The Senate

Legal and Constitutional Affairs References Committee

Use of smoke alarms to prevent smoke and fire related deaths

April 2016

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Abbreviations

ABCB	Australian Building Codes Board
ABI	Association of British Insurers
ABIN	Australian Ballistics Information Network
ABS	Australian Bureau of Statistics
AFAC	Australian Fire and Emergency Service Authorities Council
AS	Australian Standard
BCA	Building Code of Australia
CAFC	Canadian Association of Fire Chiefs
CCFMFC	Council of Canadian Fire Marshals and Fire Commissioners
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DFES	Western Australia Department of Fire and Emergency Services
EMV	Emergency Management Victoria
FPA	Fire Protection Association Australia
FRNSW	Fire & Rescue New South Wales
HIA	Housing Industry Association
LHFSN	Logan House Fire Support Network
MFB	Metropolitan Fire and Emergency Services Board
NCC	National Construction Code
NFID	National Fire Information Database
NFPA	National Fire Protection Association
NZFSC	New Zealand Fire Service Commission
QFR	Queensland Fire and Rescue
RIS	Regulatory Impact Statement
SA	Standards Australia
SAMFS	South Australian Metropolitan Fire Service
TFS	Tasmanian Fire Service
WSFS	World Fire Safety Foundation

Recommendations

Recommendation 1

2.33 The committee recommends that Australian governments collaboratively establish a national database of residential fire incidents and that state and territory fire and emergency services are adequately resourced to collect and report data to that national database.

Recommendation 2

2.36 The committee recommends that Australian governments consider establishing a national residential fire reporting and recording mechanism to capture statistics of currently unreported residential fire incidents.

Recommendation 3

3.40 The committee recommends that the National Construction Code is amended to require the installation of interconnected, and preferably mains powered, photoelectric smoke alarms, supplemented where appropriate by ionisation smoke alarms, in every residential property and specify the type of smoke alarm to be used at different locations within each residential property, taking into account the different smoke detection properties of photoelectric and ionisation smoke alarms.

Recommendation 4

3.41 The committee recommends, to give effect to Recommendation 3, that all state and territory governments adopt the amended National Construction Code and agree to apply it to all residential properties, irrespective of the age of a property.

Recommendation 5

3.43 The committee recommends that all states and territories implement mandatory compliance checks of smoke alarms in residential properties whenever a property is sold, tenanted or hired.

Recommendation 6

3.50 The committee recommends that the Commonwealth, state and territory governments develop and implement a package of measures, including but not limited to a website and resources for key stakeholders, to educate Australians about:

- **different types of smoke alarms;**

- **the benefits associated with installing smoke alarms with different smoke detection properties in particular locations within a property;**
- **the smoke alarm requirements that apply to residential properties in each jurisdiction;**
- **the importance of regular smoke alarm testing and maintenance;**
- **who has responsibility for installing and maintaining smoke alarms, and advice about how to do this or seek assistance to do so; and**
- **the triggers for compliance checking of smoke alarms (for example at time of sale, tenancy or hire).**

Recommendation 7

3.53 In the event Australian governments are unwilling to amend the National Construction Code and apply it to all building stock irrespective of classification and age, the committee recommends that they consider implementing a nation-wide smoke alarm household installation scheme that includes consultation with:

- **fire and emergency services, housing providers and the real estate agency industry; and**
- **individuals and organisations working with vulnerable members of the community.**

Chapter 1

Introduction and background

Referral of the inquiry

1.1 On 25 June 2015, the Senate referred the following matter to the Legal and Constitutional Affairs References Committee for inquiry and report by 3 December 2015:

> The use of smoke alarms to prevent smoke and fire related deaths, with particular reference to:
>
> a) the incidence of smoke and fire related injuries and deaths and associated damage to property;
>
> b) the immediate and long term effects of such injuries and deaths;
>
> c) how the use, type and installation set-ups of smoke alarms could affect such injuries and deaths;
>
> d) what smoke alarms are in use in owner-occupied and rented dwellings and the installation set-ups;
>
> e) how the provisions of the Australian Building Code relating to smoke alarm type, installation and use can be improved;
>
> f) whether there are any other legislative or regulatory measures which would minimise such injuries and deaths; and
>
> g) any related matter.

Extension of reporting date

1.2 On 12 November 2015 the Senate agreed to extend the reporting date for the inquiry to 16 March 2016. On 16 March 2016, the inquiry was extended again to 30 June 2016.

Conduct of the inquiry

1.3 Details of the inquiry were made available on the committee website. The committee also wrote to relevant organisations inviting submissions due 31 August 2015. The committee received 29 submissions, one of which was confidential. A list of submissions is at Appendix 1.

1.4 Three public hearings were held:

- Brisbane on 26 October 2015;
- Canberra on 4 December 2015; and
- Canberra on 22 February 2016.

1.5 The list of witnesses who gave evidence is at Appendix 2.

References to the Hansard transcript

1.6 References to the committee Hansard are to the proof Hansard. Page numbers may vary between the proof and the official transcript.

Acknowledgement

1.7 The committee thanks all those individuals and organisations who provided submissions and gave evidence at the public hearings.

Report structure

1.8 There are three chapters in this report.

1.9 The remainder of this chapter describes some recent fire tragedies in Australia and outlines the regulatory scheme as it applies to smoke alarms in residential settings currently.

1.10 Chapter 2 analyses data on fire related incidents in Australia, including smoke and fire-related deaths, injuries and property damage.

1.11 Chapter 3 considers the types and use of smoke alarms in residential settings.

Recent fire tragedies in Australia

1.12 There have been a number of recent fire tragedies in Australia. Sadly, some of these tragedies are particularly notable on account of the number of lives lost.

Slacks Creek fire

1.13 On 24 August 2011, 11 members of the same family were killed in a house fire in the Queensland suburb of Slacks Creek. Three women, four teenagers and four children under the age of 10 died in the fire, which has been described as Australia's worst house fire.[1] One of the survivors, Mr Tau Taufa, told the coronial inquest that:

> he remembered a smoke alarm sounding once in the 1990s and someone turned it off to get rid of the noise, but he could not remember if it was turned on again.
>
> Mr Taufa told the inquest he tried to put out the fire and he called out to those inside the house, but did not hear them.[2]

1.14 It was found that the house was fitted with two smoke alarms, neither of which had worked for years.[3]

Golinski fire

1.15 In the early hours of 26 December 2011, a fire tore through the Sunshine Coast home of chef Mr Matt Golinski, killing his wife and their three daughters.[4] The

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1 Emma Pollard and Leonie Mellor, 'Logan fire inquest: Coroner examines nation's worst domestic fire tragedy at Slacks Creek', *ABC News*, 19 August 2014, available: http://www.abc.net.au/news/2014-08-18/logan-inquest-coroner-examine-fatal-fire-slacks-creek/5677946 (accessed 8 March 2016).

2 Emma Pollard and Leonie Mellor, 'Logan fire inquest: Coroner examines nation's worst domestic fire tragedy at Slacks Creek', *ABC News*, 19 August 2014.

3 Dea Clark, 'Logan fire inquest: Impossible to determine cause of Slacks Creek house blaze that killed 11 people', *ABC News*, 19 September 2014, available: http://www.abc.net.au/news/2014-09-19/logan-fire-inquest-impossible-to-determine-cause-of-fatal-fire/5756094 (accessed 8 March 2016).

coroner identified a four outlet power board, the 240V Christmas lights and other electrical equipment close to the Christmas tree as possible sources of the fire.

1.16 The coroner's report stated that 'smoke alarms had failed to raise the family and by the time Mr Golinksi's wife Rachael awoke, the Tewantin home on the Sunshine Coast was engulfed in flames' and concluded 'if the smoke alarms had been functioning effectively the deaths could have been prevented'.[5]

Dunkeld fire

1.17 In March 2012 two children died in a house fire at Dunkeld in Victoria. The fire was believed to have started at approximately 3.00 am[6] and, according to Victorian police, was the result of a slow-combustion burner that ignited debris accumulated around the flue.[7] The parents awoke but due to the intensity of the fire were unable to reach their children.

Current regulatory scheme for residential smoke alarms

1.18 The residential smoke alarm regulatory scheme in Australia consists of:

- the National Construction Code (NCC);
- Australian Standards dealing with smoke alarms; and
- state and territory legislation and subordinate legislation.

1.19 As the remainder of this chapter demonstrates, the current regulatory scheme is complex. The smoke alarm regulations that apply to a dwelling vary depending on:

- when the property was constructed;
- in which state or territory it is located; and
- how the building is classified under the NCC.

Development of the National Construction Code

1.20 In 2008, the Council of Australian Governments (COAG) published the *National Partnership Agreement to Deliver a Seamless National Economy*, an agreement between the Commonwealth, states and territories. This agreement stated that the states and territories were responsible for working together to implement a

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4 Kym Agius, 'Matt Golinski fire: Christmas tree lights or power board "likely cause" of fatal blaze at TV chef's home', *ABC News*, 5 December 2015, available: http://www.abc.net.au/news/2015-12-05/christmas-tree-lights-coroner-matt-golinski-fatal-house-fire/7004180 (accessed 8 March 2016).

5 Kym Agius, 'Matt Golinski fire: Christmas tree lights or power board "likely cause" of fatal blaze at TV chef's home', *ABC News*, 5 December 2015.

6 Henrietta Cook and Nino Bucci, 'Screams heard as children's bodies found in burnt-out house', *The Age*, 23 March 2012, available: http://www.theage.com.au/victoria/screams-heard-as-childrens-bodies-found-in-burntout-house-20120322-1vnjs.html (accessed 8 March 2016).

7 Paul Cleary, 'Fatal flaw of cheap heat', *The Australian*, 28 May 2012, available: http://www.theaustralian.com.au/news/inquirer/fatal-flaw-of-cheap-heat/story-e6frg6z6-1226368667384 (accessed 8 March 2016).

coordinated national approach to construction requirements,[8] and that they would have shared responsibility with the Commonwealth for regulatory reform.[9] While building and plumbing codes already existed separately, this Agreement was to consolidate them. Volumes One and Two of the NCC make up the Building Code of Australia (BCA), which sets out the minimum standards for smoke alarms in residential buildings.

1.21 The NCC was adopted by each state and territory from 1 May 2011,[10] which gave the document legal effect. Any provision of the NCC may be overridden by, or subject to, state or territory legislation.[11] The NCC must therefore be read in conjunction with the relevant state or territory's legislation in order to determine the relevant requirements.

Smoke alarm regulation under the BCA

1.22 The smoke alarm installation requirements in the BCA differ depending on the relevant building's classification. Residential buildings may be classified as:

- Class 1a - a single dwelling (for example a detached house);[12]
- Class 1b - a boarding house, guest house or hostel in which more than 12 people would ordinarily be resident, or 4 or more single dwellings on one allotment for short-term accommodation;[13]
- Class 2 - building containing two or more sole occupancy units each being a separate dwellings (for example an apartment);[14]
- Class 3 - a residential building other than classes 1 or 2, which are a common place of long-term or transient living for a number of unrelated persons, including a boarding house, hostel, backpackers accommodation, hotel or motel, residential part of a school, or accommodation for the aged, children or people with disabilities;[15] and

8 Council of Australian Governments (COAG), *National Partnership Agreement to Deliver a Seamless National Economy* (2008), p. 6.

9 COAG, *National Partnership Agreement to Deliver a Seamless National Economy* (2008), p. 6.

10 *Building Act 2004* (ACT), s. 136(1); *Building (General) Regulations 2008* (ACT) reg. 43A; *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 98; *Fire and Emergency Regulations* (NT), part 2A; *Building Act 1975* (QLD), s.12; *Fire and Emergency Services Act 1990* (QLD), division 5A; *Development Regulations 2008* (SA), reg. 4; *Building Act 2000* (TAS), reg. 55; *Building Regulations 2006* (VIC), reg. 109; and *Building Regulations 2012* (WA).

11 Australian Building Codes Board (ABCB), *National Construction Code (NCC)*, vol. 1, p. 8.

12 ABCB, *NCC*, vol. 2, cl. 1.3.2.

13 ABCB, *NCC*, vol. 2, cl. 1.3.2.

14 ABCB, *NCC*, vol. 1, cl. A3.2.

15 ABCB, *NCC*, vol. 1, cl. A3.2.

- Class 4 - a dwelling found in a class 5 (office), 6 (shop, showroom or café), 7 (carpark, storage or production of wholesale goods), 8 (laboratory or goods facility) or 9 (healthcare or assembly building such as a school) building as long as it is the only dwelling in that building.[16]

1.23 In all dwellings constructed after 1 May 2011, or dwellings where substantial building work is taking place, the smoke alarms must:

- comply with Australian Standard (AS) 3786;
- be connected to consumer mains power (where supplied to building);
- be interconnected where there is more than one alarm; and
- be located on or near the ceiling on each storey.

1.24 A detailed description of further regulations that apply to particular classes of building is at Appendix 3.

1.25 The smoke alarms installed in a newly constructed dwelling must comply with the performance requirement that occupants are 'provided with automatic warning on the detection of smoke so that they may evacuate in the event of a fire to a place of safety'.[17] Smoke alarms will comply with this if:

- they are 'deemed-to-satisfy' the requirement; or
- employ an alternative solution that is at least equivalent to the 'deemed-to-satisfy' provision, or complies with the relevant performance requirements.[18]

1.26 Two jurisdictions have supplemented the requirements of the NCC. In the Northern Territory smoke alarms must be photoelectric only, and must be hard wired or powered by a sealed 10 year lithium battery unit.[19] In Tasmania, as of 1 May 2016, all tenanted premises must have smoke alarms powered by mains power or a 10 year non-removable battery.[20]

Australian Standard 3786

1.27 AS 3786 sets out the technical requirements for smoke alarms using scattered light, transmitted light or ionisation, and intended for residential application.[21] AS 3786 sets out the technical requirements for smoke alarms, including:

- a primary and secondary power source;[22]
- battery connections and the replacement of user-replaceable batteries;[23]

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16 ABCB, *NCC*, vol. 1, cl. A3.2.

17 ABCB, *NCC*, vol. 2, part 2.3.2; and vol. 1, objective EP2.1.

18 ABCB, *NCC*, vol. 1, cl. A0.5.

19 *Fire and Emergency Regulations* (NT), reg. 13A(3).

20 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), regulations 7-8.

21 Standards Australia (SA), *Australian Standard (AS) 3786-2014*, part 1.

22 SA, *AS 3786-2014*, clauses 4.9-4.10.

- optional requirement where alarms are inter-connectable;[24]
- the presence of radioactive material;[25]
- markings to be present on the alarm including point of sale packaging;[26] and
- data to be supplied with the alarm including instructions on installation and maintenance.[27]

1.28 It also specifies that photoelectric and ionisation smoke alarms must activate within a particular 'range' when exposed to the following types of fire:

- smouldering pyrolysis wood fire;[28]
- glowing smouldering cotton fire;[29]
- flaming plastics (polyurethane) fire;[30] and
- flaming liquid (*n*-heptane) fire.[31]

1.29 AS 3786 sets out a detailed testing regime for smoke alarm accreditation. The test must:

> (a) Measure the response threshold value of the specimen to be tested eight times…with the specimen being rotated 45° about its vertical axis between each measurement, so that the measurements are taken for eight different orientations relative to the direction of airflow.
>
> (b) Designate the maximum response threshold value as y_{max} or m_{max} and the minimum value as y_{min} or m_{min}.
>
> (c) Record the least sensitive orientation and the most sensitive orientation.[32]

1.30 The response value threshold is:

> … the aerosol density (*m* or *y*) at the moment that the specimen gives an alarm condition. This shall be recorded as *m*, expressed as decibels per metre, for smoke alarms using scattered or transmitted light, or as *y* for

23 SA, *AS 3786-2014*, clauses 4.12-4.13.

24 SA, *AS 3786-2014*, cl. 4.18.

25 SA, *AS 3786-2014*, cl. 4.20.

26 SA *AS 3786-2014*, cl. 4.22.

27 SA, *AS 3786-2014*, cl. 4.23.

28 SA, *AS 3786-2014*, appendix G.

29 SA, *AS 3786-2014*, appendix H.

30 SA, *AS 3786-2014*, appendix I.

31 SA, *AS 3786-2014*, appendix J.

32 SA, *AS 3786-2014*, cl. 5.2.2.

> smoke alarms using ionization and measured with the smoke-measuring instruments specified...[33]
>
> The ratio of the response threshold values y_{max}: y_{min} or m_{max}: m_{min} shall be not greater than 1.6.
>
> The lower response threshold value y_{min} shall be not less than 0.2 or m_{min} shall be not less than 0.05 dB/m.[34]

Structures constructed prior to the commencement of the NCC

1.31 The BCA sets out the minimum standards for smoke alarm installation in new residential buildings, and existing buildings subject to major new building work. The requirements for smoke alarms in buildings constructed before the NCC commenced are set out in state and territory legislation. When determining the legislative requirement with regards to existing structures, there are three considerations:

- how would the building in question be classified under the BCA?
- does the relevant state or territory require a smoke alarm for the particular building class? And,
- if so, what are the particular requirements for a building of that class in the relevant jurisdiction?

1.32 The requirement to have smoke alarms in existing structures are set out in Figure 1.1.

1.33 In addition to the requirement to have smoke alarms in buildings constructed prior to the NCC, there are other various requirements in different states and territories. For example, in the Australian Capital Territory (ACT), the unaltered part of a substantially altered Class 1 building does not have to comply with the BCA as a whole if the unaltered part complies with BCA Volume II part 3.7.2.[35]

1.34 In buildings featuring sole occupancy units within a larger structure (for example apartment buildings), fire detection systems in the common areas are regulated separately. The smoke alarm requirements discussed here only relate to the sole occupancy unit areas of the building.

1.35 In some jurisdictions, the requirement to install a smoke alarm is triggered by an event. In Tasmania, smoke alarm regulations apply only to existing properties which are tenanted.[36] In WA, only existing premises being tenanted, sold, or hired require smoke alarms.[37]

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33 SA, *AS 3786-2014*, cl 5.1.6.

34 SA, *AS 3786-2014*, cl. 5.2.3.

35 *Building (General) Regulation 2008* (ACT), reg. 24(1)(b).

36 See, *Residential Tenancy Act 1997* (TAS); and *Residential Tenancy (Smoke Alarms) regulations 2012* (TAS).

37 *Building Regulations 2012* (WA), regs 56-59.

Figure 1.1: Requirement for smoke alarms in buildings constructed prior to the NCC[38]

	Class	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Stand alone	**1a**	√	√	√	√	√	√	√	√
	1b	√	√	√	√	√	√	√	√
Units	**2**		√	√	√	√	√	√	√
	3		√	√			√	√	√
	4		√	√			√	√	√

1.36 The specific requirements for smoke alarms in existing buildings vary across the states and territories. A detailed outline of these requirements is set out at Appendix 4. To summarise these requirements:

- smoke alarms must comply with AS 3786;[39]
- interconnection of alarms is required in some cases;[40]
- all jurisdictions allow the use of both photoelectric and ionisation smoke alarms, except the NT which requires that only photoelectric alarms be used;[41]
- in most jurisdictions the alarm can be powered by either a 10 year non-removable battery or be hard wired;[42]
- requirements with regards to the location of smoke alarms either directly reference the BCA, or are similar to the BCA;[43]

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38 FPA, *Submission 18*, *p. 26.*

39 See, *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b); *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(1); *Development Regulations 2008* (SA), reg. 76B(1); *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 6; *Building Regulations 2006* (VIC), reg. 707; *Building Regulations 2012* (WA), reg. 60(2); *Fire and Emergency Services Act 1990* (QLD), s. 104RB(2); and *Fire and Emergency Regulations* (NT), reg. 13A(3).

40 See, *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b); *Fire and Emergency Regulations* (NT), reg. 13B; *Development Regulations 2008* (SA), reg. 76B; *Fire and Emergency Services Act 1990* (QLD), s. 104RB; and *Building Regulations 2012* (WA), reg. 60(4).

41 *Fire and Emergency Regulations* (NT), reg. 13A(3)

42 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(B); *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(2); *Fire and Emergency Regulations* (NT), reg. 13A(3); *Fire and Emergency Services Act 1990* (QLD), s. 104RB; *Development Regulations 2008* (SA), reg. 76B; *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 8; *Building Regulations 2006* (VIC), reg. 709; and *Building Regulations 2012* (WA), reg. 60(2).

- the owner is responsible for installing the smoke alarms;[44] and
- in most jurisdictions there are penalties for the removal of or interference with smoke alarms.[45]

43 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b); *Fire and Emergency Regulations* (NT), reg. 13B; *Fire and Emergency Services Act 1990* (QLD), s. 104RB(2); *Development Regulations 2008* (SA), reg. 76B; *Building Regulations 2012* (WA), reg. 60; *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186A; and *Residential Tenancy (Smoke Alarms) regulations 2012* (TAS), regulations 9-13.

44 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186A; *Fire and Emergency Regulations* (NT), reg. 13A(1); *Fire and Emergency Services Act 1990* (QLD), s. 104RB(1); *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), regulations 17-19; *Building Regulations 2006* (VIC), reg. 707(4), 709(8); *Building Regulations 2012* (WA), regulations 56-59; and *Development Regulations 2008* (SA), reg. 76B(4).

45 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186C; *Environmental Planning and Assessment Act 1979* (NSW), s. 125; *Fire and Emergency Regulations* (NT), reg. 13G; *Fire and Emergency Services Act 1990* (QLD), s. 104RH; *Residential Tenancy Act 1997* (SA), s 36F; and *Residential Tenancy Act 1997* (TAS), s. 36F(1).

Chapter 2

Smoke and fire related incidents, deaths, injuries and property damage

2.1 This chapter examines data on smoke and fire related incidents, deaths, injuries and property damage in Australia in comparison with some overseas jurisdictions. It then considers current inconsistencies and gaps in Australian data and ways in which this might be addressed.

Fire-related incidents

2.2 In 2013–14, Australian fire agencies attended 101,867 fire related incidents, of which 19,524 (19 per cent) involved structure fires.[1] By comparison, during the same period, the New Zealand Fire Service Commission (NZFSC) attended 10,245 fire incidents, of which 5294 (50 per cent) were structure fires.[2] From April 2013 to March 2014, there were 212,500 fires attended by Fire and Rescue Services in Great Britain; 19 per cent of these were dwelling fires.[3]

2.3 Of interest to the committee, Great Britain records statistics on the status of smoke alarms at each fire incident. For example, in 2013–14 no smoke alarm was present in 12,000 (31 per cent) of dwelling fires while a smoke alarm was present but did not operate in 19 per cent of fires.[4] England has also seen an increase in smoke alarm ownership from 8 per cent in 1988 to 88 per cent in 2011.[5]

Fire-related incidents in Australian states and territories

2.4 It is difficult to locate statistics about fire-related incidents in Australian states and territories, and even more challenging to find statistics that can be compared in a meaningful way.

2.5 The following points provide a limited snapshot of fire-related incidents in the states and territories:

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1 Australasian Fire and Emergency Service Authorities Council (AFAC), *Submission 5*, p. 2.

2 New Zealand Fire Service Commission (NZFSC), *Annual Report for the year ended 30 June 2014*, available: http://www.fire.org.nz/about-us/publications/annual-reports/Documents/NZFSC_Annual_Report_2014.pdf (accessed 7 March 2016), p. 1.

3 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/456652/Fire_Statistics_Great_Britain_2013-14___PDF_Version_.pdf (accessed 7 March 2016).

4 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, p. 5.

5 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, p. 5.

- In New South Wales (NSW) from 2010 to 2015 there were 23,766 accidental fires.[6] Between 2009-10 and 2013-14 the number of structure fires attended by Fire and Rescue NSW (FRNSW) dropped from 7495 to 6209.[7]
- Between 2002-03 and 2006-07, Queensland Fire and Rescue (QFR) attended more than 2400 structural fire incidents each year, with those incidents increasing by 9.7 per cent during that period.[8]
- In South Australia, between the 2007-2008 and 2013-2014 financial years, there was an average of 1175.6 structure fires per year.[9]
- The Tasmanian Fire Service (TFS) attended 631 structural fires in 2013-14.[10]
- During 2014 there were 3000 house fires recorded in Victoria.[11]
- From 2014-15 the Western Australia Department of Fire and Emergency Services (DFES) attended 60.27 accidental residential fires per 100,000 households.[12]

Smoke and fire-related deaths

2.6 In 1998, the Australian Bureau of Statistics (ABS) recorded that 70 people died of accidental fire or flame injuries in a house fire.[13] In 2013-2014, the Australasian Fire and Emergency Service Authorities Council (AFAC) recorded 98 'fire deaths'.[14]

2.7 In New Zealand during 2013–14 there were ten 'avoidable residential fatalities' equivalent to 0.22 per 100,000 head of population.[15] New Zealand has seen a significant reduction in deaths over the last five to ten years, attributed largely to the 'provision of fire safety education'.[16]

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6 Fire & Rescue NSW (FRNSW), *Submission 20*, p. 1.

7 FRNSW, *Annual Report 2013/14*, p. 7.

8 Queensland Fire and Rescue Service (QFRS), *Efficiency Review* (June 2008), p. 4.

9 South Australian Metropolitan Fire Service (SAMFS), *Submission 1*, p. 1.

10 Tasmania Fire Service (TFS) and State Fire Commission (SFC), *Annual Report 2013-14,* p, 10.

11 Country Fire Association (CFA), *Smoke Alarm Campaign Ready to Kick Off* (2 March 2016), http://news.cfa.vic.gov.au/news/smoke-alarm-campaign-ready-to-kick-off.html (accessed 8 March 2016).

12 Department of Fire and Emergency Services (DFES), *Annual Report 2014-15*, p. 21.

13 Australian Bureau of Statistics (ABS), *Housing Stock: Home Fire Safety*, http://www.abs.gov.au/AUSSTATS/abs@.nsf/2f762f95845417aeca25706c00834efa/1672d6d197020b08ca2570ec000e5353!OpenDocument (accessed 8 March 2016).

14 AFAC, *Submission 5*, p. 2.

15 NZFSC, *Annual Report for the year ended 30 June 2014*, p. 18.

16 NZFSC, *Annual Report for the year ended 30 June 2014*, p. 18.

2.8 During 2013–14 there were 322 fire-related deaths in Great Britain (at a fatality rate of 5.2 per million of population), 20 fewer than the year before.[17] Of the 322 fatalities, 258 were dwelling fire fatalities; 41 per cent of the fire-related deaths were caused by gas, smoke or toxic fumes, 20 per cent were the result of burns alone and another 20 per cent were caused by a combination of burns and being overcome by gas or fumes.[18] Nearly 40 per cent of dwelling fire deaths in Great Britain occurred in properties where no alarm was installed.[19]

2.9 According to the Department of Communities and Local Government (UK), throughout the 1990s and 2000s Great Britain has seen 'a clear downward trend' in fire-related fatalities.

2.10 In 2014, there were 1,298,000 reported fires in the United States of America (USA) resulting in approximately 3275 civilian deaths. Of these, 2745 deaths occurred in dwelling fires (2345 in the family home and 400 in apartment fires).[20] Since 1977, the USA has seen a reduction in the total number of home fire deaths and a gradual decline in the number of deaths per 1000 fires; however, over recent years (2009 to 2014) the number of civilian fire deaths per year has remained about the same.[21] The 2015 National Fire Protection Association (NFPA) report *Fire loss in the United States During 2014* argued that:

> There are five major strategies for reducing the death toll in home fires. First, more widespread public fire safety education is needed on how to prevent fires and how to avoid serious injury or death if a fire occurs. Information on the common causes of fatal home fires should be used in the design of fire safety education messages. Second, homeowners or property managers need to install and maintain smoke alarms and residents must develop and practice escape plans. Third, wider use of residential sprinklers must be aggressively pursued. Fourth, additional ways must be sought to make home products safer from fire. The regulations requiring more child resistant lighters are a good example, as are fire-safe cigarettes. And finally, the special fire safety needs of high-risk groups, such as young children, older adults, the poor, and people with disabilities need to be addressed.[22]

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17 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, p. 4.

18 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, p. 4.

19 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, p. 5.

20 National Fire Protection Association (NFPA), *Fire loss in the United States During 2014*, September 2015, available: http://www.nfpa.org/research/reports-and-statistics/fires-in-the-us/overall-fire-problem/fire-loss-in-the-united-states (accessed 8 March 2016), p. 13.

21 NFPA, *Fire loss in the United States During 2014*, September 2015, p. 14.

22 NFPA, *Fire loss in the United States During 2014*, September 2015, p. 15.

Fire-related deaths in Australian states and territories

2.11 As with data about fire-related incidents, data about smoke and fire-related deaths in Australian states and territories can be disparate and difficult to find. The following list outlines some statistics on smoke and fire-related deaths in the states and territories:

- In 2008 there were 25 fire fatalities in NSW,[23] with accidental fires contributing to 115 fatalities from 2010-15.[24]
- Between the 2007-2008 and 2013-2014 financial years the South Australian Metropolitan Fire Service (SAMFS) recorded 62 fire fatalities.[25]
- There were three fire fatalities in Tasmania between 2010-11, and none from 2012-14.[26]
- Based on hospital admission data, there were 103 fire related fatalities between 2004 and 2015 in the Melbourne Metropolitan District;[27] 53 of these were deemed to arise from preventable or accidental residential fires and 26 occurred in homes where there was no smoke alarm or the smoke alarm was disarmed.[28]
- Between January 2001 and December 2006 there were 33 fire related deaths in Western Australia arising out of 30 fires.[29]

Fire-related injuries

2.12 According to AFAC, during 2013-2014 there were 4114 hospital admissions due to fire-related injuries in Australia.[30]

2.13 In Great Britain during 2013-14 there were 9,748 non-fatal casualties in fires (a rate of 157 per million population), a reduction of 5 per cent from the year before. The number of casualties in dwelling fires in 2013-14 constituted 80 per cent of total non-fatal casualties and was 'the lowest figure recorded in more than a decade'.[31]

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23 NSW Fire Brigades, *Fire Fatalities Report: Study of Fatal Fires in NSW from 2004 to 2008*, p. 2.

24 FRNSW, *Submission 20*, p. 2.

25 SAMFS, *Submission 1*, p. 1.

26 TFS, SFC, *Annual Report 2013-14,* p, 11.P, 10.

27 Metropolitan Fire Brigade (VIC) (MFB), *Submission 4*, p. 3.

28 Mr Adam Dalrymple, Assistant Chief Fire Officer, Director of Fire Safety, Metropolitan Fire and Emergency Services Board (VIC), *Committee Hansard*, 4 December 2015, p. 1.

29 Fire and Emergency Services Authority of Western Australia (FESAWA), *Fatal Fires in Western Australia 2001-2006* (June 2010), p. 4.

30 AFAC, *Submission 5*, p. 2.

31 Department of Communities and Local Government (UK), *Fire Statistics: Great Britain April 2013 to March 2014*, p. 4.

2.14 In 2014, 15,775 civilians were injured in fires in the USA, a reduction of 0.9 per cent from the previous year. Of the injuries incurred, the vast majority (85 per cent) occurred in structure fires with 75 per cent of all civilian injuries in 2014 occurring in home fires.[32]

Fire-related injuries in Australian states and territories

2.15 In NSW, 3311 injuries related to accidental fires were recorded between 2010 and 2015;[33] in South Australia, between 2007-2008 and 2013-2014 125 fire injuries were recorded.[34] There were 82 accidental fire injuries in Tasmania which required hospital admission in 2011-12.[35]

Fire-related property damage

2.16 There are some difficulties associated with quantifying property damage arising from fire related incidents. Fires may not be reported and homes may not be insured, in which case the property damage is not recorded for statistical purposes.

2.17 However, some submitters did provide some estimates of the costs associated with smoke and fire-related damage to property. The Victorian Metropolitan Fire & Emergency Services Board (MFB) advised that in the past 10 years, an average of 2786 insurance claims have been made relating to residential fires, with an average cost of $32,000 per building and in 2014 the estimated value of insurance claims relating to smoke and fire damage was over $135 million.[36] AFAC told the committee that household and commercial property insurance claims in relation to fire incidents, not including major events, in the 2013-2014 totalled $702.9 million.[37] The TFS recorded that house fire insurance claims as a percentage of Tasmanian housing stock varied from $43.1 million in 2012-13 and a low of $7.7 million in 2009-10, a differential which TFS said related to the number of homes destroyed in the 2012-13 bushfire season.[38]

2.18 The NZFSC is required by law to protect property and measures its success in this area using the estimated dollar value of property damage. In 2013–14, fire damage to residential structures in New Zealand totalled NZD71.55 million and non-residential structures totalled NZD51.96 million; in both instances, these figures were below their respective targets of NZD75 million and NZD55 million per annum.[39]

2.19 Statistics from the Association of British Insurers (ABI) in 2009 demonstrated that the cost of fire damage in Great Britain was at a record level: during the first half

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32 NFPA, *Fire loss in the United States During 2014*, September 2015, p. iv.

33 FRNSW, *Submission 20*, p. 1.

34 SAMFS, *Submission 1*, p. 1.

35 TFS and SFC, *Annual Report 2013-14,* p, 10.

36 MFB, *Submission 4*, p. 4.

37 AFAC, *Submission 5*, p. 2.

38 TFS and SFC, *Annual Report 2013-14,* p, 11.

39 NZFSC, *Annual Report for the year ended 30 June 2014*, p. 19.

of that year, insurers paid out £639 million—£3.6 million every day—for damage caused by fires.[40] The ABI's data also showed:

> - Between 2002 and 2008 the cost of the average fire claim for both commercial and domestic fires doubled, to £21,000 and £8,000 respectively.
>
> …
>
> - More open plan buildings, which allow more rapid spread of fire, and the increase in out of town developments, where fires can go for longer unnoticed, are among factors contributing to the doubling of fire costs since 2002.[41]

2.20 The ABI identified 'a review of the case for making sprinklers mandatory in all new buildings as one of 'two key steps needed to tackle spiralling fire costs which, if unchecked, will increasingly put lives at risk, and damage the economy'.[42]

2.21 The NFPA estimated that the 1,298,000 fires in the USA in 2014 resulted in USD11.6 billion in direct property damage. Of that USD11.6 billion, approximately USD7.0 billion was incurred for residential properties (USD5.8 billion from family homes and USD982 million from apartments). The cost of direct property damage from fires in the USA has been declining, from USD13.8 billion in 2009.[43]

Inconsistency and gaps in data

2.22 It is difficult to calculate the number of smoke and fire-related deaths and injuries, and the cost of associated property damage caused by smoke and fire in Australia. This is primarily due to inconsistency and gaps in the data collected. Data currently available on smoke and fire-related injuries, deaths and property damage is collected by a range of different organisations in the states and territories. Some data is recorded by state and territory fire and emergency services; other data is collected by other organisations such as hospitals and insurance companies. These organisations may gather data for different times periods, particular localities, and using their own parameters.

2.23 There is also, understandably, a paucity of data on unreported fires. As FRNSW stated there are no statistics on fires which are unreported and therefore unattended by the service, or which have been reported to another agency;[44] data is not generally captured where people with a fire related injury do not seek medical

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40 Association of British Insurers (ABI), *Record rise in the costs of fire damage*, 10 December 2009, available: https://www.abi.org.uk/News/News-releases/2009/12/Record-rise-in-the-costs-of-fire-damage (accessed 7 March 2016).

41 ABI, *Record rise in the costs of fire damage*, 10 December 2009.

42 ABI, *Record rise in the costs of fire damage*, 10 December 2009.

43 NFPA, *Fire loss in the United States*, September 2015, p. 39.

44 Fire & Rescue NSW (FRNSW), *Submission 20*, p. 1.

treatment,[45] or where property damage has been caused but the fire was unreported and the owner was uninsured.

2.24 As AFAC highlighted with regard to fire-related injuries:

> …[I]njury from smoke and fire in the residential setting is not limited to burns or smoke inhalation. AFAC research indicates that the majority of fire injuries *are* burns and/or smoke inhalation, however, other (related) injuries include wounds and punctures, fractures, heart attacks, strains and sprains which occur during a fire. Such related injuries also may not be captured in the data…notwithstanding that the injuries have resulted in hospitalisation or injury to a person as a result of a residential fire.[46]

2.25 Inconsistency and gaps in data pose difficulties for authorities: as the preceding paragraphs illustrate, it is difficult to compare statistics dealing with residential fires because they are recorded in different jurisdictions in different ways over varying periods of time. For some jurisdictions it is extremely difficult to locate any statistics at all for smoke and fire related incidents, deaths or injuries. The absence of complete, accurate and consistent data in turn makes it difficult for authorities to determine the extent and impact of residential fires, identify trends, and determine whether or not particular intervention activities are warranted or effective. Indeed, Commissioner Greg Mullins, President of AFAC explained one of the ways in which NSW uses data about fire incidents to target its home fire safety visits:

> We correlate our fire incident data with census data—socioeconomic status. We find there is a direct correlation, so we target those suburbs. When a fire occurs in a home, we find that is when the awareness is highest. So we letterbox drop and say, "Firefighters are going to come and visit." We find they are waiting with open arms and they say: "Please come in. What can we do?" The awareness is the highest straight after a fire. That is just human nature.[47]

Committee view

2.26 As discussed above, gaps in the data for smoke and fire-related incidents are undesirable for a number of reasons. The committee recognises that data on these matters will never be absolutely complete. Some of the gaps, for example, result from an individual's decision not to report a fire or seek treatment and may never be captured. However, access to accurate and up-to-date data on residential smoke and fire injuries, deaths, and associated property damage is fundamental to understanding and subsequently addressing the prevalence of residential fires in Australia.

2.27 The committee believes that data on the prevalence, cause and outcome of residential fires throughout Australia needs to improve, its collection made consistent across Australian jurisdictions and its access facilitated by a single data holding. Such

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45 AFAC, *Submission 5*, p. 2; Metropolitan Fire and Emergency Services Board (MFB), *Submission 4*, p. 4.

46 MFB, *Submission 4*, p. 4.

47 Commissioner Greg Mullins, President, AFAC, *Committee Hansard*, 4 December 2015, p. 11.

a resource would be invaluable to fire and emergency services and Australian governments, providing information to direct their efforts to reduce smoke and fire-related injuries, deaths and property damage.

2.28 With respect to data collection, the committee is of the view that fire and emergency services must be required to contribute data to a national database of residential fires. At a minimum, it should include the type of fire incident, the location of the incident, the source of the fire, details of fatalities and/or injuries, information about victims (for example age and gender), whether or not a smoke alarm was present and operating, and an estimate of the cost of any property damage. The committee understands that much of this information is already collected by state and territory fire services; the committee also notes that information such as this is collected in Great Britain.

2.29 The committee is also aware that Canada is about to establish a National Fire Information Database (NFID) to 'gather and unify 10 years of fire information from across the country and create Canada's first national system for collecting fire statistics' with the intention of linking fire data with other relevant datasets and initiating the creation of 'new evidence-based research related to fire, public safety, and security'.[48] The NFID is a collaboration between the Canadian Association of Fire Chiefs (CAFC) and the Council of Canadian Fire Marshals and Fire Commissioners (CCFMFC) with federal support from the Canadian Safety and Security Program. The national database will:

- Establish a single, central database about Canada's National Fire Experience.
- Standardize and improve data collection, methodology, and analysis.
- Link fire data with existing socioeconomic data sets including health, crime, education, housing, etc. to provide a level of public safety research and data that has never been seen before
- Provide Fire Marshals and Chief Fire Officers with evidence-based research they can use to provide policy and operational guidance that respond to trends that currently cannot be adequately identified.
- Enhance the ability of fire officials to understand incident dynamics, and actual and potential threats to public safety.
- Provide a valuable data source for in depth academic research that can be combined with incident observations and experiences to generate new knowledge in the public safety domain
- Enhance and ensure the ongoing safety of the public, Canada's firefighters and other first responders.[49]

48 Canadian Association of Fire Chiefs (CAFC), *National Fire Incident Database*, available: http://www.cafc.ca/?page=NFID (accessed 8 March 2016).

49 CAFC, *National Fire Incident Database*, available: http://www.cafc.ca/?page=NFID (accessed 8 March 2016).

2.30 The CAFC has said of the NFID:

> Without trusted evidence-based data, fire officials cannot act with confidence when making choices to improve policy, resource use, and other critical matters affecting the safety of Canadian communities. Moreover, fire officials are facing increasing pressure - from both the public and government decision makers - to justify their decisions and actions with hard data. While many departments are collecting data at the local level, no single jurisdiction, department, agency or organization can accomplish this alone at the national level. The NFID will bring consistency and relevance to the data that is collected, analyzed and used. It will enhance and ensure the ongoing safety of the public, Canada's firefighters and other first responders.[50]

2.31 The committee therefore recommends that Australian governments work collaboratively to establish a national database of residential fire incidents, including but not limited to:

- the type of fire incident;
- the location of the incident;
- the source of the fire;
- details of fatalities and/or injuries;
- information about victims;
- the presence and operation of smoke alarms at the site of the incident; and
- an estimate of the cost of any property damage.

2.32 The committee suggests that in developing a national database, Australian governments give consideration to other similar databases already in use, such as the Australian Ballistics Information Network (ABIN). The ABIN manages electronic ballistic information and links local and national incidents involving firearms, with input from all states and territories.[51]

Recommendation 1

2.33 The committee recommends that Australian governments collaboratively establish a national database of residential fire incidents and that state and territory fire and emergency services are adequately resourced to collect and report data to that national database.

2.34 The committee also believes there is merit in facilitating reporting of residential fire incidents by enabling members of the public to report these directly to through a national reporting and recording mechanism, in an effort to capture statistics on currently unreported incidents. The committee suggests that such a reporting

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50 CAFC, *National Fire Incident Database*, available: http://www.cafc.ca/?page=NFID (accessed 8 March 2016).

51 The Hon Michael Keenan MP, Minister for Justice, 'New national ballistics system for police to target firearm crime', Media Release, 21 May 2014.

mechanism is available online and also via the post and by telephone; it should also provide members of the public with information about fire safety in the home, details for local fire and emergency services, and contact details for support services including medical assistance and counselling.

2.35 The committee is aware that the success of a reporting mechanism would rely on educating people about it, its use and benefits, as well as ensuring that it is easy to use. Given that those at the highest risk of smoke and fire-related death and injury are often already vulnerable (for example older Australians and Australians with a disability), such a reporting mechanism should also be publicised throughout the community sector.

Recommendation 2

2.36 The committee recommends that Australian governments consider establishing a national residential fire reporting and recording mechanism to capture statistics of currently unreported residential fire incidents.

The impact of fire-related deaths and injuries

2.37 Smoke and fire related injuries and deaths can have life-long effects on victims, their family and friends, and the emergency personnel who attend the incident. They can also lead to serious and chronic physical and psychological injury requiring ongoing support and rehabilitation. The Logan House Fire Support Network (LHFSN) stated:

> Even with a non-fatal [the occupants] have lost all of their possessions – just the shock of it all as they try to get back on their feet. We clothe them but they look at themselves and realise it is not what they used to wear. Even that affects them psychologically. It is just the little things as they try to get back on their feet. We will certainly try to help them out with furniture, but it is that lounge that you sit on after a hard days work and then here is this stranger who has come along and given you another lounge, and it is just not yours. All of the psychological effects are ongoing.[52]

2.38 Similarly, Mr Keith Golinski, whose son suffered serious burns and lost his wife and all their children in a house fire, told the committee '[y]ou never get over it. Nobody does. You simply cannot dwell on that fact. You have a life to go on with and you have to complete it without them'.[53]

2.39 Commissioner Greg Mullins, President of AFAC, recalling one of the first fire fatalities he attended as a firefighter, stated:

> It is embedded in my memory. When we arrived, at about 4 am, flames were shooting from windows on two sides of the building and residents above the unit were trapped. We extinguished the flames—although that is

52 Mr Lou Naumovski, President, Logan House Fire Support Network (LHFSN), *Committee Hansard*, 26 October 2015, p. 7.

53 Mr Keith Golinski, *Committee Hansard*, 26 October 2015, p. 21.

> a short statement, but it was really difficult to do. When we made entry to a bedroom that was totally burnt out we found a charred body sitting on the edge of the bed. I can see it now and I will never forget the walking frame just out of reach in front of where the person was.
>
> The old lady would have been about the same age as my own grandmother. We found some photos of her with her obviously beloved grandchildren. People had heard screaming earlier in the night but said they did not want to interfere. Maybe if they had heard a smoke alarm go off they would have. I was horrified by what that lady went through and I lost a lot of sleep. In my nightmares I saw my own beautiful grandmother burning.[54]

2.40 In terms of treating fire-related injuries '…treatment of burns is not a one off intervention. Surviving burn injuries involves a lifetime of ongoing treatment and rehabilitation'.[55] The financial cost of treating burn injuries is also significant. In 2010, the House of Representatives Standing Committee on Health and Ageing heard that the true cost of burn injuries is hidden. Drawing on British research which suggested that the true cost of burn injuries is obscured, with one third arising from the acute hospital cost and two thirds attributed to rehabilitation and loss of income, it was estimated that the true cost of burn injuries could be as high as $197 million a year.[56] The MFB outlined the costs (in 2012) of treating a burns patient, not including the cost of follow-up procedures and post-hospital out-patient care and therapy: the average cost of acute hospital treatment for an adult burns patient was $71,056; the cost for a burns patient with 62 per cent total body surface area burn was $842,419.[57]

2.41 With regard to property damage and loss, the MFB also stated:

> Smoke and fire related damage…can result in a loss of possessions, essential documents and valuables. It may also result in a person living in a partially damaged home or being required to relocate to other accommodation for an extended period, resulting in additional (and unplanned) financial burdens. For people without contents and/or home insurance, and/or in socially or financially disadvantaged position, the immediate and long term costs of residential fire may be severe and potentially life changing.[58]

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54 Commissioner Greg Mullins, President, AFAC, *Committee Hansard*, 4 December 2015, p. 2.

55 House of Representatives Standing Committee on Health and Ageing, *Roundtable Forum on Burns Prevention*, 2010, p. 11.

56 AFAC, *Submission 5*, p. 3.

57 MFB, *Submission 4*, p. 5.

58 MFB, *Submission 4*, p. 5.

Susceptibility to fire-related deaths and injuries

2.42 Professor Ian Thomas and Emeritus Professor Dorothy Bruck advised the committee '[i]n considering improving the level of fire safety in our communities it is important to consider the people who actually die in fires now'.[59]

2.43 The committee heard evidence indicating that people made vulnerable by age or another factor are most likely to be victims of smoke and fire-related deaths and injuries. Victorian coronial data from January 1998 to February 2005 shows that more than half of adult fatalities in accidental domestic building fires were mentally ill.[60] The study also indicated that 75 per cent of victims had alcohol or drugs in their bloodstream.[61] The study by Professors Thomas and Bruck concluded that 'many of those currently killed (or injured) are vulnerable (or at-risk) because of their age, physical or mental condition, use of alcohol or other drugs (prescribed and non-prescribed) and other factors'.[62]

2.44 The MFB likewise stated that those at risk include '…those who are less likely to be able to install and maintain a working smoke alarm…[including] elderly and disabled persons, international students and workers, and people who are socially or financially disadvantaged – in other words, persons who are among the most vulnerable in our community'.[63] The MFB highlighted that people aged 0-4 or aged over 65, and those experiencing social or financial disadvantage, are at the greatest risk of dying as a result of being involved in a residential fire.[64]

2.45 The risk of death or injury as a result of fire faced by older Australians was also discussed by National Seniors Australia, which raised concerns for older Australians in residential facilities:

> In 2011, 170,000 Australians were living in a nursing home. That will increase significantly as the population ages. Three-quarters, or 77 per cent, were aged 80 and over. Fifty-seven per cent were aged 85 and over. They are our most vulnerable Australians. They have limited or no mobility. They are unable to get out of bed on their own, often, and sometimes require two staff to help them up. Some have cognitive impairment and have challenges, therefore, understanding instructions for a quick evacuation. At the best of times, we all know, nursing homes are notorious for their staffing shortages, particularly after hours.[65]

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59 Professor Ian Thomas and Emeritus Professor Dorothy Bruck, *Submission 17*, p. 13.

60 Professor Thomas and Professor Bruck, *Submission 17*, p. 10.

61 Professor Thomas and Professor Bruck, *Submission 17*, p. 10.

62 Professor Thomas and Professor Bruck, *Submission 17*, p. 13.

63 MFB, *Submission 4*, p. 2.

64 MFB, *Submission 4*, p. 3.

65 Ms Sarah Saunders, Deputy Chief Executive and General Manager, Public Affairs, National Seniors Australia, *Committee Hansard*, 26 October 2015, p. 17.

2.46 National Seniors Australia also expressed concerns for older Australians living independently,[66] while the MFB told the committee that people aged over 65 represented 50 per cent of all preventable residential fire fatalities in the Melbourne Metropolitan District between 2000 and 2010.[67]

2.47 Emergency Management Victoria (EMV) concluded that, in light of this, '[f]or an increasing number in the community, the presence (or not) of a smoke alarm alone will not be a sufficient intervention to promote, let alone guarantee, a successful fire safety outcome'.[68] Or, as the Australian Building Code Board (ABCB) concluded when considering amendments to the National Construction Code (NCC) requirements for smoke alarms in 2012, 'design and engineering solutions are only part of the answer'.[69]

66 Ms Suzanne Lawless, Policy Manager, National Seniors Australia, *Committee Hansard*, 26 October 2015, p. 17.

67 MFB, *Submission 4*, p. 7.

68 Emergency Management Victoria (EMV), *Submission 6*, p. 2.

69 Australian Building Codes Board (ABCB), *Final Regulation Impact Statement for Decision: Assessment of options for residential smoke alarms provisions in the National Construction Code*, October 2012, p. 25.

Chapter 3

Smoke alarms: what, where and whose responsibility?

3.1 Australia has experienced several fatal fire incidents in recent years, particularly in Queensland. In this context, the type, location and use of smoke alarms were a key focus throughout this inquiry. The committee heard a range of evidence about ionisation and photoelectric smoke alarms, including the different types of fires they are intended to detect; the cost of different types of smoke alarms; and where in residential properties smoke alarms ought to be positioned.

3.2 This chapter considers some of these issues, particularly:

- whether ionisation or photoelectric smoke alarms are most appropriate for residential use;
- where smoke alarms should be positioned in residential properties, and whether smoke alarms should be mandatory in sleeping areas; and
- who should have responsibility for ensuring smoke alarms are installed in residential properties and whether the current regulatory scheme needs to be amended.

Ionisation or photoelectric smoke alarms?

3.3 Both ionisation and photoelectric smoke alarms can be used in Australian residential properties under the Building Code of Australia (BCA) and Australian Standard (AS) 3786, except in the Northern Territory where only photoelectric alarms are permissible.

3.4 Ionisation and photoelectric smoke alarms detect smoke in different ways. Photoelectric alarms:

> use a light beam aimed through the detection chamber but away from a light sensor. When smoke enters the detection chamber it scatters the light beam allowing some light to reflect onto the sensor which activates the alarm.[1]

3.5 In contrast, ionisation alarms:

> …use a small amount of radioactive material positioned between two electrically charged plates. This ionises the air and allows a current to pass through the air between the plates. When smoke enters the detection chamber it reduces the current by disrupting the flow of ions between the plates. The smoke alarm detects the drop in current and activates the alarm.[2]

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1 Metropolitan Fire and Emergency Services Board (MFB), *Submission 4*, p. 6.

2 MFB, *Submission 4*, p. 6.

3.6 The most succinct description is that photoelectric smoke alarms 'see' smoke while ionisation smoke alarms 'smell' smoke.

3.7 A number of submitters and witnesses discussed the relative merits of both types of smoke alarm: a key point of contention was whether ionisation smoke alarms are the most appropriate for use in a residential setting, considering the most common house fire incidents.

3.8 Most fatal residential fires take place at night,[3] primarily between 8.00 pm and 8.00 am, and peaking between midnight and 4.00 am.[4] There are two stages of fire: smouldering and flaming. Smouldering fires 'represent a slow surface reaction between a solid fuel and oxygen in the air resulting in inefficient burning of the fuel', producing visible smoke of a large particle size.[5] Flaming fires result when heat transferred to the surface of a burning fuel forms combustible gases which mix with oxygen in the air and burn in a hot luminous region referred to as the flame, develop rapidly and produce fine particles of smoke;[6] The Fire Protection Association Australia (FPA) submitted that, '[g]iven the types of materials used in furnishings and floor coverings etc. and the likely ignition sources within a residential occupancy, the most likely fire type to be encountered whilst occupants are asleep is a smouldering fire producing visible smoke'.[7]

3.9 Commissioner Mullins of the Australasian Fire and Emergency Service Authorities Council (AFAC) stated that smouldering fires also present a significant risk to sleeping occupants, because they produce toxic smoke which inhibits a person's ability to wake up:

> …A smouldering fire is more lethal than a flaming fire…A flaming fire produces water vapour, a lot of carbon and soot and carbon monoxide and carbon dioxide. Carbon monoxide is toxic. I will explain that in a moment. Carbon dioxide can exclude oxygen and asphyxiate. It is about 10 parts CO2 to one part carbon monoxide in a flaming fire, because there is plenty of oxygen, so it combines to form CO2 instead of CO, so it is less toxic. But the heat and the fire travel, making it untenable very quickly.
>
> The smouldering fire produces about the same amounts of carbon monoxide and carbon dioxide. If a person is asleep and they breathe in carbon monoxide their sense of smell is dulled and they will not wake up to the smell of smoke…Carbon monoxide has more of an affinity to red blood cells, which transport oxygen around the body, than oxygen so it will push out the oxygen and bond with the red blood cells. People will go into a

3 South Australian Fire Service (SAFS), *Submission 1*, p. 2.

4 MFB, *Submission 4*, Attachment 1, *Essential Knowledge Basic Home Fire Safety Learning Resource*, p. 21.

5 Fire Protection Association Australia (FPA), *Submission 18*, p. 8.

6 FPA, *Submission 18*, p. 8.

7 FPA, *Submission 18*, p. 9.

> deeper sleep until they actually become unconscious and they will not wake up. They cannot wake up. They are actually unconscious.
>
> The amount of carbon monoxide in the bloodstream can lead to the muscles that are looking for oxygen to operate the cells in the muscles. The heart muscle will just give up, because there is not enough oxygen. It is very insidious…You cannot just give [the person] oxygen. There are not enough red blood cells available to take it on.[8]

3.10 The FPA agreed that the level of fire safety risk is highest when occupants are sleeping because 'human senses are dulled during sleep and response time to any fire that is likely to start is increased'.[9]

3.11 Several submitters made particular reference to the increased risk of fire 'flashover' in modern homes. Fire flashover describes the situation in which a room and its contents become so hot that it pyrolyses, meaning that flammable vapours are given off.[10] These flammable vapours, known as hydrocarbons, then ignite. AFAC stated:

> What we find these days is that typical furnishings…have polyurethane foam…[which] burns at a far higher heat than wood, cotton or anything else, so very high temperatures. So it heats up the room far more quickly, and even the paints we have on our walls have plastics in them, so they give off hydrocarbons. Our carpet is probably synthetic and gives off hydrocarbons very quickly; the wool would not have. So there is much quicker fire development…when it is in the smouldering phase is when you have to get the warning, because you might have two to three minutes to get out of the place. So you cannot have a smoke alarm and say, "When it's flaming, it'll get me out." It is all too late. By then it is too late.[11]

3.12 The Commonwealth Scientific and Industrial Research Organisation (CSIRO) likewise stated that:

> …much of the existing research is not reflective of the new materials used in modern housing construction and furnishings. Similarly, earlier research does not always reflect room configurations and open plan living areas found in contemporary Australian homes. On this basis, CSIRO would suggest Australia considers a review of existing research, addressing gaps in understanding of modern materials and construction techniques. New research should address detection technologies and the requirements for installation, including the quantity and location through the building.

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8 Commissioner Greg Mullins, President, Australasian Fire and Emergency Service Authorities Council (AFAC), *Committee Hansard*, 4 December 2015, pp 3-4.

9 FPA, *Submission 18*, p. 9.

10 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, pp 7-8.

11 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, pp 7-8.

3.13 The majority of submitters advocated for the use of photoelectric alarms over ionisation alarms in residential settings;[12] for example, the MFB stated that 'photoelectric alarms provide the best detection across a range of fire[s]'.[13] The committee heard that photoelectric alarms perform better where fires are smouldering,[14] and are generally less likely to produce false alarms,[15] particularly in and around kitchens and bathrooms.[16] Several witnesses called for a ban of ionisation smoke alarms.[17] The Logan House Fire Support Network (LHFSN) remarked:

> Ionisation alarms are not smoke alarms; they are flame detectors. Ban them and take them off the shelves. Mandate photoelectric smoke alarms to be installed in every bedroom and every hallway.[18]

3.14 The World Fire Safety Foundation (WFSF) was equally strident in its criticism:

> For almost 15 years, The World Fire Safety Foundation has warned that scientific evidence proves that ionisation smoke alarms are so defective that they should immediately be banned and recalled.[19]

3.15 AFAC stated:

> Research we have just recently conducted in New South Wales found that photoelectric alarms operated far more quickly than ionisation alarms for smouldering fires—sometimes tens of minutes, sometimes half an hour, sooner. In a flaming fire, ionisation alarms sometimes operated more quickly than a photoelectric alarm but the difference was seconds. We very clearly advocate only photoelectric alarms. My personal view is: ionisation alarms should be banned.[20]
>
> People have said that one [alarm technology] is good for flaming fires and one is good for smouldering. In my experience as a firefighter just about every fire I have ever been to started as a smouldering fire and went

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12 See, SAFS, *Submission 1*, p. 2; Mr Adrian Butler, Chairman and Co-Founder, The World Fire Safety Foundation (WFSF), *Committee Hansard*, 26 October 2015, pp 15-16; Logan House Fire Support Network (LHFSN), *Submission 25*, p. 4; Triple Z Electrical, *Submission 23*, p. 1; FST, *Submission 27*, p. 3; Mr Keith Golinski, *Committee Hansard*, 26 October 2015, p. 24.

13 MFB, *Submission 4*, p. 3.

14 Mr Neil Savery, General Manager, Australian Building Codes Board (ABCB), *Committee Hansard*, 4 December 2015, p. 42.

15 MFB, *Submission* 4, Attachment 3, Analysis of Preventable Fire Fatalities of Older People and People with Disabilities: Risk Reduction Advice for the Community Sector, p. 36.

16 FRNSW, *Submission 20*, p. 5.

17 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, p. 4; Mr Louie Naumovski, President, LHFSN, *Committee Hansard*, 26 October 2015, p. 3; and Mr Butler, WFSF, *Committee Hansard*, 26 October 2015, p. 12.

18 Mr Naumovski, LHFSN, *Committee Hansard*, 26 October 2015, p. 3.

19 Mr Butler, WFSF, *Committee Hansard*, 26 October 2015, p. 9.

20 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, p. 4.

> through a stage until it became a flaming fire. To say that they are equal and good for different circumstances is to me a fallacy, an absolute myth.[21]

3.16 AFAC concluded that ionisation alarms are still being used in Australia because they meet a 'flawed Australian standard testing regime'.[22]

3.17 The FPA disagreed with this view, stating that 'ionisation alarms are not defective and do not fail relevant Australian standards or international tests'.[23] It did, however, state that ionisation technology 'has a particular usage, which in many cases in residential is inappropriate'.[24] It recommended that:

> All residential buildings should be fitted with photoelectric smoke alarms in the first instance in order to treat the highest fire safety risk in residential buildings. Ionisation smoke alarms are effective in detecting fast-flaming fires that contribute to some of the fire risk in residential buildings, which would only be considered supplementary to photoelectric smoke alarms.[25]

3.18 Standards Australia (SA) stated that photoelectric smoke alarms are a good minimum measure for use in residential properties because they respond to a broad range of fires:

> I think the general push has been that, as a minimum—if you are going to put the very minimum that is required into your home—you should really use photoelectric, because that will cover a broad spectrum of fires. Very rarely in a house fire are we going to have a pure fuel. Very rarely in a fire in a house, even if I am burning methylated spirits, will the only thing that is going to burn be methylated spirits. Sooner or later, it will break out onto the carpet or, if it was a kitchen fire, into the kitchen cabinets and so on…sooner or later you are going to have secondary material, secondary fuel sources, that will burn with a visible smoke. That is why the standards committee took the position it did. Even in a fast-flaming fire scenario, the belief is that photoelectric is not that far behind because you are never going to have a pure fuel.
>
> …
>
> But—on the question of banning ionisation—ionisation could still be a useful tool as a device supplementary to that minimum requirement. Banning them outright, in our opinion, is not necessarily the answer to the problem. But picking the most appropriate technology, the most fit-for-purpose technology, for the application is the issue.[26]

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21 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, p. 3.

22 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, p. 11.

23 Mr Matthew Wright, Chief Technical Officer, Deputy Chief Executive Officer, FPA, *Committee Hansard*, 4 December 2015, p. 12.

24 Mr Chris Orr, Chair of Technical Committee FP002, Standards Australia (SA), *Committee Hansard*, 22 February 2016, p. 14.

25 Mr Wright, FPA, *Committee Hansard*, 4 December 2015, p. 12.

26 Mr Orr, SA, *Committee Hansard*, 22 February 2016, p. 6.

3.19 The Australian Building Codes Board (ABCB) disagreed with this evidence. It stated that 'there has been no independent peer reviewed, robust and verifiable evidence provided to it that would support the calls to ban ionisation smoke alarms'.[27] It also submitted that:

> Another issue we need to consider is the number of fires that are flaming and the number of fires that are smouldering. We do not have that evidence either. We do not actually know. We understand that photoelectric perform better with a smouldering fire. If you think about a hotel situation or a hospital or other type of care facility, the type of fire that might initiate in that type of environment probably would be a smouldering fire. But in your own home, we know from other evidence, the majority of fires start in kitchens. They are not, necessarily, going to be a smouldering fire[28]

3.20 The CSIRO, which provides the only facility for testing smoke alarms for Australian Standard accreditation, explained that it is difficult to compare the operation of ionisation and photoelectric smoke alarms. While both alarms must activate within a particular range of smoke obscuration (that is, how dense the smoke is and how much it obscures the air), photoelectric smoke detectors are measured using a photoelectric ruler,[29] and ionisation alarms are measured against a reference ionisation detector.[30] Put simply:

> It is the same test, just with a different requirement. We compare photoelectrics to an optical measuring device. Ionisations are measured to a reference ionisation measuring device. So we have two sets of reference instrumentation.[31]

3.21 The CSIRO explained:

> We do not report the results on time; they are reported on the level of the measuring instruments at the point that the detector goes into alarm. The time is irrelevant in that test criterion. What is reported is the reference instruments' reading at the time of operation.[32]

3.22 The CSIRO also emphasised that:

> The new standard…actually requires photoelectrics to perform to a flaming fire and ionisation to perform to a smouldering fire. I think it is a much better test regime; however, the new standard was published in 2014. It was adopted into the building code in May this year, and the building code

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27 Mr Savery, ABCB, *Committee Hansard*, 4 December 2015, p. 41.

28 Mr Matthew McDonald, Group Manager, ABCB, *Committee Hansard*, 4 December 2015, p. 46.

29 Mr Mark Burgess, Executive Manager of Services, Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Committee Hansard*, p. 37.

30 Mr Burgess, CSIRO, *Committee Hansard*, p. 37.

31 Mr Burgess, CSIRO, *Committee Hansard*, p. 41.

32 Mr Burgess, CSIRO, *Committee Hansard*, p. 39.

> would be required for the manufacturing community, so manufacturers have two years to retest all their current stock.[33]

Cost of smoke alarms

3.23 The committee heard evidence about the cost of photoelectric smoke alarms as opposed to ionisation alarms, and the impact this has on consumers' purchasing decisions. Mr Naumovski informed the committee that while photoelectric alarms have decreased in cost, ionisation alarms are still significantly cheaper.[34] He argued, however, that photoelectric alarms save money over time:

> …you can purchase a nine-volt ionisation alarm for $10, but you have to buy a nine-volt battery each year. So you have to pay about $6 or $7 each year—and you have got to try and remember to replace it, or, if it false alarms, you are going to disconnect it. At the end of the 10-year period, that nine-volt alarm has cost you about $80 or $90. You can buy a photoelectric 10-year—the best technology out there right now—for $50. You are actually saving money.[35]

3.24 Mr Keith Golinski submitted that, when compared with the costs associated with house fires, it could be of financial benefit to governments to provide smoke alarms free of charge:

> I believe that the photoelectrics cost $2.50 each to produce whereas ionisations cost $1.25 each to produce. The medical costs, insurance costs and human costs are astronomical now, so even providing a million smoke alarms would be a saving. Handing out smoke alarms would be a great way to save money. They are not an expensive item. It just seems so ridiculous that such an inexpensive item is not provided.[36]

3.25 In regards to regulating new housing construction, the Housing Industry Association (HIA) indicated that it would not object to the additional cost of photoelectric smoke alarms:

> …on any cost differential between photoelectric and ionisation we would happily concede that cost, given the issue we are talking about here. Again, given that the provision now is for smoke detectors to be hard-wired and also interconnected, the differences in the products themselves I suspect would be relatively negligible in the price of the home, if it is proven that that is what the ideal solution is.[37]

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33 Mr Burgess, CSIRO, p. 37.

34 Mr Naumovski , LHFSN, *Committee Hansard*, 26 October 2015, p. 5.

35 Mr Naumovski, LHFSN, *Committee Hansard*, 26 October 2015, p. 5.

36 Mr Golinski, *Committee Hansard*, 26 October 2015, p. 23.

37 Mr Greg Weller, National Director of Communications, Housing Industry Association (HIA), *Committee Hansard*, 4 December 2015, pp 33-34.

Location of smoke alarms

3.26 The BCA mandates the installation of smoke alarms in certain locations within a residential property, but not in bedrooms. Some states and territories do currently require smoke alarms to be installed in bedrooms in buildings of a particular classification, for example, existing Class 1b buildings in NSW,[38] and Class 1b 'budget accommodation' over two storeys high in QLD.[39]

3.27 The committee heard evidence suggesting that smoke alarms should be required in each bedroom of residential dwellings. Professors Thomas and Bruck conducted a study examining smoke alarms and the likelihood of them effectively notifying sleeping occupants of a smoke source. The study concluded:

> …the effective notification of occupants can only be achieved with smoke alarms in every room. Without them in every room the sound level in many locations is likely to be too low to achieve reliable notification, particularly of sleeping people but even of many people who are awake. This is generally the case with doors open but always the case with doors closed.
>
> …in dwellings early detection of smoke can only be achieved with smoke alarms in every room. The time to detection (given a particular smoke source) is shown to be influenced by closed doors, the room in which the fire occurs, the location (room or hallway) of the detector, the type of detector and the smoke alarm manufacturer but the time to detection is particularly influenced by the type and form of the material that is burning.
>
> Early detection **and** notification therefore requires interconnected smoke alarms in every room.[40]

3.28 Commissioner Mullins of AFAC likewise stated that he had attended fires where a person perished because the fire started in their own bedroom:

> …earlier this year in Campbelltown in Sydney we had a situation where a shiftworker was asleep in the morning and had the bedroom door closed. A fire started in a wardrobe. There was no smoke alarm in the bedroom. The fire got bigger. He slept through, and the smoke alarm in the hallway did not operate, because the smoke never reached it. He perished in that fire. We found that he had woken up, but it was too late.[41]

3.29 The FPA recommended that the BCA be amended to require alarms to be installed in sleeping areas,[42] or at least master bedrooms to improve occupant response to a fire.[43] The FPA stated that, assuming the household alarms are interconnected,

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38 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186A(3).

39 *Queensland Development Code Mandatory Part 2.1 Fire Safety in Budget Accommodation Buildings*, p. 7

40 Professor Ian Thomas and Professor Dorothy Bruck, *Submission 17*, p. 11.

41 Commissioner Mullins, AFAC, *Committee Hansard*, 4 December 2015, p. 4.

42 Mr Wright, FPA, *Committee Hansard*, 4 December 2015, p. 12.

43 FPA, *Submission 18,* p. 20.

this would mean that 'the occupants of the master bedroom (in a family situation, the parents) are effectively the fire warden, who could then assist others if possible'.[44]

3.30 The ABCB agreed that installing more smoke alarms in homes, and interconnecting them, could lead to a decrease in fire fatalities. However, in a 2012 Regulatory Impact Statement (RIS) the ABCB argued that this would not be an appropriate level of minimum regulation. The Board stated that the interconnection of smoke alarms in every room of every house 'may be represented as best practice. As the National Construction Code (NCC) is a minimum regulation document it may be of value to consider a range of options between the status quo and [that option]'.[45] It stated that the ABCB:

> …operates under an intergovernmental agreement…[and]must have regard to a number of key objectives contained within the intergovernmental agreement: establish codes and standards that are the minimum necessary to achieve its mission…provide regulations that are proportional to the issue so that the benefits to society are greater than the costs…ensure that the competitive effects of regulation have been considered; and encourage a reduced reliance on regulation.[46]

3.31 The ABCB also emphasised that changes to the NCC would not automatically apply to existing building stock in all jurisdictions, and that, '[w]ithout State and Territory adoption it is likely to contribute to approximately 1.9% of the overall building stock'.[47]

Committee view

3.32 As discussed earlier in this chapter, many submitters and witnesses advocated for ionisation smoke alarms to be banned in residential settings on the basis of their perceived inferiority to photoelectric smoke alarms.

3.33 Early in the inquiry, the committee shared this view. However, as the inquiry progressed, and the committee's understanding of the differences between ionisation and photoelectric smoke alarms grew, it refined its thinking on this matter.

3.34 The committee is convinced that multiple, interconnected smoke alarms should be mandatory in all residential properties and agrees that photoelectric smoke alarms should be used in preference to ionisation smoke alarms. However, the committee does not agree that ionisation smoke alarms should be banned: photoelectric and ionisation smoke alarms detect different fires in different ways and are therefore fit for purpose in particular locations. The committee is also wary about the implications of banning outright ionisation smoke alarms: the committee believes

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44 FPA, *Submission 18,* p. 12.

45 ABCB, *Final Regulation Impact Statement for Decision: Assessment of options for residential smoke alarm provisions in the National Construction Code*, October 2012, p. 11.

46 Mr Savery, ABCB, *Committee Hansard*, 4 December 2015, p. 40.

47 ABCB, *Final Regulation Impact Statement for Decision: Assessment of options for residential smoke alarm provisions in the National Construction Code*, October 2012, p. 11.

it would be a grave error to potentially leave Australian households with the impression that no smoke alarm is better than an ionisation smoke alarm.

3.35 Across Australia, the committee believes that installation and maintenance of smoke alarms must be improved. Approaches by Australian governments to date have not succeeded, if some of the recent fire tragedies are indicative, and something must be done to ensure that all Australian homes are fitted with appropriate and working smoke alarms. It seems to the committee that the lack of smoke alarms, either because they have never been installed or because they are not operational, continues to be a significant concern with respect to residential fires.

3.36 Before discussing in more detail possible changes, the committee acknowledges the complexity of the current regulatory scheme. It could be said that there are actually nine similar yet separate regulatory schemes: eight operating in each state and territory, and one operating in relation to all newly constructed dwellings subject to the operation of the NCC. Change will not necessarily be easy, however, the committee believes that reform is necessary and must be tackled.

3.37 Making any amendments to the scheme to give effect to the committee's proposals (and applying them to every residential property in Australia, regardless of a property's classification or age) will require the support and participation of all states and territories: a number of organisations are involved in developing and implementing smoke alarm regulatory measures, and each state and territory has its own legislation dealing with smoke alarms. At present, the NCC has been adopted by each state and territory, but the agreement operates only in relation to new building stock. Many states and territories have extended some of the regulations to existing building stock, but the rules vary between building types, and between jurisdictions (see chapter 1). In this regard, the committee acknowledges comments by the ABCB that amending the NCC will not mean that improvements automatically apply to existing building stock, as well as its argument that some approach better than the status quo but not as ambitious as best practice should be attempted. The committee agrees with the first part of this statement but does not believe the challenge is insurmountable; the committee rejects the second part: Australia should undertake steps to achieve best practice for smoke alarms in residential settings.

3.38 In the committee's opinion, the following steps should be taken:

- the installation of interconnected, and preferably mains powered, photoelectric smoke alarms supplemented where appropriate by ionisation smoke alarms should be mandated for every residential property irrespective of classification or age;
- photoelectric and ionisation smoke alarms should be sited in appropriate locations within every residential property; that is, ionisation smoke alarms should be installed in locations where fast, hot fires are most likely to occur while photoelectric smoke alarms should be installed in locations where smouldering fires are most likely; and

- the current regulatory scheme, with the agreement and input of all Australian jurisdictions, must be amended to require the installation and maintenance of smoke alarms as outlined above.

3.39 The committee therefore recommends that the NCC (incorporating the BCA) is amended to require the installation of interconnected, and preferably mains powered, photoelectric smoke alarms, supplemented where appropriate by ionisation smoke alarms, in every residential property and specify the type of smoke alarm that must be used at different locations within each residential property, taking into account the different smoke detection properties of photoelectric and ionisation smoke alarms. To give effect to this change, the committee recommends that all state and territory governments adopt the amended NCC and agree to apply it to all residential properties, both new and old, and irrespective of the age of the property.

Recommendation 3

3.40 The committee recommends that the National Construction Code is amended to require the installation of interconnected, and preferably mains powered, photoelectric smoke alarms, supplemented where appropriate by ionisation smoke alarms, in every residential property and specify the type of smoke alarm to be used at different locations within each residential property, taking into account the different smoke detection properties of photoelectric and ionisation smoke alarms.

Recommendation 4

3.41 The committee recommends, to give effect to Recommendation 3, that all state and territory governments adopt the amended National Construction Code and agree to apply it to all residential properties, irrespective of the age of a property.

3.42 In some jurisdictions, the point at which a property is sold, tenanted or hired triggers the requirement that compliant smoke alarms be installed.[48] These are logical points at which a property's smoke alarms could be checked for compliance, given that they already typically involve scrutiny of the building's state of repair. Checking smoke alarms when properties are going to be rented or hired would help to ensure that occupants who may be unfamiliar with the property, or even with household fire safety, are living in a safe and compliant dwelling. It would also benefit building owners by ensuring that properties do not sit for extended periods of time with smoke alarms potentially having been disconnected or not maintained.

Recommendation 5

3.43 The committee recommends that all states and territories implement mandatory compliance checks of smoke alarms in residential properties whenever a property is sold, tenanted or hired.

48 See, *Fire and Emergency Regulations* (NT); *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS); and *Building Regulations 2012* (WA).

3.44 It is apparent that the inconsistency between jurisdictions and the lack of clear and simple information about smoke alarms from a known, trusted and centralised source means many people are currently unaware of their rights and responsibilities with regards to home fire safety.

3.45 The committee received the coronial findings from a devastating Victorian house fire which resulted in the deaths of three men in 2008,[49] which the committee regards as being particularly illustrative of this problem. This case involved a property that had been rented for some time, between different real estate agencies and without any direct landlord involvement, and where no person could definitively state whether any smoke alarms had been installed in the property and, if they had, whether or not the alarms had been maintained.[50] Coroner White stated that he was 'surprised by the lack of precise knowledge of the landlords as to the state of repair of a device so fundamental to the future safety of their tenants as a smoke detector'.[51] One of the surviving tenants stated that he had not even been sure of what a smoke detector looked like until the police showed him pictures of them on the internet.[52] Another tenant stated that they were not typically installed in his home country, so he was not familiar with them, nor was he aware that they would normally be fitted inside a house.[53] The Coroner commented that in Victoria:

> There is no specific section or regulation that specifies who is responsible for the maintenance and testing of smoke detector (sic) in a rented residence. The answer lies in the convoluted interrelationship between statute, common law and contractual principles.[54]

3.46 He recommended that:

- Victorian law be amended to ensure that all properties be fitted with hard-wired smoke alarms which have a 10 year tamper-proof battery as a backup, on every floor of every residence, regardless of the residence's age;[55]
- Victorian law be amended to clarify who bears responsibility for maintaining and testing smoke alarms;[56] and

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49 Metropolitan Fire and Emergency Services Board (MFB), *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest,* COR 2008/0041 – 0043.

50 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 - 0043, p. 11.

51 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 - 0043, p. 12.

52 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 – 0043, p. 12.

53 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 – 0043, p. 13.

54 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 – 0043, p. 14.

55 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 – 0043, p. 24.

- information be disseminated to landlords, real estate agents and property managers as to the installation and maintenance of smoke alarms.[57]

3.47 These findings, and the other fatal fires discussed in this report, demonstrate how serious the consequences can be when no person connected with a dwelling knows whether smoke alarms have been installed in a property, or has responsibility for maintaining them.

3.48 In addition to the proposal to amend the NCC, the committee believes it is vital to educate the public about the differences between smoke alarm technologies, the benefits associated with the installation of smoke alarms with different smoke detection properties in different locations, and the importance of regular smoke alarm testing and maintenance. The committee is also of the view that it is preferable to improve rates of installation and maintenance of smoke alarms in residential properties via public education as opposed to enforcement, which is likely to be a time-consuming and costly undertaking for state and territory governments.

3.49 The committee recommends that Australian governments develop and implement, in consultation with fire and emergency services, a package of measures to educate Australians about the importance of smoke alarms and the rules applying to smoke alarms in residential properties in each jurisdiction. The package should be promoted widely and include a website with clear information available in a variety of languages as well as resources to be used by stakeholders such as real estate agents, community organisations and fire and emergency services when engaging with members of the public.

Recommendation 6

3.50 The committee recommends that the Commonwealth, state and territory governments develop and implement a package of measures, including but not limited to a website and resources for key stakeholders, to educate Australians about:

- **different types of smoke alarms;**
- **the benefits associated with installing smoke alarms with different smoke detection properties in particular locations within a property;**
- **the smoke alarm requirements that apply to residential properties in each jurisdiction;**
- **the importance of regular smoke alarm testing and maintenance;**
- **who has responsibility for installing and maintaining smoke alarms, and advice about how to do this or seek assistance to do so; and**

56 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 – 0043, p. 24.

57 MFB, *Submission 4*, Attachments 4-6, *Findings into Death Without Inquest*, COR 2008/0041 – 0043, p. 25.

- **the triggers for compliance checking of smoke alarms (for example at time of sale, tenancy or hire).**

3.51 In the event that Australian governments are not amenable to amending the NCC, an alternative could be for Australian governments to subsidise (or fund completely) the installation of smoke alarms in residential dwellings across Australia, with a particular focus on vulnerable populations, and including advice with regards to smoke alarm placement. A nation-wide smoke alarm installation scheme would be a significant undertaking. It would require careful planning, consultation with fire authorities and experts, and the cooperation of the Commonwealth, state and territory governments in order to succeed. It would also be prudent to consult with public and community housing providers, and the real estate agency industry, in terms of rolling out the scheme in rental properties.

3.52 Ideally, such a scheme would ensure occupants have early warning of smoke, giving them more time to escape and contact emergency services, and thereby reducing the risk of injury and death, as well as damage to their home and other possessions. It would also be of significant value to the community as a whole. As the committee heard, it is the most vulnerable members of the community who are currently dying in house fires, a worrying trend that needs to be addressed.

Recommendation 7

3.53 In the event Australian governments are unwilling to amend the National Construction Code and apply it to all building stock irrespective of classification and age, the committee recommends that they consider implementing a nation-wide smoke alarm household installation scheme that includes consultation with:

- **fire and emergency services, housing providers and the real estate agency industry; and**
- **individuals and organisations working with vulnerable members of the community.**

Senator Glenn Lazarus
Chair

Additional Comments from Government Senators

1.1 Government Senators were not involved in the conduct of the Committee's inquiry into the Use of Smoke Alarms to Prevent Smoke and Fire Related Death ('the inquiry') as Senators were engaged on other Senate work and were unable to attend hearings. We note however the Hansard evidence of witnesses at hearings and have the benefit of written submissions. We have also reviewed the Committee Chair's Inquiry report ('the Chair's report').

1.2 The Chair's report is focused on legislative and regulatory instruments that relate to fire-detection. Government members of the committee note that almost without exception these instruments operate in state and territory jurisdictions and are not within the remit of the Commonwealth Government.

1.3 State and territory mechanisms relating to building codes do, however, intersect with the commonwealth oversight function of the Australian Building Codes Board ('the ABCB') through the application of the National Construction Code ('the NCC'). The Government members of the Committee note that the preservation of the life and safety of building occupants is a core objective of the NCC.

1.4 The Commonwealth does not have a position in relation to smoke alarms as it is a state and territory issue. Advice received by Government members of the Committee indicates that the ABCB is not currently considering any amendments to the NCC in relation to smoke alarms.

1.5 Government members remain uncertain as to why the inquiry was conducted by the Legal and Constitutional Affairs Legislation Committee when, were the issue a matter for the federal as opposed to state parliaments, this issue would have been better investigated by the Senate Economics Committee which covers the Industry portfolio.

1.6 The Chair's report offers a number of recommendations, some of which address the scope and operation of the NCC, to which Government members of the Committee offer the following remarks.

1.7 Recommendation One and Recommendation Two call for the creation of a national database of residential fire incidents and a national scheme for the reporting of fire incidents. Government Senators do not disagree with the principle of collecting and collating national data and statistics around residential fire incidents however would note that the architecture of this scheme remains unclear, in particular how this scheme would be administrated and funded. Government members of the Committee would caution against proposals that create superfluous regulatory entities that detract resources from the development of fire-prevention practices, and the actual management of fire incidents.

1.8 Recommendation Three calls for the NCC to be amended to require installation of interconnected photoelectric smoke alarms, and specify the locations and types of smoke alarms, in residential premises. It is the view of Government members that the costs in time and money of developing and deploying such a scheme, and of retro-fitting individual properties, could be prohibitive. The agreement

of all states and territories would also be necessary for the effective creation of any such national scheme.

1.9 Recommendation Four calls for state and territory governments to adopt the NCC in order to give effect to Recommendation Three. Government members suspect that each state and territory government will have its own views about the scope of building code regulation. Government members are not convinced that state and territory governments would be easily persuaded to accept an additional layer of Commonwealth oversight as a desirable outcome.

1.10 Recommendation Five calls for the introduction of mandatory compliance checks for smoke alarms. Government members would again note that the law relating to residential tenancy and residential property transfer falls within state and territory jurisdictions.

1.11 Recommendation Six calls for the creation of a website, and other stakeholder resources, to promote awareness and education around residential fire-prevention. Government members of the committee support the spirit of this recommendation.

1.12 Recommendation Seven calls for a nationwide smoke alarm consultation scheme to be implemented. Government members note that this recommendation is vague and ambiguous: the recommendation identifies the participants in the scheme but offers little regarding the operation or, indeed, the purpose of the scheme. The Commonwealth does not currently operate a website on this subject due to smoke alarms and building codes being principally a matter for state and territory governments.

Senator the Hon Ian Macdonald
Deputy Chair

Senator Dean Smith
Senator for Western Australia

Appendix 1

Public submissions

1 South Australian Fire Services

2 CSIRO

3 WALGA

4 Metropolitan Fire & Emergency Services Board

5 Australasian Fire and Emergency Service Authorities Council (AFAC)

6 Emergency Management Victoria (EMV)

7 National Seniors Australia

8 Standards Australia

9 Mr John Fitzpatrick

10 Mr Joachim Wangerek

11 Mr Michael Sobb

12 Mr Ralph and Mrs Shirley Doughty

13 Ms Susan Cross

14 Ms Jan Allen

15 Confidential

16 Mr John Taylor

17 Mr Ian Thomas and Emeritus Professor Dorothy Bruck

18 Fire Protection Association Australia

19 National Fire Industry Association

20 Fire & Rescue NSW

21 Australian Building Codes Board

22 Housing Industry Association Ltd

23 Triple.Z Electrical

24 Mr Peter Conroy

25 Logan House Fire Support Network

26 Solution Strategists Pty Ltd

27 Fire & Safety Technologies Pty

28 The World Fire Safety Foundation

29 60 Minutes

30 Confidential

31 Confidential

Tabled documents

1 Golinski family photo provided at the public hearing on 26 October 2015

2 Photos of Golinski home after fire provided at the public hearing on 26 October 2015

3 Mr Golinski's opening statement provided at the public hearing on 26 October 2015

4 Golinski family photo prayer provided at the public hearing on 26 October 2015

5 Video provided by representatives of the Australasian Fire and Emergency Service Authorities Council (AFAC) and published by Fire and Rescue NSW. Received at the public hearing on 4 December 2015

Answers to questions on notice

1 Australian Building Codes Board - Answer to question on notice from public hearing 4 December 2015 (received 17 December 2015)

Appendix 2

Public hearings and witnesses

Monday 26 October 2015—Brisbane

BUTLER, Mr Adrian, Chairman and Co-Founder, The World Fire Safety Foundation

GOLINSKI, Mr Keith John, Private capacity

LAWLESS, Ms Suzanne, Policy Manager, National Seniors Australia

MURPHY, Mr Cameron Andrew, Manager Regulatory Services, Queensland Building and Construction Commission

NAUMOVSKI, Mr Louie, President, Logan House Fire Support Network

SAUNDERS, Ms Sarah, Deputy Chief Executive and General Manager, Public Affairs, National Seniors Australia

Friday 4 December 2015—Canberra

ASHE, Dr Brian Samuel William, Director, Australian Building Codes Board

BURGESS, Mr Mark, Executive Manager, Commonwealth Scientific and Industrial Research Organisation Services, Commonwealth Scientific and Industrial Research Organisation

COATE, Ms Carmel, Executive Director, National Fire Industry Association

DALRYMPLE, Mr Adam, Assistant Chief Fire Officer, Director of Fire Safety, Metropolitan Fire and Emergency Services Board

HARDING, Mr Mike, National Manager, Building Codes and Standards, Housing Industry Association

ISAAC, Mr David Paul, Managing Director, Fire and Safety Technologies Pty Ltd

LOVERIDGE, Mr Raymond William, Director, Australian Building Codes Board

McDONALD, Mr Matthew, Group Manager, Australian Building Codes Board

MULLINS, Commissioner Greg, President, Australasian Fire and Emergency Service Authorities Council

ORR, Mr Christopher Charles, Technical Director, Fire Protection Association Australia

SAVERY, Mr Neil, General Manager, Australian Building Codes Board

WELLER, Mr Greg, National Director, Communications, Housing Industry Association

WRIGHT, Mr Matthew, Chief Technical Officer, Deputy Chief Executive Officer, Fire Protection Association Australia

YAXLEY, Mr Julian, Manager, Economics and Strategic Projects, Metropolitan Fire and Emergency Services Board

ZIPPER, Dr Marcus, Director, Commonwealth Scientific and Industrial Research Organisation Services, Commonwealth Scientific and Industrial Research Organisation

Monday 22 February 2016—Canberra

ORR, Mr Christopher Charles, Chair, Technical Committee FP002, Fire Detection, Warning, Control and Intercom Systems, Standards Australia

STINGEMORE, Mr Adam, General Manager, Stakeholder Engagement and Public Affairs, Standards Australia

Appendix 3

Further smoke alarm requirements for building classes pursuant to the NCC

Requirements for building classes	**1a**	**1b**	**2**	**3**	**4**
Smoke alarms must be installed: • (on a storey containing bedrooms), located between each part of the dwelling containing bedrooms and the remainder of the dwelling, and the hallway to the bedrooms; and • in any other storey not containing bedrooms.[1]	√	√			
A system of lighting must be installed consisting of a light incorporated within the smoke alarm, or lighting in the hallway or corridor or area served by the smoke alarm.[2]		√			
Smoke alarms must be installed: • (on every storey containing bedrooms) between each part of the unit containing bedrooms and the remainder of the unit, and any hallway servicing bedrooms; • in storeys with no bedroom alarms must be installed in egress paths Where the building itself has no sprinkler system alarms complying with AS 1670.1, alarms must be installed in public corridors and other internal public spaces, and connected to an occupant warning system.[3]			√	√	√
In areas where the use of the areas is likely to result in spurious signals (e.g. a kitchen), any other alarm deemed suitable in accordance with AS 1670.1 may be installed as long as alarms are installed elsewhere in the sole occupancy unit. An alarm acknowledgement facility may alternatively be used in these areas. If the area in question has sprinklers the alarms need not be installed in that area.[4]			√	√	√

1 Australian Building Codes Board (ABCB), *NCC*, vol. 2, part 3.7.2.

2 ABCB, *NCC*, vol. 2, part 3.7.2.

3 ABCB, *NCC*, vol. 2, part 3.7.2.

4 ABCB, *NCC*, vol. 2, part 3.7.2.

Requirements for building classes	**1a**	**1b**	**2**	**3**	**4**
Outside the sole occupancy unit area, a smoke detection system may also be installed. If installed, the system must comply with parts of AS 1670.1 and activate a building occupant warning system.[5]			√	√	√
A combination of both smoke alarms in the sole occupancy unit area, and a smoke detection system not within the sole occupancy unit area is also permissible.[6]			√	√	√
Where the class 3 part of a building is located more than two storeys above ground, or accommodated more than 20 people and is used as a residential part of a school or accommodation for the aged, children or people with a disability, a smoke alarm detection system must be provided.[7]				√	

5 ABCB, *NCC*, vol. 2, part 3.7.2.

6 ABCB, *NCC*, vol. 2, part 3.7.2.

7 ABCB, *NCC*, vol. 2, part 3.7.2.

Appendix 4

Detailed requirements for smoke alarms in existing buildings (constructed prior to the NCC)

Requirement for existing buildings	Options	Jurisdiction
Type and installation		
Compliance with AS 3786	AS 3786-1993 as published from time to time	ACT[1] NSW[2] SA[3] TAS[4] VIC[5] WA[6]
	AS 3786-1993	QLD[7]
	No year or edition specified	NT[8]
Interconnection of multiple alarms	Interconnection required because smoke alarms must be installed in accordance with the BCA	ACT[9] NT[10] SA[11]
	Interconnection required in Class 2 buildings, and the common areas of Class 1b buildings, but not required in Class 1a buildings	QLD[12]
	Interconnection only required where a building permit for the construction, erection, assembly or placement of the dwellings was granted after 1 May 2015	WA[13]
	Not specified	NSW TAS VIC

1 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b).

2 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(1).

3 *Development Regulations 2008* (SA), reg. 76B(1).

4 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 6.

5 *Building Regulations 2006* (VIC), reg. 707.

6 *Building Regulations 2012* (WA), reg. 60(2).

7 *Fire and Emergency Services Act 1990* (QLD), s. 104RB(2).

8 *Fire and Emergency Regulations* (NT), reg. 13A(3).

9 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b).

10 *Fire and Emergency Regulations* (NT), reg. 13B.

11 *Development Regulations 2008* (SA), reg. 76B.

12 *Fire and Emergency Services Act 1990* (QLD), s. 104RB.

13 *Building Regulations 2012* (WA), reg. 60(4).

Requirement for existing buildings	Options	Jurisdiction
Type and installation		
Specific type of smoke alarm	Photoelectric	NT[14]
	Ionisation	None
	Not specified	ACT NSW QLD SA TAS VIC WA
Power source	Not specified	NSW (class 1a and 2)
	Replaceable battery, 10 year non-removable battery or hard-wired (or not specified meaning that any of these options may be used)	TAS (pre May 2016)[15] VIC (building class 1a and 2)[16]
	10 year non-removable battery or hard-wired	ACT[17] NSW (class 1b and 3)[18] NT[19] QLD[20] SA[21] TAS (post May 2016)[22] VIC (class 1b and 3 only)[23] WA[24]

14 *Fire and Emergency Regulations* (NT), reg. 13A(3).

15 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 7.

16 *Building Regulations 2006* (VIC), reg. 707; Victorian Building Authority Practice Note 2006-27.

17 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(B).

18 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(2).

19 *Fire and Emergency Regulations* (NT), reg. 13A(3).

20 *Fire and Emergency Services Act 1990* (QLD), s. 104RB.

21 *Development Regulations 2008* (SA), reg. 76B.

22 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 8.

23 *Building Regulations 2006* (VIC), reg. 709.

24 *Building Regulations 2012* (WA), reg. 60(2).

Requirement for existing buildings	Options	Jurisdiction
Type and installation		
Location requirement	References BCA requirements	ACT[25] NT[26] QLD (Classes 1a and 2)[27] SA[28] WA[29]
	Similar to BCA requirements	NSW[30] TAS[31]
	Different to BCA requirements	QLD (class 1b)[32] VIC[33]
Specifically states that the smoke alarm must be functioning/ working?	Yes	NSW[34] NT (where tenanted or hired)[35] TAS[36] WA[37]
	No	ACT NT (for owner occupied) QLD SA VIC

25 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b).

26 *Fire and Emergency Regulations* (NT), reg. 13B.

27 *Fire and Emergency Services Act 1990* (QLD), s. 104RB(2).

28 *Development Regulations 2008* (SA), reg. 76B.

29 *Building Regulations 2012* (WA), reg. 60.

30 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186A.

31 *Residential Tenancy (Smoke Alarms) regulations 2012* (TAS), regulations 9-13.

32 *Queensland Development Code Mandatory Part 2.1 Fire Safety in Budget Accommodation Buildings*, p. 7.

33 See, *Victorian Building Authority Practice Note 2006-27*.

34 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(1).

35 *Fire and Emergency Regulations* (NT), reg. 13D.

36 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), regulations 17-19.

37 *Building Regulations 2012* (WA), reg. 60(2)(c).

Requirement for existing buildings	Options	Jurisdiction
Type and installation		
Is an existing smoke alarm deemed to meet the current requirements?	Yes	NSW (class 1a 2 or 4)[38] NT (ionisation alarm specified)[39] TAS (if meets AS 3786-1993)[40] WA[41]
	Not specified	ACT QLD SA VIC
Do the requirement apply to all existing buildings?	Yes	NSW NT QLD SA VIC
	Only buildings which have been substantially altered	ACT[42]
	Only tenanted premises	TAS[43]
	Only premises which is being sold, tenanted or hired	WA[44]

38 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(5).

39 *Fire and Emergency Regulations* (NT), reg. 13A(2).

40 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 6(2).

41 *Building Regulations 2012* (WA), reg. 60.

42 *Building Act 2004* (ACT), s. 42(1); *Building (General) Regulation 2008* (ACT), reg. 24(1)(b).

43 See, *Residential Tenancy Act 1997* (TAS); *Residential Tenancy (Smoke Alarms) regulations 2012* (TAS).

44 *Building Regulations 2012* (WA), regulations 56-59.

Requirement for existing buildings	Options	Jurisdiction
Type and installation		
Owner responsible for installing smoke alarms?	Specifically stated	NSW[45] NT[46] QLD[47] TAS[48] VIC[49] WA[50]
	If a smoke alarm is not installed in a building the owner is guilty of an offence	SA[51]
	Not specifically stated	ACT
Requirements for maintenance?	In a tenanted property, if the smoke alarms were installed, and regarded as a property 'fitting', a landlord would need to ensure they were in a reasonable state of repair	ACT[52] NSW[53] SA[54]
	Yes, on the part of the owner at certain times	TAS[55]
	Yes, on the part of a tenant at certain times	TAS[56]
Triggers		
Commencement of a tenancy agreement triggers requirements	Yes	NT[57] TAS[58] WA[59]
	Not specified and therefore no	ACT NSW QLD SA VIC

45 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186A.

46 *Fire and Emergency Regulations* (NT), reg. 13A(1).

47 *Fire and Emergency Services Act 1990* (QLD), s. 104RB(1).

48 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), regulations 17-19.

49 *Building Regulations 2006* (VIC), reg. 707(4), 709(8).

50 *Building Regulations 2012* (WA), regulations 56-59.

51 *Development Regulations 2008* (SA), reg. 76B(4).

52 *Residential Tenancies Act 1997* (ACT), Standard Residential Tenancy Terms, 54(1).

53 *Residential Tenancies Act 2010* (NSW), s. 62.

54 *Residential Tenancies Act 1995* (SA), s. 68.

55 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), regulations 17-19.

56 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), regulations 22-23.

57 *Fire and Emergency Regulations* (NT), reg. 13D.

58 *Residential Tenancy (Smoke Alarms) Regulations 2012* (TAS), reg. 17.

59 *Building Regulations 2012* (WA), reg. 58.

Requirement for existing buildings	Options	Jurisdiction
Triggers		
Sale of building triggers requirements	Yes	NT[60] SA[61] WA[62]
	Not specified and therefore no	ACT NSW QLD TAS VIC
Hire of building triggers requirements	Yes	NT[63] WA[64]
	Not specified and therefore no	ACT NSW QLD SA TAS VIC
Does removal of existing smoke alarms or their ceasing to function trigger requirements?	Yes	NSW[65] NT[66]
	Not specified and therefore no	ACT QLD SA TAS VIC WA

60 *Fire and Emergency Regulations* (NT), reg. 13A(2)(b).

61 *Development Regulations 2008* (SA), reg. 76B(3).

62 *Building Regulations 2012* (WA), reg. 56.

63 *Fire and Emergency Regulations* (NT), reg. 13D.

64 *Building Regulations 2012* (WA), reg. 59.

65 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186B(5).

66 *Fire and Emergency Regulations* (NT), regulations 13C-13D.

Requirement for existing buildings	Options	Jurisdiction
Penalties		
Penalties in place for removal or interference with smoke alarms	Yes	NSW[67] NT[68] QLD[69] SA[70] TAS[71]
	No	ACT VIC WA

67 *Environmental Planning and Assessment Regulation 2000* (NSW), reg. 186C; *Environmental Planning and Assessment Act 1979* (NSW), s. 125.

68 *Fire and Emergency Regulations* (NT), reg. 13G.

69 *Fire and Emergency Services Act 1990* (QLD), s. 104RH.

70 *Residential Tenancy Act 1997* (SA), s 36F.

71 *Residential Tenancy Act 1997* (TAS), s. 36F(1).