Residential Efficiency Scorecard
STAR RATING

Improving the energy performance of homes in Australia

January 2023

We acknowledge and respect Australian Traditional Owners as the original custodians of Australia's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

Acknowledgements

Our thanks to our residential energy efficiency colleagues across the world for their skills and expertise. In creating this report, we have brought together their key findings and built on their excellent work.

We extend our thanks to our colleagues in all Australian jurisdictions and the Commonwealth who provided feedback on this report.

The National Scorecard program, which builds on the Victorian Government's successful state-based Residential Efficiency Scorecard program, facilitates a nationally-consistent approach for assessing existing homes. It was piloted nationally in 2019 and further trialled in 2021, with support from all governments.

Currently endorsed by NatHERS, the National Scorecard program is expected to be fully accredited and phased into NatHERS. Until this occurs, all elements of the National Scorecard program, including the assessment tool, assessor training and assessor accreditation, will continue to be delivered by the Victorian Government on behalf of all Australian governments.

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VICTORIA State Government

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A renewed focus on energy performance

In Australia, greater attention is being placed on improving the energy performance of homes to help people meet energy costs, improve health and wellbeing, and reduce greenhouse gas emissions. Addressing a home's energy performance is especially important for vulnerable people who spend a large proportion of their income on the essential service of energy.

This report presents a summary of key findings and learnings from three recent reports on energy efficiency in existing homes. Each of these projects had a different focus and approach, providing a broad picture of the status and needs of the community and existing housing stock. The findings were consistent across all three, this report brings them together. It is clear there are significant, untapped opportunities in the area of improving performance in existing homes, this report provides best practice approaches.

The Victorian Healthy Homes program[1] used a statistically valid approach to quantify the impact of upgrades to determine whether home upgrades contributed to improved health, reduced healthcare costs as well as increased comfort and quality of life. Scorecard assessors assessed 1,000 Victorian homes over winter and partnered with upgrade providers to upgrade homes. The results from upgraded homes were compared to results of similar homes with no upgrades.

The Energy Savvy Upgrades program[2] was designed to quantify the benefits in home comfort, reduced energy costs, and greenhouse emissions for vulnerable households from upgrades. The broader aim was to learn how such programs can be scaled up and whether third-party finance was of interest to support upgrades. Scorecard assessors assessed 792 Victorian vulnerable households who were then provided part-subsidised home energy upgrades.

The RMIT study[3] reviewed published global best practice reports on home energy assessments to summarise best practice designs and learnings from the range of programs in operation. This included a summary of costs, benefits, learnings, and practical implications for program design.

[1] *The Victorian Healthy Homes program research findings* (Sustainability Victoria and University of Technology Sydney, September 2022)
[2] *Learnings from the Energy Savvy Upgrades program for vulnerable householders* (DELWP 2023)
[3] *Optimising housing assessment to drive low carbon energy efficient housing upgrades* (RMIT 2023).

Why increasing energy performance of homes is important

Increasing a home's energy performance leads to improved cost of living, improved health and comfort, reduced carbon emissions and improved resilience to extreme weather. For householders, providers, and policy makers to fully understand the value of home upgrades, it is important to consider all these outcomes together, rather than in isolation. Often, the health and comfort benefits of upgrades are not considered[4] which overlooks the subsequent cost saving to health services[5].

The five benefits of an energy efficient home

Even a relatively minor upgrade can deliver significant benefits when guided by a skilled assessor, using a robust energy performance rating to determine the best upgrades. Older Australian homes in particular were not always well designed to suit our climate. These homes can be too hot or too cold and are vulnerable to extreme weather.

> Upgrades in the range of $2,800 to $3,600 per home that focus on reducing energy costs can generate around 21% reduction in energy bills and 16% reduction in carbon emissions.[6]

[4] *Learnings from the Energy Savvy Upgrades program for vulnerable householders*, DELWP 2023
[5] Healthy Homes Program
[6] Energy Savvy Upgrades

In the Healthy Homes study, before home upgrade, 63% of households reported their home was colder than they would like at some point in winter and 20% found this every day in winter.

People with health issues typically spend more time in the home and may be more sensitive to weather conditions. Following upgrades, participants in the Healthy Homes Program who had health issues found their health costs and use of health services, such as hospital admissions and mental health services, were reduced.

In Victoria over one winter period, the healthcare system saved $887 per person[7] with an existing health condition. This investment in upgrades will pay for itself in savings within three years. Total health care costs were lower for the intervention (mean $3,394) than control (mean $4,172) group.

Higher performing homes in Australia show similar health gains to those found internationally, with substantial physical and mental health benefits. The Energy Savvy Upgrades program found that home energy upgrades increased comfort for 80% of homes that had energy reduction upgrades. The Healthy Homes program found that following upgrades there was less condensation over winter, reduced damp or musty smells and people experienced both reduced breathlessness and improved quality of life.

People with health issues typically spend more time in the home and may be more sensitive to weather conditions. Following upgrades, participants in the Healthy Homes Program who had health issues found their health costs and use of health services, such as hospital admissions and mental health services, were reduced.

In the Energy Savvy Upgrades program, where reducing energy costs, rather than improving health was the focus, 62% of participants thought their health had improved due to the upgrades. In addition, unflued gas heaters, which can be a health and safety risk, were identified and either decommissioned or serviced and a carbon monoxide detector installed.

Analyses based on the assumption households use appliances more often when they are upgraded (known as the 'rebound effect') have devalued the impact of home energy upgrades. However, recent research has found no evidence of the rebound effect. Rather, households reported they used heating appliances less often after upgrade rather than more often.[8]

Following upgrade, in winter:			
57% less likely to use a portable electric heater	**49% less likely to go to bed early**	**37% of households were more likely to use their main heater only when feeling cold**	**20% less likely to use their main heater all the time and at night**

[7] Healthy Homes Program
[8] Healthy Homes Program

What we've learned

Learnings from home energy performance upgrade programs

The four factors that drive success for home upgrade programs are both individually necessary and mutually reinforcing.

For households to be confident to progress upgrades, advice needs to be trusted, demonstrated in real world situations, accurate and comparable, plus easy to implement and focused on householder needs.

1. Prioritise householder trust

Trust is fundamental for householders firstly to engage with the opportunity presented by an upgrade program, and then progress to upgrades. It was found that households start with a low level of trust, especially regarding energy-related offerings. Any sense of 'greenwash', inaccuracy or inauthentic advice is likely to undermine trust.[9]

> When a well-run and effective program focuses on developing trust, the levels of conversion to upgrades are greater than 75%.[10]

To trust the program and take it seriously, research consistently found[11] participants need to:

- have confidence that the upgrade options offered will improve home performance,
- be provided with information that is accurate, comparable, easy to understand and focused on their needs, and
- see the upgrade advice as serious and legally robust as an investment.

Using skilled and trained government-accredited assessors who are accountable for the home rating is the primary way to generate trust.[12] Assessors need both technical and customer skills, as well as the ability to understand individual needs within different cultural groups and settings. They must also consider the health and safety of householders as well as their own. Internationally[13], assessors are usually government accredited, with penalty regimes and capacity for participants to escalate issues of concern.

Assessors visit the home to collect data and understand how the home is used, including health needs. People living in the home know what outcomes they want (such as a living area that is more comfortable), but they don't know how best to achieve this outcome. Valuing the needs of those living in the home and including them in the decision-making process for upgrades is essential. Their health needs, how the home is used, and other specific circumstances will influence the upgrades chosen.

[9] RMIT
[10] Energy Savvy Upgrades
[11] RMIT
[12] RMIT; Energy Savvy Upgrades
[13] RMIT

Consumer surveys found high levels of satisfaction with home assessors and the information they provide, ranging from 82 to 90% satisfaction ratings[14].

The research also supported location-based delivery, which not only reduces costs, but allows local networks to build confidence in home upgrade opportunities. Engagement can be through working with existing local trusted networks, community, local council, business, or other networks. Cold call offers are often seen as too good to be true, whereas referral from a trusted source and positive reports from other households is powerful. Some jurisdictions provide incentives to accredit assessors from local communities to better understand and support the needs of those communities.

For home upgrade providers, training, along with clear quality and safety requirements, increases householder confidence. This is especially for those sectors considered lower skilled, such as insulation and draught proofing.

Trust in data management is critical, as data needs to be collected for an accurate assessment of the home. When collected and de-identified, this data provides valuable information about Australian home performance. Unless the database has robust privacy protection, people will be reluctant to be involved. Householders also need protection from unwanted use of this data to sell products and services.[15] Generally, governments have the structures needed to maintain trust in data collection, as data collection by businesses is less trusted.

The overall awareness in the community of the benefits of home upgrades is low. General broad scale awareness raising is useful to strengthen the sector and support program delivery.[16] Without general community awareness, recruitment into retrofit programs comes at a higher cost and difficulty.

2. Show it works - measure outcomes and pilot new approaches

A key international finding is that measuring outcomes in real homes is important to build trust and determine whether the program is delivering its objectives. That is, did the program deliver influential ratings and unambiguous upgrades of existing homes at scale and improve cost of living, comfort, health, carbon emissions and resilience?

International research has found that modelled outcomes of upgrades do not always represent on ground performance of homes, or the experience of households[17]. This can be addressed by evaluating the outcomes in real homes. Outcomes such as: are householders satisfied with the assessment, undertaking upgrades, saving energy and money, and are more comfortable.

[14] Energy Savvy Upgrades
[15] RMIT
[16] Healthy Homes; Energy Savvy Upgrades; RMIT
[17] RMIT

Feedback from households is a priority to ensure upgrade advice is intuitive and householder focused. This testing and evaluation is also critical for trust and accuracy.

Best practice programs ensure that home ratings do provide an accurate representation of performance across the major variable factors such as

- climate zone,
- housing type,
- on-ground data collection variability and
- assessor variability.

3. Provide accurate comparable home information

Providing accurate comparable home ratings that cover energy cost, carbon emissions and comfort is fundamental for people to invest in an upgrade. Where people do not have a trusted measure for higher performance, it has been found that they will not be as comfortable to invest. Comparable information is also the basic requirement to measure and monitor the benefits of large-scale programs and policy.[18]

Home upgrade programs found an increase in the uptake of upgrades that participants said would not have been considered without the information provided by a qualified assessor.

It is important to provide householders with trusted comparable home upgrade options, it is otherwise not easy to decide how best to improve home performance. Upgrades are an important decision point for long-term benefit from a long-life asset – the home.

Determining the most effective upgrades requires significant skills covering such diverse areas as insulation, draught proofing, shading and relative window performance, as well as appliance rating and use.

Recent programs in Australia have delivered between 15 and 19 different upgrade packages.[19]

Even houses with a similar built form have widely different performance and upgrade needs due to deterioration, modification, and renovation.

[18] Healthy Homes, Energy Savvy Upgrades, RMIT
[19] Energy Savvy Upgrades; Healthy Homes

Home assessment fundamentals

- ☑ Use a scale that can compare performance: before and after upgrade, and between homes.
- ☑ Provide upgrade suggestions specific to that home, not generic advice.
- ☑ Provide intuitive householder-focused ratings, based on consumer research.
- ☑ Provide information that is easy to understand and avoids highly technical jargon.
- ☑ Promote benefits including cost saving, increased wellbeing and comfort, greater resilience and reduced carbon emissions.
- ☑ Use a scale that works across home styles and climate zones, ensure homes are not stuck at a rating, despite upgrades, simply because of the scale.

Best practice internationally is that accredited and trained assessors use an accredited and standardised tool and visit the home to obtain the data, with audits for quality. Assessment is a skilled task where probity is critical. The cost of international assessments using this model is relatively consistent. Costs are reduced when assessments are delivered in volume such as under a legislated requirement. Internationally, home assessments costs at the lower end are around $145 to $475[20] per assessment.

The critical factor in evaluating the assessment approach is that the assessment is considered useful and persuasive by the household, rather than the cost. Lower cost assessments have not generally had positive evaluations, with people equating low cost with low quality. There is a lack of evidence that these low-cost assessments generate upgrades.[21]

[20] Converted to Australian dollars, RMIT

[21] RMIT

Delivering persuasive home assessments[22]

- ☑ Ratings are consistent regardless of who performs the assessments.
- ☑ Covers the main fixed energy-using assets in the home (building shell, insulation, draughts, and fixed appliances).
- ☑ The assessor uses a standard accredited tool with standard data entry rules to ensure consistent assessments.
- ☑ The assessment is based on objective data, supported by evidence (e.g. photographs), simplifying auditing.
- ☑ The assessor is responsible for gathering data onsite and ensuring accuracy of the information and rating that they provide.
- ☑ Assessors are skilled and trained, with access to mentoring and continuing professional development.
- ☑ Assessments are audited and there is a penalty regime for inadequate performance
- ☑ Householders can escalate issues of concern.
- ☑ Assessments and associated training is regularly updated to include new technologies.

[22] RMIT

4. Consider individual and community needs

Even if convincing and accurate information about upgrades is provided, people may not progress to upgrades as they have limited time to invest. People living in regional, rural, or rental properties, those with health issues or people who are culturally and linguistically diverse may also face additional barriers to upgrading their home.[23] Upgrades need to be accessible to all, including renters and vulnerable people. For example, around one third of homes are rented and are often considered hard to upgrade. By addressing the main upgrade pain points, in one tranche of the Energy Savvy Upgrades program 42% of upgrades were delivered to rental homes.

Due to the low trust in the upgrades sector and low community awareness of the benefits of upgrades, there needs to be a clear reason to upgrade. Two approaches alone have been found to drive significant numbers of upgrades: mandatory requirements, such as displaying ratings at point of sale and lease (as occurs in the European Union) or financial incentives (as occurs in the US).[24]

In Australia, the Energy Savvy Upgrades and Healthy Homes programs found that financial incentives of around 50% of the upgrade costs, with total upgrades around $2,800 to $3,600 per home, were the minimum to stimulate action. This provided a payback period of under three years.

The Energy Savvy Upgrades program found that no households accessed third-party finance to fund upgrades, which was an option provided to all households in this program. Generally, people do not want to take on extra debt, even if they could potentially repay the debt from their energy savings. However, Environmental Upgrade Finance has not yet been tested. With this form of finance, home upgrades are funded from increased council rates repayment and the upgrade repayments therefore stay with the property, not the owner.

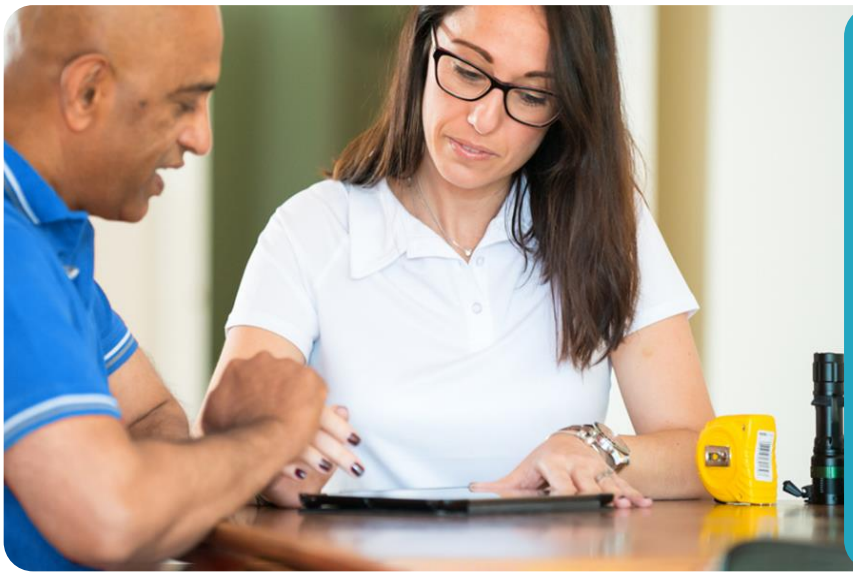
Once there is an incentive to upgrade, it is effective to have a skilled assessor provide an option to deliver upgrades through trusted providers.[25] This reduces the pain point of householders needing to find their own providers. It is efficient in delivering upgrades at scale, supports quality controls, and makes the upgrade pathway simple and low touch for households. This approach relies on accredited assessors performing the assessment, plus attention to quality oversight of the upgrades sector. Once an assessor is trusted, even those upgrades funded by landlords become more achievable, as was found in the Energy Savvy Upgrades program.

The emerging role of the home assessor is important for delivery, as poor performance would lead to de-accreditation. This approach generates a strong incentive to help people make good decisions about upgrades. Unlike other providers, the assessor's role is to provide objective advice and they may be audited on this advice.[26]

[23] RMIT
[24] RMIT
[25] Energy Savvy Upgrades
[26] RMIT; Energy Savvy Upgrades

Trust, skills, and presence in the home also allow assessors to help people access other support programs they may not be aware of.[27] Some people lack access to computers or the internet, while some programs are difficult for culturally and linguistically diverse communities to access. A home assessor can minimise the barriers to access these supports.

The barriers to participation in regions, rural areas, and for some communities should be specifically considered and addressed.[28] Otherwise costs are higher and access to assessors and upgrades is lower. Internationally, greater funding for locally based assessors and retrofit providers is used to address these barriers.



Having a trusted assessor arrange home upgrades encourages action by reducing householder pain points.

[27] Energy Savvy Upgrades
[28] RMIT; Energy Savvy Upgrades

Conclusion

Increasing a home's energy performance leads to improved cost of living, improved health and comfort, reduced carbon emissions and improved resilience to extreme weather. Without action on existing housing stock we will be unable to meet community needs and emissions reduction targets.

It is clear the benefits of home energy efficiency are far reaching, beyond reducing energy costs and greenhouse gas emissions. For householders, providers, and policy makers to fully understand the value of home upgrades it is important to consider all five benefits of an energy efficient home together, rather than in isolation (p. 5). The improvements to health, both physical and mental, are significant and have a positive flow on effect to reducing health costs.

The best practice findings as outlined in 'What we've learned' (p. 8) provide a clear pathway for overcoming roadblocks and supporting successful program design. Programs which prioritise the four key learnings have demonstrated, measurable positive outcomes across all five areas of benefit.

Need more information?

Contact us via our website: www.homescorecard.gov.au

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To view full copies of the reports, please go to:

- *The Victorian Healthy Homes Program research findings* (Sustainability Victoria and University of Technology Sydney, September 2022)
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