



**Industry-led roadmap for
quality control and safety
in insulation installation**

Steering committee



Insulation companies



Industry associations and other organisations



Acknowledgements

We would like to thank the group of committed experts that contributed to the development of this roadmap. We also thank the NSW Government, Victorian Government, Insulation Australasia and Insulation Council of Australia and New Zealand for funding *Ensuring quality control and safety in insulation installation*, which informed the development of this roadmap.

Introduction

Insulation is an essential component of a healthy, comfortable building. Adequate insulation can increase thermal comfort, lower heating and cooling bills, and reduce the prevalence of illness and death. Insulation reduces pollution, greenhouse gas emission and reliance on the electricity grid.

However, insulation needs to be properly installed in order to deliver its full value, and many existing buildings lack sufficient insulation in their walls, floors and even ceilings. This means that insulation needs to be installed in all new and existing buildings following appropriate quality control and safety processes.

To tackle this challenge, leading organisations in the insulation, building and energy efficiency industries have come together to prepare a roadmap to improve quality control and safety in insulation installation. This roadmap sets out 24 actions that should be undertaken over the next three years. The signatories of this document are committed to implementing or supporting these actions, and recommend that governments and other non-signatories follow suit.

These actions build on extensive work undertaken over the past decade, and the signatories are confident that implementing this roadmap will ensure that insulation is installed effectively, safely and affordably.

The benefits of insulation

Insulation is used in buildings to reduce the movement of heat and sound. A wide range of products are used to insulate buildings, including: batts; panels; loose-fill; sprays; structural insulated panels; and building membranes.

When new and existing buildings have adequately specified and installed insulation, the benefits to the Australian community include:

- **Better health, comfort and wellbeing**

Hot and cold weather kills around 3,000 Australians each year.ⁱⁱⁱ Upgrading our homes can reduce the number of deaths from heatwaves by as much as 90 per cent and improve Australians' health.ⁱⁱⁱ In New Zealand, a major program to

install insulation in the homes of vulnerable people has delivered an estimated \$7 in benefits for each dollar spent, largely due to improved health outcomes.^{iv}

- **Lower energy bills and a more resilient energy grid**

Ensuring that buildings have adequate insulation can reduce the energy bills of households and businesses by hundreds of dollars each year, adding up to tens of thousands of dollars over the life of a building. Insulating buildings also reduces peak demand for electricity, strengthening the grid.

- **Reduced greenhouse gas emissions**

Insulating buildings will play a critical role in reducing emissions. Insulating new and existing buildings could reduce Australia's annual emissions by 7.1 million tonnes of CO₂e.^v

- **Boosts to productivity, job creation and economic growth**

The International Monetary Fund and International Energy Agency note that upgrading buildings' energy efficiency can create up to 15 jobs per US\$1 million of expenditure.^{vi}

Why we need a roadmap for safety and quality control

Installing insulation has lower risks when compared to many other construction activities, as insulation materials are relatively light, non-toxic and can be cut and installed without the use of power tools.

However, like any activity in the construction industry, appropriate measures must be taken to manage risks that include: working in a restricted space; working at heights; contact with hazardous materials; and electrical safety.

Insulation products must also be correctly specified and installed to maximise their benefits and reduce risks for building occupants. This includes:

- Minimising unnecessary gaps in the coverage of insulation Introduction;

- Leaving space around heat-generating equipment (e.g. heating, fans and downlights); and
- Moisture management, such as ensuring that ceiling insulation batts don't touch the underside of the roof or sarking.

Australian industry and governments have already undertaken a range of actions to address safety and quality-control issues associated with insulation installation. These actions include training modules, building codes and workplace health and safety regulations.

Despite these efforts, there are still gaps in Australia's systems for ensuring quality control and safety in insulation installation. In February 2020 the Energy Efficiency Council and the Australian Sustainable Built Environment Council (ASBEC) released a report, *Ensuring quality control and safety in insulation installation*, which looked at practices in Germany, Ireland, New Zealand, the United Kingdom and United States, and found that all these countries had invested in major training and compliance programs for insulation installation.

The signatories to this roadmap propose a series of actions to deliver best practice in safety and quality control in insulation installation. Some of these actions can be undertaken by peak bodies and companies in the insulation, building and energy efficiency industries. Some of these actions must be undertaken by governments, ideally in conjunction with industry, such as strengthening the compliance regime for building regulations. Government policy will play a critical role in ensuring safety and quality control, as it has in every country examined in *Ensuring quality control and safety in insulation installation*.

The measures in the roadmap

Multiple measures are essential to ensure safety and quality control in insulation installation. The 24 measures in this roadmap are complementary, rather than alternatives. For example, world-class training programs for insulation installation will need to be supported with drivers to encourage installers to undergo training. These recommendations are set out in five broad streams:

- Information and guidelines (I);
- Training and accreditation (T);
- Requirements for insulation installations supported by governments (G);
- Compliance associated with new buildings and major renovations (C); and
- Moving beyond an insulation-only approach (B).

Some of these measures can be developed in parallel, but some cannot begin until other measures have been completed. Accordingly, we propose that these measures are rolled out over three years.

Finally, the measures in this roadmap focus specifically on safety and quality control in the installation of insulation. Further work should be undertaken to ensure that building design, construction and retrofit processes integrate all elements of the thermal envelope (including insulation, glazing and minimising thermal bridging), air tightness and systems for heating, cooling and ventilation.

A broad range of organisations are committed to working with governments to ensure that insulation installation prioritises safety and quality. We look forward to working with governments and a broad range of stakeholders to deliver better buildings.

Information and guidelines



No.	Recommended Action	Lead	Partners	Detail	Timeline
11	Develop insulation installation guidelines	Insulation Australasia (IA), Insulation Council of Australia and New Zealand (ICANZ), and other insulation orgs	Governments and insulation installers	<p>Governments and industry should collaborate to develop a national set of simple model guidelines and documents to support insulation installation in both private and public properties, including specific guidelines for retrofits.</p> <p>These guidelines should draw on existing documents, including AS 3999 <i>Installation of Bulk Thermal Insulation</i> and the supporting documentation from the New Zealand <i>Warmer Kiwi Homes</i> program. Ideally, the documents would include simple checklists to enable insulation installers, clients and governments to assess if the proper steps have been taken during insulation installation.</p>	<p>Insulation orgs release drafts in Sept 2021</p> <p>Govt approved version by 30 Jun 2022</p>
12	Develop an online portal that lists insulation products that have been verified to meet AS/NSZ 4859.1	IA, ICANZ and other insulation orgs	Governments, insulation installers and other insulation organisations	<p>Industry, with the support of governments, should develop and maintain an online list of insulation products verified to meet the requirements of the current version of the National Construction Code, which include requirements set out in AS/NZS 4859.1 <i>Materials for the thermal insulation of buildings</i>.</p> <p>The first step should be to establish a committee including representatives from industry, consumers and governments. The committee would oversee the development and maintenance of the list, and consider issues including how product testing will be verified and whether the online list will include manufacturers' recommendations on how products should be used.</p>	By 30 Jun 2022
13	Production of installation guidance materials	IA, ICANZ and other insulation orgs	Installers and other insulation organisations	The insulation industry should continue its work to develop education materials, such as the <i>Insulation Handbook</i> and guidance videos on insulation installation.	Ongoing
14	Review options to explain the quality of insulation installation	IA, ICANZ and other insulation orgs	Governments, insulation installers and other orgs	Currently, building owners and occupants find it difficult to determine the quality of an insulation installation, even if it has been recently completed. An independent review would examine the value of providing information to building owners, such as a certificate of insulation.	By 31 Dec 2022

T Training and accreditation

No.	Recommended Action	Lead	Partners	Detail	Timeline
T1	Review entry-level insulation installer training and accreditation	IA, ICANZ and other insulation orgs	Governments, installers, Artibus, training institutions and other bodies	Industry and governments should conduct a joint review to ensure entry-level training and accreditation programs for insulation installers are cost-effective, have a diversity of providers and adequately address quality and safety issues. Based on this review, organisations should either retain, refine, complement or replace these programs.	By 30 Jun 2022
T2	Develop additional training units for particular types of insulation	IA, ICANZ and other insulation orgs	Government, training institutions and other industry bodies	The insulation industry should develop training units for specific types or aspects of insulation, such as pumped insulation and structural insulated panels. These units could be completed by installers once they have completed basic insulation installation training.	Insulation orgs release drafts by 31 Dec 2021 Govts and industry finalise by 31 Dec 2022
T3	Develop a certification for Lead Insulation Professionals	IA, ICANZ and other insulation orgs	Governments, training institutions and other industry bodies	The individuals that oversee insulation installations in either retrofits or new builds require significant knowledge of materials, processes, safety and building codes. Industry should work with governments to develop a competency-based 'Lead Insulation Professional' certification, potentially based on a combination of online and onsite assessments. Separate certification may be required for those who oversee insulation in residential and commercial construction.	Scope out by 31 Dec 2021 Certification available by 31 Dec 2022
T4	Develop basic training for trades that interact with insulation	IA, ICANZ and other insulation orgs	Governments, training institutions and other industry bodies	A number of trades and professions interact with insulation before and after it is installed, such as electricians and plumbers. Insulation associations and governments should determine how each trade can be educated on insulation issues, such as integration of insulation training into Continued Professional Development where appropriate.	By 31 Dec 2021

No.	Recommended Action	Lead	Partners	Detail	Timeline
T5	Develop training for building inspectors	IA, ICANZ and other insulation orgs	Australian Institute of Building Surveyors (AIBS), building surveyors, governments	Some people that conduct building inspections (e.g. building surveyors) may require additional training to correctly and rapidly assess whether insulation has been installed in accordance with relevant requirements.	By 31 Dec 2021
T6	Industry leaders use or promote accredited insulation installers and professionals	IA, ICANZ and other insulation orgs	Major builders, HIA, MBA etc	The insulation and construction industry should recommend or voluntarily commit to using trained and accredited insulation installers and certified Lead Insulation Professionals for construction and retrofit work (Recommendations T1 and T3).	By 31 Dec 2022
T7	Conduct a cost-benefit study on requiring training for all or some insulation installers	Governments		A cost-benefit study would determine whether one or more staff on site should have insulation installer training during the installation of insulation in any new build, renovation or retrofit project. The need for a government mandate would depend on the level of voluntary uptake of accredited installers and professionals (Recommendation T6).	By 31 Dec 2023

G

Requirements for installation supported by governments

No.	Recommended Action	Lead	Partners	Detail	Timeline
G1	Require the use of verified products for government-supported insulation installations	Governments		All products used in retrofits that are supported by governments should be verified to meet the current version of <i>AS/NZS 4859.1</i> . This could later be supported by the website listing verified products (Recommendation I2).	Make an explicit requirement by 1 Jul 2021
G2	Only use pre-approved companies for government-supported insulation installations	Governments		In New Zealand, where government programs support the installation of insulation, insulation installation companies must be pre-approved as meeting criteria including use of best practice processes. Australian governments should adopt a similar approach.	As soon as tenders are released
G3	Independent audits of government-supported insulation installations	Governments		Where government programs support the installation of insulation, they should undertake or contract independent providers to conduct spot audits on a sample of installations (e.g. five per cent). Criteria for audits would be set out in insulation installation guidelines (Recommendation I1).	As soon as programs commence
G4	Require the use of trained and accredited insulation installers for government-supported insulation installations	Governments		When governments support insulation retrofits, they should require installers to adopt best practice training and accreditation schemes. Where governments consider funding retrofits in the next 12 months, they should use current schemes, such as the Clean Energy Council's Accredited Insulation Installer Accreditation. Government requirements should be updated following the review of accreditation programs (Recommendation T1).	By 31 Dec 2021
G5	Require installers to follow insulation installation guidelines for government-supported installations	Governments		Governments should require installers to follow the insulation installation guidelines (Recommendation I1) when they support insulation installation (such as building or retrofit of public housing or grants for private home upgrades).	By 30 Jun 2022
G6	Require the use of certified Lead Insulation Professionals for government-supported insulation installations	Governments		Following the development of the certified Lead Insulation Professional system (Recommendation T3), governments should require the use of certified Lead Insulation Professionals to oversee retrofits.	By 30 Jun 2023

C

Compliance in new buildings and major renovations

No.	Recommended Action	Lead	Partners	Detail	Timeline
C1	Improve general compliance and enforcement systems for the building and construction industry	Building ministers	Governments	A nationally-harmonised implementation of the recommendations from the <i>Shergold Weir Building Confidence Report</i> should be led by Australia's building ministers.	Ongoing
C2	Undertake a review to ensure insulation requirements are specified in building documentation	Governments	Associations for energy raters, architect and building designers	The proposed details of insulation (e.g. R-value) in a new building are already specified for NatHERS assessments. However, these details are not always transferred to all construction documentation. This means that design intentions are not always translated into construction. Governments should work with energy raters, architects and building designers to determine how to ensure that insulation is always specified in building plans.	By 30 Jun 2022
C3	Each jurisdiction should require a Certificate of Insulation during construction that is signed off by a certified insulation professional	Governments	Insulation industry associations	There are currently significant variations in requirements for Certificates of Insulation between jurisdictions. Some jurisdictions require a certificate signed by the installer or builder, others do not. All jurisdictions should require a formal Certificate of Insulation as a first step, and then upgrade this requirement so certificates are signed off by a certified Lead Insulation Professional to obtain a Certificate of Occupancy. The Lead Insulation Professional must confirm their sighting of either the insulation or time-and-location-stamped photographs of the insulation.	All jurisdictions to require a certificate by 31 Dec 2022 All jurisdictions to require that certified Lead Insulation Professional must sign certs by 31 Dec 2023

Moving beyond the insulation installation industry

B

No.	Recommended Action	Lead	Partners	Detail	Timeline
C4	Commence the regulatory process to consider and introduce a requirement for the provision of time-and location-stamped photos of insulation to building inspectors	Each government for its own jurisdiction		Undertake regulatory impact statements (including a cost-benefit study) to support the rapid introduction of a requirement that builders provide time-and-location-stamped photos of insulation installations to those required to carry out the final independent inspection of a building.	By 30 Jun 2022
C5	Conduct separate or joint cost-benefit studies on more involved options to improve independent assessment of insulation	Governments		Expanding on action C3, governments should conduct a joint cost-benefit study on two options that would help assess whether insulation has been installed correctly. This would assess the merits of requiring building inspectors to either: <ul style="list-style-type: none"> Carry out remote or in-person inspections while insulation is still visible; or Use thermal imaging equipment in their final inspection. 	By 31 Dec 2023

No.	Recommended Action	Lead	Partners	Detail	Timeline
B1	Undertake further analysis on options for integrated building envelope construction and retrofit	TBC	TBC	The report would explore options to foster a market for more integrated buildings, build capacity for building retrofits at scale, and communicate the importance and benefits of integrated building envelope upgrades.	By 30 Jun 2022
B2	Consider issues associated with DIY insulation	Governments	IA, ICANZ, other insulation organisations, manufacturers, retailers and importers	Governments consider issues associated with 'do-it-yourself' (DIY) insulation once appropriate systems are in place for professional installers.	By 31 Dec 2023

References

ⁱ. Gasparrini, A., Guo, Y., & Hashizume, M. (2015). Mortality risk attributable to high and low ambient temperature: a multicountry observational study. *The Lancet*, 386(1), 369–375. Accessed online 15 March 2021, [https://doi.org/10.1016/S0140-6736\(14\)62114-0](https://doi.org/10.1016/S0140-6736(14)62114-0)

ⁱⁱ. Department of the Environment. (2016). *State of the Environment 2016*. Canberra: Commonwealth of Australia. <https://soe.environment.gov.au/download/reports>

ⁱⁱⁱ. Alam, M., Rajeev, P., Sanjayan, J., Zou, P.X.W. & Wilson, J. (2018). Mitigation of heat stress risks through building energy efficiency upgrade: a case study of Melbourne, Australia. *Australian Journal of Civil Engineering*, 16(1): 64-78. <https://doi.org/10.1080/14488353.2018.1453331>

^{iv}. Grimes, A., Denne, T., Howden-chapman, P., Arnold, R., Telfar-barnard, L., Preval, N., & Young, C. (2012). *Cost Benefit Analysis of the Warm Up New Zealand: Heat Smart Programme Ministry of Economic Development*. June. http://www.healthyhousing.org.nz/wp-content/uploads/2012/05/NZIF_CBA_report-Final-Revised-0612.pdf

^v. ASBEC & ClimateWorks Australia. (2018). The bottom line: The household impacts of delaying improved energy requirements in the Building Code. In *Building Code Energy Performance Trajectory Project*. <https://www.asbec.asn.au/wordpress/wp-content/uploads/2018/03/180208-ASBEC-CWA-The-Bottom-Line-household-impacts.pdf>

^{vi}. International Energy Agency. (2020). *Sustainable Recovery*. Paris: IEA. <https://www.iea.org/reports/sustainable-recovery>

Resources

Shergold, P. & Weir, B. (2018). *Building confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*. Canberra: Building Ministers' Forum. https://www.industry.gov.au/sites/default/files/July%202018/document/pdf/building_ministers_forum_expert_assessment_-_building_confidence.pdf

Energy Efficiency Council and Australian Sustainable Built Environment Council. (2021). *Ensuring quality control and safety in insulation installation*. Melbourne: Energy Efficiency Council & ASBEC. <https://www.eec.org.au/uploads/Documents/EEC%20ASBEC%20Insulation%20Report%20-%20Feb%202021.pdf>

Timeline

By 31 Dec 2021	By 30 Jun 2022	By 31 Dec 2022	By 30 Jun 2023	By 31 Dec 2023
	I1 Develop insulation installation guidelines	G5 Require installers to follow insulation installation guidelines for government-supported installations		
G1 Require the use of verified products for government-supported insulation installations	I2 Develop an online portal that lists insulation products that have been verified to meet AS/NSZ 4859.1			
G4 Require the use of trained and accredited insulation installers for government-supported insulation installations	T1 Review entry-level insulation installer training and accreditation systems	T2 Develop additional training units for particular types of insulation	T6 Industry leaders to recommend or commit to using accredited insulation installers and Lead Insulation Professionals	T7 Conduct a cost-benefit study on requiring training for all insulation installers for new build and retrofits
G2 Only use pre-approved companies for government-supported insulation installations		T3 Develop a certification for Lead Insulation Professionals	G6 Require the use of certified Lead Insulation Professionals for government-supported insulation installations	C3 Each jurisdiction requires a Certificate of Insulation during construction that is approved by a certified Lead Insulation Professional
G3 Independent audits of government-supported insulation installations	C2 Undertake a review to ensure insulation requirements are specified in building documentation	I4 Review options to communicate the quality of insulation installation		
T4 Develop basic training for trades that interact with insulation				
T5 Develop training building inspectors	C4 Consider and introduce a requirement to provide photos of insulation to building inspectors	C5 Conduct cost-benefit studies on more involved options to improve independent assessment of insulation		
	B1 Undertake further analysis on options for integrated building envelope construction and retrofit			B2 Consider issues associated with DIY insulation
Ongoing				
I3 Production of installation guidance materials				
C1 Improve general compliance and enforcement systems for the building and construction industry				

