the Department of Economics and Economic History suggests that achieving this goal will be much more difficult than anticipated, and the reason has little to do with technology and much to do with how we are configuring our families.

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By applying a new methodology to estimate consumption using a combination of Household Budget Survey data and census demographic data, our analysis projects the evolution of residential energy consumption through 2039 and reveals a troubling paradox. Although each household and each person is expected to consume less energy thanks to technological improvements and behavioral changes, total consumption in the residential sector will increase slightly, by 0.80%, between 2024 and 2039. The main cause is demographic: Spain is experiencing an unprecedented fragmentation of households.

Between 2024 and 2030, the number of households will increase by nearly 10%, from 19.3 million to 21.2 million. This increase is primarily driven by single-person households among both working-age and elderly adults, which are projected to grow by approximately 19%. This

shift is not accidental but rather the result of decades of declining fertility, increased longevity, and, to a lesser extent, immigration that has slowed, but not reversed, population aging.
The energy problem arises because small households lose the economies of scale that characterize large ones. Heating a home for one person consumes nearly the same amount of energy as heating it for two, and cooking for one person consumes only slightly more energy than cooking for several. Historical data confirm this pattern: between 2006 and 2023, large households achieved annual consumption reductions of up to 1.83%, whereas households of elderly people living alone barely reduced their consumption and even slightly increased it.

Our research compares two projection models. The first model, which ignores household composition, predicts a 4.16% reduction in total consumption by 2039. The second, which incorporates demographic changes, projects a 0.80% increase. This discrepancy, equivalent to nearly a quarter of the estimates, indicates that traditional models are systematically optimistic because they fail to account for demographic factors.

To meet the government's target of a 1.69% annual reduction in residential energy consumption, each Spanish household would have to decrease its consumption by more than 3.4% annually, more than double the historical rate of 1.48%. This calculation highlights the magnitude of the challenge: the demographic transition toward smaller households is negating much of the progress made in energy efficiency.

The policy implications are clear. Spain must substantially accelerate the energy-efficient renovation of buildings, promote smaller, more efficient homes, and design targeted policies for single-person households and those of older adults. Without these measures, climate goals will remain unattainable, not because of a lack of technology, but because of the neglect of demographic realities.

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## References

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