Consultation RIS - Proposed NCC 2022 residential energy efficiency provisions

Overview

The Australian Building Codes Board (ABCB) is proposing to update the energy efficiency provisions for residential buildings in the 2022 edition of the National Construction Code (NCC). The proposed provisions are included in stage 2 of the NCC 2022 public comment draft (PCD).

An in-depth analysis of the impacts (both costs and benefits) of the proposed provisions is now open for comment. This analysis is presented in a Consultation Regulation Impact Statement (CRIS).

This CRIS has been developed by ACIL Allen in accordance with the best practice regulatory principles administered by the Office of Best Practice Regulation (OBPR) and set out in the ***Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies.*** *<https://obpr.pmc.gov.au/resources/guidance-impact-analysis/regulatory-impact-analysis-guide-ministers-meetings-and-national>*

Resources

To support stakeholders in providing informed comments, resources are available via the Related Documents section at the bottom of this page:

- NCC 2022 residential energy efficiency provisions – the CRIS explained
- Costs and Benefits of Upgrading Building Fabric from 6 to 7 Stars (Tony Isaacs Consulting)
- NCC 2022 Update - Whole of House Component (Energy Efficient Strategies)

You can access the full CRIS below or download a copy at the bottom of this page. You can also access a preview of the consultation via the 'consultation preview' attachment at the bottom of this page.

NCC 2022 PCD (stage 2)

NCC 2022 PCD (the technical provisions) is also open for consultation until **11:59 PM AEST 17 October 2021**. You can view the draft and supporting documentation on the **ABCB's Consultation Hub** *</engagement/ncc-2022-public-comment-draft-stage-2/consult_view/>* .

You will still be able to view the PCD once the public comment period has closed.

Why your views matter

The input of stakeholders to the CRIS is fundamental to ensuring that the Final RIS is based on the best available information. Questions have been included to guide respondents on specific matters where more information may assist in developing the Final RIS.

Providing comment

The CRIS is open for response until **11:59 PM AEDT Sunday 7 November 2021**. In line with the ABCB's process for undertaking public consultation, comment will only be accepted through the ABCB's online Consultation Hub.

Privacy Collection Statement

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- the Commonwealth Government, and State and Territory Ministers responsible for building regulation and policy, and their staff and advisers;
- other Commonwealth or State and Territory government departments and agencies;
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Confidential Information

All submissions and comments will be published unless they are marked 'commercial-in-confidence', or where "do not publish" is selected at the beginning of this survey.

Any contact details you provide within your submission will be redacted prior to your submission being published.

In order to promote debate and transparency, the ABCB prefers that all submissions and comments be provided in a way that does not require confidentiality to be maintained. However, it recognises that in some circumstances you may want to provide information in confidence.

It is the responsibility of the person making the submission to ensure that any 'commercial-in-confidence' information is clearly identified. Please consider if you can structure your response to keep only some parts confidential. If only part of your submission is confidential, you can provide the confidential part as a separate submission so that the ABCB can publish the non-confidential part of the submission.

Where confidentiality is requested for an entire submission, it will not be published by the ABCB, nor will your name or organisation details.

Please note that we may still disclose the confidential part of your submission to any of the above identified users of the information as part of the consultation process and we will use reasonable efforts to ensure that the recipients keep the submission confidential.

The ABCB or the ABCB Office may also disclose confidential information in circumstances where:

- we are required or authorised by law disclose it;
- you agree to the information being disclosed; or
- someone other than you has made the confidential information public

Your submission, comments, opinions and responses will not be published if the ABCB or the ABCB Office considers that your submission, comments, opinions and responses may contain potentially defamatory statements or other offensive comments.

By making a submission on the CRIS - Proposed NCC 2022 residential energy efficiency provisions you will be agreeing to the collection of the information you provide in your submission, and the use and disclosure of the information you provide in your submission as outlined above.

Please indicate your preference:

(Required)

Please select only one item

◯ Publish response ◯ Publish response anonymously (this will remove personal identifiers including, name and organisation)
◯ Do not publish

If you choose to submit your responses anonymously; make sure that the answers you submit do not reveal your identity as your responses will be published.

Personal Information

What is your name?

What is your email address?

(Required)

If you enter a valid email address then you will automatically receive an acknowledgement when you submit your response. You will also be provided with a link to a PDF copy of your responses.

The address you enter here will not be published.

Please select your State or Territory

Please select only one item

◯ ACT ◯ NSW ◯ NT ◯ Qld ◯ SA ◯ Tas ◯ Vic ◯ WA

What is your organisation? (if applicable)

Which best describes your industry sector?

Please select only one item

◯ Building Commercial ◯ Building Residential ◯ Building Commercial and Residential ◯ Building and plumbing products
◯ Building Certification/ Surveying ◯ Architecture and design ◯ Engineering ◯ Plumbing ◯ Compliance, testing and accreditation
◯ Legal and Finance ◯ Specialist - disability access ◯ Specialist - energy efficiency ◯ Specialist - fire safety ◯ Specialist - health
◯ Specialist - hydraulic/ plumbing ◯ Student/ apprentices ◯ Trades and other construction services ◯ Education
◯ Community and Non-Government organisations ◯ Government ◯ General Public ◯ Other

Statement of the problem

Note: all questions in this survey are optional except for question 8 on the next page.

Questions from the problem chapter of the CRIS

The following text is a summary of how the CRIS defines the problem. A full extract of the problem section of the RIS is provided after the summary.

Statement of the Problem

The residential building sector is a major source of energy demand and use.

While Australia has made considerable progress in the energy performance of residential buildings, there is still opportunity to implement actions that could further reduce the energy consumption of the sector.

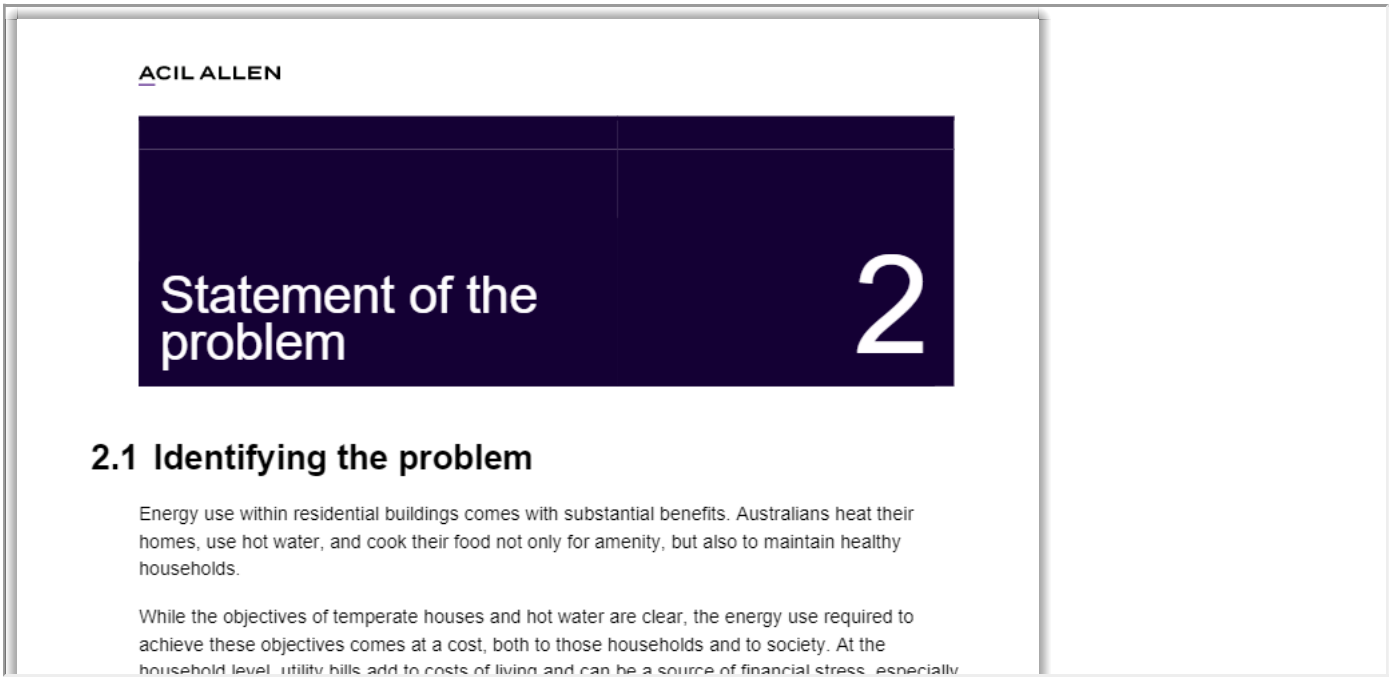
There are a number of market failures that inhibit socially optimal energy efficiency decisions and result in over consumption of energy and underinvestment in energy efficiency.

These market failures may include:

- unpriced negative externalities,
- information problems, and
- split incentives

Commonwealth, State, and Territory governments have introduced a number of measures to address these market failures, reduce energy use and improve the energy efficiency of the residential sector, including the minimum energy efficiency requirements for new residential buildings in the NCC (which have been in place since 2003 for houses and since 2005 for multi-residential buildings). However, in principle, there is a case for a further increase in the minimum energy efficiency requirements in the NCC for residential buildings.

Extract from the CRIS



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Statement of the problem 2

2.1 Identifying the problem

Energy use within residential buildings comes with substantial benefits. Australians heat their homes, use hot water, and cook their food not only for amenity, but also to maintain healthy households.

While the objectives of temperate houses and hot water are clear, the energy use required to achieve these objectives comes at a cost, both to those households and to society. At the household level, utility bills add to costs of living and can be a source of financial stress, especially

1 Does the CRIS adequately identify and define the problem?

Please select only one item

◯ Yes ◯ No ◯ Unsure

If you would like to expand on your answer, please do so below

2 Are there any other problems not considered by the CRIS?

Please select only one item

◯ Yes (please explain your answer below) ◯ No ◯ Unsure

Please expand on your answer below

3 Does the CRIS establish a case for amending the energy efficiency provisions of the NCC?

Please select only one item

◯ Yes ◯ No (please explain your answer below) ◯ Unsure

Please expand on your answer below

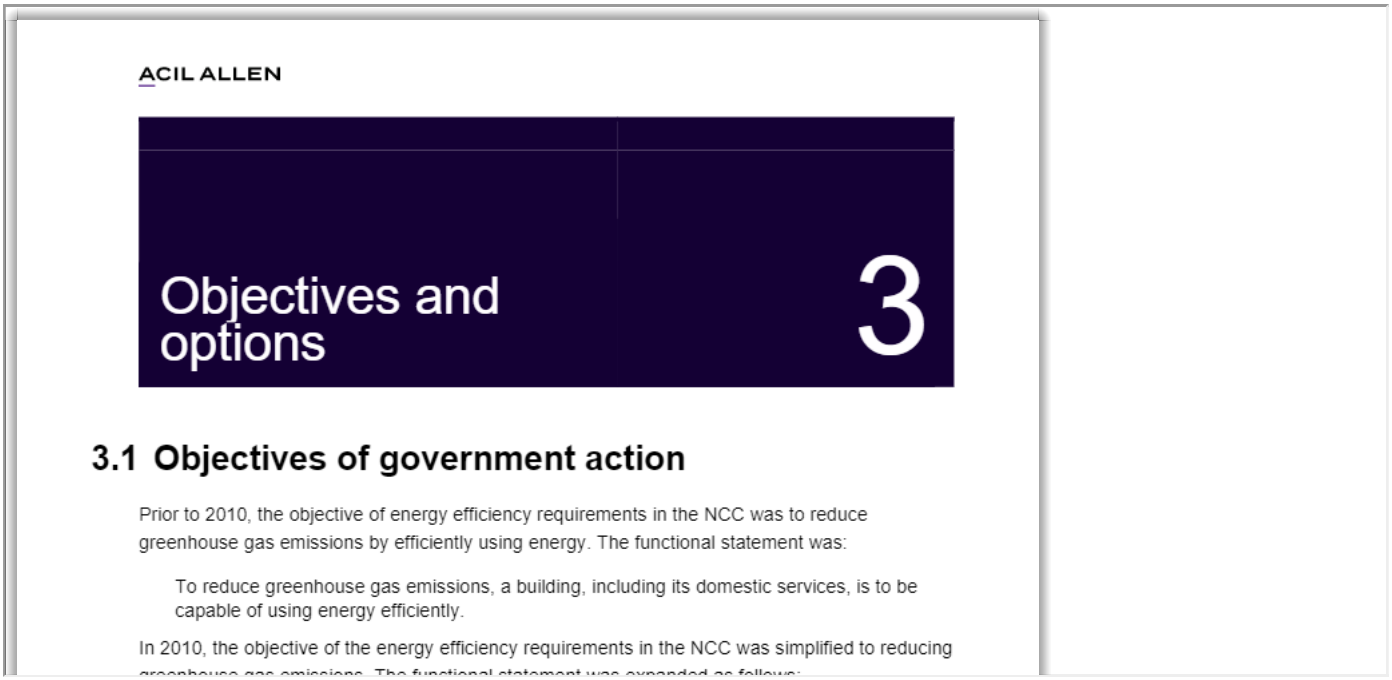
Objectives and options

Note: all questions in this survey are optional except for question 8 on this page.

Questions from the objectives and options chapter of the CRIS

To read the objectives and options chapter, click on more information below.

More information



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Objectives and options 3

3.1 Objectives of government action

Prior to 2010, the objective of energy efficiency requirements in the NCC was to reduce greenhouse gas emissions by efficiently using energy. The functional statement was:

> To reduce greenhouse gas emissions, a building, including its domestic services, is to be capable of using energy efficiently.

In 2010, the objective of the energy efficiency requirements in the NCC was simplified to reducing

4 Does the CRIS present clear, well differentiated options for amending the NCC that can achieve the stated policy objective?

You can select more than one answer below.

Please select all that apply

☐ The options are clear ☐ The options are well differentiated ☐ The options can achieve the stated policy objectives

☐ None of the above statements are true

Please expand on your answer below

5 Which of the options analysed have the ability to meet the stated objectives?

The objectives are to:

- reduce energy use,
- reduce greenhouse gas emissions,
- improving occupant health and amenity, and
- improving the resilience of a building to extreme weather and blackouts

Check all boxes that apply.

Please select all that apply

☐ Option A ☐ Option B ☐ The status quo ☐ None of the options ☐ Unsure

Why did you make that choice? And how can the options be enhanced?

6 Are there any other feasible options to address the problems identified in the previous chapter that have not been assessed in the CRIS and should be considered?

Please select only one item

◯ Yes (provide detail below) ◯ No ◯ Unsure

Please provide as much detail as you can on other feasible options

7 Of the options discussed in this chapter which would be the most effective at achieving the stated objectives and why?

	Option A	Option B	Status quo	Unsure
Class 1 *Please select only one item*	○	○	○	○
Class 2 *Please select only one item*	○	○	○	○

Please expand on your answers below

8 Which is your preferred option? (Answer required)

(Required)	Option A	Option B	Status quo	Other
Class 1 *Please select only one item*	○	○	○	○
Class 2 *Please select only one item*	○	○	○	○

Please explain your answer below

9 What should the objectives of the residential energy efficiency provisions of the NCC be?

The CRIS puts forward a set of objectives for this proposal and for the NCC residential energy efficiency provisions more broadly.

This question asks what you think the objectives should be.

Check every box that you think applies

Please select all that apply

☐ Reduce energy use ☐ Reduce greenhouse gas emissions ☐ Improve occupant health and amenity

☐ Improve the resilience of a building to extreme weather and blackouts ☐ Other

If you selected other, type the objective(s) here

Please explain your answer below

Framework for analysis

Note: all questions in this survey are optional except for question 8.

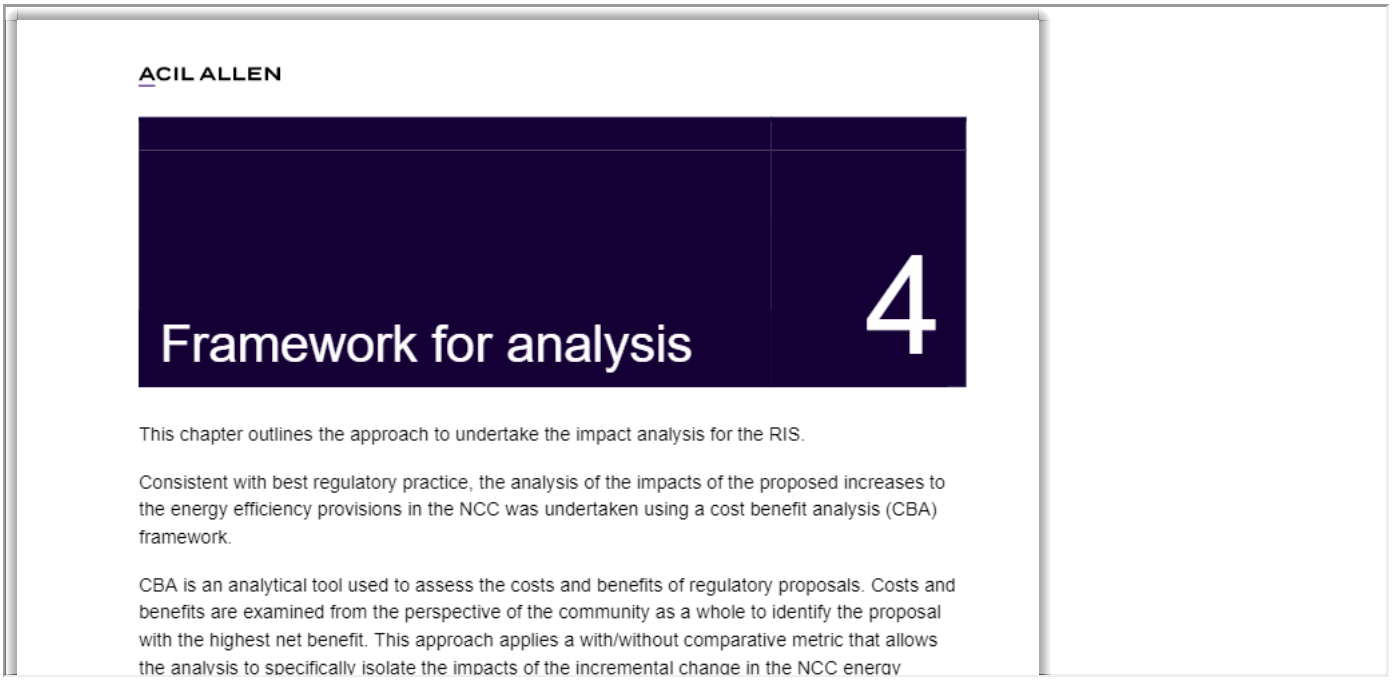
Questions from the framework for analysis chapter of the CRIS

This chapter outlines the approach used to undertake the impact analysis for the RIS.

Consistent with best regulatory practice, the analysis of the impacts of the proposed increases to the energy efficiency provisions in the NCC was undertaken using a cost benefit analysis (CBA) framework.

Click on more information below to view the framework for analysis chapter of the CRIS.

More information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Framework for analysis 4

This chapter outlines the approach to undertake the impact analysis for the RIS.

Consistent with best regulatory practice, the analysis of the impacts of the proposed increases to the energy efficiency provisions in the NCC was undertaken using a cost benefit analysis (CBA) framework.

CBA is an analytical tool used to assess the costs and benefits of regulatory proposals. Costs and benefits are examined from the perspective of the community as a whole to identify the proposal with the highest net benefit. This approach applies a with/without comparative metric that allows the analysis to specifically isolate the impacts of the incremental change in the NCC energy

10 Are there any assumptions or parameters used in the analysis that should be different?

Please select only one item

◯ Yes (please provide details below) ◯ No ◯ Unsure

Expand on your answer below. If you answered yes, is there some alternative evidence that could be considered?

Please attach a copy of any documents you wish to include to this printout.

Upload any relevant evidence here

11 Should thermal bridging in timber-framed buildings be incorporated in the analysis?

Thermal bridging is discussed at section 4.3.3 of the CRIS. Click on more information below to read this section.

More information

4.3.3 Thermal bridging

Thermal bridging is a localised weakness or discontinuity in the thermal envelope of a building that occurs when there is either a break in the insulation, less insulation or the insulation is penetrated by an element with a higher thermal conductivity.

It affects in-service performance, producing heat loss and cold spots that can lead to a build-up of condensation and promote mould growth.

Currently, the NatHERS thermal simulation tools used for the majority of building approvals do not take into account the added heat losses and heat gains due to thermal bridging and the current version of the NCC does not have provisions to fully account for thermal bridging in the thermal calculations for residential buildings.

This results in an energy efficiency performance gap where new buildings currently rated at 6 stars in reality perform to a lesser standard due to heat leakage. Tony Isaac Consulting's (TIC's)**[1]** *<#_ftn1>* estimates that the impact of thermal bridging on the energy efficiency of a dwelling is:

- in timber framed buildings, a reduction in NatHERS ratings of between 0.1 to 0.6 stars
- in steel framed buildings, a loss of performance of between 0.7 and 1.5 NatHERS stars more than the impact of timber frames (impacts are highest in cooler climates).

A one-star reduction is, on average, across most NatHERS climate zones, at least a 15 per cent reduction in a dwelling's energy efficiency.**[2]** *<#_ftn2>*

The proposed changes to the NCC 2022 include provisions to account for heat leakage through thermal bridges when calculating insulation requirements. These provisions will only apply to steel frame dwellings. These mitigation measures have been designed to ensure that dwellings with steel frames achieve a similar performance to timber-framed dwellings.

There are several implications of these changes for the analysis:

- The thermal bridging changes in NCC 2022 will result in compliance costs that are *additional* to the costs of moving the thermal shell from 6 to 7 stars (in effect, these costs will be incurred to get buildings to perform as 'true' 6 star buildings).
- Leaving aside the stringency increase from 6 to 7 stars, the thermal bridging changes in NCC 2022 will materialise the benefits of the 6 star rating that were projected in the 2009 RIS**[3]** *<#_ftn3>* for an increase in energy efficiency from 5 to 6 stars in 2009.
- Given that the 2009 residential 6 star RIS already accounted for the benefits of achieving a 'true' 6 star rating (i.e. the 2009 RIS assumed that buildings would perform as 6 stars), but did not account for thermal bridging or the costs associated with addressing this issue, the CBA for the NCC 2022 changes will account for the costs of addressing thermal bridging, but not the benefits.**[4]** *<#_ftn4>*
- Given that the NCC 2022 only includes provisions to mitigate thermal bridging in steel frame buildings, the performance gap discussed above will continue in timber frame buildings. The energy flows for timber buildings provided by EES do not include an adjustment for this gap and hence neither does the RIS. The treatment of the impacts of thermal bridging in timber frame buildings is an area where the RIS is seeking input from stakeholders during the consultation period.

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[1] *<#_ftnref1>* Tony Isaacs Consulting (TIC) 2021a, *DTS Elemental Provisions for NCC 2022*, Draft.

[2] *<#_ftnref2>* Tony Isaacs Consulting (TIC) 2021b, *Evaluating the impact of thermal bridging on energy savings predicted for the NCC 2022 RIS*, May.

[3] *<#_ftnref3>* Centre for International Economics (CIE) 2009, *Final Regulation Impact Statement for residential buildings (Class 1, 2, 4 and 10 buildings) - Proposal to revise energy efficiency requirements of the Building Code of Australia for residential buildings*, prepared for the Australian Building Codes Board, December

[4] *<#_ftnref4>* Notably, even when the 2009 RIS modelled the benefits of achieving a 'true' 6 star rating, the Net Present Value (NPV) of increasing from 5 to 6 stars was negative (-$259 million, with a BCR of 0.88) at 7 per cent discount rate (the recommended central discount rate by OBPR). Should the 'true' benefits of this increase have been modelled (i.e. the energy savings likely to be achieved when thermal bridging was accounted for , which would be lower) or the costs of mitigating thermal bridging accounted for (and hence achieving a 'true' 6 star rating), the NPV and BCR of the policy would have been even lower.

Please select only one item

◯ Yes (please explain how below) ◯ No ◯ Unsure

Please expand on your answer below. How should it be incorporated?

12 Is it reasonable to assume that industry's response to the proposed changes will be to select the lowest cost alternatives in every case?

The way that industry has been assumed to respond is detailed in Section 4.3.6 of the CRIS. Navigate to the top of this page and click on more information to read this section.

As an example: for the whole of home proposal industry has been assumed to select the lowest cost between installing PV, adopting high efficiency appliances or a combination of approaches.

Please select only one item

◯ Yes ◯ No (please expand on your response below) ◯ Unsure

Please explain your answer below

13 How would industry most likely respond to the proposed whole-of-home changes under each of the proposed options?

The way that industry has been assumed to respond is detailed in Section 4.3.6 of the CRIS.

Navigate to the top of this page and click on more information to read this section.

Select the action that you think industry will take.

	Install what is cheapest to meet the requirements (the cheaper of more efficient appliances or PV)	Continue to install the same equipment and install PV (to meet the energy budget)	Continue to install the same equipment and improve the thermal shell	Switch to using a performance solution	Other - please explain below	Unsure
Class 1 *Please select only one item*	◯	◯	◯	◯	◯	◯
Class 2 *Please select only one item*	◯	◯	◯	◯	◯	◯

Please explain your answer below

14 How would industry most likely respond to the proposed thermal fabric changes under each of the proposed options?

The way that industry has been assumed to respond is detailed in Section 4.3.6 of the CRIS.

Navigate to the top of this page and click on more information to read this section.

This question asks about industry behaviour when altering a house design from 6-star to 7-star in situations where the proposal will require it.

	Substantially maintain existing home designs, and improve the performance of materials like insulation and windows	Change building designs – reduce window sizes	Change orientation of living rooms within the home	Switch to using a performance solution	Other - please explain below	Unsure
Class 1 *Please select only one item*	◯	◯	◯	◯	◯	◯
Class 2 *Please select only one item*	◯	◯	◯	◯	◯	◯

Please explain your answer below

15 In some cases, smaller windows are assumed to be used to constrain costs or achieve compliance with the proposal. Should the impact on occupant amenity be valued and how?

Click on more information below to read the section on window size reductions from the CRIS.

More information

Assumed reductions in window sizes

To meet the proposed thermal requirements in NCC 2022 at the lowest cost of compliance, Tony Isaacs Consulting's (TIC's) modelling of the impacts of the proposed changes assumes an average reduction in window size.**[1]** *<#_ftn1>*

Notably, CSIRO's dashboard data shows that as rating levels increase, slightly smaller window sizes are selected. In particular, this data shows that the average window to floor area ratio in 7 star dwellings is lower than in 6 star dwellings. On average across Australia, 7 star dwellings have around 15 per cent smaller windows as a proportion of floor area than 6 star dwellings. Reducing window area may be a response to contain overall glazing costs because a greater proportion of windows will need to be high performance in a 7star dwelling.

CSIRO's data reveals the observed design response of people who currently choose to exceed the minimum NCC requirements and build 7 star dwellings. While it is not clear that the design response to the proposed 7 star minimum regulatory requirements would be the same, TIC's modelling argues that it is reasonable to assume that a proportion of dwellings would respond to the regulations by reducing window size, so they state they assume that 60 per cent of the window area reduction observed in CSIRO's data is implemented to meet the new thermal requirements.

TIC's analysis does not take into account of the effects on amenity or dwelling value.

While it is recognised that a reduction in window size may have a cost in terms of loss of amenity and potentially dwelling value, these costs have not been quantified and is an area where the RIS is seeking stakeholder feedback.

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[1] *<#_ftnref1>* For further details about the assumed reductions in window sizes across different locations and climate zones, please refer to TIC's report '*Report 1: Cost and Benefits of upgrading building fabric from 6 to 7 stars*'. This report is avaliable on the home page for this consultation, see 'Related documents'.

Please select only one item

◯ Yes ◯ No ◯ Unsure

Please explain your answer below. How can this be valued?

16 Does the use of a high efficiency equipment solution as a proxy for other non-modelled solutions over/under-estimate the costs of the proposed changes for Class 2 dwellings?

This question relates to section 4.3.6.

As noted in Section 4.3.6 apartments currently being built with no heating, no cooling, or neither heating nor cooling under the status-quo can comply the proposed requirements either through a higher performance building shell (above 7 stars) or a combination of a higher performing shell and a high efficiency water heater.

However, only the high efficiency equipment solution has been modelled in the cost benefit analysis as a proxy for all possible compliance pathways.

Click on more information below to read the relevant section of the CRIS.

To see the estimated costs, click on cost table below.

More information

Dwellings built with no heating, no cooling, or neither heating nor cooling

Some Class 1 and Class 2 dwellings are currently being built with no heating, no cooling, or neither heating nor cooling under the BAU. As indicated in Table 4.12 of the CRIS, these dwellings represent a significant proportion of dwellings in some states (e.g. NSW, Queensland and WA).

The regulatory default requirement for these buildings is that a Minimum Energy Performance Standards (MEPS) level heat pump is assumed to have been installed.

This is designed to ensure that heaters/coolers are not simply installed straight after occupancy as a means of avoiding the installation of solar PV during construction.

It also ensures that all dwellings are regulated on the basis of an assumed common level of service provision.

This means that someone can choose to not put in heating or cooling but they are still required to make some provisions (in terms of offsets) in case heating and/or cooling is installed after occupancy.

In light of this, Energy Efficient Strategies (EES) included these dwellings in the modelling in the following way:

In cases where solar PV can be installed, EES assumed that a MEPS level heat pump would have been installed in the baseline and calculated the solar PV that would be required to comply with the regulation. Given the assumption of no shaded blocks discussed in Section 4.3.5, this is the solution/upgrade pathway that is assumed for all Class 1 dwellings with no heating, no cooling, or neither heating nor cooling under the BAU.

In cases where solar PV cannot be installed, EES assumed that these buildings comply with the proposed NCC 2022 requirements by installing high efficiency equipment (including heating and cooling).

This is a solution/upgrade pathway that is assumed for all Class 2 dwellings with no heating, no cooling, or neither heating nor cooling under the BAU.

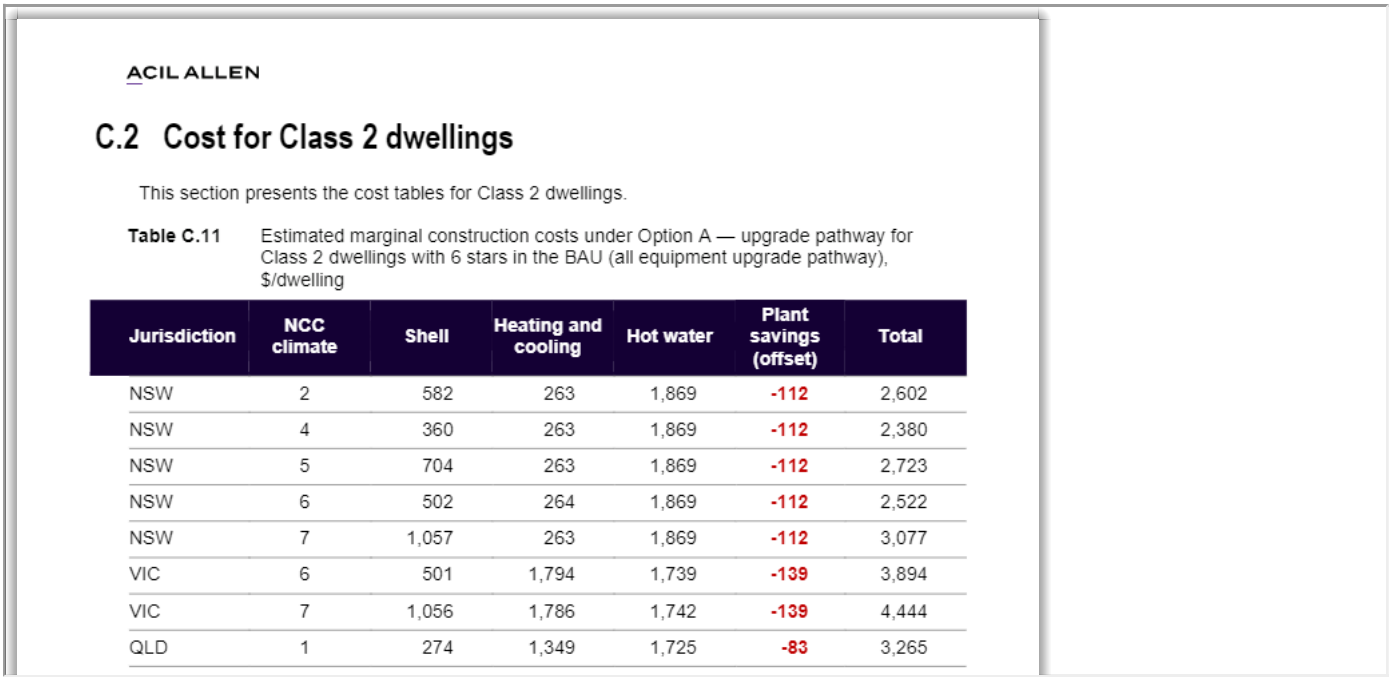
This assumption *does not mean* that the NCC 2022 would 'force' the installation of heating and cooling in these buildings.

In reality, apartments with no heating/cooling can comply with the new requirements either through a higher performance building shell (above 7 stars) or a combination of a higher performing shell and a high efficiency water heater.

However, given the limitations on the extent of the modelling that EES conducted for the RIS, those alternative upgrade pathways were not modelled.

In effect, the analysis assumes that the cost of complying via the high efficiency equipment upgrade pathway is roughly in line with the cost of complying via other alternative pathways. This assumption has not been validated.

Cost table



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C.2 Cost for Class 2 dwellings

This section presents the cost tables for Class 2 dwellings.

Table C.11 Estimated marginal construction costs under Option A — upgrade pathway for Class 2 dwellings with 6 stars in the BAU (all equipment upgrade pathway), $/dwelling

Jurisdiction	NCC climate	Shell	Heating and cooling	Hot water	Plant savings (offset)	Total
NSW	2	582	263	1,869	-112	2,602
NSW	4	360	263	1,869	-112	2,380
NSW	5	704	263	1,869	-112	2,723
NSW	6	502	264	1,869	-112	2,522
NSW	7	1,057	263	1,869	-112	3,077
VIC	6	501	1,794	1,739	-139	3,894
VIC	7	1,056	1,786	1,742	-139	4,444
QLD	1	274	1,349	1,725	-83	3,265

Please select only one item

- ◯ Yes - costs will be higher than those in the table
- ◯ Yes - costs will be lower than those in the table
- ◯ No - costs will be similar to those in the table
- ◯ Unsure

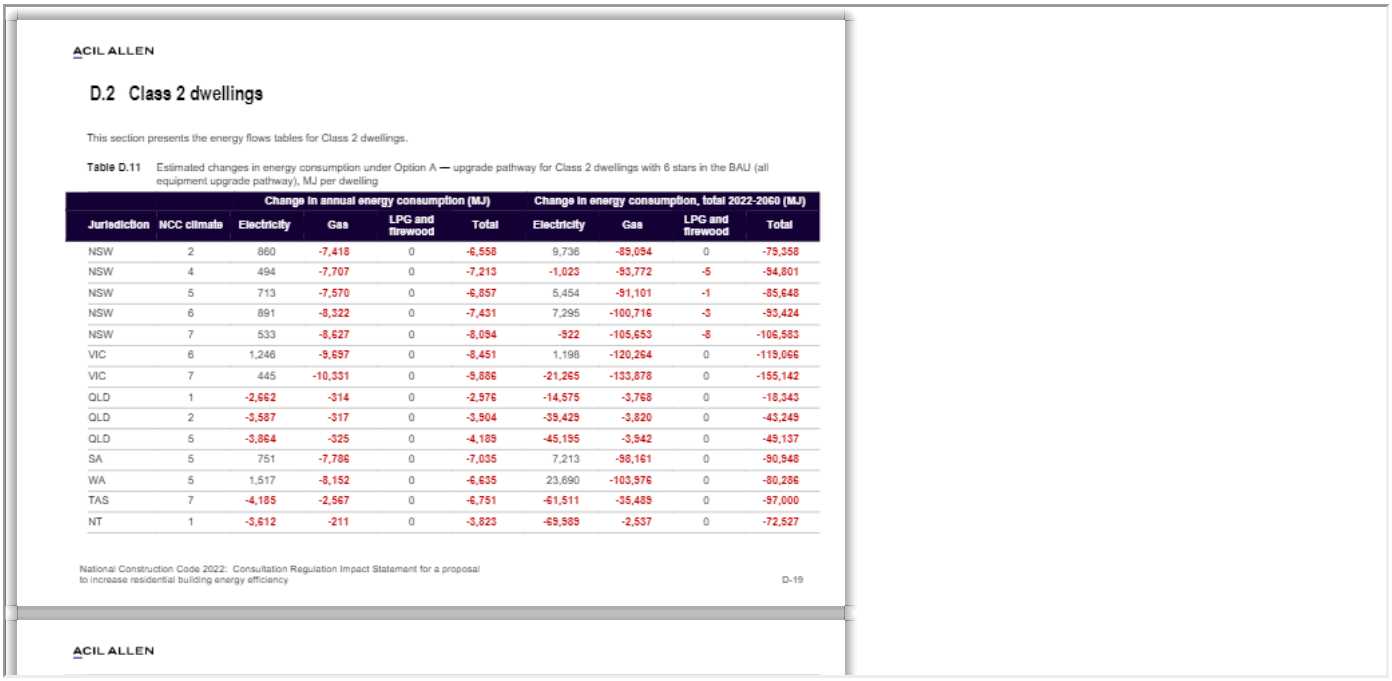
Please explain your answer below. How much will the costs be under or over estimated by?

17 Does the above proxy over/under-estimate the benefits for Class 2 dwellings? If so, by how much?

The benefits measured in this chapter are reductions in household energy use.

Click on energy savings table below to view the estimated benefits.

Energy savings table



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D.2 Class 2 dwellings

This section presents the energy flows tables for Class 2 dwellings.

Table D.11 Estimated changes in energy consumption under Option A — upgrade pathway for Class 2 dwellings with 6 stars in the BAU (all equipment upgrade pathway), MJ per dwelling

		Change in annual energy consumption (MJ)				Change in energy consumption, total 2022-2060 (MJ)			
Jurisdiction	NCC climate	Electricity	Gas	LPG and firewood	Total	Electricity	Gas	LPG and firewood	Total
NSW	2	860	-7,418	0	-6,558	9,736	-89,094	0	-79,358
NSW	4	494	-7,707	0	-7,213	-1,023	-93,772	-5	-94,801
NSW	5	713	-7,570	0	-6,857	5,454	-91,101	-1	-85,648
NSW	6	891	-8,322	0	-7,431	7,295	-100,716	-3	-93,424
NSW	7	533	-8,627	0	-8,094	-922	-105,653	-8	-106,583
VIC	6	1,246	-9,697	0	-8,451	1,198	-120,264	0	-119,066
VIC	7	445	-10,331	0	-9,886	-21,265	-133,878	0	-155,142
QLD	1	-2,662	-314	0	-2,976	-14,575	-3,768	0	-18,343
QLD	2	-3,587	-317	0	-3,904	-39,429	-3,820	0	-43,249
QLD	5	-3,864	-325	0	-4,189	-45,195	-3,942	0	-45,137
SA	5	751	-7,786	0	-7,035	7,213	-98,161	0	-90,948
WA	5	1,517	-8,152	0	-6,635	23,690	-103,976	0	-80,286
TAS	7	-4,185	-2,567	0	-6,751	-61,511	-35,489	0	-97,000
NT	1	-3,612	-211	0	-3,823	-69,989	-2,537	0	-72,527

National Construction Code 2022: Consultation Regulation Impact Statement for a proposal to increase residential building energy efficiency D-19

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Please select only one item

◯ No ◯ Yes - over-estimates the benefits ◯ Yes - under-estimates the benefits ◯ Unsure

Please expand on your answer. How much does the proxy over or under-estimate by?

18 Is it practical to apply the whole-of-home proposal to refurbishments?

As discussed in section 4.3.2, the costs and benefits of applying the proposal to refurbishments and alterations have not been included in the cost benefit analysis.

Click on more information to read this section of the CRIS.

More information

Treatment of refurbishments

There are several difficulties related to the analysis of the impacts of the proposed increased energy efficiency requirements on the refurbishment of existing buildings.

- The application of the NCC to refurbishments is covered in state/territory legislation, so individual jurisdictions can apply the NCC to refurbishments as rigorously as they see fit.
- The extent to which refurbishments comply with the NCC will vary by project (i.e. it is unknown what proportion of refurbishments will need to comply with the new NCC requirements and to what extent). Furthermore, at this stage it is still unclear if, and how, the proposed WoH requirements would apply to refurbishments.**[1]** *<#_ftn1>*
- Many existing buildings may be unable to comply with the NCC provisions, particularly the new WoH provisions.
- The costs of complying with the new energy efficiency requirements in existing houses may differ to new builds given the inherent variability of refurbishments.

Given these complexities, refurbishments have been excluded from the CBA.

---

[1] *<#_ftnref1>* For instance, the WoH/equipment components for renovations in the BASIX Alterations and Additions tool do not have any energy performance requirements. Users need to select the type of hot water system and the selection will form part of the BASIX requirement. BASIX currently prescribes 40 per cent of new or altered lighting fixtures to be fitted with energy efficient lights. If there is a pool being installed, users need to specify pool heating. Depending on the selection, BASIX will prescribe the need for pool/spa covers or a pool pump timer.

Please select only one item

◯ Yes ◯ No ◯ Unsure

Please explain your answer below

19 How will the proposals be applied to refurbishments in practice?

Please expand on your answer below

20 Would the cost of applying the whole-of-home proposal to renovations be broadly similar to the cost incurred in new dwellings?

Please select only one item

◯ Yes ◯ No - costs higher in renovations than new dwellings ◯ No - costs lower in renovations than new dwellings ◯ Unsure

If you answered no, what percentage higher or lower would the costs be (+ or -)?

Please explain your answer below

21 Would the benefits resulting from applying the whole-of-home proposal to renovations be broadly similar to the benefits received by new dwellings?

Please select only one item

◯ Yes ◯ No - benefits for renovations lower than for new dwellings ◯ No - benefits for renovations higher than for new dwellings ◯ Unsure

If you answered no, what percentage higher or lower would the benefits be (+ or -)?

Please explain your answer below

22 Are the assumptions used to estimate current and future penetration of solar PV in new buildings under the BAU appropriate?

This question relates to section 4.2.1 of the CRIS.

Click below to read an extract from this section.

More information

Current use of solar PVs

There are a number of new dwellings currently being built with solar PV. With the introduction of WoH requirements in NCC 2022 these dwellings may already have sufficient solar PV capacity installed to meet the NCC 2022 Performance Requirement.

Given this, the proportion of new residential buildings built with solar PV, and how this is expected to change in the future, was taken into account when assessing the costs and benefits of the new energy efficiency requirements in the NCC 2022.

Two key inputs are required to account for these dwellings in the economic modelling:

- an estimate of the proportion of new dwellings that are fitted with solar PV at time of construction and projections about how this is expected to change over the period of analysis
- an estimate of the average capacity of the solar PVs installed in new dwellings and assumptions about how this is expected to change over the period of analysis.

Proportion of new dwellings fitted with solar PV at time of construction

ACIL Allen has an in-house Small Scale Renewable Energy model as part of our suite of energy models. This model projects the proportion of *all* residential buildings with solar PV installed, by jurisdiction, using historical solar PV data and Australian Bureau of Statistics (ABS) data on housing dwellings, and compares these with AEMO's projections.

The proportion of *all* residential buildings with solar PV installed, by jurisdiction, in 2019 is set out in the first column of Table 4.3 of the CRIS.

Given the practical difficulties with installing solar PVs on Class 2 dwellings, most of these installations are likely to be on Class 1 dwellings.

Given the lack of data about the split in solar PV penetration by building class, the analysis assumes that the current and future penetration of solar PV in Class 2 dwellings is effectively zero.

C4NET analysis provided by the ABCB indicates that the proportion of *new* dwellings with solar PV in Victoria was 13 per cent in 2019.

To estimate solar PV penetration in new dwellings in the other jurisdictions in 2019, the ratio of the proportion of new homes with solar PV to the proportion of all buildings with solar PV in Victoria was applied to each of the other jurisdictions, except New South Wales.

The NSW Government provided more detailed actual data from BASIX on the proportion of new buildings with solar PV by climate zone in NSW, which was used instead.

The proportion of new residential buildings with solar PV installed, by jurisdiction, in 2019 is set out in the first column of Table 4.3 in the CRIS and the projected change in these installations over the period 2019-2031 is shown in Figure 4.1 of the CRIS.

It is assumed that the proportion of dwellings with solar PV installation is the same across different climate zones in each jurisdiction (except for NSW where the solar PV penetration by climate zone was provided).

Average capacity of the solar PVs installed in new dwellings

The C4NET analysis shows that the average solar PV system size being installed in new dwellings in Victoria in 2020 is around 5.7 kW.

Based on this, it was agreed with the ABCB that the modelling for the RIS would assume an average system size of 5 kW for all new housing under the BAU.**[1]** <#_*ftn1*> This assumption is held constant for the analysis period (that is, it is assumed that under the BAU, all new buildings installing solar PVs at the time of construction will install a 5 kW system).

---

[1] <#_*ftnref1*> This is slightly less than the average for Victoria's new housing but takes into account the fact that those installing solar PVs as part of the initial construction are likely to be more financially constrained and hence installer smaller systems.

	Yes	No - please state why below	Unsure
Class 1 *Please select only one item*	○	○	○
Class 2 *Please select only one item*	○	○	○

Please explain your answer. Please provide any other evidence that could be considered.

Please attach a copy of any documents you wish to include to this printout.

Upload any relevant evidence here

23 Do you have any information that could be used to estimate the proportion of blocks for which solar PV could not be installed?

This question relates to section 4.3.5 of the CRIS.

Click on more information to read this section of the CRIS.

An example of this are blocks that are shaded and therefore solar PV can not be installed for Class 1 dwellings.

More information

Section 4.3.5 Shaded blocks

EES' modelling estimated that a proportion of Class 1 buildings across most climate zones and jurisdictions would require solar PVs to be installed to meet the WoH requirements under NCC 2022, more so under Option A.

In reality, some of these buildings are unlikely to be able to install solar PVs due to issues of overshadowing. Buildings with overshadowing issues which cannot effectively install solar PVs can still meet the NCC 2022 requirements (under both Option A and B) through:

- a higher performance building shell (above 7 stars)
- high efficiency equipment
- a combination of the above.

As noted before, different levels of building shell performance (above 7 stars) were not modelled by EES for the RIS.

However, they did model a pathway where buildings comply with the new requirements through high efficiency equipment (referred to as the 'all equipment upgrade pathway').

Overall, this upgrade pathway results in higher compliance costs when compared to the other upgrade pathways modelled by EES**[1]** *<#_ftn1>* due to the higher cost of the more efficient equipment needed to meet the proposed requirements (more details about the assumed upgrade pathways for different buildings are provided in Section 4.3.6).

There is no data currently available on the proportion of shaded blocks across different locations, however it is acknowledged that this issue is more likely to affect infill developments.

A broad indication of the magnitude of this issue is provided by a study by the City of Melbourne that surveyed 212 residents to investigate awareness, attitudes, needs and barriers relating to rooftop solar PV systems.

In this study, 8 per cent of residents noted overshadowing from taller buildings as a barrier preventing them from installing rooftop solar.**[2]** *<#_ftn2>*

For the purposes of the RIS, it was agreed with the ABCB that the economic modelling would assume that no blocks are shaded, given:

- the lack of data about the magnitude of the overshadowing issues for new residential buildings
- the fact that this issue is likely to affect only infill developments
- the results of EES's modelling that show that only a relatively small proportion of buildings will adopt an upgrade pathway that involves the installation of solar PV.

The RIS will be used to seek more information on this issue. While this effectively assumes that all buildings can install solar PVs to comply with the NCC 2022 without risks of overshadowing, this scenario is unlikely.

---

[1] *<#_ftnref1>* Broadly, the upgrade pathways modelled by EES for buildings without solar PV in the BAU are: 1) retaining the BAU equipment selection and applying as much solar PV as is required to meet the requirements; 2) altering the equipment selection only (i.e. not adding solar PV); 3) altering the equipment selection plus adding as much solar PV as is required to meet the requirements. These are discussed in more detail in Section 4.3.6

[2] *<#_ftnref2>* City of Melbourne 2015, *Community Attitudes and Barriers to Rooftop Solar Final report*, August.

Please select only one item

◯ Yes (please provide this information below) ◯ No

Please explain your answer below

Please attach a copy of any documents you wish to include to this printout.

Upload any relevant evidence here

24 Do you have any information that could be used to estimate the proportion of Class 2 apartments for which sufficient solar PV could be installed to meet the energy use budget of each individual apartment?

Please select only one item

◯ Yes (please provide this information below) ◯ No

Please expand on your answer below

Please attach a copy of any documents you wish to include to this printout.

Upload any relevant evidence here

25 As noted in this chapter, expected decreases in feed-in tariffs would effectively increase the stringency of the proposed wh home requirements under Option A over time. Do you have any views on this issue?

This question relates to section 4.5.2 of the CRIS.

Click on more information below to read this section.

More information

4.5.2. Offset and export of electricity generated by solar PV

EES estimated the electricity generated from solar PV systems installed as a result of the proposed changes to the NCC 2022.

If the annual electricity generated by the solar PVs for a dwelling is less than the dwelling's total electricity demand, then it is used to offset the electric dwelling.

When a large solar PV system is installed that produces surplus electricity from household demand, the additional energy generated is assumed to be electricity grid.

The solar PV exports to the grid have been treated in the following way for this analysis at an economy-wide level:

- estimates of the *quantity* of energy saved (in PJ) due to the proposed changes in the NCC 2022 include solar PV exports, with the *value* of these based on the solar dispatch weighted wholesale electricity price
- estimates of the *quantity and value* of GHG emissions saved due to the proposed changes in the NCC 2022 account for the additional benefits g exports, as these exports would displace coal- (or gas-) generated electricity and hence effectively reduce emissions
- estimates of the *value* of health benefits generated by reductions in coal and gas generated electricity due to the proposed changes in the NCC additional benefits generated by solar PV exports, as these exports would displace coal- (or gas-) generated electricity and hence effectively red

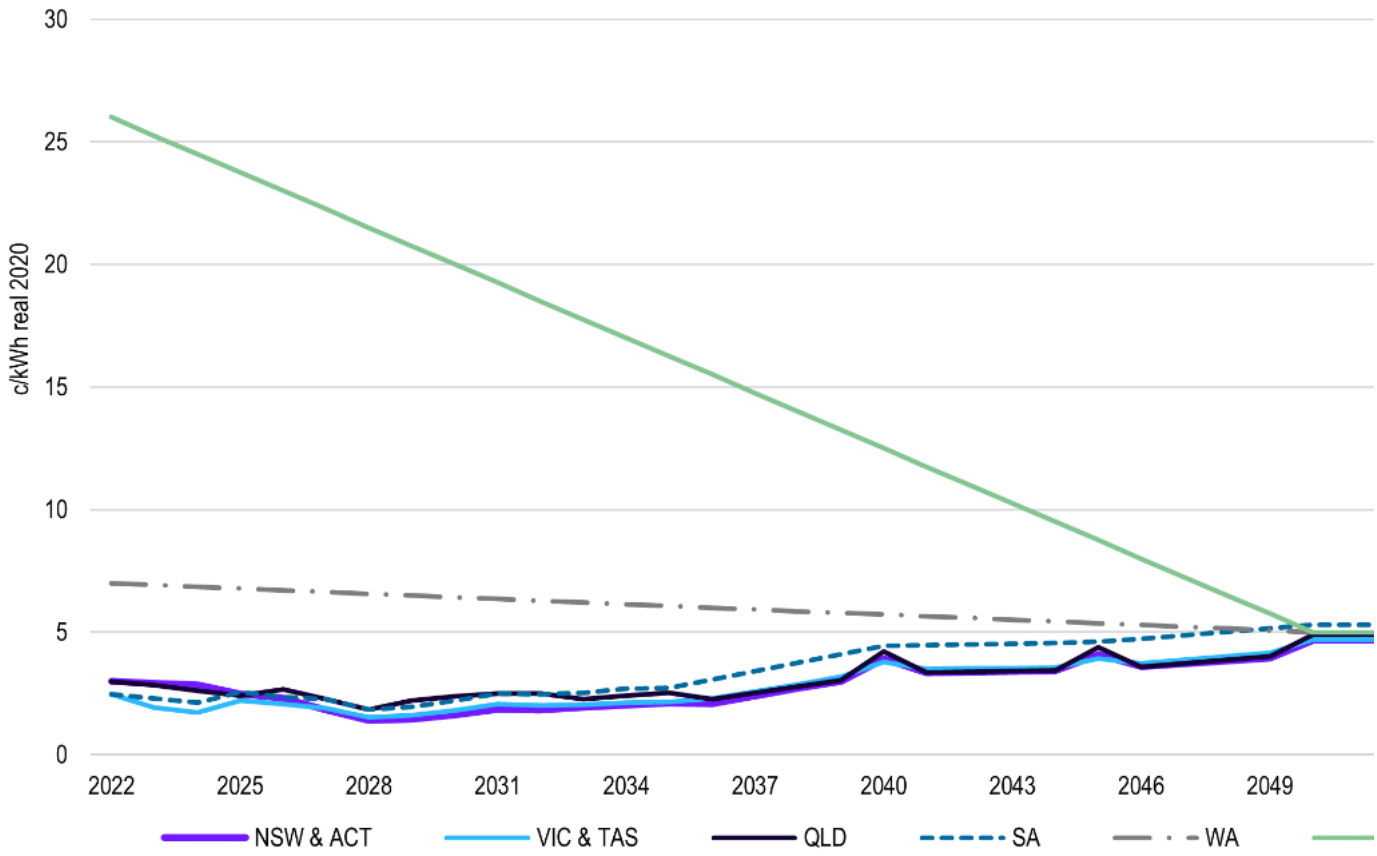
The income generated from solar PV exports to households has been accounted for in the distributional (household) analysis in Chapter 7.

Notably, the WoH modelling undertaken by EES includes the retail value of PV exports (feed-in tariffs) in the calculation of the societal cost of energy the stringency of the NCC energy efficiency requirements (the income generated by exports to the grid is treated as a cost offset).

Feed-in tariffs are expected to decrease significantly over the next few years (see Figure 4.10 of the CRIS, attached below), which would effectively in of the proposed WoH requirements under Option A over time.

At the extreme, if feed-in tariffs were zero, there would be no income from PV exports to offset the societal cost of energy of a house. Additional meas to be taken to achieve savings equivalent to 30 per cent of the societal cost of the benchmark building specified in Option B.

Figure 4.10 - Estimated feed in tariff for PV exports to grid, cents per kWh



Please select only one item

◯ Yes (please provide your views below) ◯ No

Please explain your answer below

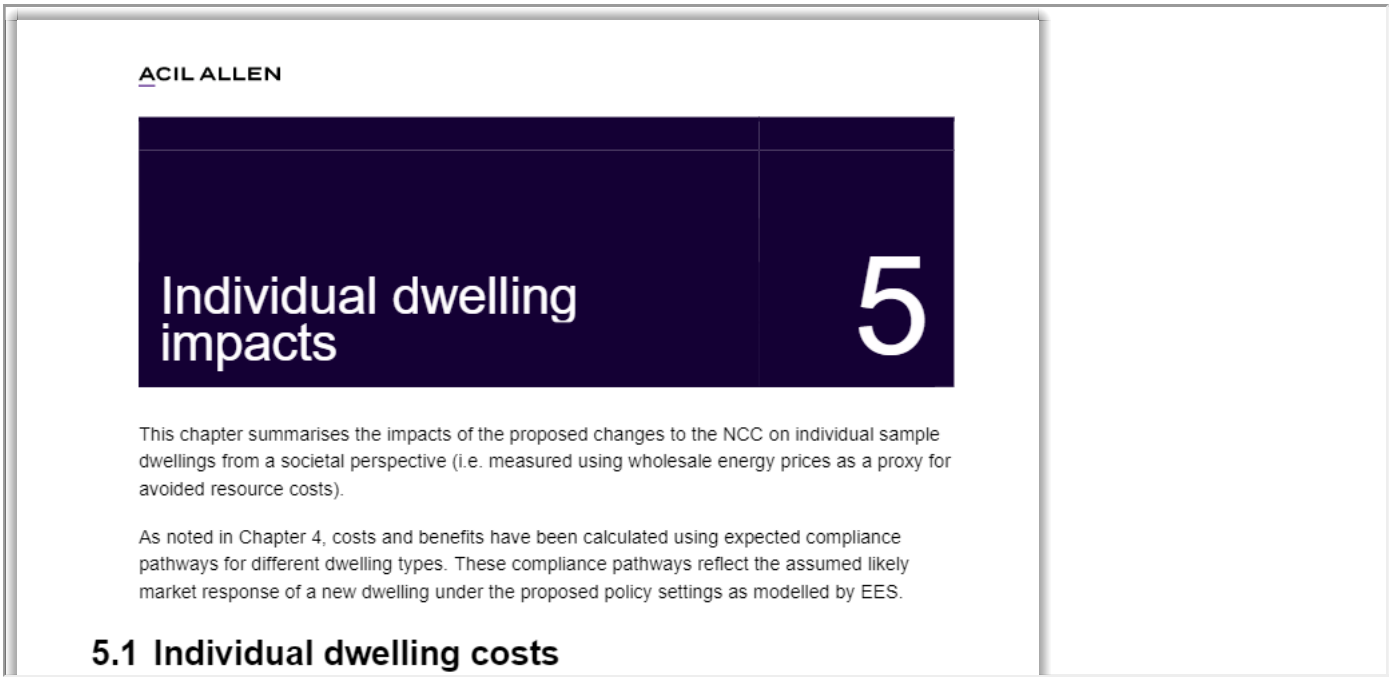
Individual dwelling impacts

Questions from the individual dwelling impacts chapter of the CRIS

This chapter summarises the impacts of the proposed changes to the NCC on individual sample dwellings from a societal perspective (i.e. measured using wholesale energy prices as a proxy for avoided resource costs).

Click on more information below to read this chapter of the CRIS.

More information



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Individual dwelling impacts 5

This chapter summarises the impacts of the proposed changes to the NCC on individual sample dwellings from a societal perspective (i.e. measured using wholesale energy prices as a proxy for avoided resource costs).

As noted in Chapter 4, costs and benefits have been calculated using expected compliance pathways for different dwelling types. These compliance pathways reflect the assumed likely market response of a new dwelling under the proposed policy settings as modelled by EES.

5.1 Individual dwelling costs

26 Are the cost estimates presented in this chapter reasonable?

This question refers to tables 5.1 to 5.4 of the CRIS, which can be viewed by navigating to the top of this page and clicking on more information.

	Yes	No - costs are under-estimated	No - costs are over-estimated	Other	Unsure
Class 1 - Option A (Table 5.1) *Please select only one item*	◯	◯	◯	◯	◯
Class 1 - Option B (Table 5.2) *Please select only one item*	◯	◯	◯	◯	◯
Class 2 - Option A (Table 5.3) *Please select only one item*	◯	◯	◯	◯	◯
Class 2 - Option B (Table 5.4) *Please select only one item*	◯	◯	◯	◯	◯

Please expand on your answer. If you selected no or other, what are your alternative estimates and the basis for the estimates?

27 Are the changes in energy consumption presented in this chapter reasonable?

This question refers to two sets of tables in the CRIS, which can be viewed by navigating to the top of this page and clicking on more information.

Tables 5.5 to 5.8 show the amount of energy saved.

Tables 5.9 to 5.12 show the dollar value of the above energy saved.

	Yes	No - the value of changes in energy use are under-estimated	No - the value of changes in energy use are over-estimated	Other - please explain below	Unsure
Class 1 - Option A (Table 5.9) *Please select only one item*	◯	◯	◯	◯	◯
Class 1 - Option B (Table 5.10) *Please select only one item*	◯	◯	◯	◯	◯
Class 2 - Option A (Table 5.11) *Please select only one item*	◯	◯	◯	◯	◯
Class 2 - Option B (Table 5.12) *Please select only one item*	◯	◯	◯	◯	◯

Please expand on your answer. If you selected no or other, what are your alternative estimates and the basis for the estimates?

Economy-wide impacts

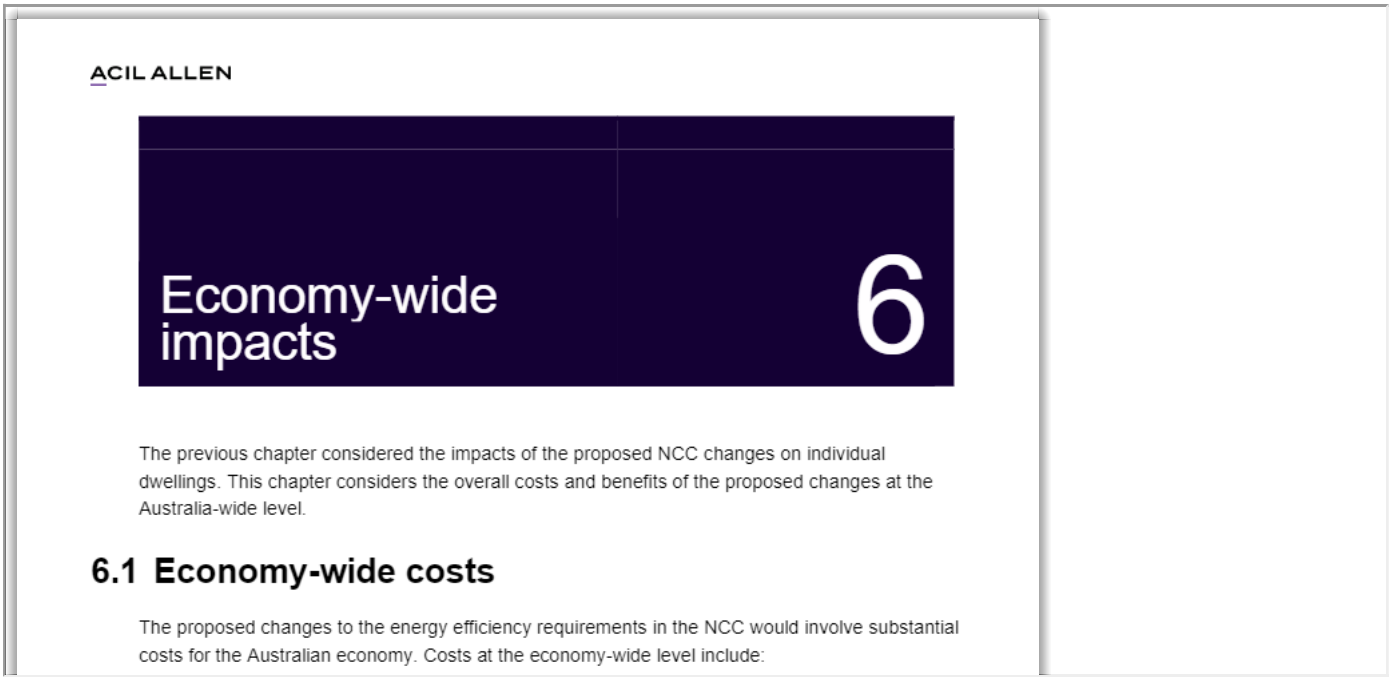
Questions from the economy-wide impacts chapter of the CRIS

The previous chapter considered the impacts of the proposed NCC changes on individual dwellings.

This chapter considers the overall costs and benefits of the proposed changes at the Australia-wide level.

To read this chapter of the CRIS, click on more information below.

More information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Economy-wide impacts 6

The previous chapter considered the impacts of the proposed NCC changes on individual dwellings. This chapter considers the overall costs and benefits of the proposed changes at the Australia-wide level.

6.1 Economy-wide costs

The proposed changes to the energy efficiency requirements in the NCC would involve substantial costs for the Australian economy. Costs at the economy-wide level include:

28 Can you provide estimates of the costs to redesign buildings and alter building products that would be incurred by industry to meet the proposed new NCC requirements?

As dicussed in section 6.1.2, the CRIS does not include estimates of the costs to redesign buildings and building products.

Answers to this question may be used to inform these costs in the Final RIS.

Please select only one item

◯ Yes ◯ No

Provide your estimate below

29 Are there any other costs (e.g. transition costs) not identified for builders and other stakeholders in transitioning to the proposed new NCC requirements?

This question relates to section 6.1.2 - implementation costs for industry.

Please select only one item

◯ Yes - please provide details below ◯ No ◯ Unsure

Please expand on your answer below

30 In terms of the realisation of the energy savings, which of the scenarios modelled is most likely to occur if the proposed changes are made to the NCC?

The full amount of energy savings is discussed at section 6.2.1. Navigate to the top of the page and click more information to read this part of the CRIS.

*The **medium realisation scenario** is where 75 per cent of the modelled energy savings are achieved in practice.*

*The **low realisation scenario** where only 50 per cent of the savings are achieved in practice.*

The impact of the different scenarios on the economy-wide benefits of the proposal are discussed at section 6.4.

Select one option below:

	Full realisation of modelled energy savings	Medium realisation scenario	Low realisation scenario	Other - please explain below	Unsure
Option A *Please select only one item*	◯	◯	◯	◯	◯
Option B *Please select only one item*	◯	◯	◯	◯	◯

Expand on your answer here. What factors will affect the realisation of modelled results?

31 Do you agree with the conclusions reached for the energy market impacts?

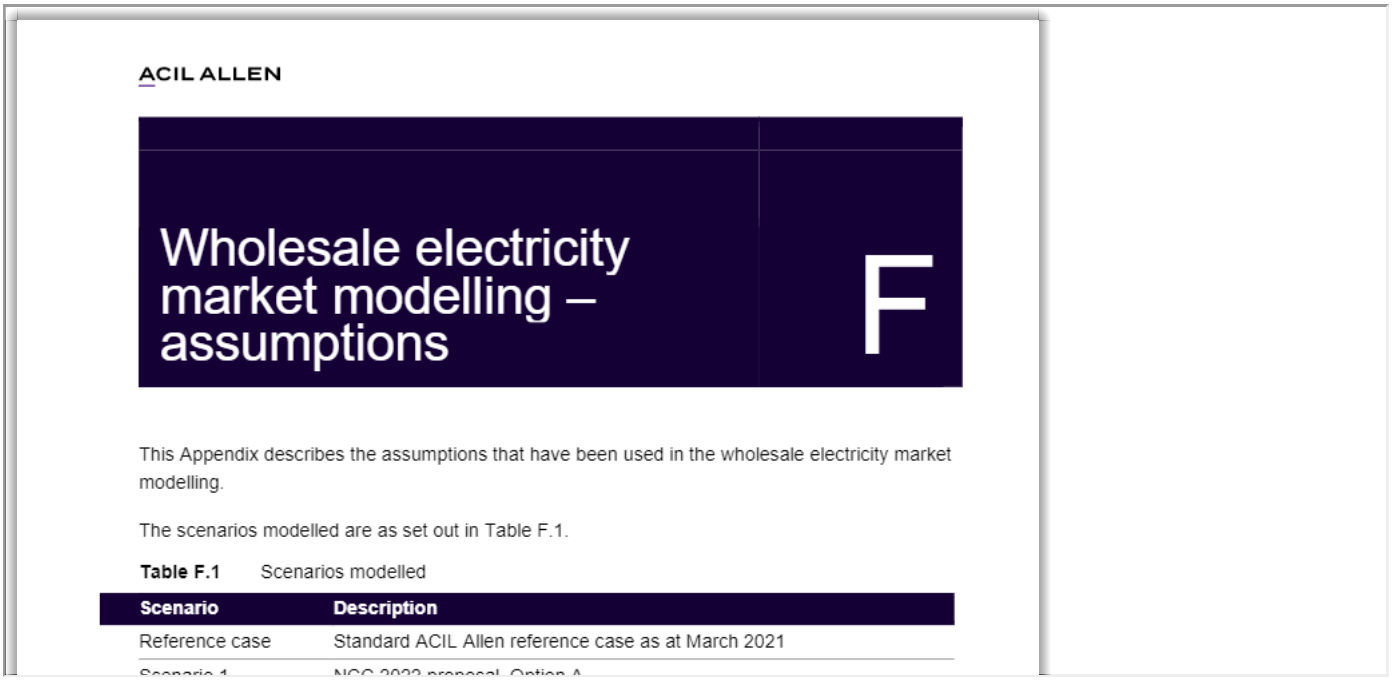
The CRIS makes conclusions for the energy market relating to:

- *wholesale prices,*
- *generator capacity and*
- *minimum demand levels*

Refer to section 6.5 of the CRIS for the full discussion. To view this section of the CRIS navigate to the top of this page and click on more information.

To review the assumptions used in estimating the energy market impacts view Appendix F and G by clicking on more information below.

More information



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Wholesale electricity market modelling – assumptions

F

This Appendix describes the assumptions that have been used in the wholesale electricity market modelling.

The scenarios modelled are as set out in Table F.1.

Table F.1 Scenarios modelled

Scenario	Description
Reference case	Standard ACIL Allen reference case as at March 2021
Scenario 1	NCC 2022 proposal, Option A

Please select only one item

◯ Yes ◯ No ◯ Unsure

Please explain your answer below

32 Are there any other assumptions or parameters that should be included in the sensitivity or breakeven analysis?

The sensitivity and breakeven analysis are presented in section 6.4 of the CRIS.

To read the sensitivity and breakeven scenarios tested, click on more information below.

More information

6.4.1 Sensitivity analysis

A sensitivity analysis was conducted to address five areas of uncertainty.

For each of these areas, the analysis was conducted as follows:

- discount rate — a low discount rate of 3 per cent and a high discount rate of 10 per cent were tested, consistent with advice from best practice regulation guides
- industry costs — an increase in industry costs of 50 per cent and a decrease in industry costs of 50 per cent were tested
- carbon prices — we tested a decrease in carbon prices of 50 per cent and two increase scenarios, where carbon prices are two times and 4.5 times the price used in the central case**[1]** *<#_ftn1>*
- rebound effect — a decrease in rebound effect to zero and an increase in rebound to 30 per cent in line with some higher estimates discussed in Section 4.5.1
- energy savings achieved in practice — a medium realisation scenario where 75 per cent of the modelled energy savings are achieved in practice and a low realisation scenario where only 50 per cent of the savings are achieved in practice.

The results of the sensitivity analysis are provided in Table 6.10 of the CRIS.

Breakeven analysis

Breakeven analyses are common practice in situations where the degree of benefit associated with a proposal is uncertain.

It involves a simulation process where key parameters of the model – in this case, the energy prices and the costs of the upgrades – are varied until the net impacts calculated through the model equal zero.

In other words, it answers the questions:

- how much would the wholesale energy prices have to increase for the proposed policy options to break even to society in cost-benefit terms?
- how much would the upgrade costs have to decrease for the proposed policy options to break even to society in cost-benefit terms?

This breakeven analysis is similar to the sensitivity analysis outlined above only the parameters are varied to achieve a particular outcome. In this case, the parameters are varied until:

1. the NPV in each jurisdiction equals at least zero and the BCR at least equals one
2. the NPV economy-wide is equal to zero and the BCR is one.

The results of the breakeven analysis are provided in Table 6.11 of the CRIS.

---

[1] *<#_ftnref1>* An increase of 4.5 times the prices is equivalent to a carbon price in 2022 of roughly $75 per tonne of abatement.

Please select only one item

◯ Yes - please outline them below ◯ No ◯ Unsure

Expand your answer here. What values should be tested and why?

33 What is the most appropriate value for avoided greenhouse gas emissions (carbon price)?

There are multiple ways that the value of greenhouse gas emission savings can be estimated.

Click on more information to read the part of the CRIS that discusses the carbon price. To see this part in context, refer to section 4.5.6.

More information

Carbon price

There are multiple approaches to estimate the cost of GHG emissions. Because the burden (costs) of emissions are almost entirely borne by third par

The value of GHG emissions, therefore, is not internalised in the market, which means that individuals do not make decisions based on the overall imp

Two approaches have been used in other RISs to estimate the value of GHG emissions:

The **social cost of carbon** (SCC, or sometimes rendered as SC-CO_2), which tries to estimate the marginal impact of an additional tonne of carbon ba

The SCC is inherently difficult to measure, both because of the difficulty in measuring the impact of a tonne of carbon a long time in the future; and be

Typically, the SCC is given as a very high, high, medium, and low value — deriving from different measures of the discount rate.

This is the approach most commonly taken before the advent of carbon markets, and is the approach used in the United States (and in other places th

Though, given the uneven distribution of effects of climate change, the SCC *can* vary between countries if the impacts are estimated locally.

The **resource cost of carbon**, which is based on the current cost of abatement. In the Australian context, this is the value of the spot price for fixed d recently moved to carbon variations using the resource cost of carbon approach.

These two methods can be roughly**[2]** <#_*ftn2*> described as a demand-price and a supply-price (respectively). In a perfectly operating market — with

Both approaches introduce uncertainty and inaccuracy for different reasons. However, both approaches have been used in policy contexts and have b

For the central case analysis in this RIS, we have used the second approach, and the Department of Industry, Science, Energy and Resources (

The ACCU spot price as at December 2020 was $16.55 per tonne.**[3]** <#_*ftn3*> As forward prices for ACCUs are not available, we have projected the abatement would reach $25 in 2030 and around $45 in 2050 (see Figure 4.12).

Additional sensitivity analysis was conducted to test the effects of changes to the value of avoided GHG emissions.

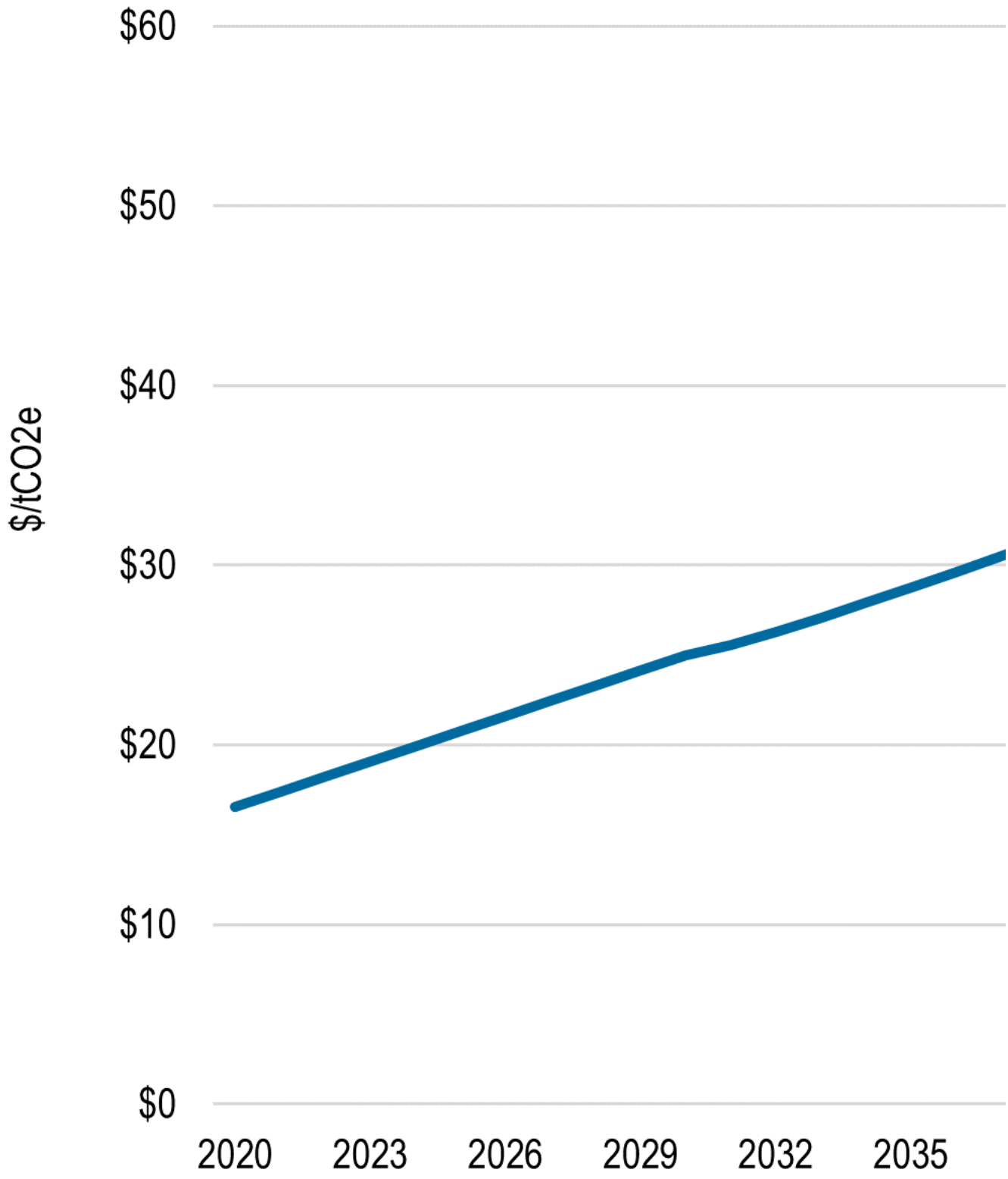
---

[1] <#_*ftnref1*> An ACCU is a unit issued to a person by the Clean Energy Regulator. Each ACCU issued represents one tonne of carbon dioxide equ

[2] <#_*ftnref2*> Very roughly. The resource cost of carbon represents a part of a truncated supply curve, however the social cost of carbon represents derived from the demanded abatement, and the resource cost of carbon is more accurately derived from the *current* supply costs of carbon.

[3] <#_*ftnref3*> Clean Energy Regulator (CER) 2021, Quarterly Carbon Market Report December Quarter 2020, March, **http://www.cleanenergyregu** *<http://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Quarterly%20Carbon%20Market%20Report%20-%20Quarter%204%20Decen*

Figure 4.12 - Cost of carbon estimates used in the CRIS, $/tCO2e



What is the most appropriate value for avoided greenhouse gas emissions (carbon price)?

Please select only one item

◯ No value ($0) ◯ Resource cost of carbon (based on the current cost of abatement, represented by the price of an Australian Carbon Credit Un

◯

Social cost of carbon (based on the future costs associated with emissions. A medium scenario of the average estimate of the future social cost of clim the CRIS).

◯ A higher social cost of carbon value ◯ Other ◯ Unsure

Please explain your answer below

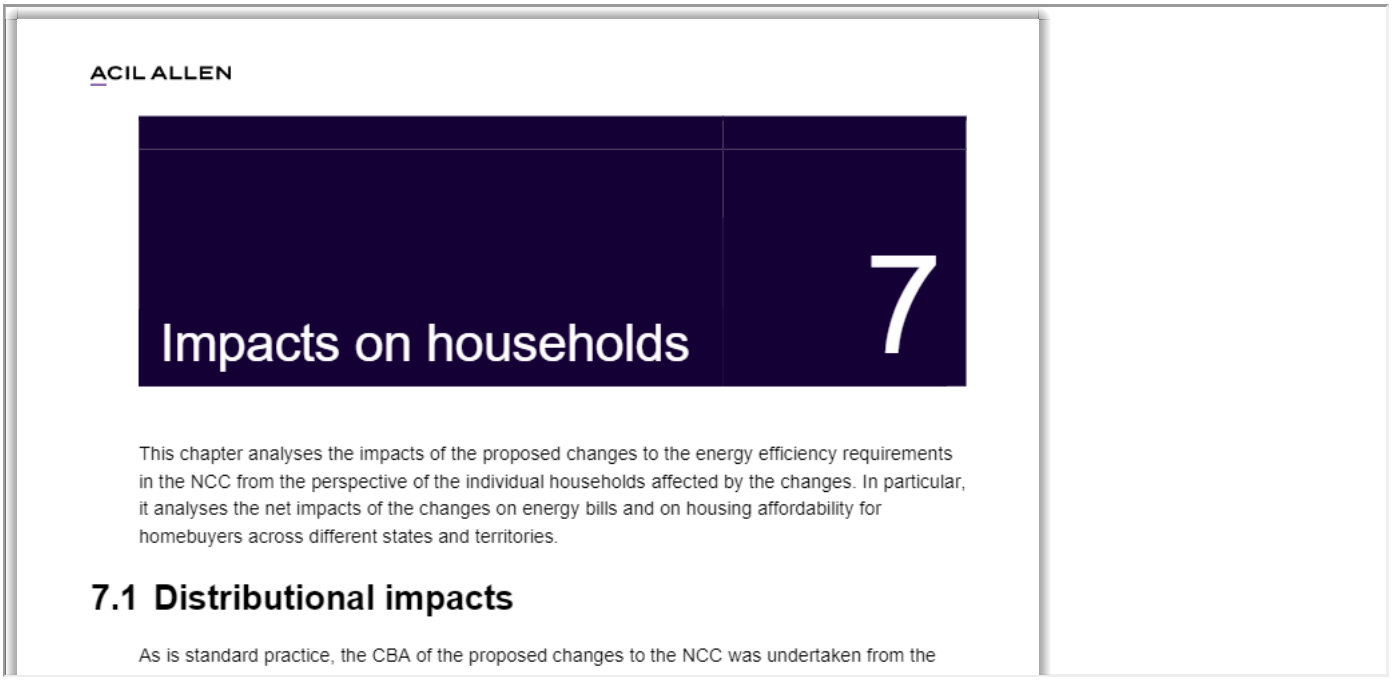
Impact on households

Question from the impact on households chapter of the CRIS

This chapter analyses the impacts of the proposed changes to the energy efficiency requirements in the NCC from the perspective of the individual households affected by the changes.

To read this chapter in full, click on more information below.

More information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Impacts on households 7

This chapter analyses the impacts of the proposed changes to the energy efficiency requirements in the NCC from the perspective of the individual households affected by the changes. In particular, it analyses the net impacts of the changes on energy bills and on housing affordability for homebuyers across different states and territories.

7.1 Distributional impacts

As is standard practice, the CBA of the proposed changes to the NCC was undertaken from the

34 What are the implications of these findings for social equity and the problem of split incentives?

Please expand on your answer below

Other impacts

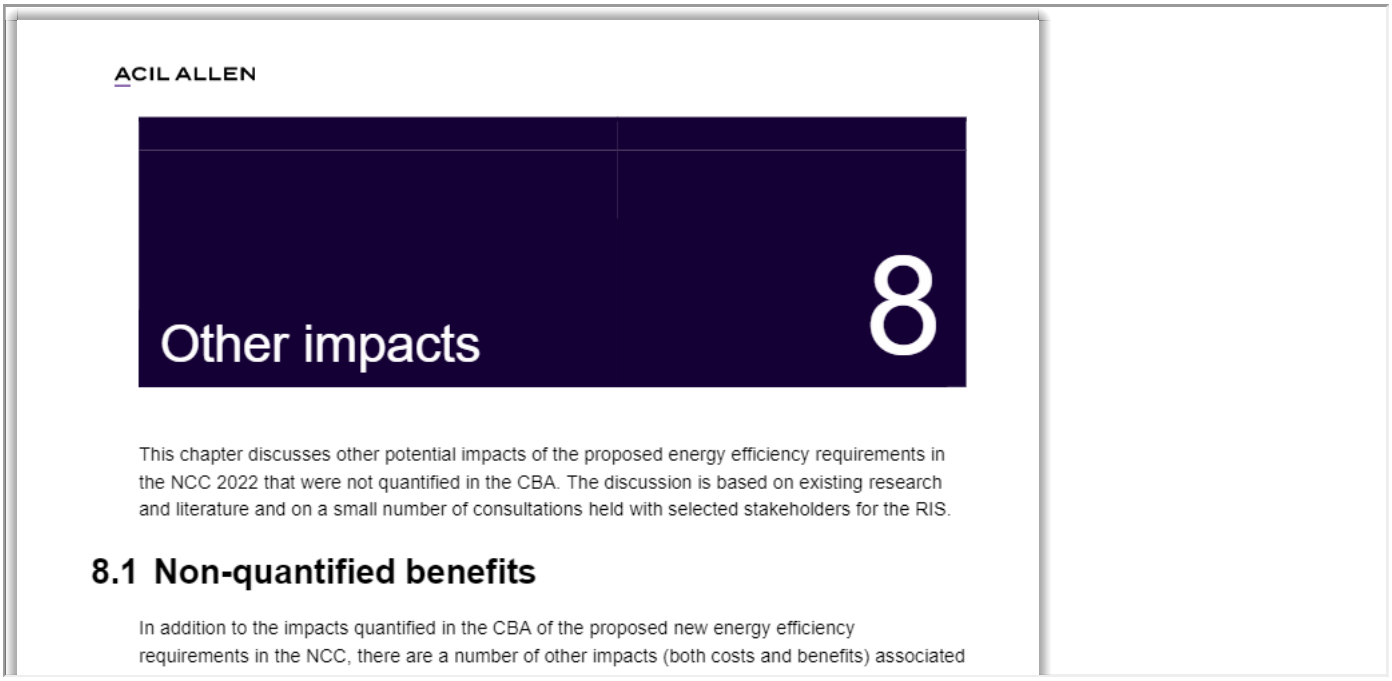
Questions from the other impacts chapter of the CRIS

This chapter discusses other potential impacts of the proposed energy efficiency requirements in the NCC 2022 that were not quantified in the CBA.

The discussion is based on existing research and literature and on a small number of consultations held with selected stakeholders for the CRIS.

To read this chapter of the CRIS, click on more information below.

More information



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Other impacts 8

This chapter discusses other potential impacts of the proposed energy efficiency requirements in the NCC 2022 that were not quantified in the CBA. The discussion is based on existing research and literature and on a small number of consultations held with selected stakeholders for the RIS.

8.1 Non-quantified benefits

In addition to the impacts quantified in the CBA of the proposed new energy efficiency requirements in the NCC, there are a number of other impacts (both costs and benefits) associated

35 Will improvements in the following areas be realised?

This question relates to the non-quantified benefits discussed in section 8.1. To read this section, navigate to the top of the page and press more information.

Select whether you think there will be an improvement or deterioration against each area below if either option is implemented.

Option A

	Improvement of...	Deterioration of...	No change in...	Unsure
Occupant health *Please select only one item*	○	○	○	○
Occupant amenity *Please select only one item*	○	○	○	○
The resilience of buildings to extreme weather and blackouts *Please select only one item*	○	○	○	○
Stability of the electricity grid *Please select only one item*	○	○	○	○
Bill stress *Please select only one item*	○	○	○	○
Gross Domestic Product (GDP) *Please select only one item*	○	○	○	○
Economic stimulus *Please select only one item*	○	○	○	○

Option B

	Improvement of...	Deterioration of...	No change in...	Unsure
Occupant health *Please select only one item*	○	○	○	○
Occupant amenity *Please select only one item*	○	○	○	○
The resilience of buildings to extreme weather and blackouts *Please select only one item*	○	○	○	○
Stability of the electricity grid *Please select only one item*	○	○	○	○
Bill stress *Please select only one item*	○	○	○	○
Gross Domestic Product (GDP) *Please select only one item*	○	○	○	○
Economic stimulus *Please select only one item*	○	○	○	○

Please explain your answers below

36 Can you provide objective evidence to enable any of the benefits that have not been quantified to be quantified?

In addition to the impacts quantified in the CBA of the proposed new energy efficiency requirements in the NCC, there are a number of other impacts (both costs and benefits) associated with energy efficiency – both private and public that cannot be quantified due to a lack of existing data for the Australian context.

These multiple impacts include the impacts of energy efficiency on:

- *health**[1]** <#_ftn1> and wellbeing*
- *the energy system*
- *the overall economy*
- *other participant benefits.*

***[1]** <#_ftnref1> As noted in section 4.5.7, health benefits are partially modelled.*

Please select only one item

◯ Yes ◯ No

Discuss any evidence here

Please attach a copy of any documents you wish to include to this printout.

Upload any relevant evidence here

Upload any relevant evidence here

37 Are there any other unintended consequences not described in the CRIS that are likely to arise from the proposed options?

Unintended consequences are discussed in section 8.6 of the CRIS.

To read this section of the CRIS navigate to the top of this page and click more information.

Please select only one item

◯ Yes ◯ No ◯ Unsure

Please explain your answer below

Final question

Thank you for taking time to help improve this RIS.

38 Are there any other comments you would like to make in relation to the analysis in the CRIS?

Additional comments

Please attach a copy of any documents you wish to include to this printout.

If you have any more documents to attach, please attach here

Do you have any feedback on this consultation?

We invite your feedback on any part of the consultation, including the consultation software, the set up of the survey, the questions asked, the CRIS itself, etc.

Your responses to this question will not be published.

Provide your feedback here