



CASE STUDY

Reducing Energy and Carbon Emissions in Social Housing

TO EAT OR TO HEAT?

HOW RETROFITTING AUSTRALIAN SOCIAL HOUSING FOR ENERGY EFFICIENCY CAN CHANGE LIVES

Most people in Australia take for granted switching the ceiling fan or air conditioning on to relieve the sticky summer heat or turning the heater up on chilly winter nights, and certainly think nothing of their right to a daily hot shower.

But for some people, these seemingly small acts represent anxiety, worry and a quality of life that's quite simply out of reach. For many people including those who live in Australia's social housing system, concern about the affordability of their energy is a fact of life. The most basic decisions about heating or cooling their home is often a choice between eating and heating.

THE AUSTRALIAN SYSTEM OF SOCIAL HOUSING

Supporting the most vulnerable and in need, the Australian system of social housing consists of public housing, community housing and Aboriginal housing. Briefly, public and Aboriginal housing is owned and managed by state and territory governments while community housing is provided by not-for-profit community organisations. Of this, government-owned public housing provides nearly 80 per cent of the housing and the community sector supplies the balance.

It's not a perfect system. While approximately 4 per cent of Australians live in social housing, almost 150,000 households are on social housing waiting lists. Decades of inadequate investment have left Australia with a growing shortfall in social housing dwellings and construction isn't keeping up with the rising need or addressing the growing backlog. Critically, much of the public stock is ageing, with associated increased need for repairs and maintenance. As a result, around 1 in 5 homes fail to meet even the governments' own minimum acceptable standards.

ENERGY HARDSHIP, A WAY OF LIFE

Energy poverty, not being able to afford electricity and gas, is a huge problem for low income households in Australia, not just in social housing.

Social housing tenants are frequently reliant on income-support, but are responsible for their own gas, electricity and water bills. Residents often spend a high proportion of their income on fuel costs or find ways to manage their energy bills by restricting usage, often in ways that reduce comfort and wellbeing and many of these have significant health impacts.

Research at the University of Wollongong's Sustainable Buildings Research Centre (SBRC) and the CRC for Low Carbon Living, a national research and innovation hub of researchers and planning, engineering, property and policy organisations, has evaluated a number of possible ways to reduce the energy and carbon emissions from social housing stock and more importantly, improve the lives of those who live there.

LIVING LABORATORIES

The project, 'Mainstreaming Low Carbon Retrofits in Social Housing', explored the opportunity for social housing providers to cost-effectively upgrade their housing stock to improve energy efficiency and thermal comfort.

From a variety of locations across NSW, 42 social housing properties were recruited to participate in the study. The project had three main activities:

- To assemble an evidence base regarding the direct benefits, co-benefits (benefits beyond energy such as health and wellbeing) and risks of the relevant upgrades.
- Monitoring and evaluation of a range of energy efficiency upgrades implemented in real world situations.
- Collaborative activities with stakeholders to assemble the resulting evidence into user-friendly formats.

Home energy audits were undertaken on the 42 social housing properties and over the course of 12 months energy consumption, internal temperature and humidity were monitored.

During the study, each of the 42 properties received an energy efficiency upgrade from their Housing Provider. This allowed researchers to gather both pre and post-installation data for comparison.

One or more of the following upgrades was implemented across the 42 properties:

- Wall insulation;
- Double glazing;
- Hot water heat pump;
- Reverse cycle air conditioning;
- Solar photovoltaics;
- Roof insulation;
- Ceiling fan;
- Draught proofing;
- Internal shading.

The researchers also conducted in-depth ethnographic interviews with a subset of the participants exploring how social housing tenants balance energy bills, comfort and health on a tight income.

Because social housing properties are generally managed and maintained through a centralised process, this was a significant opportunity for the development of a major, aggregated approach to implement low carbon retrofits in large portfolios of residential building stock.

THE SIMPLEST SOLUTIONS ARE OFTEN THE BEST

On the most fundamental level, the research demonstrated that the impacts of improved energy efficiency are far greater than purely financial. In addition, it's not necessarily the most expensive options that deliver the greatest benefit to tenants.

Tenants who took part in the research expressed genuine gratitude for the upgrades they received. From substantially reduced electricity bills to the joy of new double-glazing and ceiling fans, the upgrades vastly improved their quality of life.

The management and maintenance of these social housing properties represents a significant financial burden for their providers. But social housing represents a duty of care that extends beyond providing a roof. So while the biggest barrier to large-scale retrofits is funding, there is a growing realisation that something has to be done.

Addressing energy efficiency through a 'fabric first' upgrade system delivers immediate rewards to energy efficiency and tenant wellbeing. This approach means the performance of the components and materials that make up the building's fabric are improved first, before considering the use of additional elements. In real terms this means insulation before air conditioning, draught proofing before roof replacement.

A ROADMAP FOR SOCIAL HOUSING MANAGERS

At the completion of the study each housing provider involved was given a detailed report on the energy efficiency of their property, both before and after the retrofit, and specifics on the benefits of the upgrades to each property.

A comprehensive handbook, *Guide to Implementing Low Carbon Retrofits for Social Housing*, was written and distributed widely across social housing sector management and specifically to sustainability managers.

Providing a clear pathway to achieving low carbon homes for social housing with simple visual guides, it details a roadmap broken down into three steps;

1. Simple, high impact retrofits that can benefit all homes;
2. Higher upfront cost upgrades that will benefit most homes, and;
3. Longer payback period upgrades that are appropriate for some homes or providers with more ambitious low carbon goals.

Ultimately, the dichotomy of improving energy efficiency in social housing is that tenants face a constant struggle to pay their energy bills while their housing provider faces a substantial financial outlay to upgrade properties without the ability to recoup financial benefits from the tenants.

However given the benefits, including improved wellbeing as well as the financial benefits, to residents of energy upgrades, there is an important consequential feedback loop between what it costs to implement energy upgrades and the savings made against other areas of the welfare system, which for most of social housing tenants is all borne by the public purse.

A growing necessity exists for further study to research the impacts of different upgrades and the cost benefit analysis across the whole system.

HUMANS FIRST

The smallest social housing apartment may represent an enormous achievement for an individual. Whether it's a safe place to raise a family or the first step up from homelessness or away from a damaging domestic situation, these are personal spaces that people take pride in.

Empowerment in energy efficiency within the social housing sector is for a parent to be able to switch on a ceiling fan to cool a sleeping child, or for a pensioner to securely close a window to block the southerly chill. Making this a reality in 21st century Australia is within reach.

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