

Is building bigger houses a waste of energy?

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Credit: AI-generated image ([disclaimer](#))

Research by Iman Khajehzadeh, who graduates with a PhD in Architecture next week, explores the significance of housing decisions on the use of resources and impact on the environment.

"The average floor area of New Zealand houses almost doubled from 1974 to 2011. Over the same period, occupancy rate decreased—meaning fewer people are living in larger houses," explains

Iman.

His study found that regardless of house size, people spend the majority of their time in a few core spaces of the house and many rooms remain unused.

"My results indicate New Zealanders on average spend 16 hours per day indoors at home, and house size does not affect this. On average 55 percent of this is spent in their own bedrooms, and 30 percent of their time in the living [room](#), dining room and kitchen—the 'core' house," he says.

"Houses with more space than the appropriate 'core' are considered to be at the level of large housing based on number of additional rooms on top of the core house. Features of large houses include extra bedrooms, specialised rooms like a study or media room, more than one living space, several bathrooms including ensuites and double or triple garages."

Having a large house means using more furniture, appliances and tools to fill additional rooms, more resources for construction and higher operating energy over the life cycle of the house, says Iman.

"On average New Zealanders who live in owner-occupied houses use double the energy compared to what is required for living in that 'core' house. For example, a couple with two children living in a house with three extra rooms will use 66 percent more energy over 100 years."

House size is not just a matter of additional initial cost for buying a house, says Iman, but it has more significant future consequences.

"While decisions in terms of house size selection seem personal, they can have significant impacts on resource use as well as the environment.

More public awareness is needed regarding the role of [house size](#) in achieving sustainable architecture, and more consideration put into other options, such as co-housing, so that little used spaces can be shared by more people."

Iman's research was supervised by Professor Brenda Vale and Dr Nigel Isaacs from Victoria's School of Architecture, and had several studies including a questionnaire survey and analysis of 287 floor plans.

Iman travelled to New Zealand from Iran, where he worked as a lecturer at Persian Gulf University of Bushehr. He now teaches at the Open Polytechnic of New Zealand and plans to continue research into the potential environmental impacts of living in larger houses.

More information: An investigation of the effects of large houses on occupant behaviour and resource-use in New Zealand.

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