

An assessment of the costs and benefits of energy performance disclosure in single dwellings and apartment buildings

Department of Climate Change, Energy, the
Environment and Water

FINAL REPORT



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Executive summary

Improving the energy performance of Australian homes will make them more comfortable to live in, cheaper to run, and reduce emissions. This document considers the costs and benefits of disclosing energy performance information when homes are sold or leased to support these improvements.

The Department of Climate Change, Energy, the Environment and Water (the Department), on behalf of all state and territory governments, engaged ACIL Allen in 2023 to undertake a cost benefit analysis (CBA) for the implementation of energy performance disclosure under different scenarios in single dwellings. In 2024 the Department engaged Common Capital to undertake a similar CBA for the implementation of energy performance disclosure in apartment buildings, both individual apartments and apartment base buildings (this refers to areas of common property, common infrastructure and shared services within an apartment building shared amongst occupants and managed by the owners corporation). Both of these projects also included an assessment of additional benefits that were not included in the base CBAs, as they were more difficult to quantify or dependent on final scheme design.

These CBAs outline options for implementing disclosure of home energy rating disclosure schemes. They are informed by the Home Energy Rating Disclosure Framework, which can be found at www.energy.gov.au. The analysis for single dwellings and apartments assumes the use of the Nationwide House Energy Rating Scheme (NatHERS), specifically NatHERS for Existing Homes which is still being finalised. The analysis for apartment base buildings assumes the use of the National Australian Built Environment Rating System (NABERS) for Apartment Buildings.

This document provides a summary of the combined findings from both CBA projects. These findings can be used to inform future jurisdiction Regulation Impact Statement (RIS) processes.

Summary of key findings

Single dwellings and apartments

- There is a considerable net benefit nationally, and in all jurisdictions, for all households that implement upgrades based on their home energy rating.
- There is a net economic benefit nationally, and in all jurisdictions, for implementing mandatory disclosure at point of sale for single dwellings and apartments combined, when all robust and quantifiable impacts are considered (see Table 1).
- There is a net economic benefit in all jurisdictions for also implementing mandatory disclosure at point of lease, if scheme design decisions to reduce compliance costs and other supporting initiatives are incorporated (see Table 1). For example, a design similar to the current ACT approach where disclosure is only mandated at point of lease if a current, valid rating already exists. This provides an opportunity for renters to access energy performance information at no additional cost, which can still stimulate additional upgrades and improve the net economic impact of disclosure schemes. Without careful scheme design, however, the case to mandate disclosure at point of lease is limited.

Apartment base buildings

- There is a considerable net benefit for all owners corporations that implement upgrades based on their apartment base building energy rating.
- There is a degree of uncertainty over the true benefits of mandating apartment base building disclosure. The economic impact of mandatory disclosure for apartment base buildings is dependent on the type and depth of upgrades implemented (see Table 1) and there is currently somewhat limited data to base economic modelling and analysis on.
- The information generated through disclosure may help to unlock deeper upgrades in apartment buildings. Apartment base buildings have a complex ownership and decision-making structure that poses an additional barrier to energy performance upgrades.
- More data is needed to inform further analysis and strengthen the degree of certainty for mandating apartment base building disclosure. This could be achieved through expansion of the voluntary NABERS program or the introduction of programs like the City of Sydney's Smart Green Apartments Program in other jurisdictions and areas of NSW.

Additional opportunities of disclosure

- Disclosure of energy performance information has significant benefit beyond these quantifiable impacts. The information unlocked through disclosure schemes could be used to improve the effectiveness, efficiency and distributional equity of government and private sector support for energy performance upgrades, allowing for focussed support to those most in need. It is also likely to encourage private sector action to drive additional upgrades through business model innovation and direct support, to further improve the impact of disclosure schemes.
- An estimation of the quantum of potential additional benefits that could be unlocked through disclosure implementation is included in Figure 1, Figure 2 and Figure 3 in Section 1 of this report. These additional benefits are not included in the summary results in Table 1, as they will be dependent on final scheme design and the design of other complementary policies implemented alongside disclosure within jurisdictions. This can be explored further by jurisdictions in future RIS processes. A RIS or CBA that quantifies the benefits of disclosure in combination with broader supporting initiatives could be considered by jurisdictions.

Table 1: NPV and BCR results for mandatory disclosure at **point of sale and lease in single dwellings and apartments** (transition scenario with higher cost assessment and higher uptake rate, using the central discount rate of 5% and incorporating health benefits*) and mandatory disclosure in **apartment base buildings**. The range for apartment base buildings shows the results with lighting upgrades excluded and included in the analysis (excluded to included).

Jurisdiction	Single dwellings & apartments (point of sale) NPV (\$2023)	Single dwellings & apartments (point of sale) BCR	Single dwellings & apartments (point of sale and lease) NPV (\$2023)	Single dwellings & apartments (point of sale and lease) BCR	Apartment base buildings NPV (\$2023)	Apartment base buildings BCR
Vic	\$832M	1.68	\$1,189M	1.90	-\$13M to \$15M	0.60 to 1.41
NSW	\$442M	1.36	\$604M	1.46	-\$51M to \$13M	0.43 to 1.12
Qld	\$186M	1.30	\$468M	1.49	-\$21M to \$13M	0.39 to 1.33
ACT	\$68M	1.96	\$84M	2.10	-\$3M to \$0.7M	0.41 to 1.12
SA	\$48M	1.17	\$89M	1.29	-\$1M to \$0.7M	0.46 to 1.24
Tas	\$22M	1.20	\$45M	1.35	-\$0.1M to \$0.1M	0.59 to 1.32
WA	\$11M	1.03	\$58M	1.15	-\$4M to \$1M	0.42 to 1.16
NT	\$7M	1.40	\$15M	1.76	-\$0.3M to \$1M	0.81 to 1.79
National	\$1,689M	1.41	\$2,501M	1.56	-\$93M to \$45M	0.46 to 1.23

*The impacts included are the costs of ratings, upgrades and scheme administration; and the benefits of improved energy performance including avoided greenhouse gas emissions, avoided energy system costs, and avoided health costs associated with excess winter deaths, exposure to cold indoor temperatures, heatwave deaths and respiratory illnesses.

The scheme impacts presented in Table 1 are dependent on 10%-16% of households taking action in response to the disclosure information and upgrading the energy performance of their home or building. Designing schemes to deliver the most compelling and effective information at the lowest cost will maximise their overall impact. For example, if an additional 5% of apartments decided to upgrade their home in response to disclosure, then this would lead to a 46% increase in net economic benefit nationally.

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Introduction

This summary report documents the findings of two complementary projects to assess the costs and benefits of energy performance disclosure across Australia in single dwellings, apartment buildings, both individual apartments and apartment base buildings (this refers to the areas of common property, common infrastructure and shared services within an apartment building shared amongst occupants and managed by the owners corporation).

The Department of Climate Change, Energy, the Environment and Water (the Department), on behalf of all state and territory governments, engaged ACIL Allen in 2023 to undertake a cost benefit analysis (CBA) for the implementation of energy performance disclosure under different scenarios in single dwellings. In 2024, the Department then engaged Common Capital to undertake a similar CBA for the implementation of energy performance disclosure in apartments and apartment base buildings. Both of these projects also included an assessment of additional benefits that were not included in the base CBAs, as they were more difficult to quantify or dependent on final scheme design.

These CBAs outline options for implementing disclosure of home energy rating disclosure schemes. They are informed by the Home Energy Rating Disclosure Framework, which can be found at www.energy.gov.au. The analysis for single dwellings and apartments assumes the use of the Nationwide House Energy Rating Scheme (NatHERS), specifically NatHERS for Existing Homes which is still being finalised. The analysis for apartment base buildings assumes the use of the National Australian Built Environment Rating System (NABERS) for Apartment Buildings.

The scope of benefits of energy performance disclosure are considerably broader than the direct benefits of energy savings, emissions and network savings obtained from a home energy rating being disclosed and the home upgraded. There are substantial additional benefits, including improved health and wellbeing, accelerated market transformation and improved targeting of government investment. Some of these additional benefits occur as a direct result of the energy performance upgrades undertaken due to disclosure, while others will depend on the design and implementation of supporting initiatives to the disclosure scheme. The costs and benefits of these supporting initiatives should be considered alongside the costs and benefits of disclosure when assessing the overall economic impact of jurisdictional disclosure schemes. Examples of the potential impacts of disclosure combined with other supporting initiatives, are provided in Section 1. The combined impacts are able to be quantified and could be easily adapted for specific jurisdictional supporting initiatives to support a Regulation Impact Statement (RIS) process.

This document provides a summary of the findings from both CBA projects. These findings can be used to inform future jurisdiction Regulation Impact Statement (RIS) processes. The results of the analysis for single dwellings were integrated with the results of the analysis for apartments and apartment base buildings through a post model process. Where there were differences in methodology or assumptions between the two projects, particularly with respect to the types of additional benefits considered, proportional net economic benefits were estimated.

Section 1: Single dwellings and apartments

There is a considerable net benefit for all households that implement upgrades based on their home energy rating

The analysis for both single dwellings and apartments found considerable net benefits in all jurisdictions for households that implemented upgrades based on their energy rating. Households were assumed to implement cost effective upgrades – those with a 10 year payback period in the single dwelling analysis, and upgrades with a 10 year payback period and an upfront incremental cost under \$5,000 in apartments.

The net economic impacts from a household perspective for households that implemented upgrades are summarised in Table 2.

*Table 2: Net economic benefits (NPV \$2023) of mandatory disclosure for **households that upgrade**. This is the average payback in energy bill savings for households that upgrade over the lifetime of the scheme.*

Jurisdiction	Single dwellings Point of sale	Single dwellings Point of lease	Apartments Point of sale	Apartments Point of lease
Vic	\$4,264	\$4,086	\$1,768	\$1,754
NSW	\$4,783	\$4,803	\$2,489	\$2,352
Qld	\$4,410	\$4,464	\$1,315	\$1,171
ACT	\$5,019	\$4,824	\$2,458	\$2,200
WA	\$2,096	\$2,120	\$1,468	\$1,452
SA	\$4,345	\$4,369	\$1,723	\$1,727
Tas	\$3,613	\$3,636	\$5,496	\$6,072
NT	\$3,372	\$3,172	\$1,068	\$972
National	\$4,198	\$4,136	\$1,997	\$1,937

Evidence suggests that many households will not upgrade their property due to disclosure under a mandatory regime. The overall impact of mandatory disclosure therefore rests on whether the benefits that arise from upgraded properties are greater than the overall costs of the program, including the cost of ratings for households that take no action.

There is a net economic benefit nationally for mandatory energy performance disclosure at point of sale

The case for mandatory energy performance disclosure at point of sale is strong nationally, and in most jurisdictions (NSW, ACT, Vic, NT and Qld). The results are more marginal in SA and Tas, however, there are differences in these jurisdictions between the results in single dwellings and apartments. This may be the result of differences in the baseline efficiency of the different dwelling types within these jurisdictions or differences in assumptions around the types

of upgrades likely to occur. The case for mandatory disclosure in WA is slightly weaker. This is likely the result of higher baseline appliance efficiency, moderate climate, and a lower emissions factor for electricity. However, careful scheme design and supporting initiatives could increase the net economic benefit of the scheme in WA, as demonstrated when including the realisation of additional benefits as set out in Figure 2.

There are direct health benefits that will result from energy performance upgrades occurring under disclosure schemes. These direct benefits refer to improved household health and wellbeing from improved indoor temperatures and air quality. There is considerable research available that has been used to provide a conservative estimate of these direct health benefits. Jurisdictions should consider including these benefits in future cost benefit analyses, as they are conservative estimates which are supported by substantial evidence. True benefits are likely to be higher than those included in the analysis.

There is a strong case for implementing mandatory disclosure at point of sale, when a conservative estimate of additional direct health benefits is included in the analysis (see results presented in Table 3).

*Table 3: NPV and BCR results for mandatory disclosure at **point of sale** in single dwellings and apartments (transition scenario, using the central discount rate of 5% and incorporating health benefits). The range shows a lower cost assessment and lower uptake rate, and higher cost assessment and higher uptake rate.*

Jurisdiction	Single dwellings NPV (\$2023)	Single dwellings BCR	Apartments NPV (\$2023)	Apartments BCR	Single dwellings & apartments NPV (\$2023)	Single dwellings & apartments BCR
Vic	\$484M to \$771M	1.59 to 1.66	\$46M to \$60M	2.78 to 2.31	\$530M to \$832M	1.62 to 1.68
NSW	\$243M to \$419M	1.30 to 1.37	\$23M to \$22M	1.53 to 1.29	\$266M to \$442M	1.31 to 1.36
Qld	\$47M to \$184M	1.08 to 1.32	\$5M to \$2M	1.23 to 1.05	\$52M to \$186M	1.08 to 1.30
ACT	\$40M to \$60M	2.16 to 1.88	\$6.6M to \$7.4M	N/A to 5.00	\$47M to \$68M	2.39 to 1.96
SA	\$23M to \$47M	1.12 to 1.17	\$1.7M to \$1.5M	1.39 to 1.20	\$25M to \$48M	1.13 to 1.17
Tas	\$10M to \$19M	1.12 to 1.17	\$2.6M to \$3.6M	2.76 to 2.42	\$12M to \$22M	1.15 to 1.20
WA	-\$9M to \$13M	0.96 to 1.04	-\$0.2M to -\$2.1M	0.97 to 0.81	-\$10M to \$11M	0.96 to 1.03
NT	\$4M to \$7M	1.34 to 1.42	\$0.14M to \$0.05M	1.27 to 1.05	\$4M to \$7M	1.34 to 1.40
National	\$840M to \$1,594M	1.30 to 1.41	\$85M to \$95M	1.82 to 1.51	\$925M to \$1,689M	1.32 to 1.41

Note: Two assessment options have been included in this analysis to provide a range on the cost of assessment while NatHERS for Existing Homes is still being finalised.

Additional benefits of energy performance disclosure were quantified in both single dwellings and apartments

Both projects took slightly different approaches in quantifying additional benefits. The true quantum of additional benefits will be dependent on final scheme design and the supporting initiatives that are in place in different jurisdictions. A summary of the different types of additional benefits explored in each project is provided in Table 4.

Table 4: Summary of the different types of additional benefits quantified in the single dwellings project and the apartments project.

Category	Quantified in single dwellings	Quantified in apartments
Direct additional benefits of energy performance disclosure	<ul style="list-style-type: none"> Improvement in thermal comfort and health (cold exposure) Improved indoor air quality (reduction in dampness) 	<ul style="list-style-type: none"> Improvement in thermal comfort and health (cold and heat exposure) Improved indoor air quality (reduction in dampness and gas cooking)
Accelerated market transformation benefits	Not quantified	<ul style="list-style-type: none"> Decreased upgrade costs as a result of industry learning as the market scales due to disclosure Unlocking additional private finance through low or zero interest loans
Supporting government initiatives	<ul style="list-style-type: none"> Improvement in effectiveness of government programs Reduction in cost of energy concessions 	<ul style="list-style-type: none"> Government funding of upgrades in low-income apartments

Figure 1, Figure 2 and Figure 3 show the breakdown of potential net benefits by type for each jurisdiction for the transition from voluntary to mandatory scenario for disclosure at point of sale in single dwellings, apartments, and single dwellings and apartments combined. There is a net economic benefit in all jurisdictions.

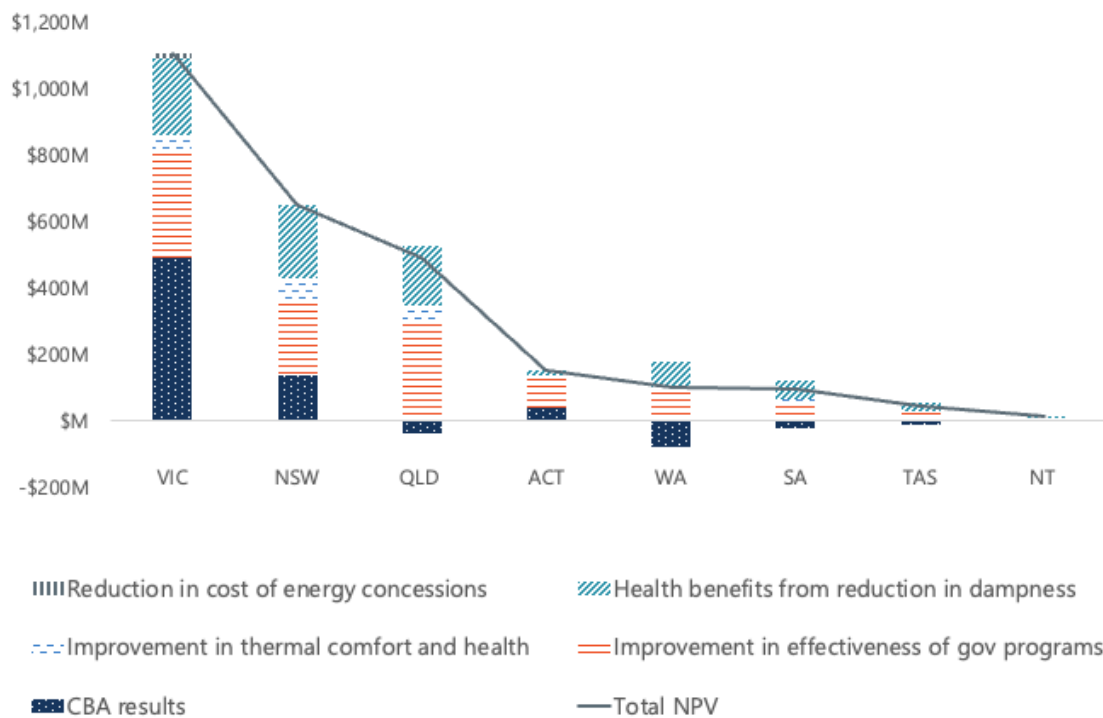


Figure 1: NPV (\$2023) breakdown by jurisdiction for the transition from voluntary to mandatory scenario for disclosure at point of sale in **single dwellings only** (higher cost assessment option) if all potential additional benefits are considered.

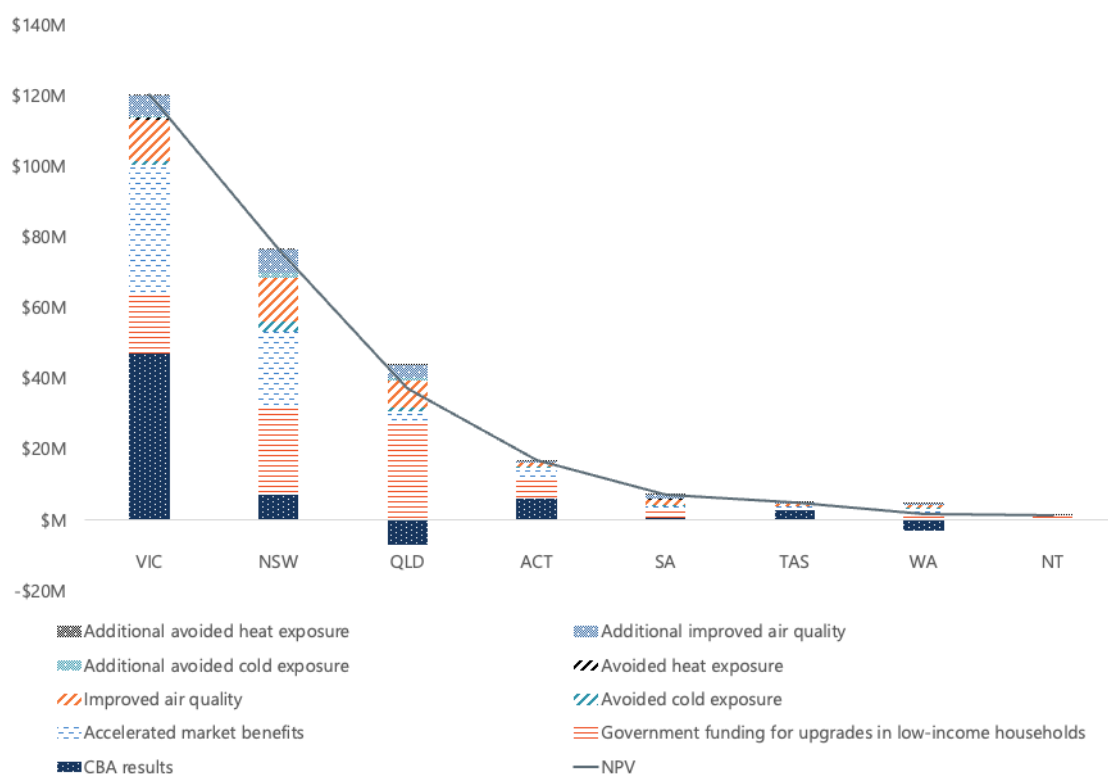


Figure 2: NPV (\$2023) breakdown by jurisdiction for the transition from voluntary to mandatory scenario for disclosure at point of sale in **apartments only** (higher cost assessment option) if all potential additional benefits are considered.

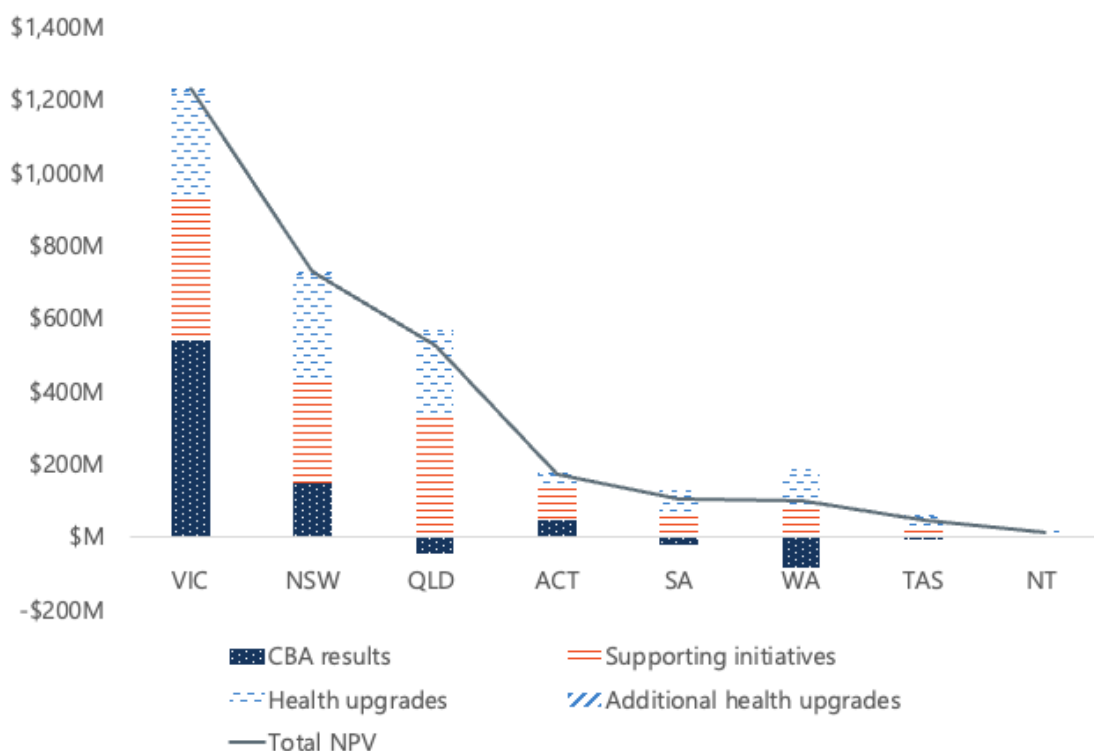


Figure 3: NPV (\$2023) breakdown by jurisdiction for the transition from voluntary to mandatory scenario for disclosure at point of sale in **single dwellings and apartments** (higher cost assessment option) if all potential additional benefits are considered.

Scheme design decisions and supporting initiatives are needed to improve the case for mandatory disclosure at point of lease

The analysis demonstrated a net economic cost nationally for the implementation of disclosure at point of lease. The combined scenario of disclosure at point of sale and lease also had a marginal net benefit or net cost in most jurisdictions. These results are due to an assumed lower uptake rate of upgrades in rented homes based on the considerable additional barriers and split incentives. The average lease turnover rate of both single dwellings and apartments is also much shorter than the sales turnover rate (2-3 years compared to 10 years). This means that over the modelled 10 year timeline of the scheme, with a certificate validity period ranging from 1-5¹ years, most rented homes must complete between 2-5 ratings. The cost of those additional ratings, combined with the lower upgrade uptake rate, make the case for energy performance at point of lease more difficult.

There are scheme design options or complementary initiatives that would considerably improve the net economic impact. Analysis shows that if a similar approach to the ACT's were followed, where disclosure is only mandated at point of lease if a current, valid rating already exists, then there would be a net economic benefit nationally, and in all jurisdictions, for disclosure at point of sale and lease in single dwellings and apartments (see

Table 5). Supporting initiatives that directly target the barriers limiting the uptake of upgrades in rented homes may also improve the economic case for disclosure at point of lease, e.g., financial incentives or complementary minimum energy performance standards.

¹ This analysis was conducted before the certificate validity period of up to 10 years was included in the Framework.

*Table 5: CBA results for the implementation of mandatory disclosure at **point of sale and point of lease** if a rating already exists (similar to the current ACT approach) using a higher cost assessment in single dwellings and apartments. All results are relative to BAU, using the central discount rate of 5%.*

Jurisdiction	Costs	Benefits	NPV	BCR
Vic	\$1,325M	\$2,514M	\$1,189M	1.90
NSW	\$1,305M	\$1,909M	\$604M	1.46
Qld	\$960M	\$1,428M	\$468M	1.49
ACT	\$77M	\$161M	\$84M	2.10
NT	\$20M	\$36M	\$15M	1.76
SA	\$307M	\$396M	\$89M	1.29
Tas	\$128M	\$173M	\$45M	1.35
WA	\$376M	\$434M	\$58M	1.15
National	\$4,472M	\$6,973M	\$2,501M	1.56

Section 2: Apartment base buildings

The economic impact of disclosure for apartment base buildings is dependent on the type and depth of upgrades implemented

Before understanding the potential economic impact of disclosure in apartment base buildings, it is important to understand that data on the opportunity to upgrade Australian apartment buildings is limited. The data used in this analysis comes from the City of Sydney Smart Green Apartments program. The limitations in the data include:

- **The small sample size is from one location.** The data available for analysis comprises upgrades in the City of Sydney only. Therefore, it may not be representative of all jurisdictions.
- **The data only covers seven years.** The data only covers a relatively short period of time (2016-2022). It is possible that a longer period of time is required to see if deeper, more complex upgrades are taken up by owners corporations e.g., upgrades to centralised hot water or Heating, Ventilation and Air Conditioning (HVAC) systems.

Based on the available data, Table 6 provides the range of possible net impacts of mandatory energy performance disclosure for apartment base buildings. The range is driven by excluding and including lighting upgrades in the cost benefit analysis. The data used in the analysis (City of Sydney Smart Green Apartments program) showed that 45% of the energy savings resulted from lighting upgrades. If lighting upgrades are included in the analysis, mandatory disclosure of NABERS ratings for apartment buildings delivers a net economic benefit. In contrast, if lighting upgrades are excluded, this reduces the economic benefits of mandatory disclosure to the point the benefits no longer meet costs.

Table 6: National results for the implementation of mandatory disclosure in apartment base buildings, using a central discount rate of 5%. The range shows the results with lighting upgrades excluded and included in the analysis.

Jurisdiction	Costs*	Benefits	NPV	BCR
NSW	\$90M to \$103M	\$39M to \$116M	-\$51M to \$13M	0.43 to 1.12
Qld	\$34M to \$40M	\$13M to \$53M	-\$21M to \$13M	0.39 to 1.33
Vic	\$31M to \$36M	\$19M to \$51M	-\$13M to \$15M	0.60 to 1.41
WA	\$7M to \$8M	\$3M to \$9M	-\$4M to \$1M	0.42 to 1.16
ACT	\$5M to \$6M	\$2M to \$7M	-\$3M to \$0.7M	0.41 to 1.12
SA	\$2M to \$3M	\$1M to \$4M	-\$1M to \$0.7M	0.46 to 1.24
NT	\$1M to \$2M	\$1M to \$3M	-\$0.3M to \$1M	0.81 to 1.79
Tas	\$0.3M to \$0.3M	\$0.2M to \$0.4M	-\$0.1M to \$0.1M	0.59 to 1.32
National	\$171M to \$198M	\$79M to \$242M	-\$93M to \$45M	0.46 to 1.23

*Costs associated with owners corporation decision-making processes have not been factored into the analysis.

Lighting was not included in the CBA for single dwellings or for apartments, as it was determined that lighting now constitutes a small portion of energy use within a dwelling, and inefficient replacement options have largely been superseded by high efficiency LEDs. This is consistent with previous research on the lighting market, which found the market has transitioned to efficient LEDs since 2014 [2]. LED lighting currently comprises approximately 75% of the residential market with a projected adoption of more than 90% by 2030 [3].

Some of the identified and implemented lighting upgrades in the City of Sydney data also involved the installation of lighting with integrated motion sensors. Energy savings from these control systems are beyond business-as-usual and would ideally be considered in the analysis. As such, the true impact of disclosure of NABERS ratings will lie between the extremes of the estimated range in Table 6 – likely somewhere closer to breaking even. Further data on energy upgrades in apartment buildings would help to reduce this uncertainty. Increased uptake of NABERS for apartments buildings in other jurisdictions would also help to provide and improve this data.

The information generated through NABERS ratings may help to unlock deeper upgrades in apartment buildings

It appears that upgrades in apartment buildings are not currently happening at scale around the country. The City of Sydney data also suggests that upgrades that are occurring are mostly limited to highly cost effective and easy to implement solutions, e.g., lighting upgrades, behavioural changes and optimised controls (e.g., adding carbon monoxide sensors or variable speed drives). However, it should be noted these findings are based on the limited data available, which in turn creates limitations for this analysis as outlined previously.

The uptake of deeper upgrades would improve the net economic impact of apartment base building disclosure. However, there are considerable barriers preventing these types of upgrades. These barriers are even larger than those faced by owners and occupants of single dwellings and individual apartments. The challenges of the shared decision making process and the need to raise collective capital are difficult to overcome. Deeper upgrades of centralised services are also potentially quite disruptive to the residents and hence may be less likely to occur unless at end of life, regardless of the cost effectiveness of upgrading sooner.

Due to these limitations in data availability, there is a degree of uncertainty over the true benefits of mandatory apartment base building disclosure. As such, there may be advantages in taking a staged approach. Supporting the expansion of the voluntary program within NSW and in other jurisdictions in the short term (as the City of Sydney have done) may be beneficial in unlocking important data around the prevalence of centralised services in apartment buildings and understanding the barriers to upgrades. This data could then help to further inform the case for mandatory disclosure.

Section 3: Additional opportunities of disclosure

Information from energy performance disclosure schemes could encourage private sector action

Energy performance information disclosure can be valuable to encourage private sector action and innovation, by increasing the volume and quality of data availability in the sector. Currently, there is limited data on energy performance in the residential sector. Without data, businesses do not have the evidence to design new business models to service this market. Disclosure represents a step change opportunity to build actionable de-identified pre-competitive datasets that can enable innovation. Property market suppliers and finance providers could use pre-competitive data from disclosure to drive business model innovation and to stimulate upgrades.

As a result of climate-related financial risk disclosure obligations on financial institutions, there will be an incentive for banks to improve the energy and emissions performance of their portfolios over time. Several financial institutions have previously commented they would consider targeting new financial products to fund upgrades in underperforming dwellings [3]. This may be in the form of discounted finance offered to customers that are willing to bundle energy performance upgrades into their home loan at point of purchase, or even owners that wish to take out a new green loan mid-tenure to finance an upgrade. Unlocking discounted private finance could increase the impact of disclosure if a higher overall upgrade uptake rate is achieved. An increased upgrade uptake rate scenario was modelled in the apartments disclosure analysis, to represent the potential impact of accessible discounted private finance. This analysis found that if increased access to private finance enabled a 5% increase in upgrade uptake in apartments, then an additional \$44M in net benefits could be delivered nationally (taking the overall national net benefit of disclosure in apartments to \$139M).

Energy performance disclosure at scale can accelerate market transformation

Programs like disclosure that stimulate upgrades can also drive a virtuous cycle of market transformation through the industry. Disclosure acts primarily on information barriers that allow stakeholders to become aware of, and place value on, what were previously invisible dwelling attributes. Owners and occupants in turn pursue upgrades to realise this value. While not all households will make these upgrades, the group that does can be critical to reduce other barriers in the market – namely cost barriers. This is particularly true when disclosure increases the installation rates of newer technology that is still coming down the cost curve. Costs only come down through deployment – any long term, stable policy that stimulates deployment of newer technologies (e.g. LED lighting or heat pumps) increases industry learning, which unlocks cost reduction for the whole market. This has already been observed in the built environment, for example where energy savings schemes like the NSW Energy Savings Scheme (ESS), Victorian Energy Upgrades (VEU) program, South Australian Retailer Energy Productivity Scheme (REPS), and ACT Energy Efficiency Improvement Scheme (EEIS) drove upgrades in the lighting market. A 2017 NSW Lighting Market Impact Evaluation [5] found that upgrades under the ESS increased competition and efficiency in the market, which in turn

drove down costs for the whole lighting market – not just for those customers participating in the scheme.

The experience of other jurisdictions that have been scaling up the deployment of energy performance technologies in the residential sector, like heat pumps, suggest that cost reductions could be meaningful [5]. A systematic review of historic and forecast domestic heat pumps installed costs in the United Kingdom and Europe suggests that local non-equipment installation costs demonstrate the greatest cost reduction potential – as high as 30% [5]. Switzerland and the Netherlands experienced the greatest overall installed heat pump cost reductions (equipment costs and installation costs) in the order of 18-25% [5]. These were jurisdictions with highly competitive markets and strong policy support. In the context of mandatory disclosure in apartment buildings, an 18-25% reduction in heat pump costs would result in an additional net benefit of \$2M nationally. If similar cost reductions were seen with other energy performance technologies deployed at scale, then even greater net benefits could be achieved.

Careful scheme design and supporting initiatives within jurisdictions can unlock further additional benefits

Disclosure schemes will operate within the context of broader jurisdiction residential policy landscapes. Disclosure can both complement existing policies and programs and unlock new opportunities for targeted supporting initiatives, including:

- **Improved targeting of existing government programs.** Implementing disclosure generates considerable data that can improve the targeting of existing government programs. There is scarce data to identify low performing homes to target government funding. Disclosure can provide data on geographies, demographics and dwelling characteristics that correlate with poor energy performance and poor uptake of existing government incentives (i.e. disclosure can help to identify access barriers faced by specific groups within the target population of existing government programs).
- **Improved monitoring and evaluation of existing programs.** Due to poor data availability, many existing programs cannot robustly evaluate real world outcomes to understand if the program is achieving its overall goals. In particular, there is no baseline data. The information that will become available through disclosure can be used to monitor and evaluate the baseline starting point and the tangible outcomes of programs, as well as the progress that occurs as a result of disclosure itself.
- **More effective and equitable new programs developed.** The data from disclosure can support more effective design and targeting of new government programs. Disclosure data can be used to increase program design effectiveness, efficiency and equity for target populations, understand the most efficient scale of funding and determine where to target minimum standards.
- **Funding upgrades for low-income households living in apartments would deliver additional benefits.** Low-income households face the greatest barriers to upgrades. They are more likely to be renters and face capital constraints, both of which prevent them from undertaking upgrades in response to receiving a rating, which can result in bill savings and mitigate adverse health impacts from poor performing dwellings. The opportunity to upgrade these households represents major public benefit – disclosure unlocks the

capacity for governments to target these households that would otherwise be unable to access the full benefits of disclosure. There may also be a flow on effect for existing energy rebate schemes for households in, or vulnerable to, energy hardship.

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