

Television Technology and Market Assessment

March 2025

Report prepared for the Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Authors: Prof Ramon Lobato, John Wallace, Ashleigh Dharmawardhana, Dr Alexa Scarlata, Dr Daniel Featherstone



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Glossary

Television terminology

Television set (TV)	An electronic device that can receive terrestrial radio frequency broadcasts of video and audio content and display that content on its screen. This report uses <i>television</i> to refer to the medium of television and <i>TV</i> to refer to the device.
Non-internet-connected TV	A TV that can only be used to watch terrestrial television broadcasts. It does not contain a central processing unit, or application software, that enables the user to stream internet content on their TV.
Smart TV:	A TV that has a central processor (i.e., an internal computer) that enables it to run an operating system and a range of different application software, including software designed to stream video and audio content over a connection to the internet.
Operating system (OS):	The software run by the central processing unit of a smart TV to manage all of the hardware and software in the TV and enable it to perform its functions (e.g., Android TV, Google TV).
Application software (apps)	Software other than the operating system of a smart TV that enables the end-user to perform specific functions on a smart TV.

Connected television device terminology

Connected TV (CTV) device	An electronic device that, when connected to a TV, augments the capability of the TV so it can receive terrestrial broadcast or internet content. Examples include media streaming devices, streaming-capable games consoles, pay-TV set-top boxes, and VAST set-top boxes.
Game console	A device for playing video games (e.g., PlayStation, Xbox). When connected to a TV, enables the user to connect a TV to play online games and use other online video services.
Media streaming device	A type of CTV device that enables users to stream internet content on their TVs (e.g., Google TV, Apple TV, Amazon Fire TV) and/or mirror content from smartphones, tablets, and computers (e.g., Chromecast).
Pay-TV set-top box	A CTV device that enables users to receive pay-TV transmissions and stream internet content on their televisions (e.g., Foxtel iQ, Hubbl, Fetch set-top boxes).
VAST set-top box	A CTV device that enables users to receive, decode and display Viewer Access Satellite Television (VAST) broadcasts on their TVs.

Technical specifications and capabilities of televisions and connected television devices

Capabilities	The ability of each device to perform particular functions of interest to the consumer, such as stream content or receive DVB-T2 broadcasts. Capability statements reduce the need for advertisers to explain, and for consumers to understand, the necessary combinations of detailed technical specifications required for a device to perform the particular functions that are of interest to consumers.
Technical specifications	A detailed description of the electronic performance of each of the key component parts of a TV or CTV device. Technical specifications are published online by manufacturers and retailers.
Device lifespan	The period (in years) between device acquisition and disposal.
Internet of Things (IoT)	A generic term used to describe the rapidly expanding range of electronic devices that have been designed to connect to the internet and exchange data with other connected devices.
Content terminology	
Broadcast content	Video and audio content distributed by terrestrial radio frequency TV broadcasts.
BVOD	A broadcast video-on-demand service that allows the user to access free broadcast content over the internet (e.g., ABC iview, SBS On Demand, 7Plus, 9Now, 10Play).
Free-to-air (FTA)	Free television programs broadcast on standard public or commercial networks.
Internet content	Video and audio content distributed over the internet. May include streaming content from SVODs and BVODs.
Pay TV	A subscription-based service that supplies video and audio content to users via cable, satellite and internet TV (i.e., streaming over the internet).
Streaming	A method of transmitting or receiving video and/or audio content over the internet.
SVOD	A subscription video-on-demand service that allows the user to access video content over the internet via subscription payment (e.g., Netflix, Stan, Disney+).

Transmission terminology

Transmission technology	The different systems and hardware used to distribute (i.e., broadcast or stream) analogue and digital video and audio content.
DVB-T2 broadcasts	Digital terrestrial broadcasts that require DVB-T2-capable TVs (or CTV devices) to receive, as well as appropriate software to decode (e.g., HEVC and MPEG-4 codecs).
DVB-T2-capable	Capable of receiving second-generation Digital Video Broadcasting - Terrestrial (DVB-T2) broadcasts.

Television receiver (tuner) terminology

DVB-S2 tuner	An RF tuner capable of receiving the second-generation Digital Video Broadcasting by Satellite broadcasts (DVB-S2), as defined by the European Standard EN 302 307-1.
DVB-T tuner	An RF tuner capable of receiving terrestrial broadcasts consistent with the Digital Video Broadcasting – Terrestrial (DVB-T) standard. Note: Australia has recently adopted an updated DVB-T2 standard (see below).
DVB-T2 tuner	An RF tuner capable of receiving second-generation Digital Video Broadcasting -Terrestrial (DVB-T2) broadcast standard, which has recently been introduced in Australia. The increased efficiency of DVB-T2 allows transmission of ultra-high definition 4K content, or greater quantities of high-definition content.
RF tuner (receiver)	The component within the TV responsible for receiving terrestrial radio frequency broadcasts (i.e., detecting, demodulating and demultiplexing those transmissions).
Free-to-air antenna	An indoor or outdoor antenna designed for receiving broadcast television signals. Often used interchangeably with the term <i>aerial</i> . May be positioned indoors (internal antenna, e.g., 'rabbit ears antenna') or on the roof of the user's home (external antenna).
Satellite antenna	An antenna designed to receive satellite TV broadcasts in conjunction with an appropriate CTV device.

Content compression (encoding) and decompression (decoding) terminology

AV1	An open-source, royalty-free, video coding format originally designed by the Alliance for Open Media for video transmissions over the Internet.
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Codec	A process used to both compress and encode, as well as decompress and decode, digital video and audio content. Codecs enable a much higher rate of data to be broadcast or streamed over time. TVs need appropriate hardware and/or software to decompress and decode both broadcast and streaming content.
MPEG	A generic term typically used to describe the standard developed by the Moving Pictures Expert Group (MPEG) to compress and decompress digital video and/or audio content.
MPEG-2	A video coding standard currently used to encode and decode standard definition digital television broadcasts in Australia as well as lower resolution internet content. One of the oldest and least efficient codecs. Other newer and more efficient variants are MPEG-4 and HEVC.
MPEG-4	A more recent and efficient video coding standard, also known as H.264, that enables substantially greater compression efficiency than MPEG-2. Although MPEG-2 is the terrestrial TV broadcasting standard in Australia, all broadcasters are also currently using a mixture of MPEG-2 and MPEG-4 compression codecs to encode their broadcast stream of content, particularly their High Definition and some Standard Definition content.
HEVC	A High Efficiency Video Coding standard that is even more efficient than MPEG-4. Content compressed using the HEVC standard uses around 25% of the bandwidth that would be required to broadcast the same content using the MPEG-2 standard.
VP9	An open-source and royalty-free video coding format developed by Google, and used for web and mobile streaming.

Screen resolution terminology

Full High Definition (FHD)	A resolution of 1920 x 1080 pixels (also referred to as a 1080p resolution screen, which is required to display existing 1080i broadcasts).
High Definition (HD)	A resolution of 1280 x 720 pixels (also referred to as 720p).
Quad High Definition (QHD)	A resolution of 2550 x 1440 pixels (also referred to as 1440p).
Screen resolution	The number of discrete horizontal and vertical points (pixels) of colour that a TV screen is capable of displaying.
Standard Definition (SD)	A resolution less than or equal to 720 x 576 pixels in Australia (also referred to as 576i, where the 576 refers to the number of vertical Final pixels, and the i stands for interlaced scan), or 720 x 480 pixels in the United States (also referred to as 480p, where the 480 refers to the number of vertical pixels, and the p stands for progressive scan).

Ultra High Definition (UHD) A resolution of at least 3480 x 2160 pixels (also referred to as 4K, which is the approximate number of horizontal pixels) or 7680 x 4320 pixels (also referred to as 8K).

Connectivity terminology

Aerial port A connector typically found on the wall of a home that enables the user to connect their TV or CTV device to an external antenna.

Bluetooth A wireless interface that enables digital data (e.g., audio content) to be transferred wirelessly between Bluetooth-enabled devices (e.g., between a TV and Bluetooth-enabled speakers).

Ethernet A system for connecting several devices together to form a network that enables digital content to be exchanged between those devices (e.g., it enables a smart TV to be connected to a modem that is then connected to internet).

HDMI A proprietary High-Definition Multimedia Interface that enables digital data (e.g., video and/or audio content) to be transferred over a HDMI cable.

USB A Universal Serial Bus interface that enables digital data (e.g., video and/or audio content) to be transferred over a USB cable.

Wi-Fi A wireless interface that enables digital data (e.g., video and audio content) to be streamed wirelessly between Wi-Fi-enabled devices.

Demographic terminology

ABS Australian Bureau of Statistics.

ASGS The ABS Australian Statistical Geography Standard.

Low-income The income level below which individuals in Australia become eligible to receive the Low-Income Health Card (presently \$789/week for a single, \$1339/week for a couple or a single with one child, and \$1373/week for a couple with one child).

Metropolitan A region located within the capital cities, as per the ABS Australian Statistical Geography Standard 2021.

Nonmetropolitan A region located outside the capital cities, as per the ABS Australian Statistical Geography Standard 2021.

Region A generic term used to refer to any specific geographic area of Australia.

Remote region A nonmetropolitan region that is a substantial distance away from major population centres, per the ABS Australian Statistical Geography Standard 2021. This includes both the Remote Australia and Very Remote Australia regions.

Executive Summary

Television in Australia is a hybrid system comprising terrestrial free-to-air, internet, cable, and satellite distribution. To watch television, Australian consumers require devices – such as television sets (TVs), set-top boxes, and media streaming devices – with specific capabilities relating to broadcast standards, signal compression, and internet connectivity.

This report investigates the capabilities of TVs and connected TV (CTV) devices sold on the Australian market, with a view to exploring how these capabilities shape Australian audiences' current and future access to television and other online video content. Connected TV is defined here as video content streamed over the internet and watched on a TV.

The following methods were used to undertake this research:

- analysis of publicly available technical specifications for TVs and CTV devices sold in Australia, as published by manufacturers and retailers of those devices;
- analysis of the supply of those devices in a sample of retail stores, with reference to geographic patterns of availability and unavailability; and
- a nationally representative online consumer survey regarding TVs and CTV devices acquired in the last 12 months.

Using these methods, the report assesses the capabilities, availability, and consumption of TVs and CTV devices in Australia, to understand how these factors may impact consumers' access to television now and in the future. The report's key findings are as follows:

1. The majority of TV models supplied on the Australian market (at least 63%) meet current standards for broadcast television, including DVB-T2 broadcasting (**Section 2**). Additionally, the consumer survey found that these DVB-T2-capable TVs comprise the vast majority of TVs acquired by Australian consumers within the last 12 months, with 88% of respondents acquiring a TV that appears to be DVB-T2-capable (**Section 5**).
2. A smaller number of TV models available in Australia – including many TVs in the sub-\$1000 price bracket – do not have DVB-T2 capability according to their published specifications. These TVs often comprise obsolete models that cannot be sold in countries that have adopted DVB-T2 broadcasting. The consumer survey revealed that these non-DVB-T2-capable TVs are more likely to be used by consumers aged 65+, low-income consumers, and those living in nonmetropolitan areas (**Section 5**). Considerable uncertainty surrounds the actual capabilities of these TVs, and further product testing is recommended. The DVB-T2 capabilities of these TVs may be understated for reasons explained in **Section 1.6**.
3. The retail availability of TVs and, to a lesser extent, CTV devices is geographically stratified. Consumers living in the major cities have access to the widest range of devices while consumers in regional and remote areas of Australia have a reduced access to devices, with fewer stores to choose from and less possibility of ordering online (**Section 3**).

4. The use of CTV devices, especially media streaming devices, is now common in Australia (**Section 7**). This suggests a growing level of familiarity with CTV devices among the population. Around 67% of consumers who had purchased a TV in the last 12 months had augmented the capabilities of that TV by connecting a CTV device. However, 72% of CTV devices acquired by survey respondents in the 12 months to July 2024 are not DVB-T2-capable.

1. Introduction

1.1 Background

For much of the last century, the TV was a familiar device with a known set of technical characteristics. Chief among these was the ability to receive and decode broadcast signals. Over time, TVs – and the various external devices that can be connected to them – have become considerably more complex. Since the 1980s, the introduction of teletext, digital television, and pay-TV, alongside new external devices including VCRs, game consoles, pay-TV set-top boxes, and DVD and Blu-Ray players, has required new technical specifications and standards. The recent emergence of smart TVs has added further complexity to Australians' television viewing.

Within this evolving technological environment, access to television and online video content increasingly relies on the specific capabilities of devices, including TVs, set-top boxes, and streaming devices. Where devices have insufficient capabilities, access issues may arise. For example, non-internet-connected TVs cannot access online television, and TVs that have only MPEG-2 capabilities cannot access high-definition digital broadcasts (which require a minimum of MPEG-4). CTV devices can often be used to bridge these capability gaps, as when users make non-connected TVs "smart" by adding a Google TV, Apple TV, or other media streaming device.

In late 2024, Australia adopted the DVB-T2 standard for digital television broadcasting, allowing greater efficiency of distribution and the ability to broadcast ultra-high definition (UHD) 4K video. However, some TVs used in homes and sold in stores around Australia are not yet DVB-T2-capable.

In May 2024, the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) commissioned Sapere Research Group and its partner RMIT University to conduct research into the capabilities, availability, and sales of TVs and CTV devices on the Australian market. DITRDCA requested data and analysis pertaining to 2 research questions:

1. What are the technical specifications of TVs and CTV devices available in the Australian marketplace?
2. What are the current Australian consumer trends in TV purchasing?

In addition, DITRDCA requested detailed information regarding:

- the make and model number of TVs;
- their screen size and resolution;
- RF and Internet capability;
- TV standards;
- compression techniques;
- operating systems;
- connectivity methods; and
- retail availability of those devices (e.g., in-store and online availability in metropolitan and regional areas of Australia).

This report presents findings in relation to these research questions. **Part A** (Technical specifications and availability) was written by John Wallace from Sapere Research Group. **Part B** (Consumption of TVs and CTV devices) was written by Professor Ramon Lobato, Ashleigh Dharmawardhana, Dr Alexa
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Scarlata, and Dr Daniel Featherstone of RMIT University. Denis Gallagher, Elias Plastiris, and Scott O'Keefe of CHOICE provided expert input and peer-reviewed the final report.

1.2 Methodology

In Australia, as in other territories, sales data for TVs and CTV devices is not a matter of public record. Such information is held – and is closely protected – by key industry stakeholders including manufacturers, retailers, and their industry associations. As a result, there is no single, publicly available, robust data set that can be accessed for research and policy purposes. Commercial datasets offered by market research providers (e.g., Nielsen) were found to be unsuitable due to scope, cost, or commercial restrictions. Given these constraints, and the greater granularity of data possible through direct research, the team decided to gather data directly by conducting empirical research into device specifications, availability, and consumption.

Technical specifications

To determine the technical specifications of devices sold on the Australian market, the research team collected data from various online sources during Q2-Q3 2024. The primary source for specifications was manufacturer websites. Where specifications for particular models were not available from manufacturer websites, additional sources were consulted including:

- CHOICE's TV testing database, which provides detailed information on popular Australian TV models gathered through CHOICE lab testing;
- retailer websites, such as jbhifi.com.au and harveynorman.com.au; and
- the Flatpanels HD TV Database (flatpanelshd.com/TVdatabase.php), which provides information on the technical specifications of models available in Europe. Such information can be of assistance in identifying the more detailed specifications of similar models available in Australia.

Where these additional sources produced missing, incomplete, conflicting, or questionable specifications, a result of NS (not specified) was noted.

The research team also consulted experts from Free TV Australia, Freeview Australia, OzTAM, and CHOICE who provided technical advice on TV and CTV devices sold in Australia.

The method of technical specifications analysis used in this report is subject to **significant limitations** which are explained more fully in **Section 1.6**.

Availability

To determine the retail availability of devices across Australia, the research team identified the major stores (JB Hi-Fi, Good Guys and Harvey Norman) and online-only retailers (Kogan and Appliances Online) that supply TVs and CTV devices across Australia and supplemented that list with additional smaller, independent retailers with stores in the more remote regions of Australia (Bing Lee, Retravisson, Betta and Videopro). A sample of locations across Australia was then selected including 12 major cities, 4 inner regional cities, 7 outer regional cities, and 15 towns located in the remote/very remote regions of Australia (**Appendix A**). The websites of the selected retailers were then consulted to obtain information on the availability of each of the TVs and CTV devices offered in each of those

locations (which included around 100 to 200 TV models for the major retailers). The data collection noted 4 different categories of availability: available in-store, available from another store, available for home delivery, and available from an online-only retailer (**Section 3**).

As outlined in **Section 3** and **Appendix A**, to verify the online availability data, a subsample of these retailers in each of these metropolitan and regional areas was contacted by phone to check the in-store availability of selected TVs and CTV devices (32 major retail stores and 27 smaller stores operated by independent retailers across Australia).

Consumer survey

To understand consumer trends in Australia, a nationally representative online consumer survey was conducted in June-July 2024. The survey targeted Australian adults who acquired a TV and/or CTV device in the last 12 months. 1825 Australian adults completed the survey, of whom 1441 had acquired a TV and 651 had acquired a CTV device (267 had acquired both a TV and a CTV device). The survey was co-designed by RMIT and DITRDCA. During the design phase, the RMIT team drew on insights from their prior research on TV use, consumption, and retailing in Australia (Lobato, Scarlata, and Schivinski 2023; Scarlata and Lobato 2024).

The survey included multiple-choice and open-ended questions about TV and CTV device purchase, use, configuration, and capabilities. Most participants needed between 5 and 10 minutes to complete the survey. Screening questions were used to determine whether respondents were eligible to participate. The survey was nationally representative according to age, gender, location, income status, and education; no weighting was used. Open-ended question responses were coded by the RMIT-based research team using qualitative content analysis.

The survey was delivered by market research firm The Online Research Unit, which conducted a pilot with 40 respondents as part of their quality assurance process. Minor adjustments were made as a result of this pilot, including adding 2 new questions. The initial 40 responses are included in the overall sample where appropriate. The Online Research Unit and RMIT conducted checking for straight-lining, superfast, and junk responses. Such responses were excluded from analysis where necessary. Adjusted survey sample sizes excluding those responses are noted throughout this report.

Percentages in this report are rounded to the nearest whole number. For this reason, percentages may not sum to 100% and there may be discrepancies between single and aggregated percentages.

1.3 Insights from prior research

TVs and CTV devices have been the focus of previous research by government agencies, regulators, market research firms, and academics both in Australia and overseas. The purpose of these studies has often been to understand how different kinds of devices may enable or restrict access to television services, including broadcast and online television. Such research is especially important at moments of market disruption. For example, the transition from analogue to digital broadcasting required the mass upgrade of household television devices in many nations, along with substantial changes to manufacturing, marketing, and usage of television devices worldwide (Galperin 2004, Hart 2004). The ongoing transition from broadcast to online television in Australia presents a comparable moment of transition in which research is needed to understand such changes.

Available market-level data on consumer electronics sales in Australia provides a high-level view of these trends. For example, IBISWorld (2023) observe that online retail sales of consumer electronic equipment have been increasing rapidly since 2007. This increase reflects the combined effect of a range of factors that have increased the supply of more technically capable consumer electronic equipment on the Australian market, including smartphones, tablets, laptops, desktop computers, and high-resolution monitors, as well as smart TVs. It is notable that the dynamics of both supply and demand significantly fluctuated during the COVID-19 pandemic. IBISWorld also observe that demand for consumer electronics goods is highly volatile, with annual growth rates ranging from annual increases of more than 40% in 2009 to a decrease of 0.6% in 2022. This volatility reflects the sensitivity of demand for consumer electronic equipment.

Consumer surveys are another valuable source of knowledge regarding consumption trends in consumer electronics markets. For example, the *Television and Media Survey* (DITRDCA 2023) found that, of Australian adults:

- 97% have one or more working TVs at home, with the average number of TVs at home being 2.0;
- 77% have one or more TVs connected to the internet at home;
- 9% have purchased a TV in the last 6 months;
- 61% use a broadcast antenna to access free-to-air TV; and
- 52% have used a CTV device of some kind in the last 6 months, with the most commonly used devices being Chromecast, Apple TV, and Foxtel set-top boxes. Use of CTV devices was consistently higher in metropolitan regions than in nonmetropolitan regions. The notable exception was Telstra TV, which had higher levels of use in nonmetropolitan areas.

DITRDCA's *Television Consumer Survey* (2022) includes additional questions on TV acquisition and setup. It found that the most common reason given for buying a new TV was "to upgrade or keep up with new technology" (39%), and that the feature Australians consider most important when buying a new TV is that it is internet-enabled (29%). Other features considered most important were price (20%) and resolution/picture quality (16%).

Research into TV ownership and use is also conducted by other government agencies. The *Communications and Media in Australia* survey by the Australian Communications and Media Authority (ACMA 2023) found that 78% of Australians have a smart TV at home, noting that this figure has risen steadily in recent years. The largest increase in smart TV ownership in 2023 was for Australians aged 75 or over (73%, compared to 59% a year earlier).

RMIT researchers have also examined smart TV use in Australia, via a national consumer survey (Lobato, Scarlata, and Schivinski 2023) and interviews with consumer electronics retailers (Scarlata and Lobato 2024). Their studies found that:

- 5 leading brands (Samsung, LG, Sony, Hisense, and TCL) account for around 86% of the Australian smart TV market;
- 22% of Australian adults use a smart TV that is 5 or more years old, which is likely to entail reduced functionality including obsolescence of apps; and
- 26% of Australian adults do not know how to download apps, customise the order of apps and change privacy settings on their smart TVs.

Researchers have consistently found that smart TV use in Australia is growing, and that most Australian adults are enthusiastic users of streaming services and CTV devices. However, studies consistently identify a contingent of broadcast-only users who have not made the transition to streaming television. The RMIT study estimates this broadcast-only cohort to be around 17% of Australian smart TV users (Lobato, Scarlata, and Schivinski 2023).

Other research investigates TV and CTV device use from the perspective of particular social groups facing access barriers. Using survey methods, these studies are often concerned with questions of digital inclusion, or the degree to which "all Australians can access and use digital technologies effectively" (Australian Digital Inclusion Index 2024). For example, the Australian Communications Consumer Action Network (ACCAN) has investigated how different social groups access television and online video content in Australia (ACCAN 2022), finding that:

- consumers on a very low income (<\$15,000 per year) were far less likely to own a smart TV than those on higher incomes;
- ownership of smart TVs increases with proximity to a capital city and decreases with age;
- lower-income households watch less streaming television than higher-income households; and
- regional consumers and consumers aged over 50 are more likely to value free-to-air TV highly.

RMIT's *Mapping the Digital Gap* study (Featherstone et al 2023) investigates television and internet access in 13 remote First Nations communities, many of which rely on VAST (Viewer Access Satellite Television) to access broadcast content. VAST provides access to satellite rebroadcasts of the free-to-air channels where a reliable signal from a transmission tower is not available. The study found that access to working VAST infrastructure, and limited ability for cost-effective repairs of VAST infrastructure, was a major access barrier for many First Nations communities. Additionally, the study noted a "wide variation in households without VAST services between sites, ranging from 17-19% in Djarindjin and Wujal Wujal to 48% in Yuelamu and Wadeye and 100% in Gängaṅ homeland" (Featherstone et al 2023: 50). One consequence of this lack of access to broadcast television in many communities is that users need to stream video content on their phones, which often incurs high data charges and congests mobile networks in those communities (Featherstone et al 2023).

While these reports provide vital information on television access in Australia, there are several knowledge gaps regarding TV and CTV device acquisition, use, and capabilities. Notably, there is a lack of supply-side studies of TVs and CTV devices, including geographic analyses of availability of these devices, and consumer studies that gather detailed information on device configuration and capabilities.

This report aims to fill these knowledge gaps by integrating analysis of the availability, consumption, and capabilities of devices sold on the Australian market.

1.4 The structure of TV and CTV device markets in Australia

In consumer electronics markets, the terms TV and CTV device are often used as if they refer to relatively similar groups of products. In practice, however, this is not the case. TVs and CTV devices have diverse capabilities and are therefore not perfect substitutes in consumption.

This report finds substantial differences in both the:

- capabilities and technical specifications of the different types of TVs currently supplied on the Australian market (**Section 2**), ranging from entry-level non-internet-connected TVs through to smart TVs capable of displaying UHD broadcasts and internet content; and
- availability of those TVs (**Section 3**), which can differ substantially across regional areas of Australia due to size, weight, and associated distribution challenges.

In addition, there are also substantial differences in the capabilities and technical specifications of the CTV devices that are supplied on the Australian market (**Section 2**). Although the most popular CTV devices are media streaming devices (e.g., Apple TV, Google TV), other CTV devices are also currently supplied on the Australian market, including set-top boxes, that allow:

- consumers with older TVs that have analogue tuners to receive digital television broadcasts;
- consumers to access subscription broadcasting services as well as internet content (e.g., Foxtel iQ boxes); and
- consumers to access the VAST service (i.e., VAST satellite TV boxes).

As outlined in **Part B** of this report, consumers of TVs and CTV devices also have different incomes and budgets to spend on TVs and CTV devices; and preferences and needs for different types of TVs and CTV devices.

Overall, this means that there is not one market for either TVs or CTV devices in Australia. Rather, there are multiple segmented and geographically defined markets for these products. This is reflected by the variation in the market prices charged for those products, that range from less than \$100 to well over \$10,000. This variation in prices is due to differences in the:

- costs of producing and distributing those different models of TVs and CTV devices that have different technical capabilities; and
- willingness of consumers to pay for those different types of TVs and CTV devices (i.e., differences in consumer demand for those products, which are due to differences in their incomes and preferences for those different types of products).

Indeed, the key focus of this report is on market segments that are of particular interest for regulatory policy purposes, namely the markets for:

- TVs that are potentially capable of receiving, decoding and displaying DVB-T2 broadcasts; and
- TVs that lack those capabilities and would require the addition of a compatible CTV device to receive DVB-T2 terrestrial broadcasts.

1.5 International trends and their influence on the Australian market

Analysis of the Australian market for TVs and CTV devices reveals the substantial influence that international trends are having on the types and technical capabilities of those products supplied in Australia (**Part A**) and purchased by Australian consumers (**Part B**).

In particular, trade liberalisation since the 1970s has facilitated the globalisation of the markets for TVs and CTV devices, as well as the digital content they are capable of displaying (**Section 2.6**). This has enabled the manufacturers of those products to reap substantial cost savings (economies of scale and scope) through the mass production of those products for the global market, rather than just for smaller segments of that market (e.g., Australia).

As a result, the technical specifications of TVs and CTV devices supplied on the Australian market are now primarily determined by the broadcasting standards that apply in some of the world's largest markets for TVs (e.g., parts of Europe and Asia which already have widespread DVB-T2 broadcasts).

This explains the reason why most of the TVs supplied on the Australian market are already potentially capable of receiving and decoding DVB-T2 transmissions, since those capabilities are already required to receive terrestrial broadcasts in those major global markets.

In addition, it also explains why some TVs are still being supplied on the Australian market that may not be capable of receiving DVB-T2 broadcasts (e.g., TVs that lack a DVB-T2 tuner). Since Australia has not yet commenced DVB-T2 broadcasts, suppliers have an opportunity to sell TVs on the Australian market that are not DVB-T2-capable. These TVs are largely obsolete and difficult to sell in countries that have already commenced DVB-T2 broadcasts.

Although this provides Australian consumers with a source of less expensive TVs in the short term, there may be costs associated with individual equipment upgrades if additional technical capabilities were required in the longer term. Given that Australia adopted the DVB-T2 broadcasting standard in late 2024, the status of these potentially non-DVB-T2-capable TVs is of particular importance.

This report finds that most consumers are purchasing TVs that are already capable of receiving DVB-T2 broadcasts (**Section 5.1**). However, a small minority of consumers are still purchasing TVs that might not be DVB-T2-capable based on their published technical specifications. In addition, consumers are also purchasing CTV devices to upgrade the capabilities of their existing TVs, particularly their ability to use the latest streaming apps.

Existing international research on the adoption of TVs and CTV devices provides useful context here. Among the most detailed studies conducted to date are those by the British media regulator Office of Communications (Ofcom). Ofcom's *The Communications Market Report* (Ofcom 2024a) includes estimates of smart TV adoption and CTV device use across the UK, with detailed demographic breakdowns available via an online dashboard. Other Ofcom reports contain valuable insights about other capabilities of TVs in the UK. For example, Ofcom's *Future of TV Distribution* report includes forecasts of the number of households in the UK with a DVB-T (not DVB-T2) receiver as their primary and secondary TV by 2030, estimating this to be around 0.2 million and 0.9 million homes respectively (Ofcom 2024b: 27).

Additionally, the Ofcom Technology Tracker also considers usage of smart TV devices; it found that 23% of adults in the UK do not connect their TV to the internet (ibid 15). Ofcom has also produced several detailed studies of digital inclusion which consider TV access, with one study noting much lower levels of smart TV use among people with a disability (Ofcom 2021). Other international studies investigate the dynamics of TV and CTV device markets, platforms, and operating systems (e.g., Rethink Research 2023).

This international research provides useful context for policymakers to benchmark Australian markets, consumers and products against other countries, amidst the transition of Australian television to DVB-T2 and online distribution.

1.6 Limitations of the study

It is important to note that this report relies on information obtained from 2 main sources that each have their own respective limitations:

1. publicly available information provided by manufacturers and retailers on the technical specifications and availability of TVs and CTV devices; and
2. survey data regarding the types and capabilities of TVs and CTV devices purchased by a sample of Australian consumers.

Each of these data sources are limited in important ways. These limitations contribute to inherent uncertainty regarding the capability, availability, and consumption of the TVs and CTV devices discussed in this report.

Uncertainty surrounding the technical specifications of TVs and CTV devices

Like consumers, this report relies on publicly available technical specifications when analysing the models of TVs and CTV devices supplied on the Australian market and their capabilities. As such, the results of the specifications analysis need to be interpreted with caution. There is no guarantee that this publicly available information provides an accurate indication of the actual capabilities of the TVs and CTV devices in question.

While most suppliers of TVs and CTV devices on the Australian market provide information on the technical specifications of the products they sell, the quantity and quality of this information differs substantially.

In general, detailed technical specifications tend to be available for the major brands of TVs and CTV devices (e.g., Samsung, LG, Sony, TCL, Hisense). By contrast, considerable uncertainty can surround some of the technical specifications of the lesser-known brands and models of TVs and CTV devices.

The only way of eliminating the uncertainty currently surrounding the technical capabilities of the TVs and CTV devices supplied on the Australian market is through rigorous technical testing of their actual capabilities.

Such testing is both complex and time consuming. This means that it is neither feasible, or desirable, to test the technical capabilities of all TV models and CTV devices supplied on the Australian market.

Rather, alternative approaches need to be used to reduce those costs in testing, including:

- relying on the results obtained by other jurisdictions that have tested the capabilities of the same models that are supplied on the Australian market;
- conducting test transmissions to determine the ability of consumers in particular regional areas to receive DVB-T2 test transmissions on their existing TVs; and
- limiting testing to a representative sample of TVs supplied on the Australian market. For example, the Free TV Australia (2023) report *On the Technical Performance of TV Receivers in Australia* tested a sample of 33 TVs sold in Australia.

The evidence presented in this report suggests that the greatest variation in capabilities relevant to Australian broadcast policy is found in the lower end of the TV market, among cheaper, less-capable TVs. These TVs are the most likely to have uncertain or restricted capabilities. It would therefore be useful to focus technical testing on those cheaper TVs. This approach would help to clarify the causes and implications of the variance in technical specifications noted in this report, while also expanding the scope of existing testing research (Free TV Australia 2023).

Uncertainty surrounding the ability of some TVs and CTV devices to receive, decode, and decompress DVB-T2 broadcasts

There is also considerable uncertainty regarding the DVB-T2 capability of some TVs and CTV devices. Additionally, the information provided by the suppliers of certain TVs and CTV devices does not always specify whether those products have MPEG-4 and HEVC codecs.

The uncertainty inherent in technical specifications is potentially explained, to some extent, by the combined effects of a number of factors including the:

- absence of DVB-T2 terrestrial TV broadcasts in Australia, which means that there has been no real need for consumers to know whether or not the radio frequency tuners in their TVs and CTV devices are capable of receiving and decoding those broadcasts;
- absence, until recently, of Australian DVB-T2 standards (**Section 2.6**). This may explain, to some extent, both the:
 - reluctance of some manufacturers to advertise that their TVs and CTV devices are capable of receiving DVB-T2 broadcasts; and
 - careful use of the term “DVB-T2 ready” to refer to the ability of a device to receive potential DVB-T2 broadcasts; and
- increasing complexity of TVs and CTV devices, arising from rapid advances in consumer electronics technology that are:
 - increasing the costs that manufacturers have to incur in order to develop a consistent set of technical specifications for each of their constantly evolving products;
 - reducing the ability of consumers to understand those different technical capabilities and what they mean for the capabilities of those devices (e.g., their ability to use those devices to watch free-to-air TV, stream internet content, and/or play video games); and
 - encouraging manufacturers, retailers, and consumers to focus on the overall capabilities of TVs and CTV devices rather than the detailed combinations of technical specifications that those devices need in order to be capable of performing those functions. For example, a TV may be marketed as 4K-capable without listing specific codecs in the technical specifications.

Overall, these trends partially explain why:

- technical specifications are often missing or uncertain, as noted in the results of the empirical analysis (**Section 2**);
- some manufacturers' published specifications may not fully capture the actual capabilities of their devices;
- some consumers may prefer to purchase TVs and CTV devices produced by well-known global brands over cheaper products produced by lesser-known brands; and
- the publicly available information on the technical specifications of the TVs and CTV devices supplied on the Australian market that is used for the purposes of this report may understate the actual technical capabilities of those products.

By implication, analysis based on published technical specifications alone – such as that presented in **Section 2** of this report – is inherently limited. Specifically, there is a risk that analysis of technical specifications may underestimate the capabilities of many TVs sold in Australia. This is because, as noted above, some TVs may be capable of receiving DVB-T2 broadcasts even though their technical specifications do not explicitly indicate that they have the DVB-T2 tuner, and MPEG-4 and HEVC codecs, required to access those broadcasts. For this reason, data on technical capabilities presented in Sections 2 and 5 of this report should be interpreted as minimum estimates of the actual capabilities of those devices.

Uncertainty surrounding the availability of TVs and CTV devices across Australia

Similarly, while most retailers provide information on the availability of each of the TVs and CTV devices they advertise on their websites, the quantity and quality of that information tends to vary substantially between retailers.

Some major retailers provide detailed information on whether or not each model is in stock in the consumer's preferred store and when the consumer can expect delivery if they place an online order. By contrast, other smaller independent retailers only list the products that are potentially available and require the consumer to call the store to check whether that product is actually available. As a result, uncertainty surrounds the availability of TVs and CTV devices advertised for sale on the Australian market (**Section 3**), particularly in the more remote and regional areas of Australia.

An additional limitation of this report is that it relies on data collected in Q2-Q3 2024. As such, it offers a snapshot of a highly fluid market. It is likely that both availability and technical specifications of devices will have changed by the time this report is published and will continue to change in coming years.

Uncertainty surrounding consumption of TVs and CTV devices

The consumer survey, which has a margin of error of 3%, is subject to several limitations.

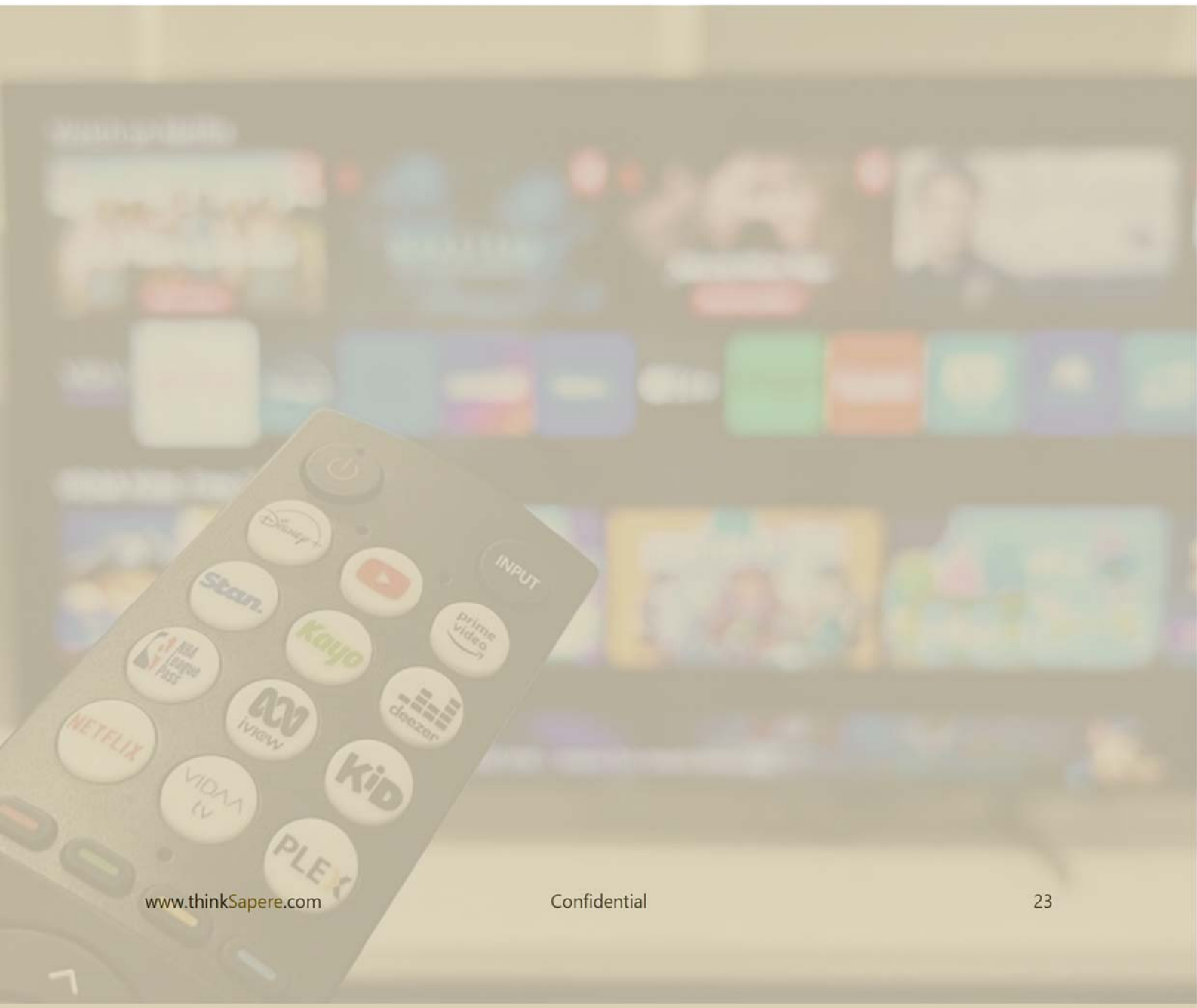
Online surveys can only reach people who have home or mobile internet connections, and these surveys are more convenient to complete using a home internet connection (95% of respondents to the survey had a home internet connection). This inevitably skews the sample away from mobile-only internet users and non-internet users. As a result, the survey is likely to have insufficiently captured non-internet-user and mobile-only cohorts. The specific equipment, access, and digital literacy contexts of these cohorts may therefore be under-represented in survey findings.

There are also limitations to the method used to identify respondents' devices. The survey asked respondents for information regarding the device manufacturer, model number, screen size, resolution, screen type, price, and retailer. The research team then used these variables to manually identify the relevant TV or CTV device, or product range, and its technical capabilities, in tandem with the technical capabilities analysis discussed in **Section 1.2**. In most cases this approach was successful, allowing the research team to identify the capabilities of a specific device or product range. However, in a small number of cases (n=7) such identification was not possible, and those responses were excluded from the analysis. Other survey responses may also contain inaccurate information, despite the quality assurance process described in **Section 1.2**, or may have been categorised incorrectly by our research team.

For these reasons, care must be taken when interpreting data. Like the technical specifications and availability data in **Part A** of the report, the consumer survey findings presented in **Part B** are also shaped by inherent limitations.

PART A:

Technical specifications and availability of TVs and CTV devices



2. Capabilities of TVs and CTV devices

Key findings

- **Most TVs are already potentially capable of receiving DVB-T2 broadcasts**

Most (63%) of the TV models advertised as being supplied Australian market (whether or not they are available in the market) are already potentially capable of receiving, decoding and displaying DVB-T2 broadcasts (i.e., they are “DVB-T2-capable”). This is because most (64%) have DVB-T2 tuners that are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts, and also have MPEG-4 and HEVC decoders, and UHD displays. However, as noted in **Section 3**, the proportion of DVB-T2-capable TVs available from key retailers is much higher (80% rather than 63%).

The proportion of DVB-T2-capable TVs advertised as being supplied on the Australian market (63%) could be even higher due to the uncertainty currently surrounding published technical specifications. In addition, most TVs (91%) are also smart TVs that enable users to stream content over the internet. Most of the remaining TVs without a DVB-T2 tuner (36%) are also likely to be able to receive DVB-T2 broadcasts with the addition of an appropriate set-top box. Only a small proportion (less than 1%) of the TVs supplied on the Australian market are unlikely to be ready to receive DVB-T2 broadcasts with the addition of a set-top box.

- **Most CTV devices are not designed to receive DVB-T2 broadcasts**

Most (86%) of the CTV devices supplied on the Australian market lack a tuner capable of receiving existing DVB-T, or potential DVB-T2 broadcasts. However, a minority of CTV devices (21%) are potentially capable of receiving DVB-T2 broadcasts. Those devices include set-top boxes that are designed to allow users to access pay-TV services (e.g., Hubbl and Fetch TV set-top boxes) and Australia’s Viewer Access Satellite Television service (i.e., VAST set-top boxes which can receive existing DVB-S2 satellite broadcasts).

- **Australia is *potentially* well prepared for DVB-T2 broadcasts**

Australia is *potentially* well prepared for DVB-T2 broadcasts due to the high proportion of DVB-T2-capable TVs supplied on the market (63%), the even higher proportion of DVB-T2-capable TVs that are available for purchase from key retailers (80% as discussed in Section 3), as well as the availability of DVB-T2 CTV devices.

The extent to which Australia is *actually* prepared for the introduction of DVB-T2 broadcasts depends on the extent to which consumers are purchasing DVB-T2-capable TVs, which is discussed in **Part B** of this report.

2.1 TVs and CTV devices provide access to broadcast and internet content

Australian consumers potentially have access to a rapidly expanding range of digitally compressed and encoded video and audio content from 3 main sources:

- terrestrial and satellite TV broadcasts;
- internet content, including free and paid streaming content from public-service broadcasters, commercial networks, and streaming services; and
- other sources of video and audio content, including DVDs.

In order to access that content, however, consumers also need access to TVs and CTV devices capable of receiving/streaming, decompressing, decoding, and displaying that rapidly expanding range of content.

TVs and CTV devices are not the only consumer electronic devices that are used by consumers to access that content. Rather, a range of other devices can be used that are outside the scope of this report, including:

- mobile devices including laptops, tablets, and smartphones, that are able to connect wirelessly with the internet;
- personal computers equipped with either an internal TV tuner card, or an external TV tuner stick plugged into a USB port, that is capable of receiving terrestrial TV broadcasts; and
- personal computers connected to the internet via a modem.

However, as discussed further in **Part B** of this report, TVs and CTV devices continue to play an important role in providing consumers with access to that content. This means that the technical capabilities of the TVs and CTV devices being supplied on the Australian market can have a significant influence on the extent to which consumers can enjoy that content.

In particular, as discussed further below, the ability of TVs and CTV devices to receive, decompress, decode, and display DVB-T2 broadcasts will influence the ability of consumers of those products to access the content of those broadcasts.

2.2 Most TVs are already potentially DVB-T2-capable

The capabilities of each TV are determined by particular combinations of technical specifications

Sapere research indicates that currently there are around 30 brands that supply over 900 different models of TVs on the Australian market. The numbers of different brands and models of TVs supplied on the Australian market are, however, constantly changing over time as new models are added that supersede existing models, which are then discontinued and withdrawn from the market. This process can take several years until the stocks of discontinued models are finally exhausted.

The capabilities of each of those TVs, which include their ability to receive both existing DVB-T broadcasts and potential DVB-T2 broadcasts, are determined by particular combinations of technical specifications (**Section 2.5**). For example, in order to receive, decode, and view existing terrestrial broadcasts, a TV needs to have at least:

- an RF tuner that is capable of receiving DVB-T transmissions;
- a codec that is capable of decompressing and decoding those broadcasts (i.e., an MPEG-2 codec); and
- a screen that has sufficient resolution to display a standard definition (SD) broadcast (e.g., 576i).

By contrast, in order to receive, decode, and display high definition (HD) digital terrestrial broadcasts, a TV needs to have at least:

- an RF tuner that is capable of receiving existing DVB-T broadcasts;
- codecs that are capable of decoding broadcasts that contain both SD and HD content (i.e., an MPEG-4 codec, which is also capable of decoding MPEG-2 content); and
- a screen that has sufficient resolution to display those HD broadcasts (e.g., a 720p or higher resolution screen that is capable of displaying those HD broadcasts).

However, to receive both existing terrestrial broadcasts as well as potential DVB-T2 terrestrial broadcasts without the addition of a set-top box, or to stream internet content without the addition of a media streaming device, a TV needs to have:

- an RF tuner capable of receiving both existing DVB-T, as well as potential DVB-T2, broadcasts (i.e., a DVB-T2 tuner which can also receive DVB-T broadcasts);
- codecs capable of decompressing and decoding both existing SD digital video broadcasts (i.e., MPEG-2 codec) and HD broadcasts (i.e., MPEG-4 codec) as well as UHD broadcasts (i.e., a HEVC codec);
- a central processor capable of running the software required to decode those broadcasts and stream content from the internet (i.e., it needs to be a smart TV); and
- a screen resolution sufficiently high to display the content contained in those broadcasts and internet streams.

This means that to determine the ability of TVs advertised as being supplied on the Australian market to receive, decode, and display DVB-T2 broadcasts, it is necessary to identify the:

- brands and models of TVs that are advertised as being supplied on the Australian market using the methodology outlined in **Section 1.2**;
- technical specifications of each of those TVs that are set out in **Section 2.5**;
- combinations of technical specification that a TV must have in order to be able to receive, decode, and display DVB-T2 broadcasts, which are briefly outlined above; and
- proportions of TVs that have those combinations of technical specifications, which are discussed further below.

It is then necessary to determine the extent to which those TVs are actually available for purchase from retailers, which is discussed further in **Section 3**.

Readiness of TVs supplied on the Australian market to receive DVB-T2 broadcasts

As illustrated in **Figure 1** and outlined further below, the TVs supplied on the Australian market fall into 3 main categories of readiness to receive DVB-T2 broadcasts:

1. TVs that are already capable of receiving DVB-T2 broadcasts, since they have DVB-T2 tuners and are able to decode HEVC and MPEG-4 encoded content and a screen with sufficient resolution to display the content contained in DVB-T2 broadcasts;
2. TVs that have the potential to be able to receive DVB-T2 broadcasts with the addition of a set-top box; and
3. TVs that are unlikely to be able to receive DVB-T2 broadcasts, even with the addition of a set-top box.

Since 2016, the major global TV manufacturers have been supplying TVs on the Australian market that are capable of:

- receiving DVB-T SD, HD and FHD terrestrial broadcasts, as well as potential DVB-T2 broadcasts (i.e., since they have a DVB-T2 tuner);
- decompressing and decoding DVB-T SD, HD, and FHD terrestrial broadcasts, as well as potential DVB-T2 broadcasts (i.e., since they have HEVC and MPEG-4 codecs); and
- displaying DVB-T SD, HD and FHD broadcasts, as well as potential DVB-T2 broadcasts (i.e., since they have at least 4K displays).

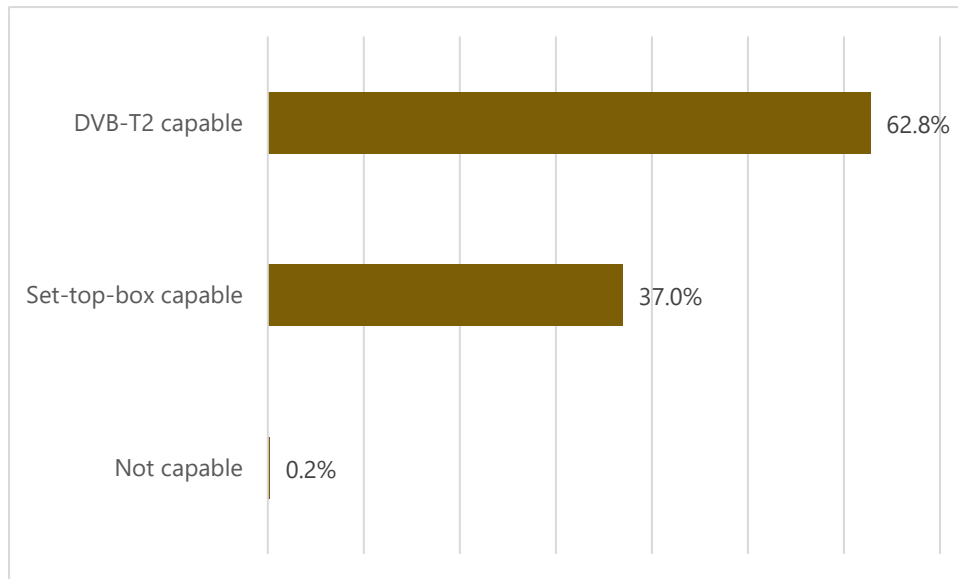
Those TVs tend to be the models that the major brands have designed to meet the needs of the global market, rather than the specific needs of Australian consumers (i.e., they are manufactured for the global market and need to have those capabilities to receive such terrestrial broadcasts in other countries).

This the reason why, as illustrated in **Figure 1**, most (i.e., at least 63%) of the TV models advertised as being supplied on the Australian market are already capable of receiving, decoding, and displaying DVB-T2 terrestrial broadcasts (i.e., they are DVB-T2-capable), since they are supplied by major global brands and already have those capabilities. Indeed, this proportion could be even higher due to the:

- uncertainty that currently surrounds the ability of some TVs to receive and decode potential DVB-T2 terrestrial broadcasts, which is discussed further in **Section 1.6**; and
- existence of TVs that have the potential to receive, decode, and display DVB-T2 HD broadcasts, but not potential UHD broadcasts.

In addition, as discussed further in Section 3, the proportion of DVB-T2-capable TVs available for purchase key retailers is much higher (80% rather than 63%).

Figure 1: Readiness of TVs to receive, decode, and display DVB-T2 broadcasts



Source: Sapere analysis of TV technical specifications data sourced from websites of manufacturers (n=930)

It is important to note that the supply of DVB-T2-capable TVs is not the result of either:

- the demand from Australian consumers for TVs with such capabilities. A DVB-T2 tuner is not needed to receive existing DVB-T terrestrial TV broadcasts in Australia. However, TVs that already have DVB-T2 tuners can receive existing DVB-T broadcasts due to the backward compatibility of the DVB-T2 standard. In addition, those TVs also potentially have the ability to receive DVB-T2 broadcasts; or
- Australian TV standards. As discussed further in **Section 2.6**, Standards Australia has only recently introduced a new standard for receivers of VHF/UHF DVB-T2 television broadcasts (AS 5362:2024), and compliance with this standard is not mandatory.

Rather, as discussed in **Section 2.6**, the supply of DVB-T2-capable TVs is the fortuitous result of the combined effects of the globalisation of the markets for both TVs and the content that is displayed on those TVs (e.g., demand for 4K streaming content).

2.3 Most other TVs would also be potentially DVB-T2-capable with the addition of a set-top box

Some uncertainty currently surrounds the technical specifications of the remaining 37% of TV models currently supplied on the Australian market (**Section 1.6**). However, **Figure 1** illustrates that almost all of that 37% is likely to be TVs that are able to receive and display DVB-T2 broadcasts with the addition of a set-top box, since they have:

- sufficient connectivity (e.g., HDMI inputs) to allow the addition of a set-top box that is capable of receiving and decoding DVB-T2 broadcasts (i.e., a set-top box that has a DVB-T2 tuner, as well as MPEG-4 and HEVC codecs). As indicated in **Figure 8**, at least 98% of all TVs have an HDMI connection that would facilitate the use of a set-top box; and
- screens with sufficient resolution to display DVB-T2 terrestrial broadcasts.

2.4 A small proportion of TVs may not be DVB-T2-capable

As illustrated in **Figure 1**, only a small proportion (less than 1%) of TVs supplied on the Australian market may not be capable of receiving, decoding, and displaying DVB-T2 terrestrial broadcasts even with the addition of a set-top box due primarily to their lack of:

- connectivity (e.g., due to the lack of HDMI connections); and/or
- a screen with sufficient resolution to display the content contained in DVB-T2 broadcasts.

These TVs are still being supplied on the Australian market to meet the needs of those consumers that are either looking for a cheap monitor, or need a TV that is compatible with older legacy devices (e.g., VCRs and older games consoles).

This proportion could be higher (e.g., up to around 2%) due to the uncertainty surrounding the technical specifications of some of the TVs supplied on the Australian market (**Section 1.6**).

2.5 Technical specifications of TVs and CTV devices supplied on the Australian market

Technical specifications differ substantially between TVs

As illustrated in **Figures 2 to 9**, there are substantial differences in the technical specifications and prices of TVs supplied on the Australian market.

At one end of the spectrum are the new, higher-priced, large-screen smart TVs that contain a central processor. Those TVs are capable of not only receiving, decoding, and displaying SD, HD, and FHD terrestrial broadcasts, but also DVB-T2 broadcasts.

At the other end of the spectrum are the much lower-priced non-internet-connected TVs that are only capable of receiving terrestrial broadcasts in SD. There are still a few non-internet-connected TVs being supplied on the Australian market that have analogue RF tuners that are not capable of receiving current digital terrestrial TV broadcasts. These TVs now make up only a tiny percentage (less than 1%) of the models supplied on the Australian market.

Figures 2 to 9 outline the proportion of TV models supplied on the Australian market that have particular technical specifications, including:

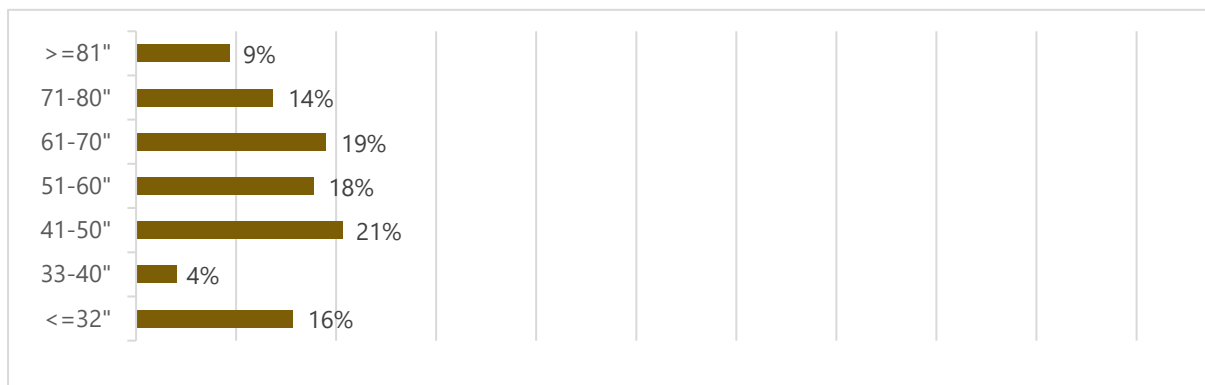
- Screen size. As illustrated in **Figure 2**, screen sizes of TVs vary from smaller than 32" through to larger than 81":
 - 9% have a screen size greater than 81";
 - 14% have a screen size between 71" and 80";
 - 19% have a screen size between 61" and 70";
 - 18% have a screen size between 51" and 60";
 - 21% have a screen size between 41" and 50";
 - 4% have a screen size between 33" and 40"; and
 - 16% have a screen size smaller than 32";

- Screen resolution. As illustrated in **Figure 3**, resolution capabilities vary between TV devices:
 - 75% are capable of displaying content in Ultra High Definition 4K (UHD 4K) resolution;
 - 12% have a Full High Definition (FHD 1080p) resolution;
 - 9% have a High Definition (HD 720p) resolution;
 - 2% have an Ultra High Definition 8K (UHD 8K) resolution; and
 - 2% have other lower resolutions (e.g., 800 x 600 pixels);
- RF tuner (i.e., radio frequency tuner/receiver). As illustrated in **Figure 4**, the proportions of TVs with each type of tuner are as follows:
 - 85% of have either a DVB-T or DVB-T2 tuner, and 12% have a tuner of uncertain capability that is most likely to be a DVB-T tuner;
 - most TVs (64%) have DVB-T2 tuners that are capable of receiving both existing DVB-T and potential DVB-T2 terrestrial broadcasts;
 - 22% only have a DVB-T tuner according to published specifications;
 - 12% of TVs supplied on the Australian market do not specify whether the tuner is DVB-T2-capable or only DVB-T-capable). This means that the proportion of TVs with DVB-T2 tuners could be even higher than 64%;
- Smart TV capability (i.e., an internal processor capable of running application software). As illustrated in **Figure 5**:
 - 91% of TVs are now smart TVs that contain a processor (i.e., internal computer) that is capable of running a variety of application software; and
 - only 9% are non-internet-connected TVs;
- Operating system software (i.e., software used by smart TVs). As illustrated in **Figure 6**, smart TVs use a range of different operating systems, including market leader Android/Google TV, Samsung's Tizen, LG's webOS, and Hisense's VIDAA:
 - 29% use the Android TV operating system;
 - 18% use the Google TV operating system (which is also an Android variant);
 - 17% use the WebOS operating system;
 - 12% use Tizen;
 - 8% use VIDAA;
 - 2% use Roku; and
 - 3% either use other operating systems (e.g., Linux) or are non-internet-connected TVs that do not have operating systems;
- Decoding software (i.e., codecs used to decompress and decode content). As illustrated in **Figure 7**, the proportions of TVs that have the ability to decode a range of MPEG-2 and MPEG-4, as well as HEVC and VP9, encoded content are as follows:
 - at least 77% of TVs have MPEG-4 decoders and are able to decode both MPEG-2 and MPEG-4 encoded content, 4% are only able to decode MPEG-2 content, and 19% have uncertain MPEG capability that is most likely to be MPEG-2 capability;
 - 81% are able to decode existing MPEG-2 encoded content, since they have either a MPEG-2 or MPEG-4 decoder, and 19% have uncertain ability to decode MPEG-2 encoded content;
 - 73% have HEVC (i.e., H.265) decoders;
 - 46% have AV1 decoders; and
 - 19% have VP9 decoders;

(These proportions could be different due to the uncertainty surrounding whether some TVs have those capabilities);

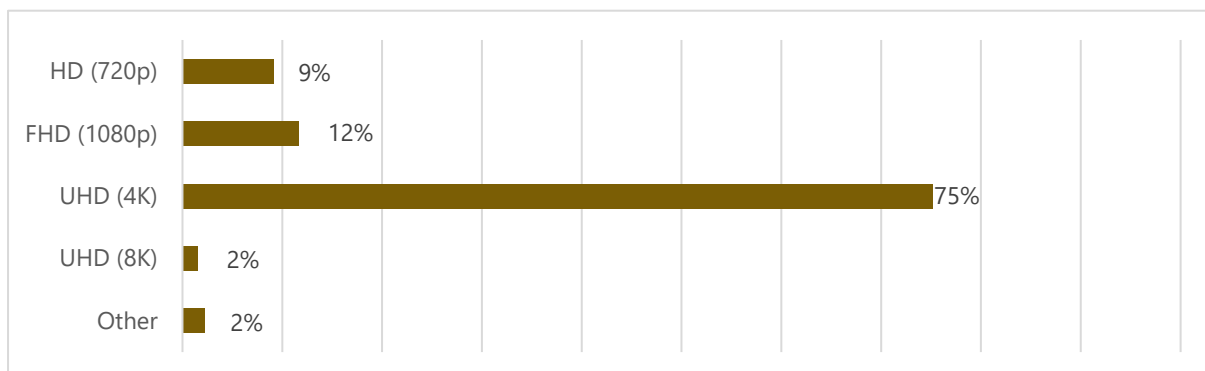
- Connectivity (i.e., ability to connect to external devices). As illustrated in **Figure 8**, TVs currently sold on the Australian market provide a wide range of connections that enable the TV to be connected to the internet through an ethernet port, as well as to a wide range of other devices through USB and HDMI ports, as well as wireless Wi-Fi and Bluetooth connections:
 - 98% of TVs have an HDMI port;
 - 96% have a USB port;
 - 89% have an ethernet port;
 - 87% have Wi-Fi connectivity; and
 - 81% have Bluetooth connectivity;
- Price. As illustrated in **Figure 9**, the prices of TVs supplied on the Australian market range from less than \$500 to more than \$10,000, with a median price of \$1,299:
 - 27% are priced between \$1,000 and \$2,999;
 - 17% are priced between \$500 and \$999;
 - 16% are priced less than \$500;
 - 10% are priced between \$3,000 and \$4,999;
 - 7% are priced in excess of \$10,000; and
 - 5% are priced between \$5,000 and \$9,999.

Figure 2: Screen sizes of TVs advertised as being supplied on the Australian market



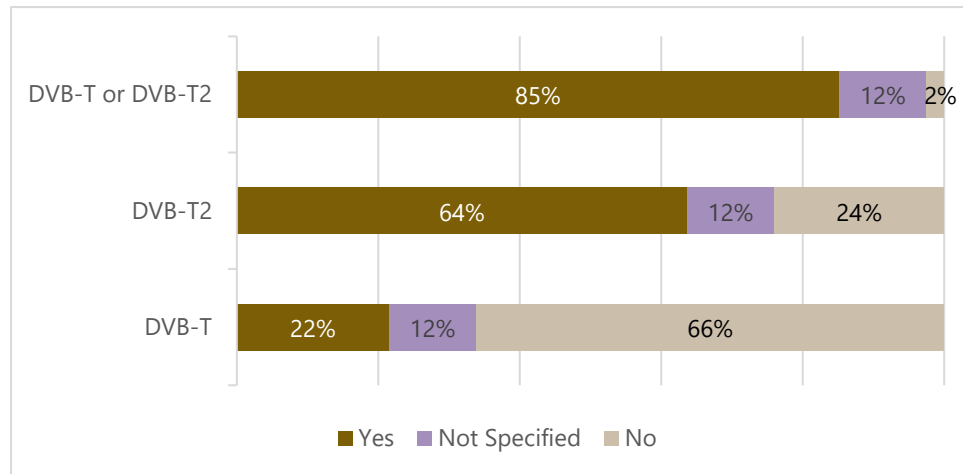
Source: Sapere analysis of TV technical specifications data sourced from websites of manufacturers (n=930)

Figure 3: Screen resolution of TVs advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930)

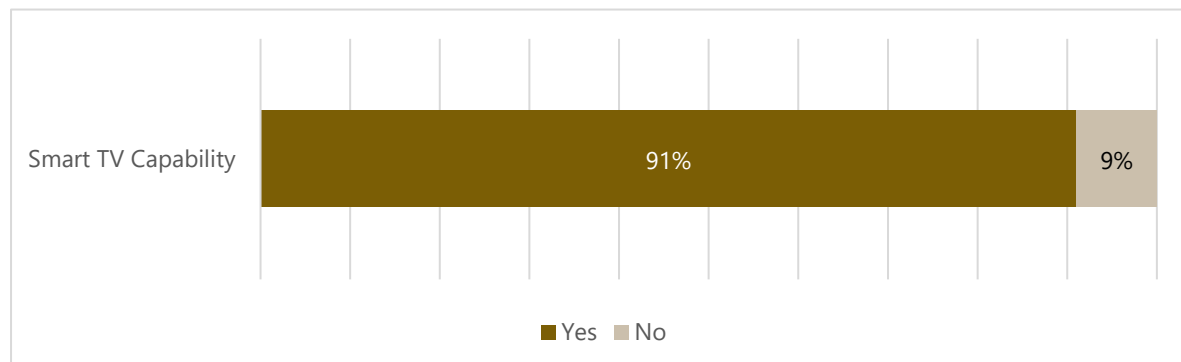
Figure 4: RF tuners used by TVs advertised as being supplied on the Australian market



Notes: DVB-T refers to a DVB-T only tuner; DVB-T2 refers to a DVB-T/T2 (backwards compatible) tuner; DVB-T or DVB-T2 refers to the ability to receive DVB-T broadcasts due to the existence of either a DVB-T only or DVB-T2 tuner.

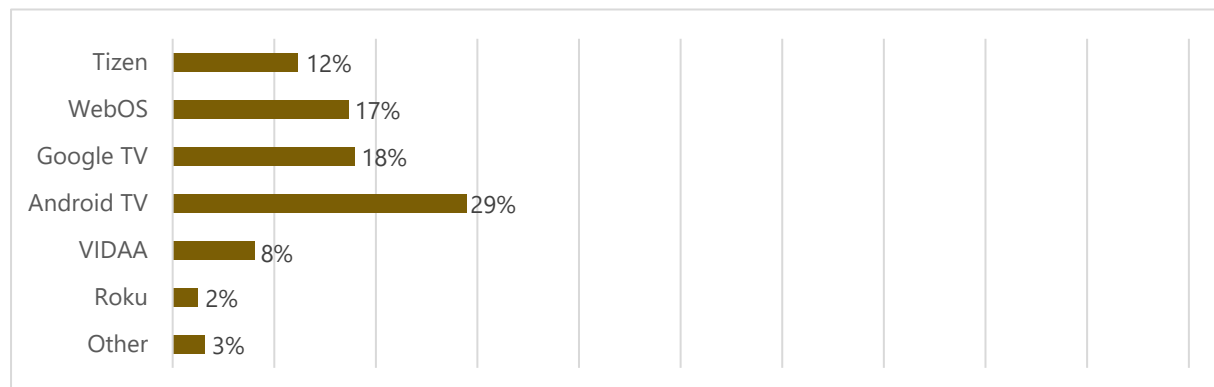
Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930)

Figure 5: Smart TVs advertised as being supplied on the Australian market



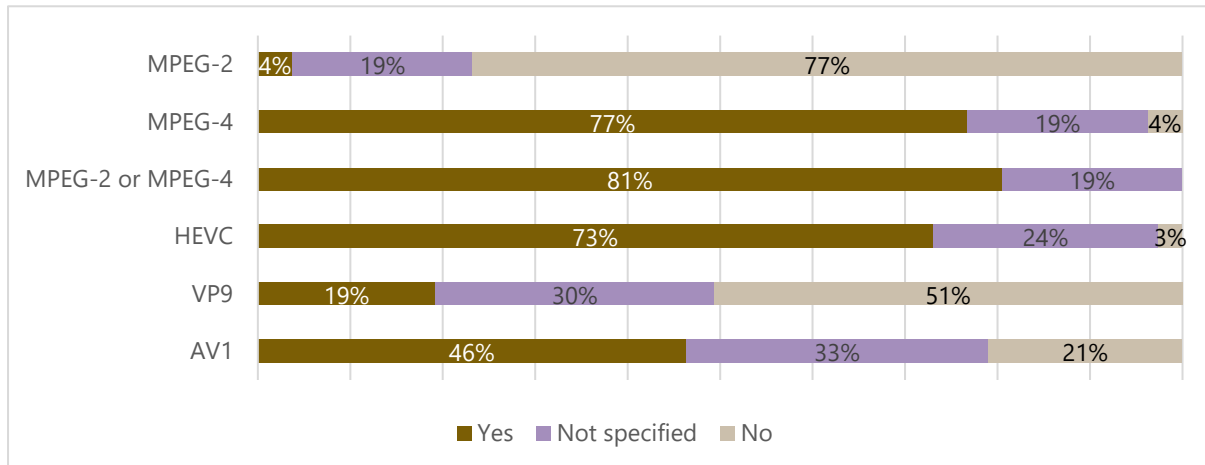
Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930)

Figure 6: Operating system software used by smart TVs advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930)

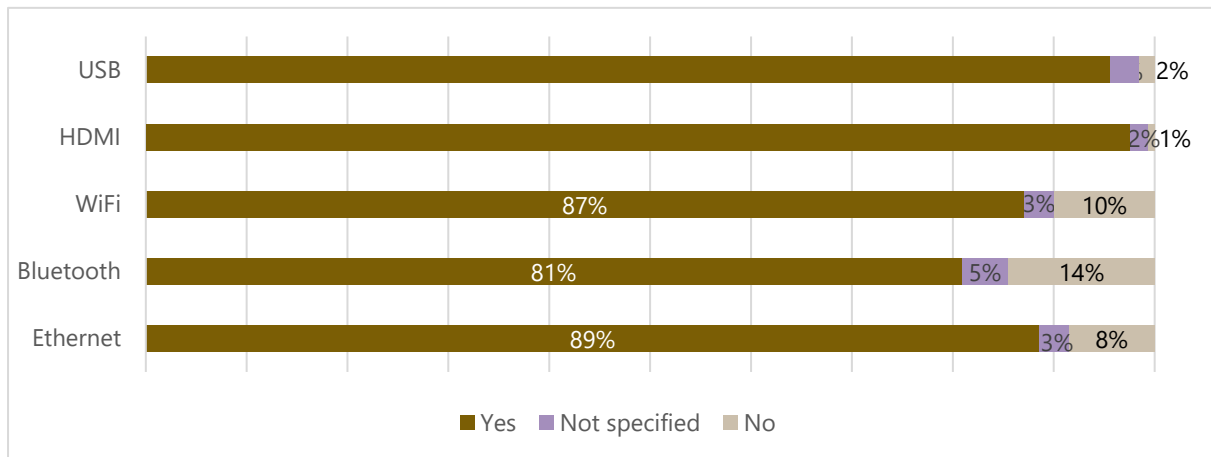
Figure 7: Decoding software (codecs) used by TVs advertised as being supplied on the Australian market



Notes: MPEG-2 refers to MPEG-2 only; MPEG-4 refers to MPEG-2/4 (backwards compatible); MPEG-2 or MPEG-4 refers the ability to decode MPEG-2 content due to the existence of either a MPEG-2 or MPEG-4 decoder.

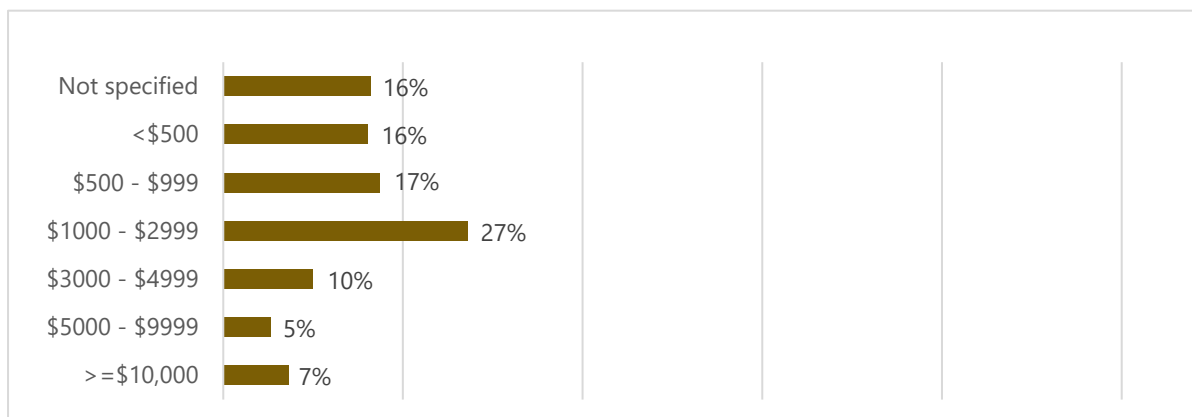
Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930).

Figure 8: Connectivity of TVs advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930)

Figure 9: Prices of TVs advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=930)

Most CTV devices are media streaming devices that are not capable of receiving terrestrial broadcasts

The capabilities of the CTV devices supplied on the Australian market, which includes their ability to receive existing DVB-T and potential DVB-T2 broadcasts, are also determined by their technical specifications.

In contrast to TVs, the market for CTV devices is smaller and less complex. Currently there are only around 8 major brands that supply around 30 of the most popular CTV devices on the Australian market.

These popular CTV devices, which are set out in **Appendix B**, fall into 3 main categories:

- media streaming devices (e.g., Apple TV, Google Chromecast, Amazon Fire TV Sticks);
- game consoles (e.g., Microsoft Xbox and Sony PlayStation); and
- set-top boxes, which include pay-TV set-top boxes (e.g., Foxtel iQ5 and Telstra Fetch) and VAST satellite receiver set-top boxes.

In addition to those popular CTV devices, there is also a wide range of other niche and minor-brand devices supplied on the Australian market. However, the consumer survey results indicate that those CTV devices only comprise a small (6%) share of the market. The relatively small range of popular CTV devices currently supplied on the Australian market is explained, to some extent, by the:

- increasing technical capabilities of the TVs being supplied on the Australian market, including the release by the major brands of cheaper entry-level versions of their more expensive products in competition with the cheaper brands;
- rapidly falling prices of smart TVs capable of streaming UHD 4K content;
- frequency with which consumers purchase new TVs, which is discussed further in **Part B** of this report; and
- concentration effects in the global consumer market for media streaming devices, operating systems, and platforms.

In combination, these trends mean that there are potentially fewer numbers of older, legacy TVs requiring CTV devices to meet the current needs of consumers.

The technical capabilities of these popular CTV devices are summarised in **Figures 10 to 16**, which outline the proportion of those CTV device models currently being supplied on the Australian market that have each of the capabilities listed, namely:

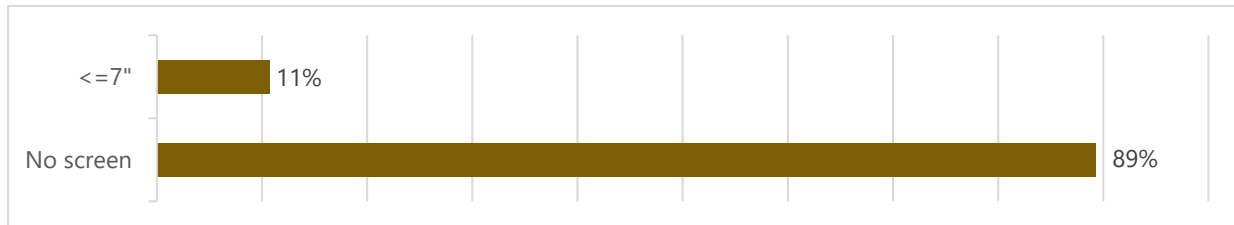
- Screen size. As illustrated in **Figure 10**, whether a CTV device has a screen varies, with:
 - 89% of CTV devices supplied on the Australian market do not come with a screen (i.e., they are designed to provide their output on a TV screen or monitor); and
 - 11% have a screen size less than or equal to 7";
- Resolution. As illustrated in **Figure 11**, the resolution of CTV devices is as follows:
 - 57% of those CTV devices have an Ultra High Definition 4K (UHD 4K) resolution;
 - 25% have a Full High Definition (FHD 1080p) resolution;
 - 7% have an Ultra High Definition 8K (UHD 8K) resolution;
 - 7% have a Quad High Definition (QHD 1440p) resolution; and
 - 4% have a High Definition (HD 720p) resolution;

- RF tuner. As illustrated in **Figure 12**, most CTV devices do not contain an RF tuner/receiver:
 - 71% of CTV devices are media streaming devices that have no tuner, since they are designed to stream internet content, rather than receive terrestrial broadcasts, and the remaining 29% have an RF tuner;
 - 21% are set-top boxes with DVB-T2 tuners that are capable of receiving both existing DVB-T and potential DVB-T2 terrestrial broadcasts and the remaining 86% do not. None of the CTV devices DVB-T only tuners; and
 - 14% are satellite TV set-top boxes that have a DVB-S2 tuner and the remaining 86% do not;
- Operating system software. As illustrated in **Figure 13**, most of those CTV devices are smart devices that incorporate central processors that use a range of different operating systems:
 - 50% of CTV devices use the Android TV operating system;
 - 11% use the Xbox operating system;
 - 11% use the Orbis (PlayStation 4) operating system;
 - 11% use the Horizon operating system;
 - 7% use the TV OS operating system;
 - 4% use the Entertainment OS operating system; and
 - the remaining 7% of CTV devices use operating systems that are not specified;
- Decoding software (i.e., codecs used to decode content). As illustrated in **Figure 14**, CTV devices contain codecs that enable those devices to decode a range of MPEG-2 and MPEG-4, as well as HEVC, VP9, and AV1 encoded content. The proportions of CTV devices with each type of codec are as follows:
 - 64% of CTV devices have HEVC (i.e., H.265) codecs;
 - 46% have MPEG-4 codecs (i.e., they are able to decode both MPEG-2 and MPEG-4 content) and none of those devices have MPEG-2 only decoder;
 - 39% have VP9 codecs; and
 - 21% have AV1 codecs;

(These proportions could be different due to the uncertainty surrounding whether some CTV devices have these codecs);
- Connectivity (i.e., ability to connect to external devices). All CTV devices (i.e., 100%) can be connected to the internet, as well as a range of other devices, through a variety of different interfaces that are illustrated in **Figure 15**. This includes ethernet, USB and HDMI ports, as well as wireless Wi-Fi and Bluetooth connections:
 - 100% of CTV devices have an HDMI port;
 - 96% have Wi-Fi connectivity;
 - 82% have an ethernet port;
 - 82% have a USB port; and
 - 71% have Bluetooth connectivity (This proportion could be higher in view of the uncertainty surrounding the Bluetooth connectivity of 4% of those major-brand CTV devices);
- Price. As illustrated in **Figure 16**, the prices of CTV devices supplied on the Australian market range from less than \$50 to more than \$500, with a median price of \$249:
 - 29% have a price between \$300 and \$499;
 - 21% have a price between \$100 and \$199;
 - 14% have a price between \$200 and \$299;

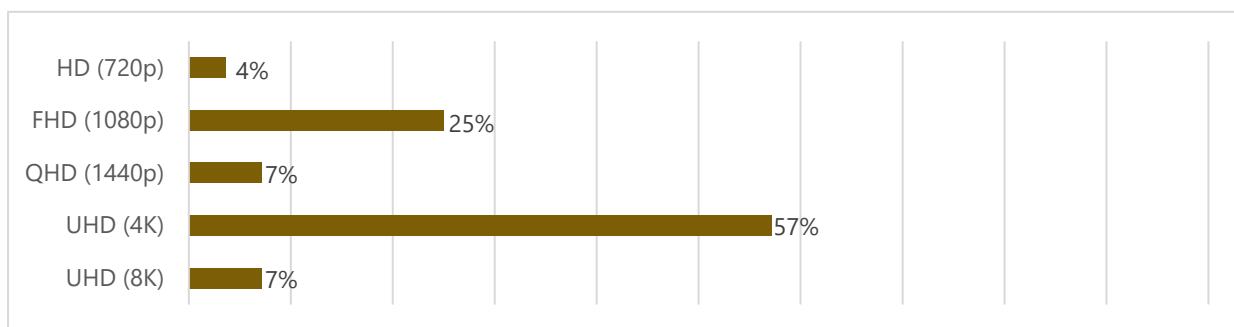
- 14% have a price between \$50 and \$99; and
- 4% have a price of less than \$50.

Figure 10: Screen sizes of CTV devices advertised as being supplied on the Australian market



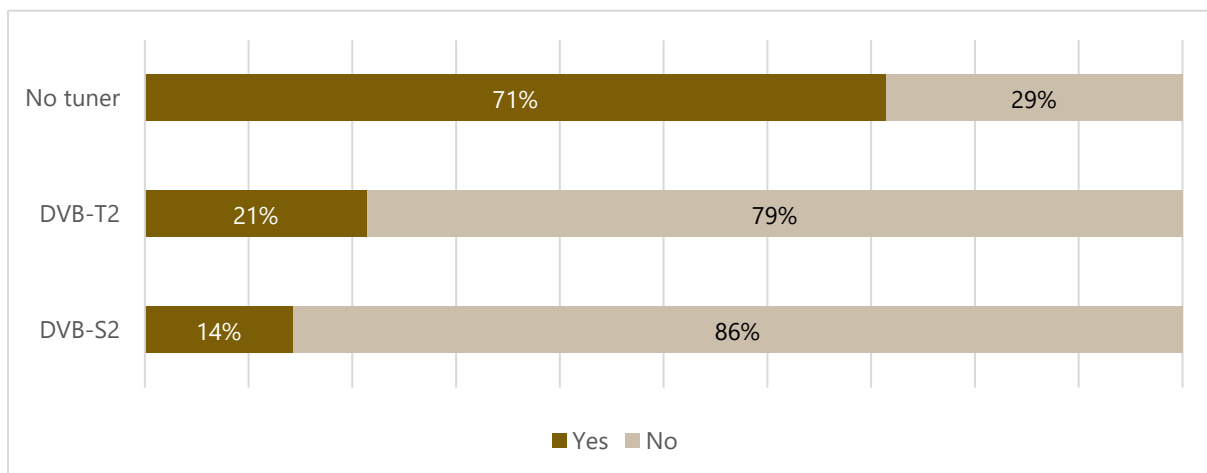
Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

Figure 11: Resolution of CTV devices advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

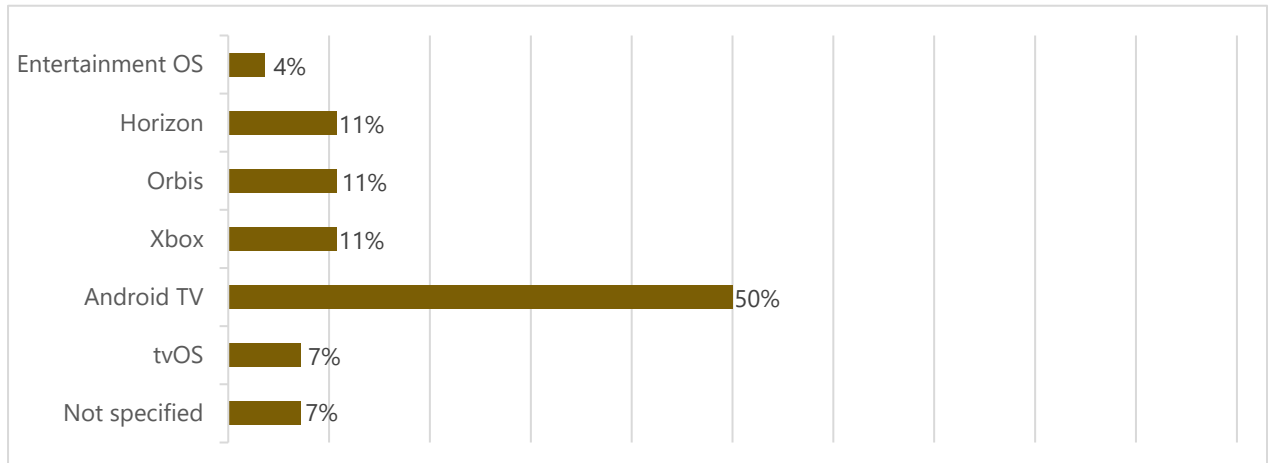
Figure 12: RF tuners used by CTV devices advertised as being supplied on the Australian market



Note: None of the popular CTV devices have DVB-T only tuners. However 21% have DVB-T2 tuners that are backward compatible

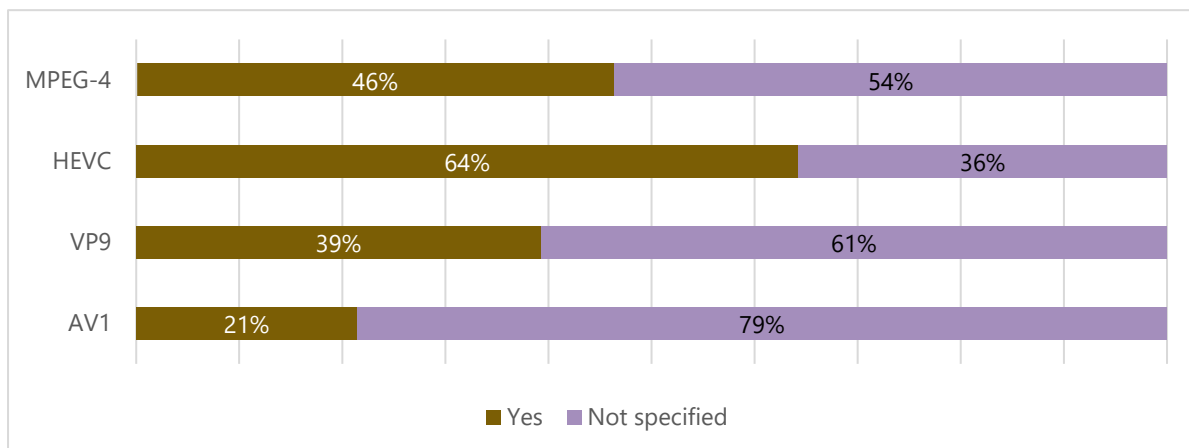
Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

Figure 13: Operating system software used by CTV devices advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

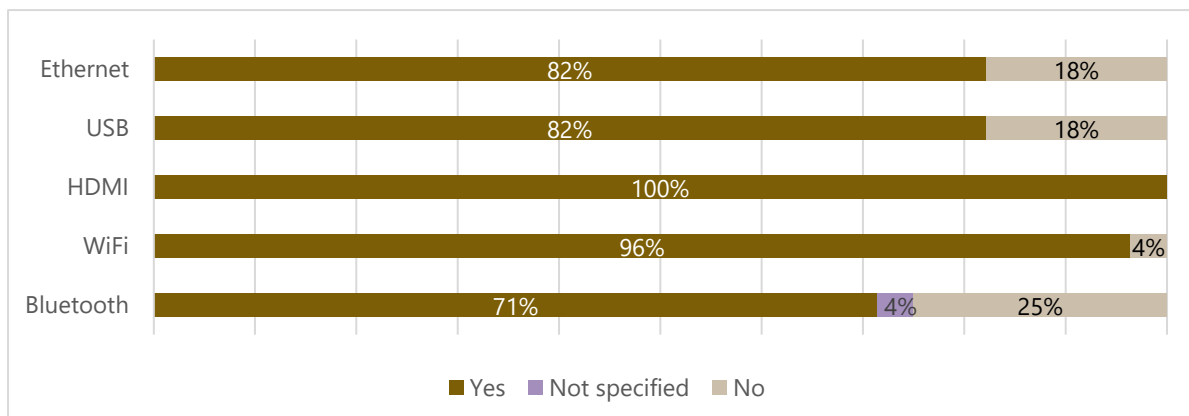
Figure 14: Decoding software (codecs) used by CTV devices advertised as being supplied on the Australian market



Note: None of the popular CTV devices have MPEG-2 only decoders. However, 46% have MPEG-4 decoders that are backward compatible with MPEG-2

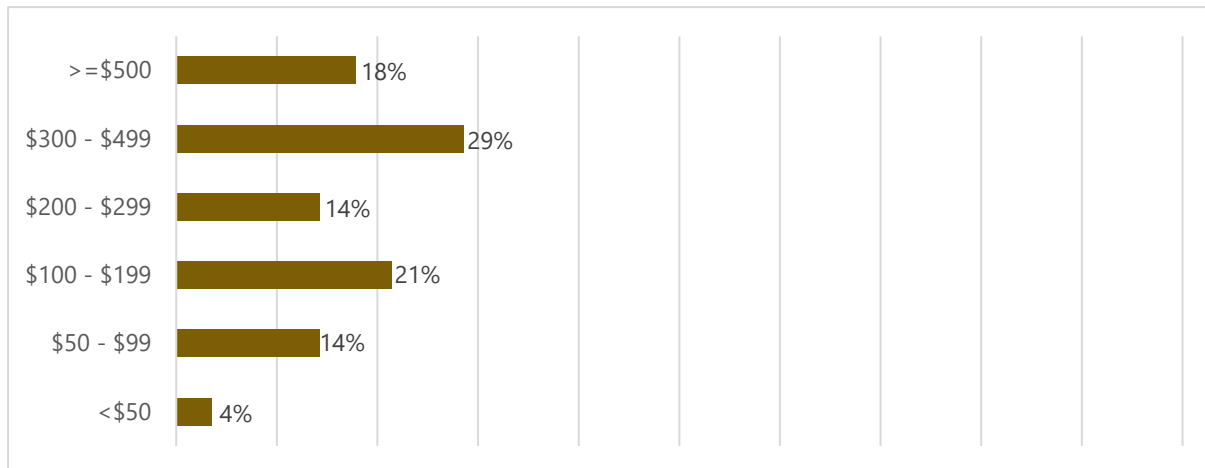
Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

Figure 15: Connectivity of CTV devices advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

Figure 16: Prices of CTV devices advertised as being supplied on the Australian market



Source: Sapere analysis of the technical specifications data sourced from manufacturer websites (n=28)

As with TVs, the capabilities of CTV devices depend on the particular combination of technical specifications that they offer.

Since DVB-T2 terrestrial television broadcasts have not yet commenced in Australia, there is little demand at the moment for CTV devices that are capable of receiving and decoding potential broadcasts.

This may be one reason why most (71%) of the CTV devices that are currently sold by major retailers of consumer electronic devices in Australia are media streaming devices that cannot receive either existing or potential terrestrial broadcasts (i.e., since they lack a DVB-T or DVB-T2 tuner).

Rather, most of those major CTV devices are designed to have a combination of technical specifications that enable media streaming. These include:

- connections to enable them to be plugged into the internet and enable their output to be connected to a TV (e.g., ethernet and/or HDMI connections);
- codecs required to decode the content streamed from the internet (e.g., typically MPEG-4 codecs, as well as HEVC codecs in some cases); and
- application software required to stream internet content from different sources (e.g., apps to stream free to air broadcasts over the internet as well as other free and subscription content).

Some CTV devices are available that could potentially be used to receive and decode DVB-T2 broadcasts

Most of the popular CTV devices supplied on the Australian market are media streaming devices that do not have the ability to receive terrestrial broadcasts. However, there are some CTV devices that are also potentially capable of receiving and decoding DVB-T2 terrestrial broadcasts. This includes some CTV devices that have the DVB-T2 tuners, as well as the MPEG-4 and HEVC codecs, required to decode those broadcasts.

Notably, the pay-TV set-top boxes that currently provide consumers with access to subscription TV services via cable, satellite and the internet are already capable of receiving DVB-T2 or DVB-S2

broadcasts and decoding MPEG-4 and HEVC encoded content (e.g., Foxtel's iQ set-top boxes, Hubbl and Fetch TV boxes).

In addition, the 2 main models of satellite TV set-top boxes supplied by VAST™ Certified Decoder Manufacturers are also already capable of receiving Australia's existing Viewer Access Satellite Television (VAST) broadcasts. Those set-top boxes are able to receive the existing broadcasts that use the DVB-S2 standard and have the MPEG-4 and HEVC decoders required to decode the content of those broadcasts.

As previously noted, there is also a range of lesser-known CTV devices supplied on the Australian market that *may* also have the ability to receive and decode DVB-T2 broadcasts. These are mostly Android streaming devices without a screen.

However, unlike the most popular CTV devices, greater uncertainty surrounds the actual technical specifications and capabilities of those devices. The limited information provided on those devices, which generally relates to device capabilities (e.g., ability to stream internet content in UHD 4K), rather than to detailed technical specifications, suggests these devices are typically:

- media streaming devices that do not incorporate an RF tuner (83%);
- use an Android TV operating system (almost all);
- have some combination of Wi-Fi, USB, ethernet and HDMI connections; and
- are able to decode MPEG-4 encoded content (100%).

2.6 Key factors influencing the capabilities of TVs and CTV devices

As noted in **Section 1** and outlined further below, the technical specifications and capabilities of the TVs and CTV devices supplied on the Australian market are potentially influenced by a range of factors including:

- rapid advances in technology;
- globalisation of the markets for TVs and digital content; and
- the development of more consistent global TV standards.

Rapid advances in technology

Early TVs used discrete analogue components, including thermionic valves and monochrome cathode ray tube displays. In addition, they used manual radio frequency tuners that required the user to get up to change between the limited range of TV channels and terrestrial broadcast content available at that time (initially one channel and then two).

By contrast, today's smart TVs and CTV devices make extensive use of large-scale integrated digital component parts (e.g., SoC, or 'System on a Chip' components, which are integrated circuits that contain many of the key systems required by a smart TV on a single chip). In addition, they also typically have remote controls, search engines, and voice recognition systems that enable the user to locate the content they wish to display from the comfort of their lounge chairs.

TVs sold today represent the culmination and convergence of a wide range of technologies that were originally developed for use in computers (e.g., desktop, laptop, and tablets), as well as smartphones.

Those technologies are now being used in TVs to receive, decompress, decode, and display the continually expanding range of digital content that is available through both terrestrial broadcasts and internet streaming.

Although these rapid changes in technology have generated substantial benefits for those individuals who have purchased these new TVs, they have also imposed substantial costs on owners of existing TVs and CTV devices by reducing the useful life of those products.

All physical assets, including consumer durables such as TVs and CTV devices, have a limited useful life. Physical wear and tear can shorten the effective life of devices. However, changes in technology, such as the rapid changes in TV technology and broadcasting standards over the last few decades, can also have this effect. For example, the transition from analogue to digital TV broadcasting reduced the remaining useful lives of all analogue TVs on the market, thereby resulting in a loss in the value in use of those TVs to all existing owners.

It is here that set-top boxes have played an important role in facilitating the introduction of new technology and terrestrial broadcasting standards. In effect, set-top boxes help to extend the useful lives of existing TVs that would otherwise have been rendered obsolete by advances in technology and broadcasting standards.

Globalisation of the markets for TVs and digital content

The convergence of computer technologies with the technologies used in TVs and mobile phones, in conjunction with the liberalisation of international trade since the 1970s, has also resulted in the increasing globalisation of the markets for both:

- consumer electronic devices including TVs and CTV devices; and
- digital content, including content distributed through terrestrial broadcasts and the internet.

This has enabled the manufacturers of consumer electronic equipment to reap substantial:

- economies of scale through mass production for the global market; and
- economies of scope by producing component parts that are used by a wide variety of consumer electronic equipment (e.g., flat panel displays that are used not only in TVs, but also in computer monitors).

As a result, the global markets for consumer electronic equipment are now dominated by:

- a few large multinational companies that manufacture TVs and the key component parts they use (e.g., flat screens and integrated circuits such as the SoCs used in smart TVs); and
- the overall preferences and needs of global TV consumers, particularly those located in the large European and American markets, rather than the specific needs of consumers in small countries such as Australia.

This increasing globalisation of the markets for consumer electronic equipment helps to explain why most of the TVs supplied on the Australian market are already potentially capable of receiving DVB-T2 transmissions. This is not the result of Australian broadcasting standards, which have only recently been released for DVB-T2 TVs. Rather, it is the fortuitous result of manufacturers producing TVs that are designed to meet the world's largest markets for TVs (e.g., Europe and Asia which already have DVB-T2 broadcasts). It is the second-generation DVB-T2 standards that have been developed for the

European markets that set most of the standards with which most TVs imported into Australia by leading global brands comply. Since the DVB-T2 standards are backwardly compatible with Australia's DVB-T broadcasting standards, manufacturers do not have to make TVs that are only DVB-T capable for the Australian market.

The globalisation of the market for consumer electronic equipment has also provided the suppliers of TVs and related parts with greater opportunities to mitigate the risks and costs they face as a result of changes in technology and global broadcasting standards.

Rapid changes in technology and terrestrial broadcasting standards impose costs on all owners of existing TVs. This includes not only the consumers who have already purchased a TV, but the suppliers of existing TVs that hold stocks of those TVs and their component parts.

It is important to note, however, that there are substantial differences in both the:

- timing and rates of change in terrestrial broadcasting standards in different countries (e.g., due to differences in their rates of regulatory review and reform); and
- timing and rates of uptake in new TVs incorporating the latest technologies (e.g., due to differences in consumer preferences and incomes across jurisdictions, as well as the additional time it takes to transport heavy and bulky TVs to smaller, more remote markets such as Australia).

These timing differences, together with the globalisation of the markets for consumer electronic equipment and component parts, provide *an incentive for suppliers to redirect their sales of products that have been rendered obsolete* in some jurisdictions (e.g., due to changes in technology and terrestrial broadcasting standards) to other smaller and more remote jurisdictions, such as Australia, that:

- have been relatively slow to introduce new terrestrial broadcasting standards (e.g., DVB-T2); and
- experience delays in the introduction of TVs that incorporate new technologies, which may first appear in the largest electronics markets such as US, Asia and Europe.

While this might enable some Australian consumers to obtain cheaper TVs in the short term, these short-term benefits inevitably come at a greater cost in the longer term both to:

- consumers, who may subsequently discover that they need to purchase another TV or set-top box to receive DVB-T2 broadcasts; and
- the Australian community as a whole, by increasing the costs arising from the transition to the new broadcasting standards and TV technologies.

Development of more consistent global TV standards

In parallel with the globalisation of the markets for TVs and digital content, both industry and regulators have been working on the development of more consistent global technical standards for the delivery of digital media.

In particular, since its foundation in 1993, the DVB Project – an industry-led consortium within the European Broadcasting Union – has been developing and maintaining open technical specifications for digital media delivery. Those standards are published by a Joint Technical Committee (JTC) of the

European Telecommunications Standards Institute (ETSI), European Committee for Electrotechnical Standardization (CENELEC) and European Broadcasting Union (EBU).

Until recently, the basic standards that TV receivers need to meet to receive free-to-air terrestrial VHF/UHF DVB-T broadcasts in Australia (e.g., a DVB-T tuner and the ability to decode MPEG-2 encoded content) were set out in *AS 4933 Digital television - Requirements for receivers for VHF/UHF DVB-T television broadcasts including ancillary services*.

On 15 November 2024, however, Standards Australia published a new standard (*AS 5362:2024 Requirements for receivers for VHF/UHF DVB-T2 television broadcasts including ancillary services*). That new standard was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 1 November 2024.

As noted in its Preface, that new standard includes an extensive range of new specifications beyond those set out in the DVB-T specifications contained in *AS 4933:2024 (Digital television - Requirements for receivers for VHF/UHF DVB-T television broadcasts including ancillary services)*.

Those new standards are intended to provide sufficient detail "to allow receiver manufacturers to design and manufacture DVB-T2 receivers to meet Australian technical and regulatory requirements, including the following:

- (a) DVB-T2 Multiple Physical Layer Pipes, which allow separate adjustment of the robustness of each delivered service within a channel to meet the required reception conditions (e.g., in-door or roof-top antenna).
- (b) DVB-T2 Single Frequency Network implementation, which allows an efficient management of frequency utilization and permits an extension of the *coverage* area.
- (c) Increased bit rate efficiency with High Efficiency Video Coding (HEVC), leading edge High Dynamic Range/High Frame Rate picture formats and multi-channel immersive AC-4 audio coding.
- (d) Australian regulatory requirements such as program classification codes, e.g., for parental guidance and time zone different to those applicable in Europe".

The new standards reference both the specifications produced by:

- the Joint Technical Committee (JTC) Broadcast of the European Broadcasting Union (EBU), Comité Européen de Normalization ELECTrotechnique CENELEC) and the European Telecommunications Standards Institute. In particular, the Preface notes that Standards Australia's membership of the DVB Project allows it to support the development of Australian digital TV standards, which are focussed on the adoption of ETSI/DVB standards; and
- NorDig (nordig.org), which is a cooperative organisation consisting of Nordic and Irish television companies and telecom companies that was founded in 1997 to specify a common platform for Digital Television to be used within the Nordic region (Denmark, Finland, Iceland, Norway, Sweden) and Éire. As noted in the Preface to the new Australian DVB-T2 standards, those NorDig specifications have been used since 2011 by many consumer electronics manufacturers in the design of DVB system digital television receivers deployed in Australia.

This highlights the important influence that the European ETSI DVB Standards and Nordig Unified Requirements have had to date, and will continue to have in the future, on the technical specifications of digital TVs supplied on the Australian market.

2.7 Implications for consumers

Risks and uncertainty arising from the introduction of new broadcasting standards

As noted in **Section 1.6**, the introduction of new broadcasting standards inevitably creates risks for consumers, which include both:

- upside risks (i.e., potential benefits or opportunities) for those consumers who are either:
 - considering the purchase of a new TV or CTV device, since they have the option of choosing one that is compatible with those new standards; or
 - have already purchased a new TV or CTV device that is compatible with those new standards;
- downside risks (i.e., potential costs) for those consumers who have already purchased a TV or CTV device that is not compatible with those new standards.

In addition, the introduction of new DVB-T2 broadcasting standards also inevitably creates uncertainty for consumers regarding:

- the potential benefits they will derive from being able to receive DVB-T2 broadcasts (e.g., due to the uncertainty surrounding the content of those broadcasts);
- the potential costs they will have to incur in order to receive those broadcasts (e.g., due to the uncertainty that surrounds whether their existing TVs will be capable of receiving those broadcasts, or whether they will have to purchase a new TV or a new CTV device in order to receive those broadcasts).

Consumers have flexibility to manage the risks and uncertainty arising from the potential introduction of DVB-T2 broadcasts

Australia is *potentially well prepared* for the introduction of DVB-T2 broadcasts in view of the high proportion of TVs that are either:

- DVB-T2-capable; or
- capable of receiving DVB-T2 broadcasts with the addition of a set-top box capable of receiving DVB-T2 broadcasts.

In view of the high proportion of DVB-T2-capable TVs that are supplied on the Australian market, consumers will have greater flexibility to realise the potential benefits arising from the introduction of DVB-T2 broadcasts than would otherwise have been the case (e.g., if there were only a few DVB-T2 TVs supplied on the market). In particular, this will:

- provide consumers who are considering the purchase of a new TV with the option of choosing from a much wider range of DVB-T2-capable models than would otherwise have been the case; and
- provide consumers who have already purchased a DVB-T2 TV with the option of being able to access the content provided by DVB-T2 broadcasts once those broadcasts commence (i.e., it provides them with the option to access a wider range of content sources than would otherwise have been possible).

Similarly, consumers will also have greater flexibility to reduce the costs arising from the introduction of DVB-T2 broadcasts due to the range of CTV devices supplied on the Australian market that are capable of receiving those broadcasts.

In particular, this range gives those consumers who have already purchased a TV that is not DVB-T2-capable the option of purchasing a less expensive CTV device that is capable of receiving DVB-T2 broadcasts, rather than having to purchase a new, and potentially much more expensive DVB-T2-capable TV.

The extent to which Australia is *actually prepared* for a potential introduction of DVB-T2 broadcasts will depend, of course, on the extent to which consumers purchase those DVB-T2-capable TVs and CTV devices. This is discussed further in **Part B** of this report.

3. Availability of TVs and CTV devices

Key findings

- **Consumers in major cities have access to the greatest range of TVs and DVB-T2-capable TVs**

The ability of Australians to receive DVB-T2 broadcasts depends on the availability of TVs supplied on the Australian market (i.e., the ability of consumers to purchase those TVs from retailers), which varies substantially across Australia. Consumers located in major cities tend to be able to access a higher proportion of the TVs advertised by the selected major retailers and smaller independent retailers included in our analysis from either their preferred store (34%), from another store (44%), by placing an order with a store (78%), or with an online-only retailer (83%). In addition, the consumers located in major cities also have access to the highest proportion of available TVs that are capable of receiving, decoding and displaying potential DVB-T2 broadcasts (83% of the TVs available in major cities from the selected retailers are DVB-T2-capable). This is similar to the proportion of TVs across Australia that is DVB-T2-capable (80%).

- **Consumers outside major cities have access to a narrower range of TVs but a high proportion of those TVs are DVB-T2-capable**

As the distance that a consumer lives from a major city increases, the range of TVs available tends to decrease. For consumers located in outer regional areas, a smaller proportion of TVs advertised for sale is available in-store (31%), from another store (28%), by placing an order in-store or online from those stores (48%), or an order from an online-only retailer (75%). Consumers living in remote and very remote areas of Australia have access to the smallest range of TVs, with an even smaller proportion of TVs being available in-store (21%), from another store (12%), by placing an order with a store (45%), or an order from an online-only retailer (33%). As the distance that a consumer lives from a major city increases, the proportion of available TVs that are DVB-T2-capable also tends to decline, but only slightly (79% of TVs available in outer regional Australia and 75% of TVs available in remote and very remote Australia from the selected retailers are DVB-T2-capable). Overall, this means that although consumers living outside major cities have access to a narrower range of TVs, a high proportion of those TVs are still DVB-T2-capable.

- **CTV devices are more readily available across Australia**

The availability of CTV devices supplied on the Australian market also varies across regional areas of Australia, but to a lesser degree than TVs. CTV devices are more readily available than TVs in view of their small size and weight, which means they can be delivered to most regions of Australia through normal parcel post. Since DVB-T2 terrestrial broadcasts have yet to commence in Australia, most of the CTV models supplied by the selected retailers tend to be media streaming devices that do not contain an RF tuner (i.e., they are CTV devices that are not DVB-T2-capable). However, a limited number of DVB-T2-capable CTV devices are also available from those selected retailers to consumers located outside of Australia's major cities. Those consumers can also purchase DVB-T2-capable CTV devices from other specialist providers.

3.1 TV availability varies across Australia

The ability of consumers to receive potential DVB-T2 broadcasts does not depend solely on the capabilities and technical specifications of TVs advertised as being supplied on the Australian market. It also depends on the retail availability of TVs capable of receiving those broadcasts. That is, the ability of consumers in each region of Australia to purchase DVB-T2-capable TVs.

At first, it might seem reasonable to assume that since there is a wide range of TVs and CTV devices currently supplied on the Australian market, all Australians have equal access to those products regardless of their locations, budgets, and needs.

In practice, however, this is not the case. Although retailers in Australia advertise a wide range of brands and models of TVs for sale in Australia on their websites, not all of those models are:

- available for sale at any one point in time;
- available in-store at any point in time for customers to pick up;
- available for sale to consumers who live in more remote areas of Australia.

Rather, as outlined further below, the availability of TVs varies across Australia.

As noted in **Section 1.2** and **Appendix A**, the methodology used to determine the availability of both TVs and CTV devices across Australia involved selecting a sample of the main retailers of consumer electronic equipment across Australia, which include:

- major retailers (e.g., JB Hi-Fi, Good Guys, and Harvey Norman stores);
- smaller retailers, including the small independent retailers that operate stores in some of the more remote regions of Australia (e.g., Bing Lee, Retravisson, Betta, and Videopro stores); and
- major online-only retailers (e.g., Kogan and Appliances Online).

Information was obtained from the websites of those selected retailers on each of the models of TVs and CTV devices they advertise on their websites. The number of TVs and CTV devices these selected retailers advertise on their websites differs both across those retailers and over time (e.g., as new models are added and older models are deleted). In general, at any one time, most of the major retailers selected advertise up to around 200 models of TVs, but a much smaller number of popular CTV devices (up to around 30 models of the more popular CTV devices), which are listed in **Appendix B**. By contrast, the smaller retailers selected tend to advertise lower numbers of TV and CTV device models.

Those websites were then used to determine the availability of each of those TVs and CTV devices for supply to customers located in a number of selected locations around Australia of varying degrees of remoteness (outlined in **Appendix A**), as defined by the Australian Statistical Geography Standard (ASGS) Remoteness Structure. The ASGS Remoteness Structure uses the [Accessibility/Remoteness Index of Australia Plus \(ARIA+\)](#) to define 5 classes of relative geographic remoteness across Australia: Major Cities of Australia; Inner Regional Australia; Outer Regional Australia; Remote Australia; and Very Remote Australia, which are illustrated in **Figure 17**. In effect, ARIA+ measures the distances people must travel to obtain services. That is, it measures remoteness in terms of access along the road network from populated localities to each of the 5 categories of Service Centre that are based on population size.

Specifically, information was collected from each of the selected retailer websites on whether each of the TVs and CTV devices advertised for sale on that website was available:

- in-store (i.e., from the store selected for the purposes of the availability analysis. This is the preferred store that would normally be selected by the customer);
- from another store operated by the same retailer (e.g., a more distant store);
- by placing an order for home delivery with a store, either in person or online, for the TV to be delivered to the customer's address. This includes any special orders that might have to be placed to order some TV models. Not all retailers provide an indication of whether an order is a special order or not. As a result, it is not possible to provide aggregate figures for this category of availability; or
- from an online-only retailer (i.e., Appliances Online, Kogan).

A selected number of retailers in each of these regions of Australia were then called to verify the online availability data for a selection of TVs and CTV devices they advertise. This included:

- 32 major retail stores (4 major retail stores in each State and Territory – one in each: capital city, other major city/inner regional area, outer regional area, and remote/very remote area); and
- 27 stores operated by smaller independent retailers located in major cities, outer regional and remote/very remote regions of each State and the Northern Territory.

Additional information was also collected from those retailers, particularly those in the more remote regions of Australia, on the key factors that influence the availability of the TV and CTV models they advertise. The results of that telephone audit confirmed the accuracy of the information that retailers provide on their websites regarding the availability of the TVs and CTV devices they advertise for sale.

The results of that research into the regional availability of TVs are set out in **Table 1** and discussed further below.

Table 1: Availability of TVs from selected retailers across Australia by Remoteness Area

Availability	Major cities of Australia	Inner regional Australia	Outer regional Australia	Remote and very remote Australia
Available in-store	34%	30%	31%	21%
Available from another store	44%	47%	28%	12%
Available for home delivery	78%	40%	48%	45%
Available from an online-only retailer	83%	90%	75%	33%

Notes: Percentages indicate the proportion of all TVs advertised on the websites of selected retailers in each Remoteness Area that are available in the selected store, from another store, for delivery from the retailer, or delivery by an online-only retailer.

See **Section 1.2** and **Appendix A** for further information on the methodology used for the purposes of this analysis.

Source: Sapere analysis of the TV availability data provided by the websites of retailers (n=1080)

Although **Table 1** provides information on the availability of TVs across regions of Australia, it does not indicate the technical capabilities of those TVs. To access DVB-T2 broadcasts, consumers also need access to TVs that are capable of receiving, decoding and displaying those broadcasts.

As a result, in addition to determining the proportion of all advertised TVs that are available across Australia which is outlined in **Table 1**, it is also necessary to determine the technical capabilities of those available TVs, which are outlined in **Table 2** and discussed further below.

Table 2: Technical capability of TVs available from selected retailers across Australia by Remoteness Area

Technical capability of available models	Major cities of Australia	Inner regional Australia	Outer regional Australia	Remote and very remote Australia	Australia
DVB-T or DVB-T2 tuner	100%	100%	100%	100%	100%
DVB-T2 tuner	92%	91%	90%	88%	90%
MPEG-2 or MPEG-4 decoder	100%	100%	100%	100%	100%
MPEG-4 decoder	99%	99%	98%	98%	98%
HEVC decoder	100%	100%	100%	100%	100%
Internet access (i.e., smart TV)	99%	99%	99%	99%	99%
Partially DVB-T2-capable (i.e., DVB-T2 tuner, MPEG-4, HEVC, Internet, FHD display)	3%	3%	4%	3%	3%
DVB-T2-capable (i.e., DVB-T2 tuner, MPEG-4, HEVC, Internet, UHD display)	83%	81%	79%	75%	80%

Notes: Percentages indicate the proportion of TVs that are available in-store or for delivery from selected retailers in each Remoteness Area that have the particular technical capabilities listed in the first column.

Source: Sapere analysis of the TV availability data provided by the websites of retailers (n=1080) and published technical specifications

Specifically, **Table 2** indicates the proportion of TVs that are available in each remoteness area of Australia that have:

- each of the key technical capabilities that are required to receive and decode DVB-T2 broadcasts (i.e., a DVB-T2 tuner, MPEG-4 and HEVC codecs, and internet access which would be required to stream any of the content contained in DVB-T2 broadcasts that is also provided on the internet); and
- the particular combinations of technical capabilities required to receive, decode and display the content contained in DVB-T2 broadcasts. In particular, in order to receive, decode and display:
 - some of the content contained in DVB-T2 broadcasts, consumers will require a TV that has a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access (to access any DVB-T2 broadcast content that is also streamed on the internet) and a full high definition (FHD)

display that is capable of displaying standard definition (SD) and high definition (HD) content;

- all of the content contained in DVB-T2 broadcasts, consumers will require a TV that has a DVB-T2 tuner, internet access (to access any DVB-T2 content that is also streamed on the internet) and an ultra high definition (UHD) display that is capable of displaying SD, HD and UHD 4K content.

In addition, it is also useful to determine how the technical capabilities of those available TVs differ across remoteness areas of Australia depending on whether they are available from in-store retailers, or online-only retailers, which is outlined in **Table 3**.

Table 3: Technical capability of TVs available from selected in-store and online-only retailers across Australia by Remoteness Area

Technical capability of available models	In-store retailers (major cities)	Online-only retailers (major cities)	In-store retailers (inner regional)	Online-only retailers (inner regional)	In-store retailers (outer regional)	Online-only retailers (outer regional)	In-store retailers (remote and very remote)	Online-only retailers (remote and very remote)
DVB-T2	96%	83%	95%	84%	95%	82%	96%	71%
MPEG-4	100%	97%	100%	96%	100%	96%	100%	93%
HEVC	100%	100%	100%	100%	100%	100%	100%	100%
Smart TV	100%	98%	100%	98%	100%	98%	100%	97%
Partially DVB-T2-capable (i.e., DVB-T2 tuner, MPEG-4, HEVC, Internet, FHD display)	4%	2%	4%	2%	6%	2%	5%	1%
DVB-T2-capable (i.e., DVB-T2 tuner, MPEG-4, HEVC, Internet, UHD display)	89%	70%	88%	70%	85%	68%	87%	51%

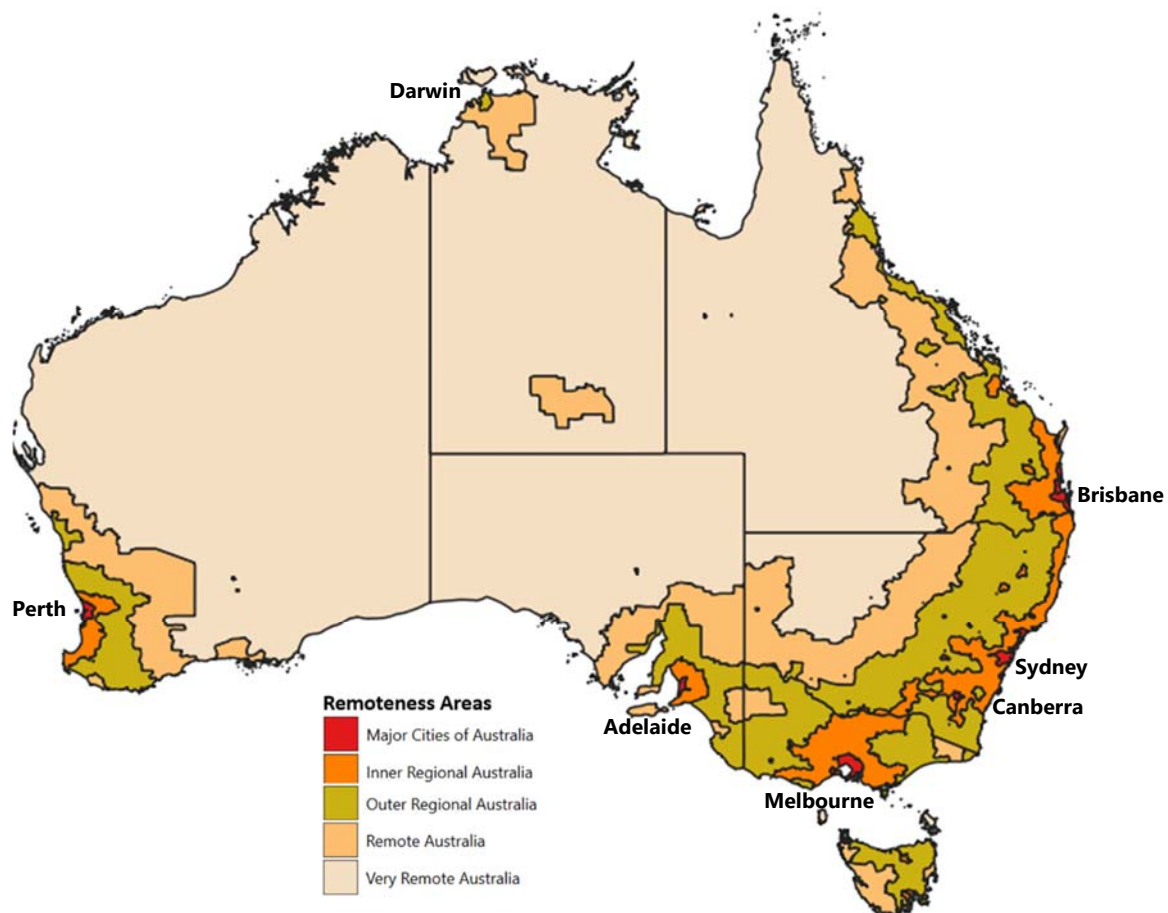
Notes: Percentages indicate the proportion of TVs that are available in-store or for delivery from selected in-store, or online-only, retailers in each Remoteness Area that have the particular technical capabilities listed in the first column (i.e., the proportion of the total number of TVs available from in-store retailers in each Remoteness Area, or the proportion of the total number of TVs available from online-only retailers, that have each of those technical capabilities)

Source: Sapere analysis of the TV availability data provided by the websites of retailers (n=1080) and published technical specifications

Specifically, **Table 3** provides the same information about the technical capabilities of the TVs that are available in each remoteness area of Australia as does **Table 2**. However, in this case it provides information on the technical capabilities of the TVs that are available from the selected in-store and selected online-only retailers in each of those regions (i.e., the proportions of the total number of TVs that are available from the selected in-store, or online-only retailers, in each of those regions that have the technical capability specified in the first column). By contrast, **Table 2** provides information on the technical capabilities of the TVs that are available from all of the selected retailers in each of those remoteness areas.

As discussed further below, the additional information outlined in **Table 3** may help explain some of the differences outlined in **Table 2** in the technical specifications of the TVs available across each of the remoteness areas of Australia (i.e., the extent to which those differences are due to differences in capabilities of the TVs available from the selected in-store and online-only retailers).

Figure 17: Remoteness Areas of Australia



Source: ABS (2023) Digital boundary files. ASGS Edition 3, Reference period July 2021-June 2026

Consumers who live in and around major cities have access to the greatest range of TVs and DVB-T2-capable TVs

In general, consumers who live in and around major cities tend to have access to the greatest range of TVs (i.e., a greater proportion of the TVs advertised by the selected retailers on their websites).

Specifically, as outlined in **Table 1**, in those major cities:

- 34% of TV models advertised on retailer websites are available in-store;
- 44% are available from another store operated by the retailer (i.e., a store other than the one identified for the purposes of the analysis);
- 78% are available to order from a store for delivery. This includes TVs that are available through special order, if any; and
- 83% are available to order from an online-only retailer.

Similarly, in inner regional Australia:

- 30% of TV models advertised on retailer websites are available in-store;
- 47% are available from another store;
- 40% are available to order from a store for delivery (including any TVs that are available through special order); and
- 90% are available to order from an online-only retailer.

In addition, as outlined in **Table 2**, consumers who live in and around major cities also tend to have access to the greatest proportion of DVB-T2-capable TVs (i.e., a greater proportion of the TVs available in those regions are DVB-T2-capable).

Specifically, **Table 2** indicates that in major cities:

- 100% of the TVs that are available in-store, or for delivery from, the selected retailers in those major cities are able to receive DVB-T broadcasts since they have either a DVB-T or DVB-T2. Although some TVs have a tuner of uncertain capability, it is most likely to be a DVB-T tuner;
- 92% have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts);
- 100% have the ability to decode MPEG-2 content since they have either a MPEG-2 or MPEG-4 codec. Although some TVs have uncertain MPEG capability, it is most likely to be MPEG-2 capability;
- 99% have an MPEG-4 decoder (i.e., they are capable of decoding both MPEG-4 and MPEG-2 encoded content), 100% have an HEVC decoder, and 99% are smart TVs with internet access;
- 3% are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays); and
- 83% are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays).

Similarly, in the inner regional areas surrounding those major cities:

- 100% of the TVs that are available in-store, or for delivery from, the selected retailers in those inner regional areas are able to receive DVB-T broadcasts since they have either a DVB-T or DVB-T2. Although some TVs have a tuner of uncertain capability, it is most likely to be a DVB-T tuner;
- 91% of the TVs that are available in-store, or for delivery from, the selected retailers in inner regional Australia have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts);
- 100% have the ability to decode MPEG-2 content since they have either a MPEG-2 or MPEG-4 codec. Although some TVs have uncertain MPEG capability, it is most likely to be MPEG-2 capability;
- 99% have an MPEG-4 decoder (i.e., they are capable of decoding both MPEG-4 and MPEG-2 encoded content), 100% have an HEVC decoder, and 99% are smart TVs with internet access;
- 3% are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays); and
- 81% are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays).

Similarly, **Table 2** also indicates that across Australia:

- 100% of the TVs that are available in-store, or for delivery from, the selected retailers across Australia are able to receive DVB-T broadcasts since they have either a DVB-T or DVB-T2. Although some TVs have a tuner of uncertain capability, it is most likely to be a DVB-T tuner;
- 90% have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts);
- 100% have the ability to decode MPEG-2 content since they have either a MPEG-2 or MPEG-4 codec. Although some TVs have uncertain MPEG capability, it is most likely to be MPEG-2 capability;
- 98% have an MPEG-4 decoder (i.e., they are capable of decoding both MPEG-4 and MPEG-2 encoded content), 100% have an HEVC decoder, and 99% are smart TVs with internet access;
- 3% are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays); and
- 80% are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays).

Overall, the proportions of TVs available from the selected retailers in capital cities and inner regional areas that are DVB-T2-capable (i.e., 83% and 81% respectively) are:

- higher than the proportion of TVs supplied on the Australian market that are DVB-T2-capable (i.e., 63%, as set out in **Section 2** of this report); and
- more consistent with the results of the consumer survey conducted for the purposes of this report, which indicate that 88% of respondents who had acquired a TV in the last 12 months acquired a DVB-T2-capable TV (see **Section 7**). That is, it is likely to reflect the decision of the selected major retailers in those regions to supply a higher proportion of “brand name” TVs to meet consumer preferences for those popular DVB-T2-capable TVs.

Table 3 indicates that there are some differences in the technical capabilities of the TVs that are available from the selected in-store retailers in comparison with those available from the selected online-only retailers. In general, the proportion of TVs available from the selected in-store retailers in major cities and inner regional Australia that have each of the capabilities listed in the first column of that table tend to be either higher, or equal to, those for the selected online-only retailers. For example, the proportion of TVs available from the selected in-store and online-only retailers that are DVB-T2-capable are 89% and 70% respectively for major cities, and 88% and 70% for inner regional Australia.

In addition, **Table 3** indicates that there is little difference in the technical capabilities of the TVs available from the selected in-store retailers in major cities and inner regional Australia. For example, 89% of the TVs available in major cities from the selected in-store retailers are DVB-T2-capable. Similarly, 88% of the TVs available from the selected in-store retailers in inner regional Australia are DVB-T2-capable.

This explains the reason why **Table 2** indicates that the proportions of TVs available in major cities that have each of the capabilities listed in the first column of that table are only slightly higher than those available in inner regional Australia.

Specifically, **Table 3** indicates that:

- 96% of the TVs that are available in major cities from the selected in-store retailers, and 83% of TVs available from online-only retailers, have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts). Similarly, 95% of the TVs available from the selected in-store retailers, and 84% of those available from online-only retailers in inner regional Australia also have a DVB-T2 tuner;
- 100% of the TVs available in major cities and inner-regional Australia from the selected in-store retailers have an MPEG-4 decoder, an HEVC decoder and internet access. In addition, 100% of the TVs available from the selected online-only retailers in major cities, as well as inner regional Australia, also have an HEVC decoder. Similarly, of the TVs available from the selected online-only retailers in major cities, 97% have an MPEG-4 decoder and 98% have internet access. In addition, of the TVs available from the selected online-only retailers in inner-regional Australia, 96% have an MPEG-4 decoder and 98% are smart TVs with internet access;
- 4% of the TVs available in major cities and inner regional Australia from the selected in-store retailers, and 2% of TVs available from online-only retailers, are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays);
- 89% of the TVs available in major cities from the selected in-store retailers, and 70% of those available from online-only retailers, are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays). Similarly, 88% of TVs available in inner regional Australia from the selected in-store retailers, and 70% of those available from online-only retailers, are DVB-T2-capable.

Consumers who live further away from those major cities have access to a narrower range of TVs and DVB-T2-capable TVs

By contrast, consumers who live further away from major cities have access to a reduced range of TVs. That is, as the distance that a consumer lives from major cities increases, the range of TVs to which they have access tends to decrease.

As indicated in **Table 1**:

- consumers who live in outer regional Australia tend to have access to a narrower range of TVs than those living in the major cities and inner regional cities. Specifically:
 - 31% of TV models advertised on retailer websites are available in-store (in contrast to 34% for major cities);
 - 28% are available from another store (in contrast to 44% for major cities);
 - 48% are available to order from a store for delivery, including TVs that are only available through special order, if any (in contrast to 78% for major cities); and
 - 75% are available to order from an online-only retailer (in contrast to 83% for major cities);
- consumers who live in remote and very remote Australia tend to have access to the smallest range of TVs. Specifically:
 - 21% of TV models advertised on retailer websites are available in-store from a store that can be located a long distance (e.g., greater than 200km) away from the consumer (in contrast to 34% for major cities);
 - 12% are available from another store, which once again can be located a long distance away from the consumer (in contrast to 44% for major cities);
 - 45% are available to order from a store for delivery (in contrast to 78% for major cities); and
 - 33% are available to order from an online-only retailer (in contrast to 83% for major cities).

In particular, this is likely to reflect, to some extent, the much smaller numbers of Australians who live in those more remote areas. As outlined in **Table 5** and discussed further in **Section 3.3**, only around 9% of Australians live in outer regional, remote, and very remote regions of Australia. In view of the smaller populations in those more regions, retailer stores located in those regions tend to carry narrower ranges of TVs to meet the less diverse needs and budgets of the smaller populations they serve (e.g., limited stocks of the most popular cheaper models). Although some more remote stores can actually hold more stock than some stores in major cities, remote consumers are less able to access stock from other nearby stores.

Reduced availability of devices in regional and remote areas is also likely to reflect the smaller numbers of major consumer electronics stores located in those outer regional, remote, and very remote regions of Australia, which is illustrated in **Figure 20** and discussed further in **Section 3.3**.

This means that consumers living in outer, remote, and very remote regional Australia may have to travel longer distances to pick up their TVs either from their “local” store, or another store “near” them. If this is not practicable, they have no other option other than to place an in-store or online order for the TV they want that the supplier is able to deliver to their location.

If the supplier is not able to deliver to their location (as is often the case, particularly for larger TVs), then the consumer will have to arrange for delivery to another address where they can pick it up.

Alternatively, the consumer can organise their own freight services. However, this can result in both:

- higher freight costs, particularly when it involves multiple carriers; and
- further delays in the delivery of their goods (e.g., typically an additional 2 to 3 weeks).

In addition, as outlined in **Table 2**, consumers who live further away from major cities have access to a reduced proportion of available TVs that are DVB-T2-capable. That is, as the distance that a consumer lives from major cities increases, the proportion of available TVs that are DVB-T2-capable tends to decrease.

Specifically, **Table 2** indicates that in outer regional Australia:

- 100% of the TVs that are available in-store, or for delivery from, the selected retailers in outer regional Australia are able to receive DVB-T broadcasts since they have either a DVB-T or DVB-T2. Although some TVs have a tuner of uncertain capability, it is most likely to be a DVB-T tuner;
- 90% have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts);
- 100% have the ability to decode MPEG-2 content since they have either a MPEG-2 or MPEG-4 codec. Although some TVs have uncertain MPEG capability, it is most likely to be MPEG-2 capability;
- 98% have an MPEG-4 decoder (i.e., they are capable of decoding both MPEG-4 and MPEG-2 encoded content), 100% have an HEVC decoder, and 99% are smart TVs with internet access;
- 4% are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays); and
- 79% are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays).

Similarly, in remote and very remote Australia:

- 100% of the TVs that are available in-store, or for delivery from, the selected retailers in remote and very remote Australia are able to receive DVB-T broadcasts since they have either a DVB-T or DVB-T2. Although some TVs have a tuner of uncertain capability, it is most likely to be a DVB-T tuner;
- 88% have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts);
- 100% have the ability to decode MPEG-2 content since they have either a MPEG-2 or MPEG-4 codec. Although some TVs have uncertain MPEG capability, it is most likely to be MPEG-2 capability;
- 98% have an MPEG-4 decoder (i.e., they are capable of decoding both MPEG-4 and MPEG-2 encoded content), 100% have an HEVC decoder, and 99% are smart TVs with internet access;
- 3% are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays); and

- 75% are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays).

Overall, this means that although consumers living outside Australia's major cities have access to narrower ranges of TVs as indicated in **Table 1**, a high proportion of those available TVs are DVB-T2-capable as indicated in **Table 2** (i.e., 79% of the TVs available from selected stores in outer regional Australia and 75% of TVs available from selected stores in remote/very remote Australia).

The proportions of TVs that are available from the selected retailers in outer regional Australia, as well as remote/very remote Australia, that are DVB-T2-capable (i.e., 79% and 75% respectively) are also:

- higher than the proportion of TV models supplied on the Australian market that are DVB-T2-capable (i.e., 63%, as set out in **section 2** of this report); and
- more consistent with the results of the consumer survey conducted for the purposes of this report, which indicate that 88% of respondents who had acquired a TV in the last 12 months acquired a DVB-T2-capable TV (see **Section 7**).

Once again, **Table 3** indicates that there are some differences in the technical capabilities of the TVs available from the selected in-store retailers in comparison with those available from the selected online-only retailers. In general, the proportion of TVs available from the selected in-store retailers in outer regional, as well as remote and very remote Australia, that have each of the capabilities listed in the first column of that table tend to be either higher, or equal to, those for the selected online-only retailers. For example, the proportion of TVs available from the selected in-store retailers in outer regional Australia that are DVB-T2-capable is 85%, whereas 68% of the TVs available from the selected online-only retailers are DVB-T2-capable.

However, **Table 3** also indicates that there are some substantial differences in the technical capabilities of the TVs that are available in remote and very remote Australia from online-only retailers in comparison with the technical specifications of TVs available from retailers in other regions of Australia. For example, only 51% of the TVs available in remote and very remote Australia from the selected online-only retailers are DVB-T2-capable. By contrast, the proportions of DVB-T2-capable TVs that are available from the selected in-store retailers in remote and very remote Australia and other regions of Australia are much higher (i.e., they range from 87% in remote and very remote Australia through to 89% in major cities, 88% in inner regional Australia, and 85% in outer regional Australia). Similarly, the proportions of DVB-T2-capable TVs that are available from online-only retailers in other regions of Australia are also much higher than they are in remote and very remote Australia (i.e., they range from 68% in outer regional Australia through to 70% in major cities and inner regional Australia). **Section 3.3** identifies some of the key factors that may be responsible for those differences in the capability of TVs that are available across Australia.

Specifically, **Table 3** indicates that:

- 95% of the TVs that are available in outer regional Australia from the selected in-store retailers, and 82% of TVs available from online-only retailers, have a DVB-T2 tuner (i.e., they are capable of receiving both potential DVB-T2 broadcasts as well as existing DVB-T broadcasts). Similarly, 96% of the TVs available from the selected in-store retailers, and 71% of those available from online-only retailers in remote and very remote Australia, also have a DVB-T2 tuner;
- 100% of the TVs available in outer-regional Australia, as well as remote and very remote Australia, from the selected in-store retailers have an MPEG-4 decoder, an HEVC decoder and

internet access. In addition, 100% of the TVs available from the selected online-only retailers in outer regional Australia, as well remote and very remote Australia, also have an HEVC decoder. Similarly, of the TVs available from the selected online-only retailers in outer-regional Australia, 96% have an MPEG-4 decoder and 98% have internet access. In addition, of the TVs available from the selected online-only retailers in remote and very remote Australia, 93% have an MPEG-4 decoder and 97% are smart TVs with internet access;

- 6% of the TVs available in outer regional Australia from the selected in-store retailers, and 2% of TVs available from online-only retailers, are partially DVB-T2-capable since they are capable of receiving and decoding potential DVB-T2 broadcasts, but only capable of displaying that content in FHD (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access, but only FHD displays). Similarly, 5% of the TVs available in remote and very remote Australia from the selected in-store retailers, and 1% of TVs available from online-only retailers, are partially DVB-T2-capable;
- 85% of the TVs available in outer regional Australia from the selected in-store retailers, and 68% of those available from online-only retailers, are DVB-T2-capable (i.e., they have a DVB-T2 tuner, MPEG-4 and HEVC codecs, internet access and UHD displays). Similarly, 87% of TVs available in remote and very remote Australia from the selected in-store retailers are DVB-T2-capable. However, as discussed above, only 51% of the TVs available from online-only retailers in remote and very remote Australia are DVB-T2-capable.

3.2 There is less variation in the availability of CTV devices across Australia

As outlined in **Table 4** (discussed further below), CTV devices are more widely available across Australia. While there is some geographic variation in availability of CTV devices, this is comparatively less than in the case of TVs.

Table 4: Availability of CTV devices from selected retailers across Australia by Remoteness Area

Availability	Major cities of Australia	Inner regional Australia	Outer regional Australia	Remote and very remote Australia
Available in-store	61%	65%	59%	36%
Available from another store	31%	31%	16%	2%
Available for home delivery	86%	92%	95%	95%
Available from an online-only retailer	78%	78%	79%	79%

Notes: Percentages indicate the proportion of all CTV devices advertised on the websites of selected retailers in each Remoteness Area that are available in the selected store, from another store, for delivery from the retailer, or delivery by an online-only retailer.

See **Section 1.2** and **Appendix A** for further information on the methodology used for the purposes of this analysis.

Source: Sapere analysis of the popular CTV device availability data provided by the websites of retailers (n=28)

Consumers who live in and around major cities have access to the greatest range of CTV devices

As with TV access, consumers who live in Australia's major cities also tend to have access to the greatest range of CTV devices from the retail stores located in and around those cities.

Specifically, as outlined in **Table 4**, in:

- major cities:
 - 61% of CTV models advertised on retailer websites are available in-store;
 - 31% are available from another store;
 - 86% are available to order from a store for delivery; and
 - 78% are available to order from an online-only retailer;
- inner regional Australia:
 - 65% of CTV models advertised on retailer websites are available in-store;
 - 31% are available from another store;
 - 92% are available to order from a store for delivery; and
 - 78% are available to order from an online-only retailer.

Consumers who live in more remote regions also have reasonable access to CTV devices

Since CTV devices are much smaller and lighter than TVs, the costs of holding stocks of those devices and transporting those devices tend to be lower. As a result, those devices tend to be more readily available to the consumers who live in smaller and more remote cities and towns.

Unlike TVs, the proportion of advertised CTV devices that are available for purchase either in-store or online does not reduce as much for more remote areas of Australia. Specifically, in:

- outer regional Australia:
 - 59% of CTV models advertised on retailer websites are available in-store (in contrast to 61% for major cities);
 - 16% are available from another store, which can be located a long distance away from the consumer (in contrast to 31% for major cities);
 - 95% are available to order from a store for delivery (in contrast to 86% for major cities); and
 - 79% are available to order from an online-only retailer (in contrast to 78% for major cities);
- remote and very remote Australia:
 - 36% of CTV models advertised on retailer websites are available in-store from a store that can be located a long distance (e.g., in excess of 200km) away from the consumer (in contrast to 61% for major cities);
 - 2% are available from another store, which once again can be located a long distance away from the consumer (in contrast to 31% for major cities). This small percentage is due to the limited number of other stores in those remote and very remote regions;
 - 95% are available to order from a store for delivery (in contrast to 86% for major cities); and

- 79% are available to order from an online-only retailer (in contrast to 78% for major cities).

Although lower proportions of the total number of advertised CTV devices are available in-store in outer regional Australia (59%) and remote/very remote Australia (36%) than in major cities (61%), most of those devices can be ordered for delivery even to the more remote regions of Australia either from retail stores (95%) and the 2 online-only retailers included in the analysis (79%).

Since Australia has yet to commence DVB-T2 terrestrial broadcasts, however, most major retailers (i.e., JB Hi-Fi, Good Guys, and Harvey Norman) and smaller independent retailers mainly supply popular CTV devices that are designed to stream internet content, rather than receive DVB-T2 broadcasts.

This means that there is an insufficient data to support a detailed regional analysis of the technical capabilities of those devices such as that provided in **Table 2** for TVs (i.e., the sample size is too small to support such a detailed quantitative analysis). Although there is some uncertainty surrounding the technical specifications of popular CTV devices advertised by the selected retailers across Australia, it is most likely that they can all be connected to the internet and are capable of decoding both MPEG-2 and MPEG-4 content (otherwise they would not be capable of streaming high-resolution internet content).

However, only a proportion of those popular CTV devices are specified as being HEVC capable. Although some uncertainty surrounds the HEVC capability of some popular CTV devices, some indication of the HEVC capability of CTV devices can be obtained from their ability to stream Netflix content, which requires an HEVC decoder to stream 4K content and some HD content. This suggests that the only popular CTV devices that don't have HEVC capability are certain gaming devices. Overall, this indicates that:

- all popular CTV set top box devices are DVB-T2 capable (for terrestrial set-top boxes) or DVB-S2 capable (for satellite set-top boxes);
- none of the popular CTV streaming devices or gaming devices include an RF tuner;
- all popular CTV streaming devices are capable of being connected to the internet, and decoding MPEG-2, MPEG-4, and HEVC encoded content (HEVC capability is indicated by the ability of the device to stream Netflix); and
- most popular CTV gaming devices can be connected to the internet and are able to stream MPEG-4, MPEG-2 and HEVC encoded content.

In addition, an analysis of the limited data available indicates that consumers living outside major cities do have access to some DVB-T2 compatible CTV devices (e.g., Fetch and Hubbl set-top-boxes). Those consumers can also purchase those DVB-T2 and DVB-S2-capable CTV devices from other specialist suppliers (e.g., pay-TV suppliers and suppliers of VAST satellite set-top-boxes).

3.3 The availability of TVs and CTV devices is potentially influenced by a range of key factors

As outlined below, the availability of TVs and CTV devices across Australia is potentially influenced by the combined effects of a range of factors, including the:

- geographic distribution of Australia's population, most of whom live in capital cities and other major regional cities;
- location of Australia's major consumer electronic retail stores, most of which are located in the more populated metropolitan regions of Australia;
- ability of retailers to obtain supplies of TVs and CTV devices, which is greater for retail stores located in metropolitan regions (e.g., due to longer delivery times and higher transport costs);
- ability of online retailers to deliver the TVs and CTV devices they sell to customers in the more remote areas of Australia; and
- geographic differences in the availability of terrestrial broadcasts and internet services, consumer preferences, and disposable incomes.

Most Australians live in and around major cities

As outlined in **Table 5**, Australia's population at 30 June 2023 was 26.6 million, most of whom live in its major cities (73%) and their surrounding inner and outer regional areas (26%), with the remaining population living in its remote and very remote areas (2%).

Table 5: Population of Australia by Remoteness Area (2023)

Remoteness Area	Estimated Resident Population	Proportion of total population
Major cities of Australia	19,343,743	73%
Inner regional Australia	4,683,975	18%
Outer regional Australia	2,119,123	8%
Remote Australia	304,013	1%
Very remote Australia	198,024	1%
TOTAL	26,648,878	100%

Source: ABS (2024). Regional population, 2022-23 financial year.

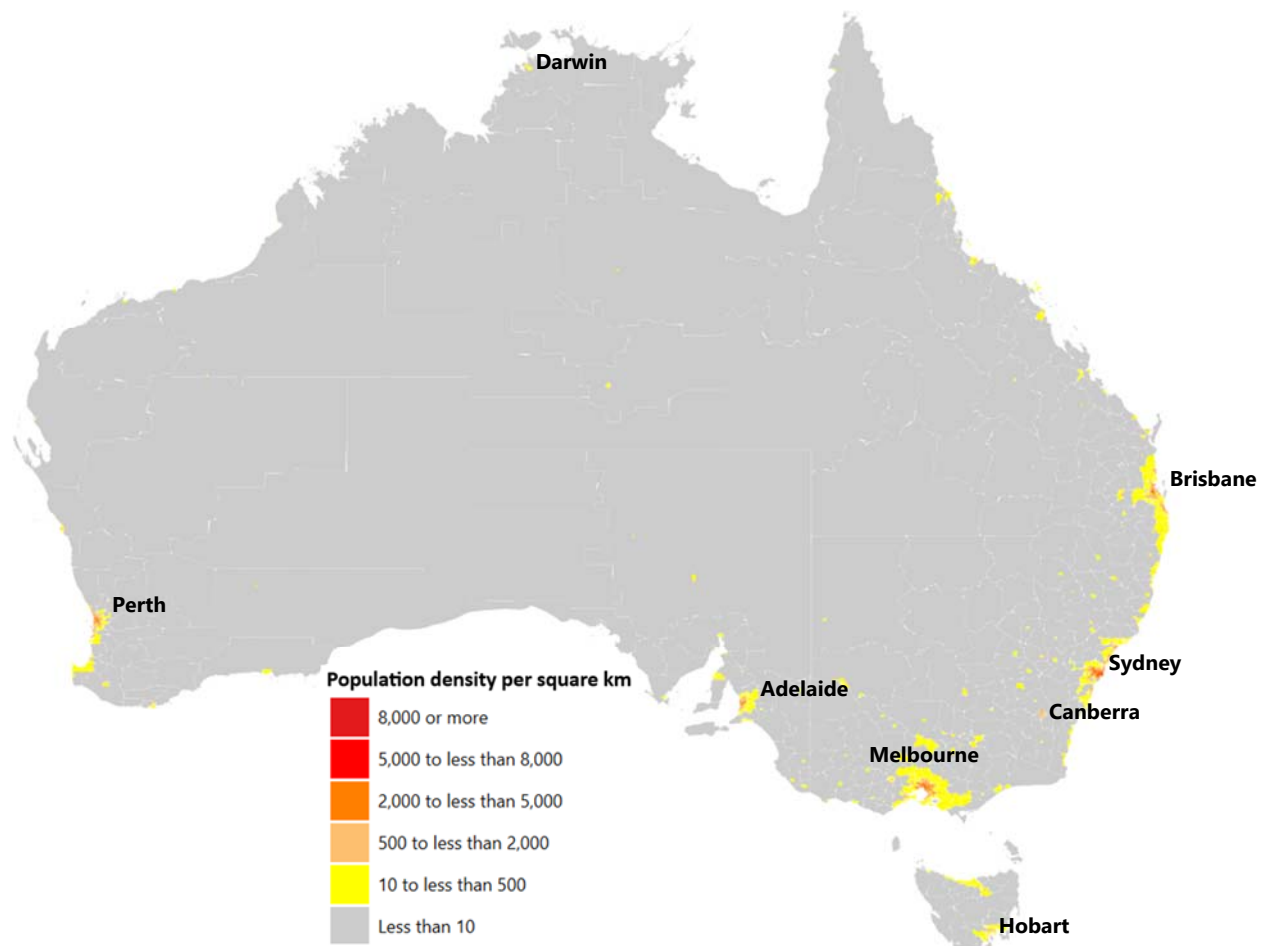
This concentration of the population in and around Australia's major cities can also be seen in **Figure 18**, which indicates the population density in each area of Australia (Statistical Area 2, or SA2).

The areas of highest population density (i.e., those areas shaded in dark red, red and orange) are located in and around Australia's major cities. Indeed, the population is so densely clustered around the major cities that it is difficult to see the most densely populated areas of Australia. Those most populated SA2 areas are located in and around Australia's most populous cities – Melbourne and Sydney. In order to see those more densely population areas, it is necessary to zoom in on the SA2

areas in and around those major cities. For example, **Figure 19** illustrates the population densities for each of the SA2 areas in and around Sydney.

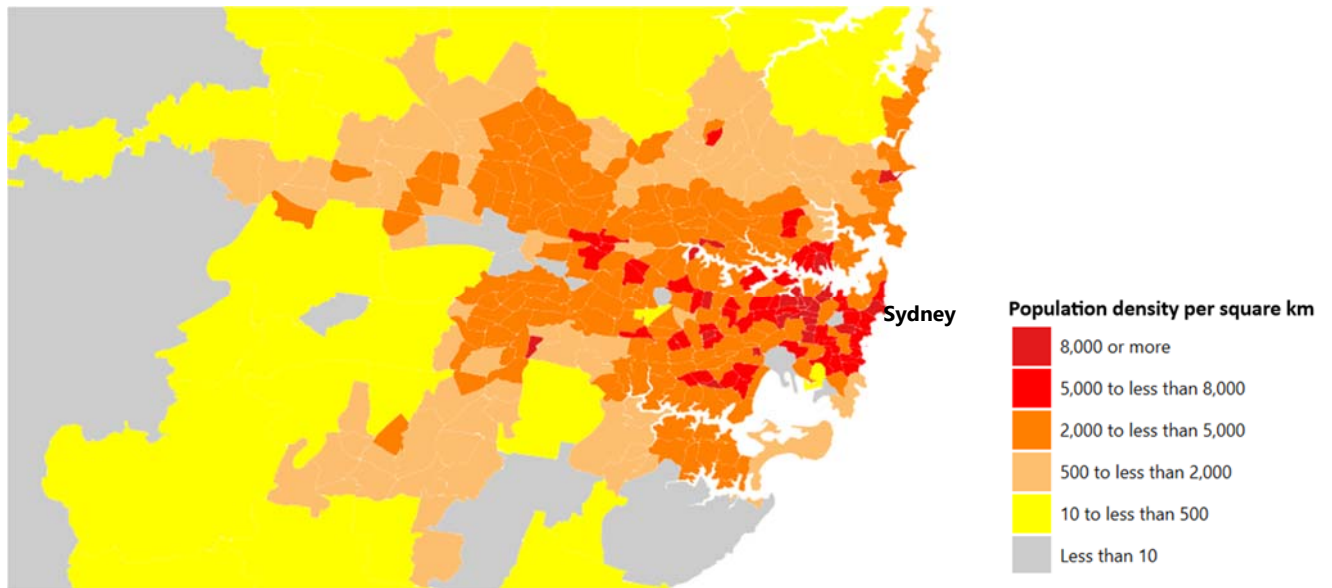
Large areas of Australia have either very low population densities or are unpopulated, as illustrated by the grey shaded areas in **Figure 18** (i.e., areas where there is a population density of less than 10 people per square kilometre).

Figure 18: Population density for each Statistical Area 2 in Australia (2023)



Source: ABS (2024). Population estimates by SA2, 2001 to 2023, GDA2020, in GeoPackage.

Figure 19: Population density for each Statistical Area 2 in and around Sydney (2023)



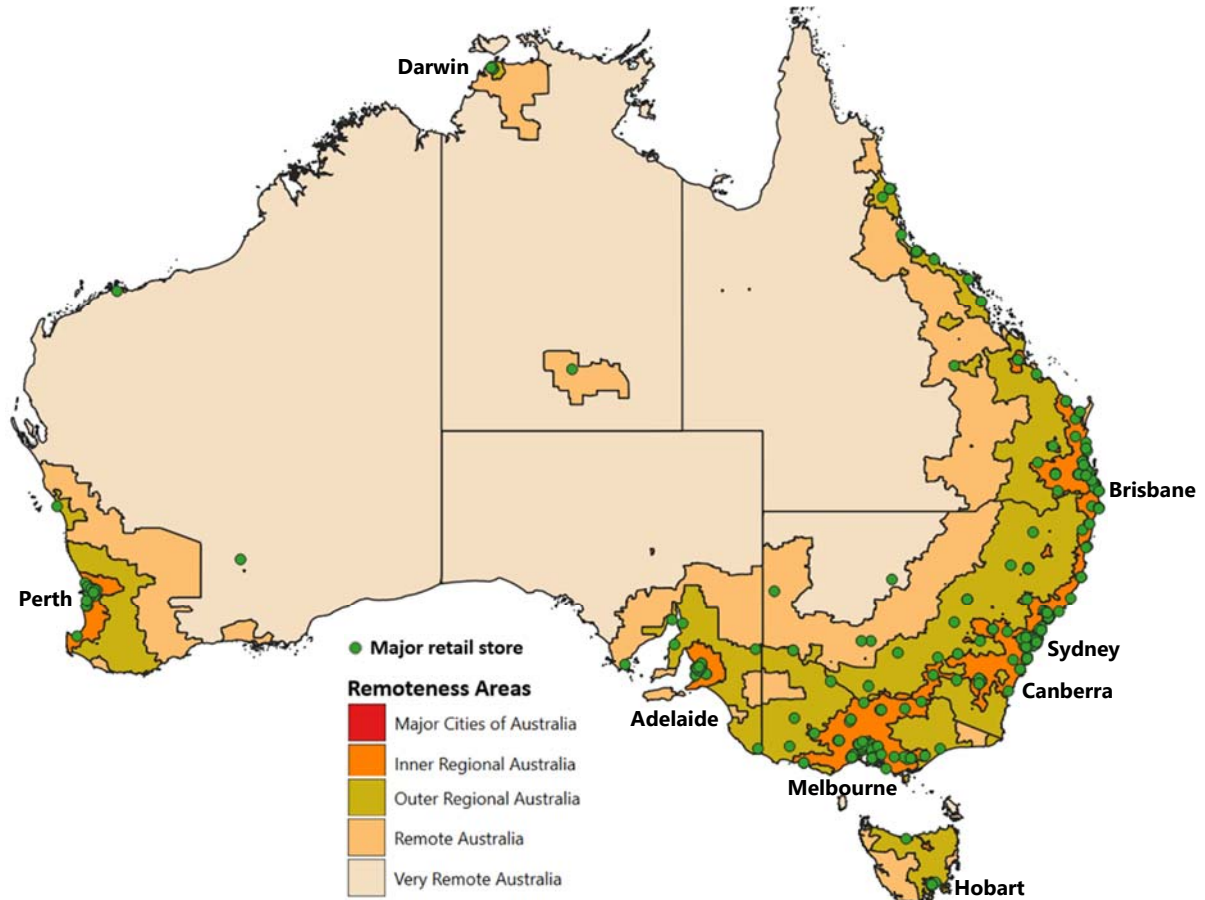
Source: ABS (2024). Population estimates by SA2, 2001 to 2023, GDA2020, in GeoPackage.

Most consumer electronics retail stores are also located in and around Australia's major cities

The results of the consumer survey indicate that most consumers (62% of the sample) still prefer to purchase their TVs and CTV devices in-person at retail stores. This means that the location of Australia's main consumer electronic retail stores is likely to influence both the availability of TVs and CTV devices across Australia, as well as the types of TVs and CTV devices purchased by consumers (i.e., by constraining their choices to the types of TVs and CTV devices available in those stores).

As illustrated in **Figure 20**, the greatest numbers of Australia's major consumer electronic retail stores, (i.e., JB Hi-Fi, Good Guys, and Harvey Norman stores), which are indicated by the green markers, are located in and around the major cities and their surrounding inner regional areas where most of the population lives.

Figure 20: Location of Australia's major consumer electronic retail stores by Remoteness Area



Source: ABS (2023). Digital boundary files. ASGS Edition 3, Reference period July 2021 - June 2026, Remoteness Area - 2021 – Geopackage. Store locations sourced from retailer websites.

To see the relationship that exists between the number of retail stores and population density more clearly, it is necessary to examine a particular region of Australia in greater detail. For example, **Figure 21** illustrates the population density and locations of the major retail stores in and around Sydney.

This indicates that:

- the largest numbers of stores are located in those areas with the highest population densities (i.e., those inner-city areas where the population density is 5000 people per square kilometre or greater); and
- other stores are also located in the major outer regional areas (i.e., outer regional areas where the population density is 500 to less than 2000 people per square kilometre).

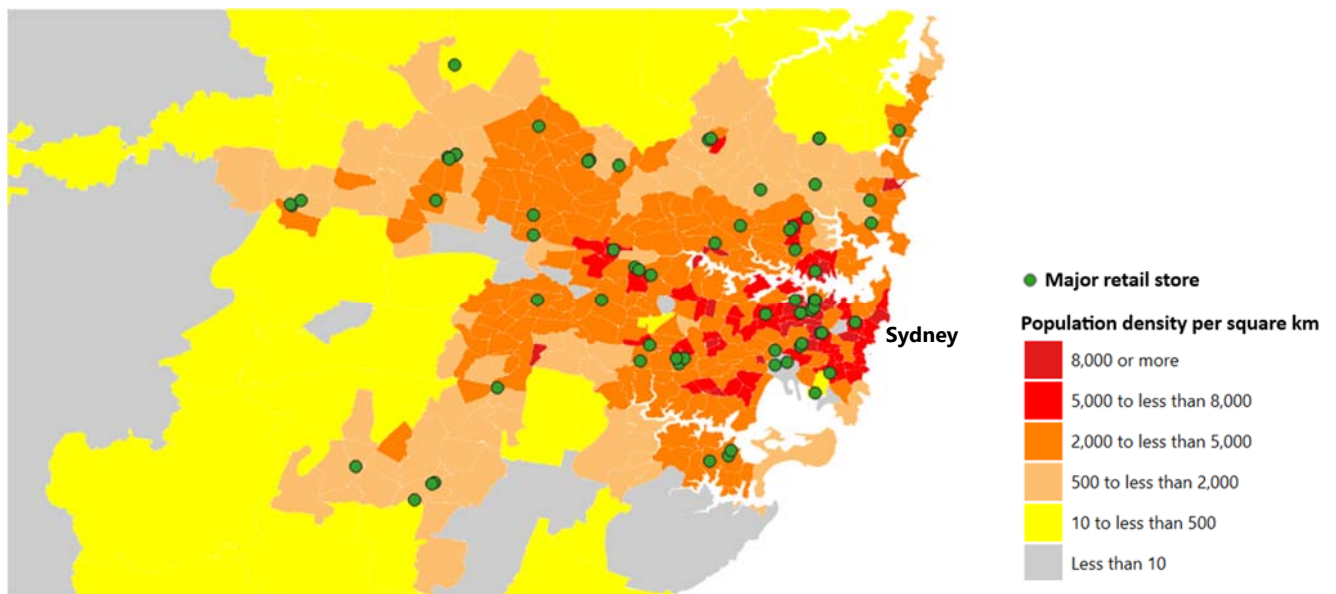
This overall pattern of distribution of consumer electronic retail stores is repeated across the rest of Australia, namely the:

- greatest numbers of stores are located in and around the cities and regions that have the highest population densities; and
- the number of stores in each region reduces as the population and remoteness of those regions decreases.

Such a distribution reflects the fact that the number of consumer electronic stores that a particular region can sustain depends on the size of the population in and around the region in which those stores are located.

As illustrated in **Figures 20 and 21**, the high population in most of Australia's largest cities is sufficient to sustain multiple consumer electronic stores. By contrast, as the population of each region declines, so too does the number of stores it can sustain. Inevitably, this means that the population density of the more remote regions of Australia cannot support even one major consumer electronic retail store.

Figure 21: Location of Australia's largest consumer electronic retail stores in and around Sydney



Source: ABS (2024). Population estimates by SA2, 2001 to 2023, GDA2020, in GeoPackage. Store locations sourced from supplier websites.

Given the higher transport costs associated with TVs (which as discussed further below increase with their size and weight), retailers in more remote areas can gain an advantage over their online competitors by holding stocks of TVs and CTV devices to meet the needs of their local communities.

However, that local advantage is offset to some extent by the costs of holding those stocks. Those stockholding costs include increased space, as well as the risks associated with not being able to sell it all. In order to mitigate those costs and risks, remote retailers tend to hold only limited stocks of the most popular brands and models of TVs that meet the budgets and preferences of their customers in that area.

Retailers in more remote areas can experience difficulties obtaining timely supplies of TVs

The ability of retailers to supply TVs and CTV devices to their customers is influenced by the availability of wholesale supplies of the types of devices required by their customers.

For retail stores located in Australia's capital cities this is typically not a problem. The main limitation here is the stocks held by the major wholesalers in their warehouses, which are typically located in those cities.

It is also less of a problem for CTV devices due to their small size and weight, which makes them more readily transportable between wholesalers, retailers, and their customers.

However, retailers in more remote areas can experience difficulties obtaining timely deliveries of the TVs they need to meet their customers' requirements, particularly for small stores in more remote areas that make small and infrequent orders.

As noted in **Appendix A**, when auditing the availability of a sample of TVs and CTV devices advertised by smaller, independent, retailers located in the more remote regions of Australia, information was also collected on key factors influencing the availability of those products in-store and for delivery.

Those discussions indicated that the in-store availability of TVs and the availability of those TVs for delivery is influenced by a range of factors.

In particular, the in-store availability of TVs and their availability to order is influenced by the number of potential customers they supply (i.e., the populations of their towns and the other areas they supply) and the preferences of those customers. Retail stores in larger towns, or smaller towns that supply regions with larger populations, tend to keep a wider range of different brands (e.g., big brands as well as popular lesser-known brands) in a wider range of different sizes in-store to meet the broader needs of their larger populations. By contrast, stores in smaller towns only keep a limited range of smaller less expensive popular models (e.g., mainly less expensive, smaller-size big brand models as well as the cheaper non-big brand models), mostly in the 65" and smaller sizes, which as outlined below is the size range that is more readily transportable to more remote regional areas. They then order the larger ones in to meet customer needs and avoid the risks associated with holding those more expensive models in stock.

In addition, the sizes of the orders those retailers place also affects when their orders are delivered. Larger stores in more populated areas are able to place larger orders that are given higher priority by suppliers. By contrast, stores in areas with smaller populations are not able to place large orders and hold large stocks (since TVs and CTV devices become out of date on a yearly basis and consumers prefer the latest models). In view of the smaller and less frequent orders they place, their deliveries may be given lower priority by suppliers and they may have to wait longer for the delivery of those items.

Delivery times are also influenced by the:

- distance of the store from the closest big city where the supplier's warehouse is located. Larger stores located closer to the bigger cities tend to be able to carry a wider range of stocks and offer shorter delivery times due to their closer proximity to the warehouses that are located in the bigger cities; and
- ability of the suppliers of each of the different brands to deliver to the store, which varies across both brands depending on the stocks of each model they are holding and the regional areas where the stores are located.

It is difficult for retailers to deliver TVs to consumers in the more remote regions of Australia

Due to Australia's vast size, the tyranny of distance continues to have a substantial impact on the availability of TVs across Australia. Although most of Australia's population lives in and around its largest cities, the remainder of the population is spread across vast distances.

Consumers who live in the more remote regions of Australia (i.e., those classified as Remote Australia and Very Remote Australia by the Australian Geographical Remoteness Structure) have to be prepared to either:

- travel long distances (e.g., in excess of 200km) to purchase a new TV from their "nearest" retail store that has in-store stocks of that TV; or
- place a phone or online click-and-collect order for that TV so they can pick it up from the store at a later date.

When this is not practicable (e.g., where the consumer is not willing or able to travel to the closest store), those consumers have a limited range of other options, which include:

- ordering that TV for delivery to their location by an online retailer (e.g., a store that also takes online orders, or from an online-only retailer), which is only a viable option if that online retailer can deliver that TV to their location, or to a location near them. Some online retailers, and online-only retailers, either do not deliver any TVs to more remote areas of Australia, or only offer delivery for certain TVs; or
- organising their own freight, which might involve the use of multiple carriers, which typically involves higher delivery costs, as well as longer delays which also impose costs on the consumer (i.e., the opportunity cost of having to wait longer to enjoy the benefits of the new TV they have purchased).

By contrast, due to their small size and weight, CTV devices can be delivered through the postal system, which may be one reason why those devices are more readily available in the more remote regions of Australia, unlike larger and heavier TVs.

Shipping costs tend to be weight and distance based (i.e., they increase as the weight of the package and the distance it must travel increases). For example, for parcels in the range of 5kg to 22kg, Australia Post charges a fee that comprises 2 parts:

- basic charge of \$22.85 for all destinations (which includes the cost for 5kg); and
- a zone-based distance charge per additional kg of weight in excess of 5kg, rounded up to the nearest kg. These distance charges per kg range from around 20c per kg for parcels sent within Sydney, to around \$9.15 for parcels sent from Sydney to North Western Australia.

Additionally, the ability of consumers to place an order for online delivery appears to be constrained to some extent by the:

- size and weight of those TVs can vary substantially across TVs with different screen sizes; and
- maximum size and weight restrictions that Australia Post and other courier services (e.g., DHL) impose. Those restrictions explain, to some extent, why online deliveries are not available from some retailers for TVs in excess of a certain size (e.g., around 55").

Geographic differences in the availability of broadcasts and internet services, consumer preferences and disposable incomes

The ability of consumers to access the content they desire is not just influenced by the availability of TVs and CTV devices in the regions in which they live. It is also influenced potentially by the availability of other services in their regions, namely the availability of terrestrial and satellite broadcasts, as well as internet services. Any perceived or actual constraints on access to broadcast or internet content may also be reflected in both the types of products supplied by retailers, and the types of products that consumers choose to purchase, which is discussed further in **Part B** of this report.

Consumers across Australia experience different levels of access to terrestrial TV broadcasts. As recognised by the ACMA (ACMA 2024), even some consumers who live in Australia's major cities can have difficulties accessing terrestrial broadcasts. This can be due to a range of factors including the lack of an outdoor antenna (e.g., consumers living in apartments) and those living in areas where there is either poor quality reception (i.e., fringe reception areas), or no reception (i.e., black spot areas).

This is, of course, the reason why the Government introduced the [Viewer Access Satellite Television](#) (i.e., VAST) service. VAST provides digital television and radio services to viewers in remote areas of Australia; as well as viewers who are unable to receive digital TV through their normal antenna. These reception difficulties can arise due to a range of factors including local interference, surrounding terrain, or distance from the transmitter in their area. VAST provides its users with a minimum of 16 digital television channels and 14 digital radio channels, which the same number of channels available in metropolitan terrestrial areas. This includes content provided by the ABC, SBS and commercial broadcasters.

Australians also experience differences in internet service, which is illustrated by the [National Broadband Network \(NBN\) Coverage Map](#), as well as the coverage maps provided by other main telecommunications and Internet Service Providers. This includes coverage maps provided by [Telstra](#), [Optus](#), [TPG Telecom](#), [Aussie Broadband](#), [iiNet](#), [Vodafone](#), [Dodo](#), [Exetel](#), [Belong](#) and [Superloop](#). In recognition of those differences, the Government has developed a [Better Connectivity Plan for Regional and Rural Australia](#) in order to improve that access. In addition, as part of that Plan, the Government is also currently conducting a [National Audit of Mobile Coverage](#). That audit is intended to better identify mobile coverage black spots across Australia to help target investment, and to provide an independent resource that better reflects on ground experiences of mobile coverage provided commercially by mobile providers. The audit is scheduled to run until 30 June 2027.

However, it is not clear whether, and to what extent, those existing differences in the geographic availability of terrestrial TV broadcasts and internet services are influencing the observed geographic differences in the ability of TVs and CTV devices.

In theory, it is possible that some of the observed reduction in the availability of TVs in the more remote regions of Australia might reflect the:

- reduced availability of internet services in those regions. This is one factor that might reduce consumer demand in those regions for internet-capable smart TVs, which comprise most of the TVs that are advertised by Australia's major retail stores on their websites; and

- greater reliance of consumers in those regions on other sources of content (i.e., free to air terrestrial broadcasts) and ability to use cheaper TVs, including non-internet-connected TVs, to meet those needs.

For example, this might explain, to some extent, why the consumer survey (**Part B**) found a slight but persistent pattern of:

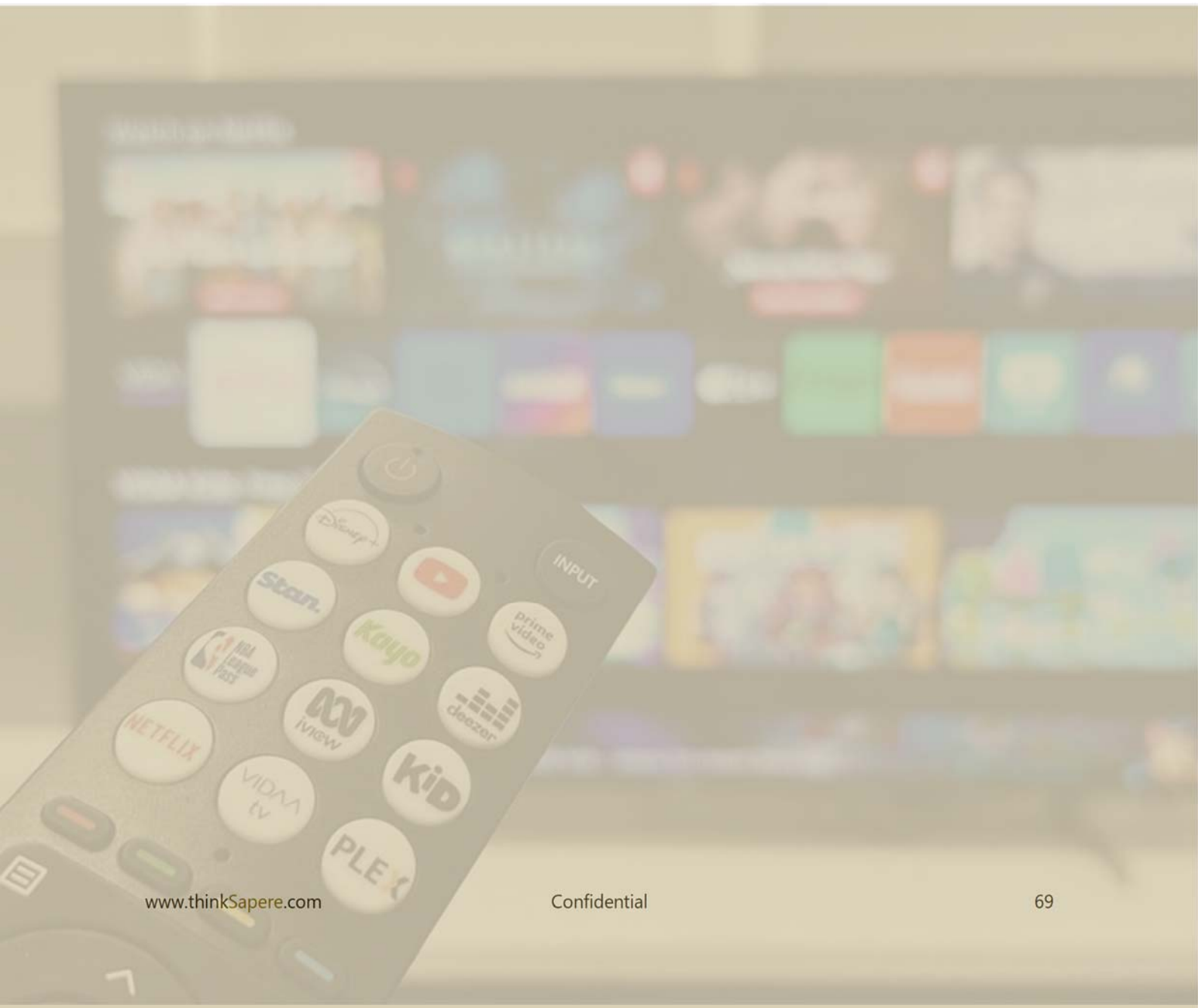
- greater use of streaming video services in capital cities as compared to nonmetropolitan areas; and
- greater free-to-air television viewing in nonmetropolitan areas as compared to capital cities.

It is important to note, however, that the observed differences in the geographic availability of TVs could be due to a range of factors other than geographic differences in the availability of internet services. For example, it could be due to geographic differences in the preferences of consumers for the content that is provided by terrestrial TV broadcasts, as opposed to the content that is streamed over the internet. In addition, it could also be due to differences in the disposable incomes of consumers. Similarly, in theory, it is also possible that some of the observed reduction in the availability of CTV devices in the more remote regions of Australia may reflect the:

- reduced demand for CTV devices that are designed solely to stream internet content, which comprise most of the popular models of CTV devices that are advertised by major retailers on their websites; and
- increased demand for the smaller range of advertised CTV devices that are designed primarily to enable consumers to receive other sources of content (i.e., free-to-air and pay-TV satellite transmissions) and their consequent need for set-top boxes that help them access that content (e.g., VAST and pay-TV set-top boxes).

For example, this might explain, to some extent, the reasons why the *Television and Media Survey* found that a relatively greater proportion of Telstra set-top boxes are being used in non-metropolitan regions of Australia (8%) as opposed to non-metropolitan regions (4%). Once again, however, it is important to note that the observed differences in the geographic availability of different types of CTV devices could be due to a range of factors other than geographic differences in the availability of internet services. For example, it also could be due to differences in consumer preferences and disposable incomes.

PART B: Consumption of TVs and CTV devices



4. Overall market for TVs and CTV devices in Australia

Key findings

- **Australians are enthusiastic consumers of TVs and CTV devices**

16% of Australian adults purchased a new TV in the 12 months to July 2024. Additionally, 8% of Australian adults purchased a CTV device in that same period. These figures are broadly in line with previous DITRDCA research and suggest that enthusiasm for television and consumer technology remains strong.

- **Three leading retailers account for 73% of TV sales**

JB-HiFi, The Good Guys, and Harvey Norman are responsible for around three quarters of TV sales in Australia. This indicates a concentrated market for TVs and suggests that decisions made by these three retailers about what devices to stock and how to present them are consequential for technology adoption in Australia.

- **The most popular price bracket for a new TV is \$500-\$1000**

Retail prices of TVs range from under \$100 to over \$10,000, and the median price paid in Australia is \$1295. However, the most popular price bracket for new TVs is \$500-\$1000. Consumer decisions appear to be influenced by retailer discounting as more than half (58%) of the survey respondents claimed they bought their TV on sale or at a discounted price.

- **Most consumers buy their TV in-store**

76% of respondents bought their TV in-store compared to 18% who used home delivery and 6% who bought via click-and-collect. This preference for in-store buying affirms the power of major retailers to shape the consumer electronics market.

4.1 Australia's TV retail market is relatively concentrated

According to the consumer survey findings, 16% of Australian adults purchased a new TV in the 12 months between July 2023 and July 2024.

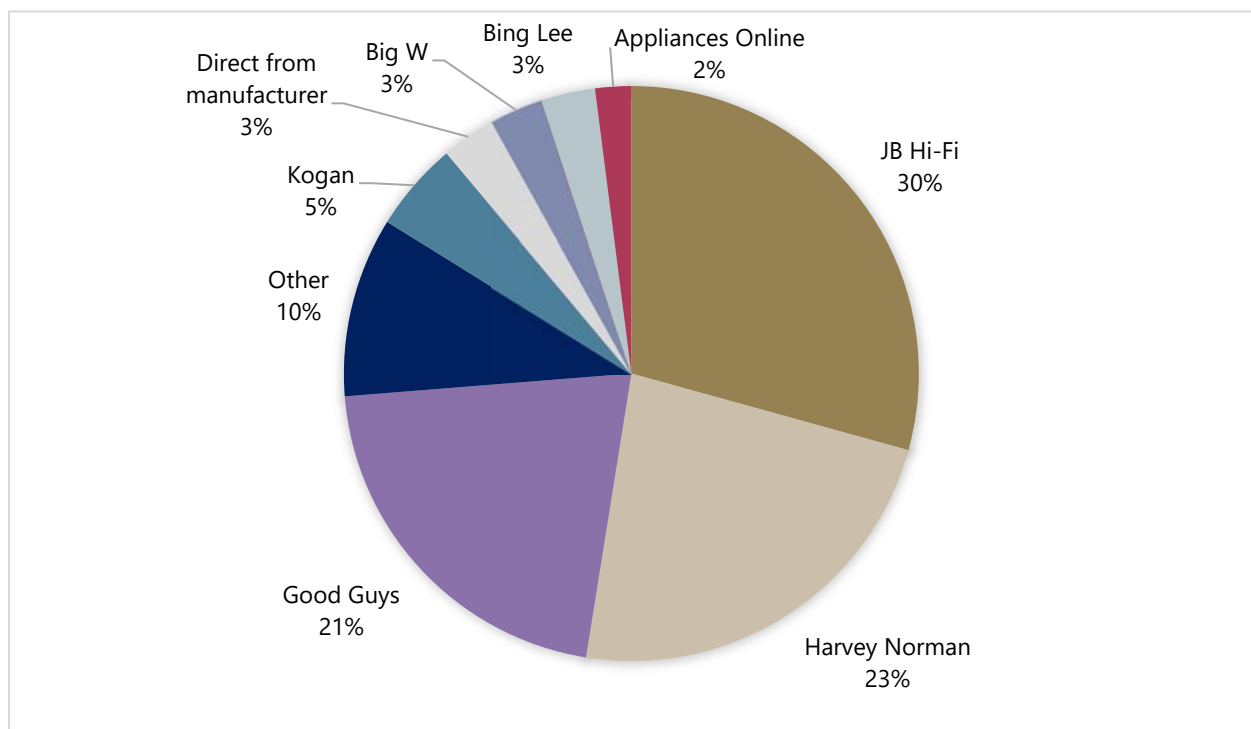
To put this finding in context, earlier research by DITRDCA (2022, 2023) found that 9% of Australians reported buying a new TV in the last 6 months prior to those 2 surveys. Compared to the DITRDCA studies, the current results are slightly lower. The reasons for this cannot be identified with precision, but seasonal differences and changing economic conditions, such as rising cost-of-living pressures, may account for some of this reported difference. This variation is within the survey's margin of error.

Among new TV purchasers, 76% indicated that they had 2 or more TVs at home. In other words, it appears that a clear majority of TVs bought in Australia over the last year are for multi-TV households.

Most TV sales occur through the 'Big 3' retailers

The survey found that the vast majority of Australians buy their TVs in-store from one of the major consumer electronics retailers (**Figure 22**).

Figure 22: Retailers from which survey respondents purchased new TVs



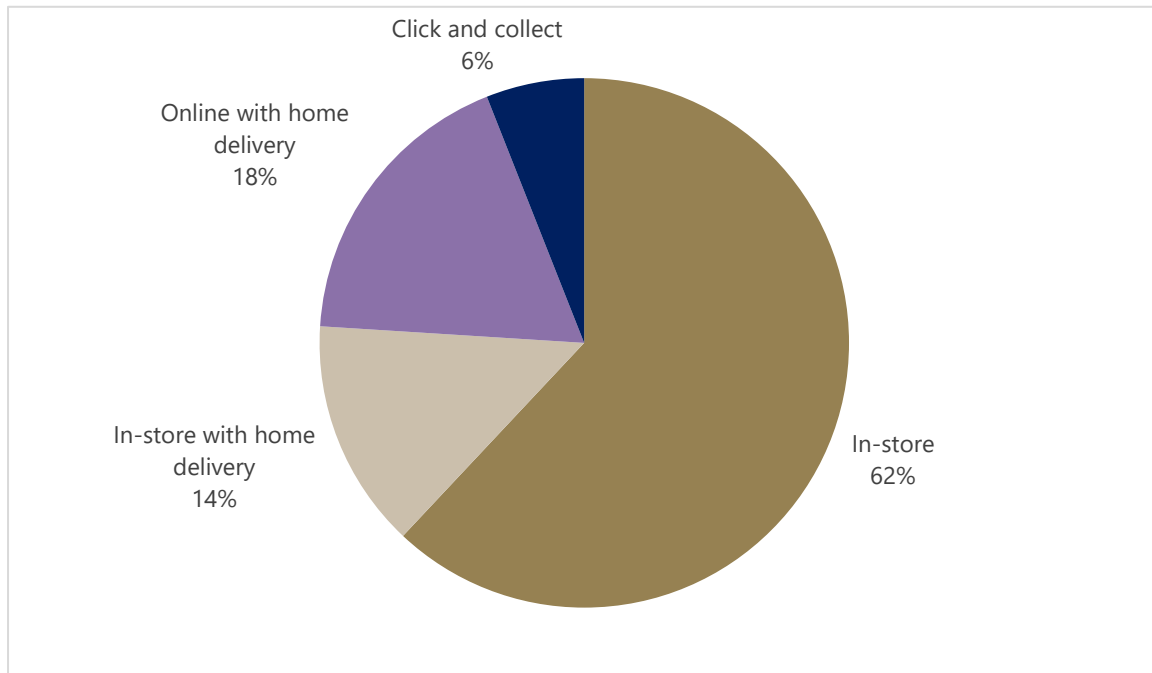
Source: RMIT consumer survey (n=1317)

The 'Big 3' retailers – JB Hi-Fi, Harvey Norman, and The Good Guys – accounted for almost 3 quarters of TV sales reported in the survey, with 30% of respondents buying at JB Hi-Fi, 23% at Harvey Norman, and 21% at Good Guys.

The next most popular retailers included Kogan (5%), Big W (3%), Bing Lee (3%), and Appliances Online (2%). An additional 3% of respondents indicated that they bought their TVs direct from the manufacturer.

Methods of purchase

Figure 23: Methods of purchase - TVs



Source: RMIT consumer survey (n=1317)

Figure 23 shows how respondents purchased their TVs – whether in-store or online. Overall, 76% of respondents bought their TV in-store, including 14% of respondents who bought the TV in-store then had it home-delivered. Delivery is a common practice for larger TVs, especially those with a screen size of 65 inches or more, that are impractical to transport in a passenger vehicle. Stores also regularly advise customers that panels must be transported vertically, so as not to void their warranty.

In contrast, 24% bought online using click-and-collect (6%) or home delivery (18%).

The clear preference for in-store buying suggests that most consumers still prefer to inspect TVs in person before they commit to purchase.

For online TV sales, the leading retailers were Kogan and JB Hi-Fi (both 18%), closely followed by The Good Guys (15%), Harvey Norman (7%), and Appliances Online (9%). The popularity of Kogan is noteworthy here, given the specific product characteristics discussed in **Section 5** of this report. The survey suggests that price plays a key role here: the median price paid for a TV purchased from Kogan was \$549 compared to a median price of \$1295 for all retailers.

The survey also asked respondents about whether their TV was in-stock at the time of purchase. The vast majority (94%) indicated that their TV was in stock, with only 6% stating that they had to wait for the TV to arrive. For those who had to wait, most (74%) received their TV within 2 weeks.

Again, this points to the instant gratification dynamic of consumer electronics retailing in Australia. When buying a large item like a TV, consumers prefer to transact in-store, in person, and on the spot, rather than online or via special order.

Rental of TVs was also captured in the survey. The response rate was under 1%, reflecting the very low prevalence of TV rental – once a substantial part of the market in Australia. The survey does not capture reasons for this decline, though falling consumer electronics prices in recent decades may be a contributing factor.

The median price paid for TVs in Australia is \$1295

The median price paid for TVs, as reported by survey respondents, was \$1295. This is similar to the median price of TVs supplied on the Australian market, which is \$1299.

The most popular price bracket was \$500-\$1000, with 27% of respondents saying they bought a TV within this bracket.

A notable finding from the survey was that over half (58%) of respondents claim they bought their TV on sale or at a discounted price. This reflects not only the enthusiasm of Australian consumers for finding a bargain, but also the strategies of TV retailers who may routinely “discount” their sticker prices to meet those pervasive customer expectations.

Second-hand TV sales are marginal compared to new sales

As well as buying new products, Australians also acquire TVs second-hand. The survey asked about second-hand acquisition to understand how prevalent this practice is compared to buying new.

The survey found that second-hand and other parallel markets comprise a small part of overall consumption, with only 3% of respondents stating they bought their TV second-hand. An additional 5% of respondents stated they received the TV as a gift.

Among second-hand TV buyers, the most popular options were Facebook Marketplace (35%), direct from previous owner (20%), or a local store (12%).

This overwhelming preference for buying new TVs is likely related to the substantial changes to TV capabilities in recent years, which have diluted the perceived value of older, less technically capable, TV stock.

CTV devices have different consumption patterns from TVs

According to the survey, 8% of Australian adults had purchased a CTV device in the last 12 months. Additionally, 3% of Australian adults had purchased both a CTV device and a TV in the last 12 months.

The median price paid for new CTV devices, as reported by survey respondents, was \$100.

Survey findings revealed several differences in CTV and TV device consumption in Australia. For example, half (47%) of CTV device purchasers buy online compared to only a quarter (24%) of TV purchasers buying online.

Another difference is retailer choice: the top 3 retailers for CTV devices are JB Hi-Fi (32%), Amazon (14%), and Telstra (10%). While JB Hi-Fi in top spot is unsurprising, the popularity of Amazon and

Telstra tells an interesting story. Amazon, which had an almost negligible share of the TV market, is much more popular for CTV devices because these devices are well suited to online shopping: they are small and easily deliverable. Meanwhile, Telstra is a major supplier of set-top boxes given its partnership with Fetch TV, and its former product, Telstra TV.

CTV devices are also given as gifts: 15% of those who had acquired a CTV device in the last 12 months received it as a gift (compared to 5% for TVs). The fact that CTV devices are more likely to be gifted than TVs reflects the lower-price point of CTV devices – many are under \$100 – which makes them well suited for gifting.

CTV device markets in Australia are overwhelmingly new-product markets, with very little second-hand exchange. Only 5% of respondents who had acquired a CTV device in the last 12 months bought that device second-hand. Of these second-hand purchases, most were via eBay or Facebook Marketplace.

4.2 Upgrading is a key driver of TV and CTV device purchases

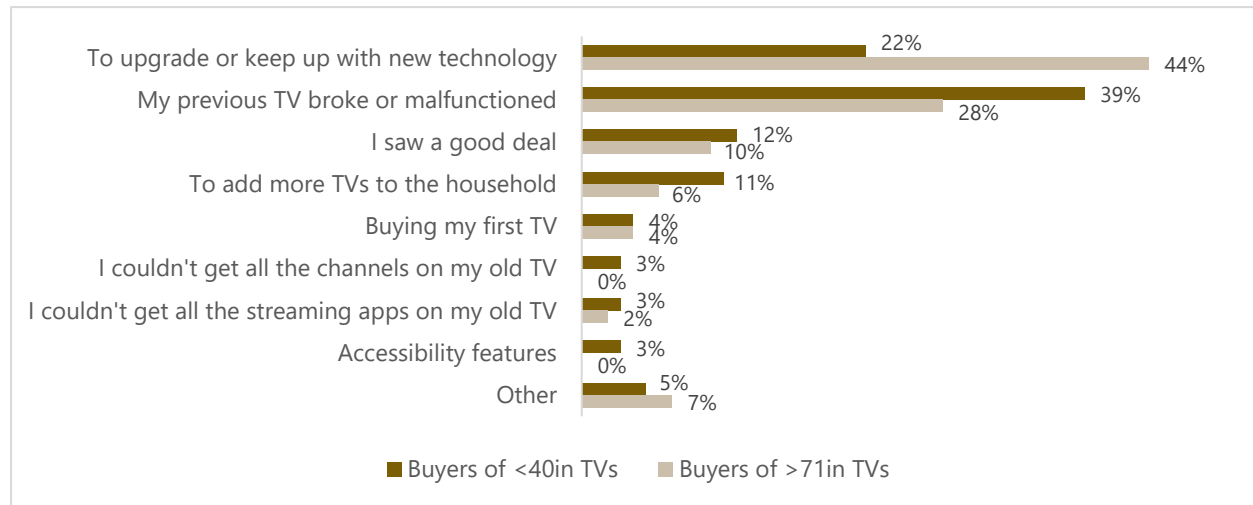
To explore the motivations behind purchases, the survey asked participants to indicate the reason(s) for their most recent purchase. The 3 most frequently cited reasons for buying a new TV were: upgrading or keeping up with new technology (37%), a malfunction or breakdown of their previous TV (33%), and taking advantage of a good deal (12%). The remaining options were less common (>10% each), and included: adding more TVs to the household, inability to access all streaming apps or channels, buying a first TV, and accessibility features.

These results highlight 2 key motivations: one driven by a desire for advanced features and performance, and the other by practical necessity.

Looking more closely at these findings, patterns within certain cohorts can be observed (**Figure 24**). For example, 44% of consumers who bought very large TVs (screen size 71 inches or over) were motivated by upgrading to the latest technology, whereas only 22% of consumers who bought small TVs (screen size 41 inches or smaller) had the same motivation. This striking difference points to the distinct use-cases for small TVs, which are most commonly bought to replace a broken TV (39%), because the consumer saw a good deal (12%), or to add more TVs to the household (11%).

As screen size is related to price, a similar pattern applies for those who purchased cheaper TVs under \$500 (43% replace, 13% add extra TVs) compared to those who purchased TVs above \$2000 (20% replace, 5% add extra TVs).

Figure 24: Motivations of TV buyers, by screen size



Source: RMIT consumer survey (n=1441)

Age also makes a difference here. Australians aged 65+ are more likely than younger consumers to make a purchase out of the need to replace a broken unit (48%), compared to 25% aged 25-34 and 33% aged 18-24.

4K TVs with large screens are most popular among consumers

The survey asked participants to identify key features of their TV including screen size, resolution, and screen type. These results should be treated with some caution because they rely on consumer recall of technical features and, as such, may be inaccurate.

In **screen resolution**, a noticeable trend was the adoption of UHD (4K) TVs. More than half (55%) of the sample had acquired a 4K TV, with an additional 4% having an 8K TV. This indicates the normalisation of 4K as the expected standard for most Australian consumers.

Australians consume a wide array of differently TV **screen sizes**, according to a bell curve. The most popular sizes are 51-60 inches (27%) and 61-70 inches (24%). TV screen sizes at either extreme are substantially less popular: around 5% for 32-inch TVs or smaller, and the same amount (5%) for 81-inch TVs or larger.

The most popular **screen types** reported in the survey were QLED (23%) and LED (25%). However, consumer confusion regarding screen type, due in part to confusing and changing nomenclature used by manufacturers, may affect these results.

The figures cited above refer to what consumers claim to know about their TVs. But it is also worth noting the areas of consumer ignorance, as these reveal something about the priorities of consumers and what they regard as worth knowing.

For example, only 3% of consumers did not know their TV's screen size, suggesting this is basic and important knowledge for consumers.

A much higher proportion of the sample (22%) do not know their screen type, suggesting widespread consumer confusion as a result of consumer electronics marketing practices.

Technical capabilities related to broadcasting (compression, broadcast standards, etc.) are discussed further in **Section 5**.

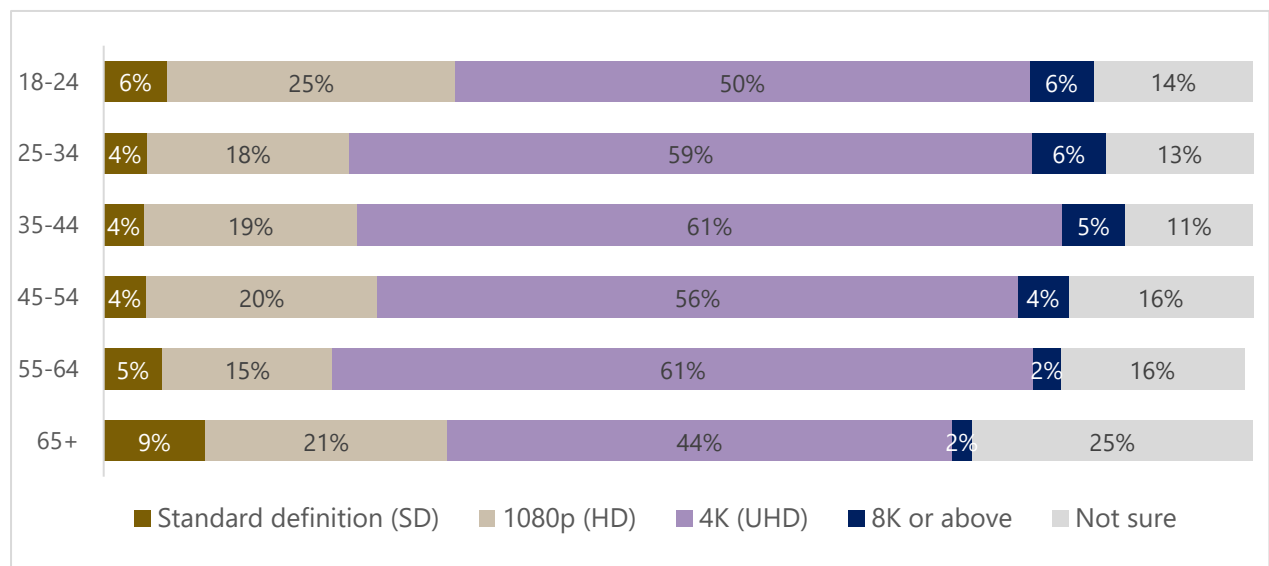
Men prefer larger TVs with higher resolution

Some patterns were observed in the demographic characteristics of TV buyers and the kinds of TVs they purchase.

For example, men make up a higher proportion of new TV buyers than women (54% men, 46% women, <1% nonbinary). Men are also much more likely to buy 4K TVs than women (63% of men compared to 46% of women) and are somewhat more likely than women to buy very large-screen TVs (56% men compared to 44% women, for TVs 71 inches and above).

Age also makes a difference to TV buying behaviour. **Figure 25** shows that respondents aged 65+ are the least likely to buy a 4K TV, with 44% of this cohort buying a 4K TV compared to 61% of 55-64-year-olds, 56% of 45-54-year-olds, 61% of 35-44-year-olds, and 59% of 25-34-year-olds. Respondents aged 65+ are also the most likely group to be unsure of the TV's resolution (25% are unsure).

Figure 25: TV resolution by age



Source: RMIT consumer survey (n=1441)

Despite this, the survey found that these older respondents are more likely to be satisfied with their TV than younger people, and they also tend to keep their TVs for longer.

Finally, some geographic differences in TV buying behaviour were also observed. These are discussed in **Section 6** on nonmetropolitan users.

CTV devices are also purchased to facilitate access to streaming apps

When given the option to select one or more motivations for purchase, 46% of participants advised that they bought their CTV device to provide access to streaming apps. Around the same proportion of respondents (45%) noted a desire to upgrade or keep up with new technology.

Additionally, a quarter (25%) of CTV device purchases were motivated by seeing a good deal (as compared to 13% of TV purchases). Other common reasons given were included accessibility features (19%), replacing a broken device (19%), or because they liked the remote control (14%).

When asked what factor is most important when buying a CTV device, 43% of participants said price (compared to 22% for TV purchases). This suggests that, at their lower price point, streaming devices are seen as a cheap and effective way to increase the TV's capabilities. Additionally, 25% of participants said ease of use was most important to them, while 18% said having the latest streaming apps, and 12% said resolution and picture quality.

4.3 User satisfaction with TVs and CTV devices is very high

The survey found very high levels of satisfaction with TVs purchased in the last 12 months.

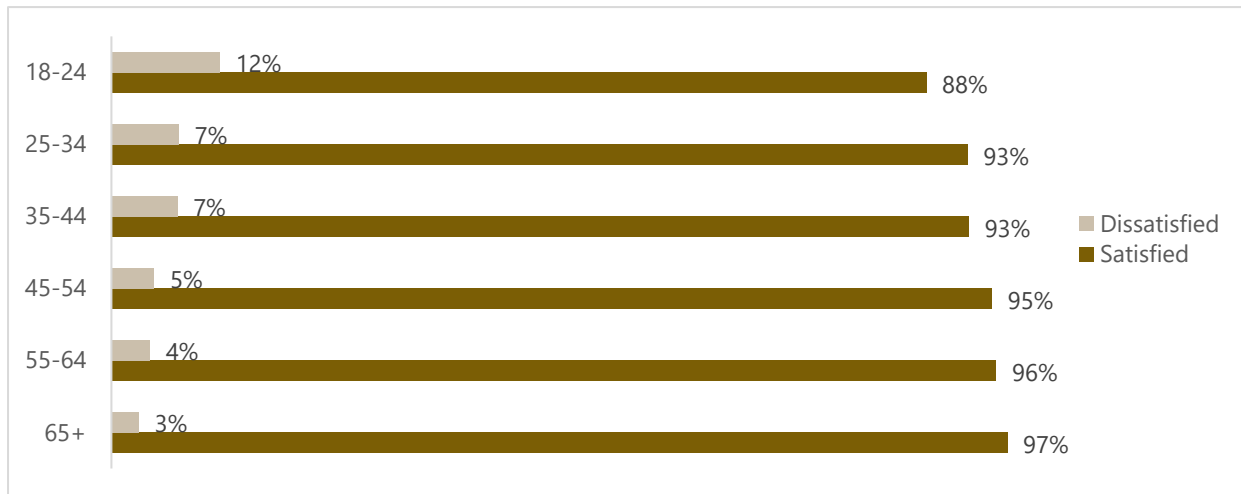
Participants were asked about satisfaction with picture quality, sound quality, ease of use, accessibility, and other TV features. The overall level of satisfaction (satisfied/very satisfied) for each of these factors was between 77% and 97%. The highest levels of satisfaction were reported with picture quality and ease of use.

Satisfaction with the TV tends to increase with age (**Figure 26**). The highest levels of satisfaction were found among Australians aged 65 and over, with only 3% of this cohort expressing dissatisfaction with the TV. For comparison, 12% of respondents aged 18-24 expressed dissatisfaction with the TV.

This age discrepancy may reflect the striking improvements in the picture quality and capabilities of TVs compared to the analogue sets that Australians aged 65+ grew up with. Lower expectations and awareness regarding smart TV features among this older cohort compared to younger Australians may also be a factor.

Overall, these data suggest that TVs are comfortably exceeding customers' expectations. Given electronics attracts the most consumer complaints of any industry in Australia (ACCC 2023a: 121), the very high levels of satisfaction reported by survey respondents is remarkable. However, it is important to note that the survey refers only to *new* products (less than 12 months old); it is to be expected that dissatisfaction will increase over time as these products wear out.

Figure 26: Satisfaction with TV (apps and channels offering) by age



Source: RMIT consumer survey (n=1342)

More specifically, the survey also investigated respondents' satisfaction with the broadcast and content capability of TVs by asking the question: "Does your TV offer all the apps and channels you need?".

Respondents again responded overwhelmingly positively overall, with 95% reporting no problems with accessing apps or channels on their TV. Many participants left approving responses:

"Premium quality with all needed functions"

"It offers a superior range of apps and channels"

Of the small number (5%) of respondents who reported a problem, 2% of respondents noted a problem with apps, particularly broadcast video-on-demand (BVOD) apps:

"No. 9NOW is no longer available which is very disappointing"

"No I cannot get 10 play"

<1% noted a problem with channels, particularly free-to-air channels:

"Does not allow easy access to free to air tv, have to go through 9 Now etc"

3% did not specify the nature of the problem.

The survey also asked about consumers' satisfaction with CTV devices. Similarly high levels of satisfaction were found among new CTV device purchasers. The highest levels of satisfaction related to the devices' ease of use and access to streaming apps (both 82%). This suggests that CTV devices are meeting, and often exceeding, the expectations of customers.

5. Consumption of TVs and CTV devices by technical capability

Key findings

- **The vast majority of TVs sold in Australia are DVB-T2-capable**

The consumer survey found that 88% of respondents who had acquired a TV in the last 12 months have acquired a DVB-T2-capable TV. The remaining 12% of respondents acquired a TV that may not be DVB-T2-capable. This finding is subject to the limitations of technical specifications analysis (**Section 1**) and may understate the overall capability of these TVs. Further research including technical testing is needed to clarify which TVs are non-DVB-T2-capable and how their users would be affected by a shift to DVB-T2 broadcasting.

- **The consumption of potentially non-DVB-T2-capable TVs is shaped by multiple vectors of inequity**

Low-income consumers are more than twice as likely to acquire potentially non-DVB-T2-capable TVs compared to other income groups (21% of low-income respondents have a potentially non-DVB-T2-capable TV compared to 9% for other income groups). Consumers of potentially non-DVB-T2-capable TVs are also somewhat more likely to:

- be nonmetropolitan (16% of nonmetropolitan respondents have a potentially non-DVB-T2-capable TV compared to 11% of metropolitan respondents);
- be aged 65+ (16% of respondents aged 65+ have a potentially non-DVB-T2-capable TV compared to 10%-12% for other age groups); and
- not have a university degree (16% of respondents without a degree have a potentially non-DVB-T2-capable TV compared to 8% of respondents with a degree).

- **Potentially non-DVB-T2-capable TVs are priced low with fewer capabilities**

Potentially non-DVB-T2-capable TVs are more likely to have smaller screen sizes (42% were under 50 inches, compared to only 25% of DVB-T2-capable TVs) and lower resolution (12% have SD compared to only 4% of DVB-T2-capable TVs). The median price paid for these TVs by survey respondents was \$500.

- **There is no evidence of widespread consumer concern or dissatisfaction**

Survey respondents who buy these devices are happy with their performance. Satisfaction levels with potentially non-DVB-T2-capable TVs ranged between 75% and 96% – a similar result to DVB-T2-capable TVs which are, on average, considerably more expensive.

Section 2 of this report noted that around 36% of the TV models available on the Australian market do not have DVB-T2 capability according to their published technical specifications. However, this referred only to the *supply* of potentially non-DVB-T2 TVs, not their *consumption*.

This Section of the report adds another dimension to this analysis by asking:

- What proportion of TVs purchased in Australia are potentially non-DVB-T2-capable?
- Who is buying these potentially non-DVB-T2-capable TVs (consumer demographics)?
- What is the consumer experience of these TVs (satisfaction, home configuration, and use)?

The consumer survey included a number of questions about the respondent's TV, including the brand, model, features, and capabilities. From this information, the research team was able to identify likely users of non-DVB-T2-capable TVs following the methodology outlined in **Section 1**. Analysis of this cohort was then conducted to identify particular demographic characteristics as compared to the overall sample.

5.1 Most consumers are acquiring DVB-T2-capable TVs

Table 6 confirms that the vast majority of Australians (88%) who acquired a TV in the last 12 months acquired a TV that is DVB-T2-capable (i.e., has a DVB-T2- tuner).

Table 6: Proportion of respondents with a TV capable of DVB-T2, MPEG-4, HEVC and internet connection, according to publicly available technical specifications

	DVB-T	DVB-T2	MPEG-2	MPEG-4	MPEG-2 or MPEG-4	HEVC	Internet-connected
Capable	100%	88%	100%	95%	100%	93%	99%
Not capable	0%	6%	0%	1%	0%	1%	1%
Uncertain	0%	6%	0%	3%	0%	7%	0%

Source: RMIT consumer survey (n=1432). MPEG-2 refers to MPEG-2 only; MPEG-4 refers to MPEG-2/4 (backwards compatible); MPEG-2 or MPEG-4 refers the ability to decode MPEG-2 content due to the existence of either a MPEG-2 or MPEG-4 decoder

These DVB-T2-capable TVs should therefore be capable of showing all licensed network television signals transmitted in any Australian region, subject to broadcast coverage, and would continue to access television broadcasts after a theoretical transition to DVB-T2 broadcasting.

5.2 A small minority of consumers are acquiring TVs that may not be DVB-T2-capable

However, around **12%** of respondents who acquired a TV in the last 12 months acquired a TV that may not be DVB-T2-capable.

This cohort of potentially non-DVB-T2-capable TVs can be broken down further into different subcategories (**Table 7**). These include TVs with some combination – but not all – of DVB-T2, MPEG-4,

and HEVC. (Note: for reasons noted in **Section 1.6**, the actual capabilities of TVs may be greater than what is noted in technical specifications, which were the data source for this analysis.)

Table 7: Capabilities of TVs acquired in the last 12 months by respondents to the consumer survey

TV capabilities according to published technical specifications	% of sample with these capabilities
Smart TV with DVB-T2, MPEG-4 and HEVC (standard TV)	88%
Smart TV with DVB-T, MPEG-4 and HEVC	4%
Smart TV with DVB-T, MPEG-4 but not HEVC	4%
Smart TV with DVB-T and MPEG-2 only	1%
Other TV configurations	4%

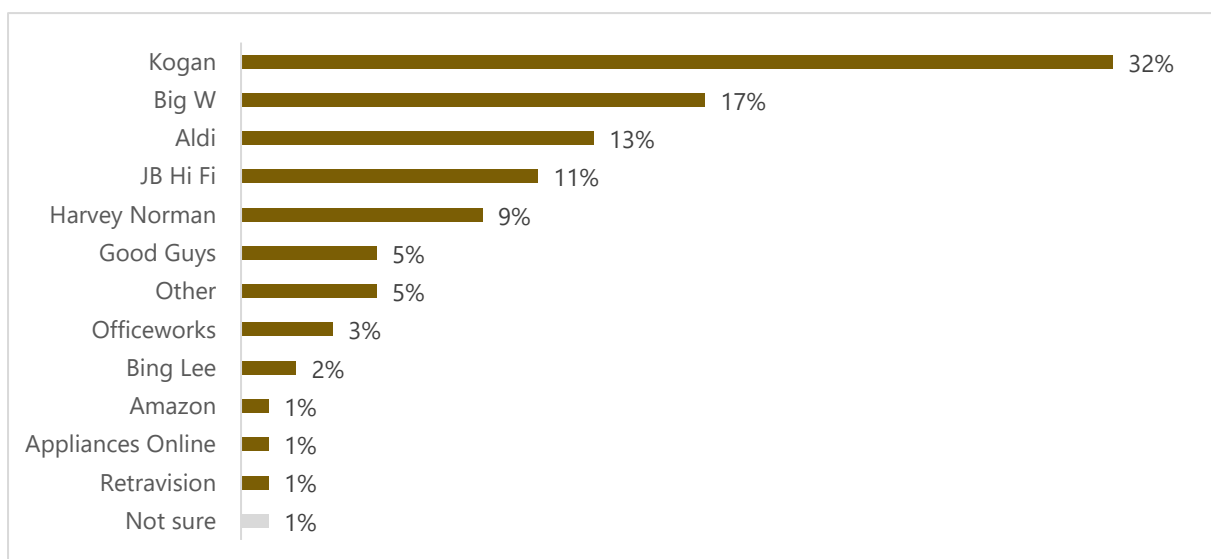
Source: RMIT consumer survey (n=1432). MPEG-4 refers to MPEG-2/4 (backwards compatible)

Some of these consumers who have acquired potentially non-DVB-T2-capable TVs may experience problems accessing DVB-T2 broadcasts. For this reason, it is important to understand this sector of the market and its retail contexts.

Many potentially non-DVB-T2-capable TVs are bought online or at discount retailers

The survey asked respondents to identify where they bought their potentially non-DVB-T2-capable TVs (**Figure 27**). The analysis revealed that potentially non-DVB-T2-capable TVs are commonly bought at online-only or discount retailers. The most common retailers mentioned were Kogan (32%), Big W (17%), Aldi (13%), JB Hi-Fi (11%), and Harvey Norman (9%).

Figure 27: Retailer distribution for potentially non-DVB-T2-capable TVs, according to published specifications



Source: RMIT consumer survey (n=152)

This is a noticeably different retail ecology compared to the overall sample (**Section 4**), in which the “Big 3” retailers (JB Hi-Fi, The Good Guys, and Harvey Norman) were dominant.

The survey also asked respondents about the price they paid for the potentially non-DVB-T2-capable TV. Unsurprisingly, these TVs were priced much lower than DVB-T2-capable TVs. The median price paid for potentially non-DVB-T2-capable TVs was \$500 (mean \$719). In comparison, the median price paid for DVB-T2-capable TVs was 3 times higher at \$1500 (mean \$1818). Clearly, potentially non-DVB-T2-capable TVs occupy a different segment of the market from DVB-T2-capable TVs.

The survey also found that potentially non-DVB-T2-capable TVs acquired by respondents to our consumer survey were more likely to:

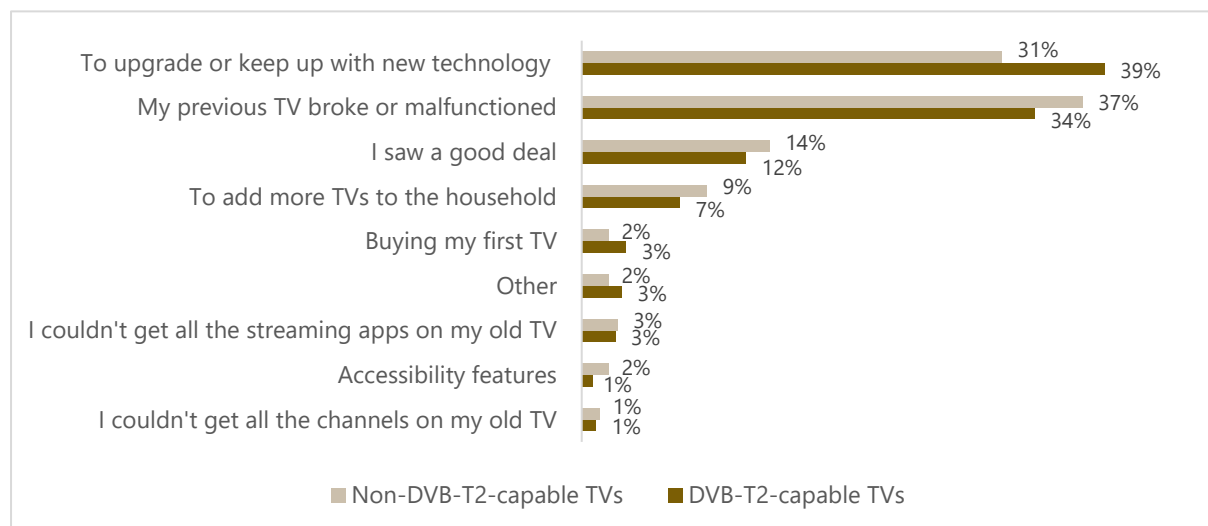
- have smaller screen sizes (42% of these TVs were under 50 inches, compared to only 25% of DVB-T2-capable TVs); and
- have standard definition (12% of potentially non-DVB-T2-capable TVs have SD compared to only 4% of DVB-T2-capable TVs).

Buyers of potentially non-DVB-T2-capable TVs are more price-sensitive

Buyers of potentially non-DVB-T2-capable TVs also appear to be more price-sensitive than buyers of DVB-T2-capable TVs. Around 30% of respondents with non-DVB-T2-capable TVs noted price as the most important decision factor when buying a TV, compared to 22% for those with DVB-T2-capable TVs who noted price as the most important decision factor.

Respondents with potentially non-DVB-T2-capable TVs were also less likely to be concerned about the resolution and less likely to be motivated by upgrading or keeping up with technology (**Figure 28**).

Figure 28: Reasons for purchase – potentially non-DVB-T2-capable TVs and DVB-T2- capable TVs



Source: RMIT consumer survey (n=175)

Interestingly, respondents with a potentially non-DVB-T2-capable TV tended to have more TVs than other respondents (average number of TVs: 2.6 for potentially non-DVB-T2-capable TVs, 2.3 for a DVB-T2-capable TVs). This may suggest that some consumers are buying cheaper, less capable TVs as supplements (e.g., a TV for the bedroom, kitchen, or caravan), and may already have a more capable and expensive TV in their main viewing area.

Overall, this suggests a market for potentially non-DVB-T2 TVs that is strongly shaped by price factors. These TVs are much cheaper than higher-capability TVs, and the people who buy them are also more price-sensitive than other consumers.

Age, income, location, and education make a difference to the capability of TVs purchased

The consumer survey explored whether particular cohorts of Australians are more or less likely to acquire a potentially non-DVB-T2-capable TV.

It found that the likelihood of acquiring a non-DVB-T2-capable TV was higher among:

- **low-income** respondents, who were more than twice as likely to buy a potentially non-DVB-T2-capable TV compared to all other income brackets (21% of low-income respondents have a potentially non-DVB-T2-capable TV compared to an average of 9% for all other income brackets);
- respondents **without a university degree** (16% of respondents without a university degree have a potentially non-DVB-T2-capable TV compared to 8% of respondents with a university degree);
- respondents in **nonmetropolitan areas** (16% of nonmetropolitan respondents have a potentially non-DVB-T2-capable TV compared to 11% of metropolitan respondents); and
- respondents **aged 65+** (16% of respondents aged 65+ bought a potentially non-DVB-T2-capable TV compared to between 10% and 12% in other age cohorts).

In other words, the likelihood of acquiring a non-DVB-T2-capable TV is much higher for low-income Australians, and is somewhat higher for respondents aged 65+, those without a university degree, and those living in nonmetropolitan areas.

Gender does not appear to be associated with the likelihood of acquiring a potentially non-DVB-T2-capable TV.

Table 8 indicates a modest difference between the capabilities of TVs purchased by respondents in metropolitan and nonmetropolitan areas. For example, 89% of TVs purchased by respondents in metropolitan areas have a DVB-T2 tuner compared to 84% of TVs purchased by respondents in nonmetropolitan areas. This small difference is likely the result of consumers in nonmetropolitan areas having a preference for lower-priced, less-capable TVs, as shown in the analysis of nonmetropolitan consumption (**Section 6.1**).

Table 8 also shows the capability of CTV devices purchased by metropolitan and nonmetropolitan respondents. This suggests that nonmetropolitan consumers are more likely than metropolitan consumers to purchase CTV devices with DVB-T2 tuners. Possible reasons for this, which are discussed in **Section 6**, may include the relatively higher proportion of Fetch devices acquired by nonmetropolitan consumers as compared to metropolitan consumers.

Table 8: TVs and CTV devices purchased by metropolitan and nonmetropolitan consumers

	Metropolitan	Nonmetropolitan
TVs		
DVB-T2 tuner	89%	84%
DVB-T only tuner	11%	16%
MPEG-4	95%	96%
MPEG-2 only	5%	4%
HEVC	92%	94%
No HEVC	8%	6%
CTV devices		
DVB-T2 tuner	28%	47%
No DVB-T2 tuner	72%	53%
MPEG-4	100%	100%
MPEG-2 only	0%	0%
HEVC	90%	95%
No HEVC	10%	5%

Source: RMIT consumer survey (n=1432 TVs, n=651 CTV). MPEG-4 refers to MPEG-2/4 (backwards compatible).

Table 9 shows how the likelihood of acquiring a non-DVB-T2-capable TV is related to multiple socioeconomic factors. For example, 84% of nonmetropolitan respondents with a potentially non-DVB-T2-capable TV do not have a university degree, whereas only 54% of the overall sample of TV buyers do not have a university degree. Similarly, more than half (52%) of the nonmetropolitan respondents with a potentially non-DVT-T2-capable TV are low-income, whereas only 22% of the overall sample of TV buyers are low-income.

Table 9: Respondents with potentially non-DVB-T2-capable TVs, by location

	Metropolitan	Nonmetropolitan
TVs		
Male	54%	47%
Female	46%	53%
Aged 18-25	4%	0%
Aged 25-34	12%	11%
Aged 35-45	22%	15%
Aged 45-55	23%	8%
Aged 55-65	17%	16%
Aged 65+	23%	50%
Low-income	26%	52%
Other income	74%	48%
University degree	40%	16%
No university degree	60%	84%
Non-English language spoken at home	16%	2%
Only English-speaking	84%	98%
CTV devices		
Male	58%	53%
Female	42%	47%
Aged 18-25	3%	1%
Aged 25-34	19%	9%
Aged 35-45	31%	22%
Aged 45-55	17%	23%
Aged 55-65	16%	17%
Aged 65+	14%	28%
Low-income	11%	20%
Other income	89%	80%
University degree	66%	38%
No university degree	34%	62%
Non-English language spoken at home	21%	10%
Only English-speaking	79%	90%

Source: RMIT consumer survey (n=175 TVs, n=465 CTV devices).

DVB-T2-capable and potentially non-DVB-T2-capable TVs are used differently

The survey also revealed some subtle differences in usage patterns. For example, respondents with potentially non-DVB-T2-capable TVs are less likely to have connected their TV to the internet (78% of respondents with potentially non-DVB-T2-capable TVs have connected their TV to the internet compared to 90% of respondents with DVB-T2-capable TVs).

Respondents to the survey were also asked to nominate which kinds of television services they use. Users of potentially non-DVB-T2-capable TVs were found to be:

- less likely to watch SVODs (18% of respondents with potentially-non-DVB-T2-capable TVs never watch SVODs compared to 10% of those with DVB-T2-capable TVs doing the same); and

- slightly less likely to use BVOD applications (31% of respondents with potentially non-DVB-T2-capable TVs watch BVODs often or very often, compared to 35% of those with DVB-T2-capable TVs doing the same).

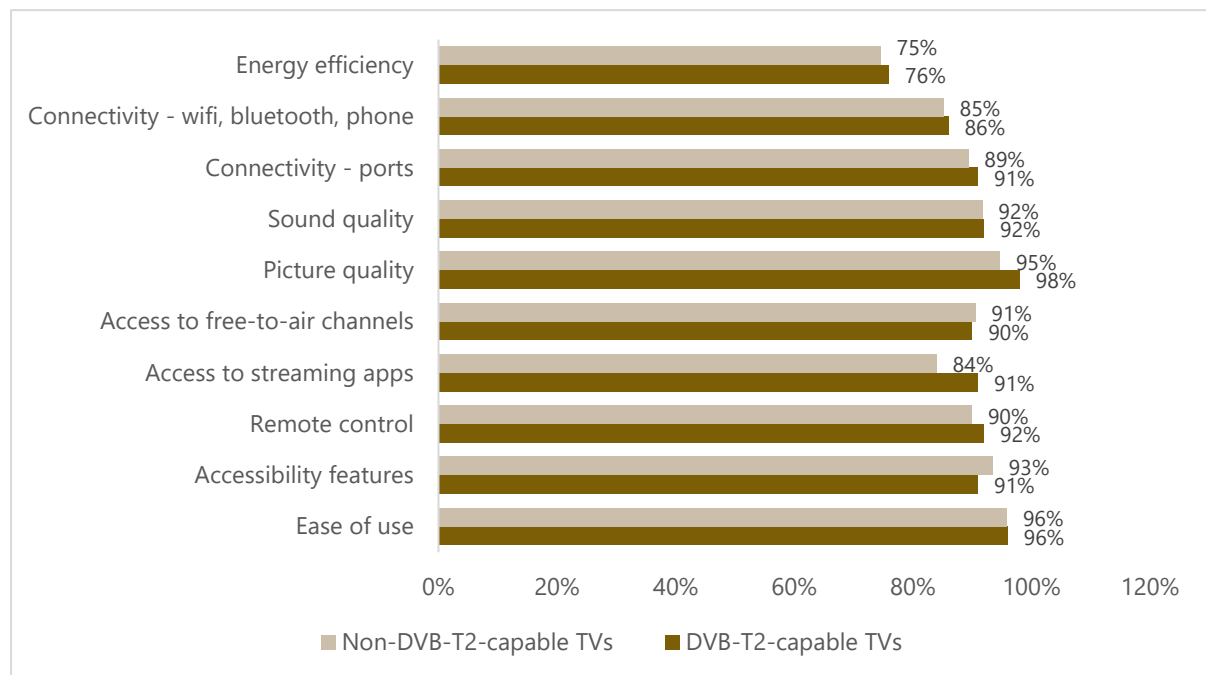
User satisfaction with potentially non-DVB-T2-capable TVs is high

However, the survey also found that potentially non-DVB-T2-capable TVs are meeting the needs of their users.

The survey asked respondents about their level of satisfaction with these TVs, with reference to picture quality, access to apps, ease of use, and other attributes (**Figure 29**). Satisfaction levels (satisfied/very satisfied) for potentially non-DVB-T2-capable TVs ranged between 75% and 96% – a very similar result to that for users of DVB-T2-capable TVs which are, on average, considerably more expensive.

Overall, the survey produced no evidence to suggest widespread consumer concern or dissatisfaction in relation to their cheaper, less capable, TVs.

Figure 29: Satisfaction with DVB-T2-capable and non-DVB-T2-capable TVs



Source: RMIT consumer survey (n=175)

6. Nonmetropolitan consumers

Key findings

- **Nonmetropolitan consumers buy TVs as frequently as metropolitan consumers, but they spend substantially less on those TVs**

The consumer survey found that the median price for a TV purchased by nonmetropolitan consumers is \$1000, compared to a median price of \$1500 for metropolitan consumers, reflecting higher price sensitivity of nonmetropolitan consumers. Nonmetropolitan consumers are also more likely than metropolitan consumers to buy small-screen and low-resolution TVs. Additionally, nonmetropolitan consumers retain their TVs for slightly longer than metropolitan consumers (23% of nonmetropolitan respondents used their last TV for 10 or more years compared to 18% of metropolitan respondents).

- **Nonmetropolitan consumers are slightly more likely than metropolitan consumers to have a non-DVB-T2-capable TV**

16% of nonmetropolitan consumers surveyed have a potentially non-DVB-T2-capable TV, compared to 11% of metropolitan respondents. CTV devices are also less frequently connected to the TV in nonmetropolitan areas compared to metropolitan areas.

- **Nonmetropolitan consumers use free-to-air TV more and BVODs less than metropolitan consumers**

Nonmetropolitan consumers are more likely to watch live free-to-air channels often (65% often/very often) compared to respondents in the capital cities (57% often/very often). However, respondents in nonmetropolitan areas use BVODs slightly less frequently (12% never) than respondents in the capital cities (8% never).

- **The supply, acquisition and use of devices can vary markedly between nonmetropolitan regions**

In particular, the supply of TVs and CTV devices in remote First Nations communities has distinctive characteristics. These vary from community to community but frequently involve a very limited range of available devices, higher purchase costs, and more frequent repair. Specific factors affecting supply of TV devices in First Nations communities are discussed in **Section 6.3**.

Section 3, which examined differences in the supply of TVs across Australia, found that the availability of a wide range of TV models decreases in nonmetropolitan areas. Building on those findings, the present Section focuses on **nonmetropolitan consumers** and the kinds of devices they purchase.

It also considers the device preferences and usage behaviours of those nonmetropolitan consumers.

For the purposes of this analysis (**Section 6**), nonmetropolitan is defined as all areas outside the state and territory capital cities, including regional cities. Approximately 72% of the survey respondents are metropolitan and 28% are nonmetropolitan.

Overall, no meaningful difference was observed between metropolitan and nonmetropolitan consumers in regards to TV purchase frequency. In other words, consumers in the capital cities are no more likely to have bought a TV in the last 12 months than consumers outside the capital cities. This aligns with DITRDCA's *Television and Media Survey 2023* (DITRDCA 2023), which found no statistically significant difference in frequency of TV purchases between metropolitan and nonmetropolitan areas. Nor did our research team observe any meaningful differences regarding the number of TVs in the home, new vs. second-hand buying, or whether the TV was bought on sale or at full price.

However, the survey revealed other important differences.

6.1 Nonmetropolitan consumers have distinctive TV purchase patterns

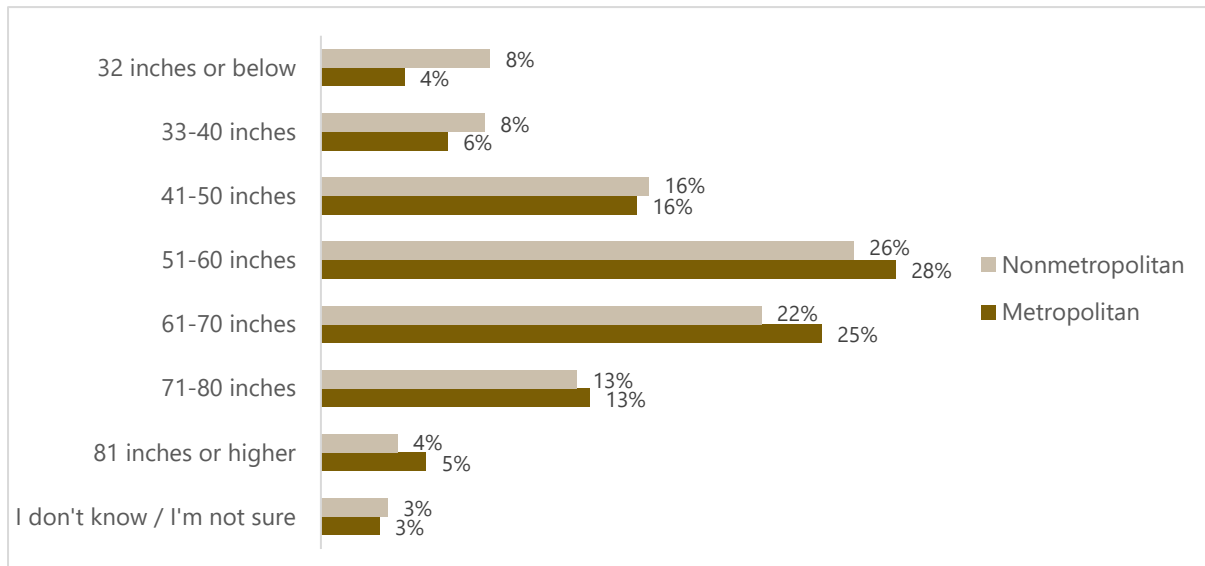
TVs purchased by nonmetropolitan consumers are cheaper and smaller

Nonmetropolitan consumers **spend substantially less** on their new TVs than metropolitan consumers. The median price for TVs purchased by nonmetropolitan consumers is \$1000, which is \$500 lower than the median price for TVs purchased by metropolitan consumers. Nonmetropolitan consumers are also less likely to buy a 4K TV or above, with 48% of nonmetropolitan respondents buying a 4K TV or above compared to 58% of metropolitan respondents.

There are several possible explanations for this geographic pattern. One factor may be differences in disposable income between metropolitan and nonmetropolitan consumers. For example, ABS (2024) data indicate that areas with the highest average disposable income in Australia are in the capital cities. Another possible factor is supply dynamics, as supply of TVs is often more constrained in nonmetropolitan areas than in metropolitan areas (**Section 3**).

The survey also observed differences in screen size preference. As illustrated in **Figure 30**, nonmetropolitan consumers are more likely to purchase small TVs (32 inches and below) and less likely to buy large TVs (61 inches and above). Possible reasons for this may include the aforementioned differences in disposable income and supply dynamics in nonmetropolitan regions.

Figure 30: TV screen sizes purchased by metropolitan and nonmetropolitan consumers



Source: RMIT consumer survey (n=1441)

TVs purchased by nonmetropolitan consumers are more likely to be non-DVB-T2-capable, but the reverse is true for CTV devices

As noted in **Section 5**, nonmetropolitan respondents to the consumer survey were more likely than metropolitan respondents to have a potentially non-DVB-T2-capable TV. Around 16% of nonmetropolitan respondents have a potentially non-DVB-T2-capable TV compared to 11% of metropolitan respondents.

Conversely, **Table 10** shows that CTV devices purchased by consumers in nonmetropolitan areas are more likely to be DVB-T2-capable than CTV devices purchased by consumers in metropolitan areas (44% of nonmetropolitan consumers acquired a DVB-T2-capable CTV device compared to 23% of consumers in metropolitan locations). The lack of a T2 tuner in CTV devices is not necessarily cause for concern, as these devices are typically bought to stream internet content.

One factor that may explain the greater prevalence of T2-capable CTV devices in nonmetropolitan areas is Fetch, which has a T2 tuner (30% of nonmetropolitan respondents with a CTV device had acquired a Fetch, compared to 15% of metropolitan respondents). The popularity of Fetch in nonmetropolitan areas is in turn related to the existing mobile network coverage of Fetch's part-owner and distributor Telstra. As noted by the Australian Competition and Consumer Commission, Telstra's mobile network outside the capital cities may give Telstra an "enduring competitive advantage" in nonmetropolitan areas (ACCC 2023b).

Further socio-demographic data on respondents with DVB-T2-capable and non-capable CTV devices is offered in **Table 11**.

Table 10: CTV devices by DVB-T2 capability and location

	Metropolitan	Nonmetropolitan
DVB-T2 tuner	28%	47%
No DVB-T2 tuner	72%	53%

Source: RMIT consumer survey (n=465).

Table 11: Respondents with potentially non-DVB-T2-capable CTV devices by location

	Metropolitan	Nonmetropolitan
Male	58%	53%
Female	42%	47%
Aged 18-25	3%	1%
Aged 25-34	19%	9%
Aged 35-45	31%	22%
Aged 45-55	17%	23%
Aged 55-65	16%	17%
Aged 65+	14%	28%
Low-income	11%	20%
Other income	89%	80%
University degree	66%	38%
No university degree	34%	62%
Non-English language spoken at home	21%	10%
Only English-speaking	79%	90%

Source: RMIT consumer survey (n=465).

TVs purchased by nonmetropolitan consumers more likely to be purchased in-store and from independent retailers

The survey found that nonmetropolitan consumers are slightly less likely to purchase their TV from one of the top 3 retailers, JB Hi-Fi, Harvey Norman, and The Good Guys (70% nonmetropolitan, 75% metropolitan).

In other words, buying TVs from independent retailers (those other than the 'Big 3') was slightly more common in nonmetropolitan areas. Around 30% of nonmetropolitan respondents bought their TV from an independent retailer compared to 25% of metropolitan residents doing the same. Notably, 3% of nonmetropolitan consumers bought their TV from Betta Electrical compared to >1% of metropolitan consumers.

Overall, however, independents are still a marginal presence in both metropolitan and nonmetropolitan markets.

New TVs purchased in nonmetropolitan areas were more likely to be purchased in-store and therefore were slightly less likely to be bought online.

Table 12 also shows the methods of purchase (in-store or online) used by metropolitan and nonmetropolitan respondents. This suggests that nonmetropolitan consumers are more likely to purchase in-store, even noting the lower density of stores in nonmetropolitan areas as discussed in **Section 3**.

Table 12: Online and home delivery of TVs by location

	Metropolitan	Nonmetropolitan
In-store	59%	71%
In-store – home delivery	16%	9%
Online – click and collect	7%	4%
Online – home delivery	18%	16%

Source: RMIT consumer survey (n=1317)

Additionally, no meaningful difference was found between metropolitan and nonmetropolitan regions regarding whether the TV was in-stock at the time of purchase. Across both metropolitan and nonmetropolitan areas, the vast majority (93-94%) of respondents indicated that the TV was in stock at the time of purchase.

Survey data analysis also revealed a difference in retailers when it comes to metropolitan versus nonmetropolitan CTV device acquisition. Nonmetropolitan respondents are more likely to buy from Telstra and are less likely to buy from JB Hi-Fi. This aligns with the finding of other research (DITRDCA 2023) that users outside the capital cities report higher use of Telstra TV devices compared to users in the capital cities.

Nonmetropolitan consumers are less driven by upgrade motivations

When examining reasons for purchasing TVs, the survey found some subtle differences between metropolitan and nonmetropolitan consumers.

Nonmetropolitan consumers were more likely than metropolitan consumers to purchase a TV because their previous TV broke (32% metropolitan, 39% nonmetropolitan). In contrast, metropolitan consumers were more likely than nonmetropolitan consumers to purchase a new TV to upgrade or keep up with technology (40% metropolitan, 33% nonmetropolitan). This is likely related to the differences in income and supply between metropolitan and nonmetropolitan consumers, as noted above.

6.2 Nonmetropolitan consumers have distinctive viewing and usage behaviours

Nonmetropolitan users watch more free-to-air TV

As shown in **Table 13**, respondents in nonmetropolitan areas are more likely to watch live free-to-air channels (65% often/very often) compared to respondents in the capital cities (57% often/very often).

However, respondents in nonmetropolitan areas use BVODs less frequently (12% never) than respondents in the capital cities (8% never). This aligns with DITRDCA's (2023) findings that Australians outside capital cities are less likely to access free-to-air television through on-demand access (54% nonmetropolitan compared to 62% metropolitan).

The survey also found that nonmetropolitan respondents use free video streaming services less frequently (15% never, compared to 10% never in metro).

No difference was observed in frequency of use of SVODs between metropolitan and nonmetropolitan users.

Table 13: BVOD, SVOD and free-to-air TV use by location

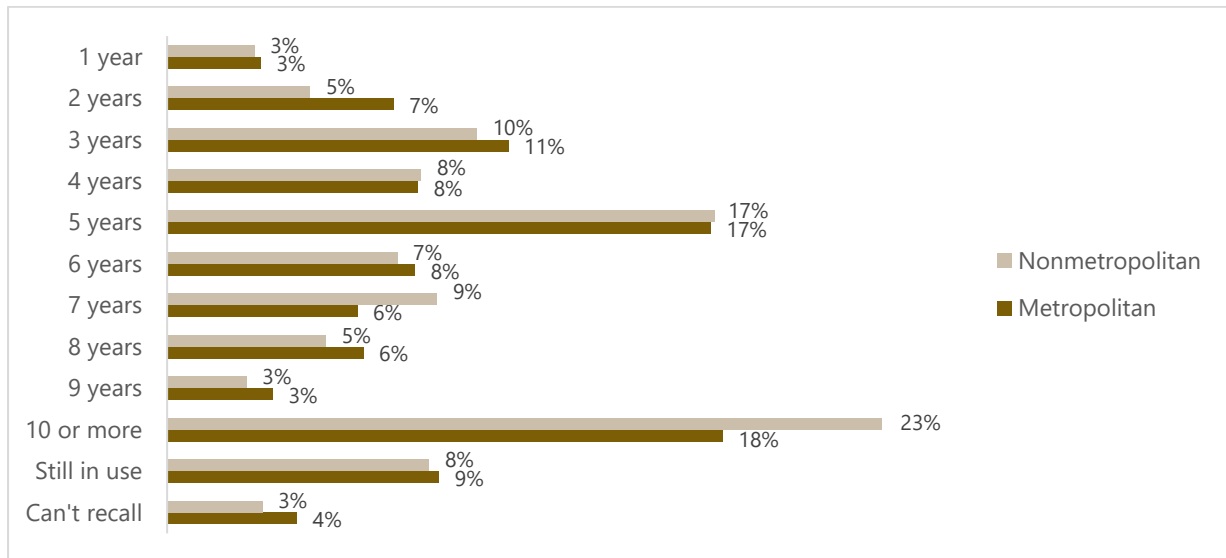
	Never	Rarely	Sometimes	Often	Very often
Use BVODs - metropolitan	8%	16%	40%	25%	10%
Use BVODs - nonmetropolitan	12%	16%	36%	23%	13%
Use SVODs - metropolitan	10%	19%	30%	25%	16%
Use SVODs - nonmetropolitan	15%	22%	28%	21%	14%
Watch live free-to-air channels - metropolitan	6%	11%	26%	27%	30%
Watch live free-to-air channels - nonmetropolitan	5%	11%	18%	29%	36%

Source: RMIT consumer survey (n=1825)

Nonmetropolitan users keep their TVs for longer

Finally, the survey suggests that nonmetropolitan Australians retain their TVs for longer, with 23% of nonmetropolitan respondents retaining their last TV for 10 or more years compared to 18% of those living in capital cities (**Figure 31**). This longer retention period may be due to aforementioned differences in disposable income between metropolitan and nonmetropolitan areas (i.e., consumers retaining TVs for longer due to economic necessity) as well as differences in app usage patterns as observed above (i.e., reduced need to refresh TVs to use latest apps).

Figure 31: Retention of TVs: nonmetropolitan and metropolitan respondents

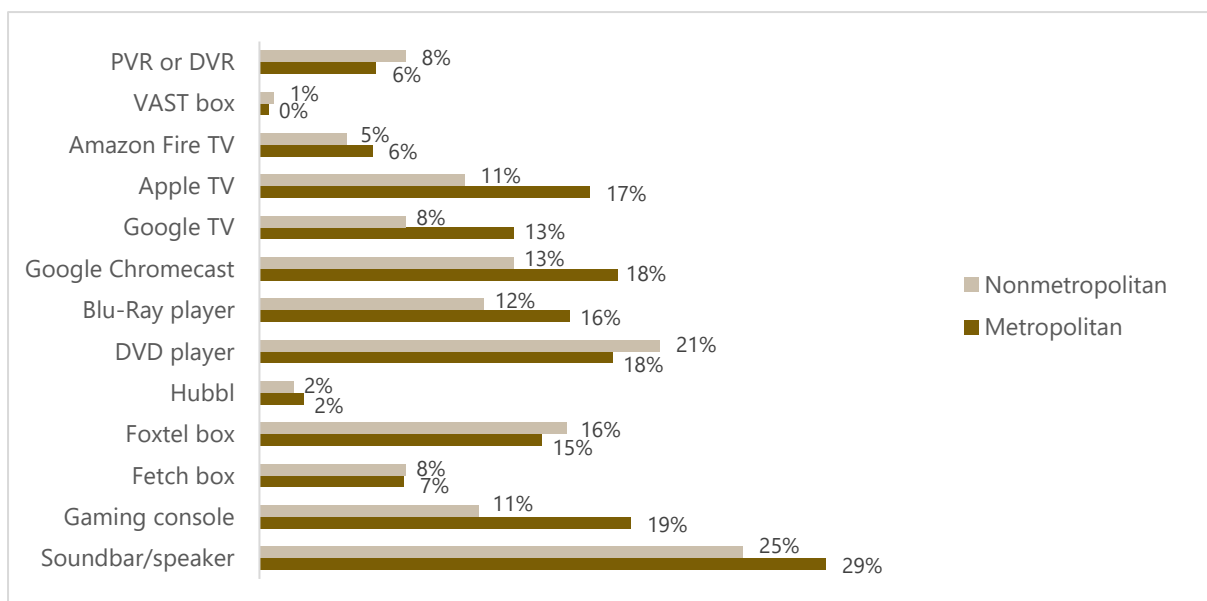


Source: RMIT consumer survey (n=1441)

CTV devices are less frequently connected to the TV in nonmetropolitan areas

Overall, respondents in nonmetropolitan areas had fewer CTV devices connected to their TV – an average (mean) of 1.4 compared to 1.7 in metropolitan regions. Differences were also observed in relation to specific device types, with nonmetropolitan respondents less likely than those in the capital cities to have Google TV, Apple TV, Chromecast, and gaming consoles connected to their TV (**Figure 32**).

Figure 32: Device ownership amongst nonmetropolitan and metropolitan respondents



Source: RMIT consumer survey (n=1441)

Interestingly, respondents in nonmetropolitan areas are slightly more likely to have a free-to-air antenna connected to their TV (80% nonmetropolitan, 75% metropolitan).

6.3 Remote First Nations communities experience constraints on device access

Case study by Associate Professor Daniel Featherstone, RMIT

The supply of TVs and CTV devices in remote First Nations communities has distinctive characteristics, which vary from community to community. These require close policy attention.

The Mapping the Digital Gap project (2022-24) based at RMIT has conducted detailed investigations into TV and internet access in 13 remote First Nations communities. Key insights from this research are noted below.

Supply and affordability

Remote First Nations communities are not served by mainstream electronics retailers. As a result, the primary option for purchasing TV sets, VAST set-top boxes (needed due to TV being delivered via VAST satellite in remote Australia) and connected devices such as gaming consoles or streaming hubs, is via the community store (i.e., a small, general store selling miscellaneous items - often the only store in the community).

Affordability of devices is affected by low incomes and high costs of devices, despite most items sold being low-priced brands that have fewer capabilities than higher-priced devices. TVs can cost up to 100% more in community stores than in regional stores due to being bulky items with high freight costs (trucked long distances via unsealed roads or ferry for island communities) and lack of bulk purchasing.

However, in most communities there is often little option but to purchase from the community store due to cost of travel to regional centres and difficulty in transporting a bulky item. While some remote residents use online shopping for smaller items, the freight cost for a TV would be prohibitive.

There is relatively high turnover of TV sets in remote First Nations households due to supply of low-quality brands, high wear and tear in overcrowded housing, and lack of options for maintenance or technical support.

Cost of VAST satellite equipment

Most remote communities rely on VAST satellite set-top boxes for access to TV services, including 11 of 13 sites visited for the Mapping the Digital Gap research. The household survey found that an average 60% of households in these communities did not have free to air TV access, primarily due to VAST satellite equipment – set-top box (STB), dish or cabling – not working or not being installed.

For houses without VAST services, the most common point of failure was the STB (51%), with 26% reporting damage to the satellite dish or cabling. VAST STBs cost between \$349 and \$608 in the remote community stores visited. The same item (UEC DSD 4921) can be purchased online for \$250-270. Another issue is the difficulty of activating the STB smart card, which requires a working satellite connection, a mobile service, email address and the consumer's ability to follow a complex activation process.

Despite being a requirement to access free to air TV services, First Nations households are responsible for the maintenance of VAST satellite dishes, cabling and replacement of VAST set-top boxes (this was a Federal Government decision as part of the digital switchover / VAST rollout in 2012-13). Apart from the Torres Strait region, none of the remote communities visited had a maintenance program in place for VAST satellite dishes. The lack of technicians, and very high cost to travel from regional centres, means that it is not feasible for households to repair or replace satellite equipment.

As a result, the rate of access to TV services by remote First Nations households has steadily reduced over the last decade. There is high demand for local TV broadcast services to be re-established in communities to reduce the need for STBs. Prior to 2012/13, analogue TV broadcasting was available in most communities, with BRACS community broadcasting available in about 147 sites.

Use of smart TVs as monitors

Due to high rate of failure of VAST equipment, cost of smart TVs, and changing viewing habits, many remote First Nations households no longer have a TV.

Those households without a VAST service that do have a TV typically use it for watching YouTube or streaming services (see viewing preferences below), connected via Wi-Fi using a mobile phone or 4G modem. There is also some use of DVDs or shared content on USB sticks.

The reliance on online and streamed content using pre-paid mobile data, which accounts for over 98% of remote mobile users surveyed in 2024, makes TV viewing a high household cost. The most commonly purchased recharge voucher costs \$35, providing 15GB of data. For context, an HD movie can use 2-4 GB/hour and a 4K movie can use 7GB/hour, therefore the consumer would need to regularly purchase recharge vouchers to consume UHD content.

Impact of lack of TV services

One implication of the lack of working VAST TV services is high use of pre-paid mobile devices as a primary means of accessing TV services online. This has the impact of high household costs to access entertainment that other Australians can access for free, as well as adding congestion to mobile services in remote and very remote communities. Congestion of mobile services is a substantial issue in most remote communities visited due to limited bandwidth available and rapidly increased demand in recent years, largely due to streaming services, making basic phone and internet use difficult at peak use times.

Additionally, with lack of access to TV news services, there is increased reliance on social media for news, with the increased prevalence of misinformation and disinformation, hate speech and racist commentary through social media, as well as targeted advertising (Carlson and Frazer 2021; Fredericks et al 2021).

TV viewing preferences

The 2024 Mapping the Digital Gap survey found that there was higher use of streaming services than free-to-air TV services in the sites reliant on VAST TV. Specifically, it found:

- 32% of respondents used YouTube daily (a further 16% used weekly)
- 18% of respondents used streaming services such as Netflix, Binge and Disney Plus daily (a further 18% used weekly)

Comparatively, commercial TV networks (7,9 and 10) were the most popular services among the Freeview TV services (14% daily, 17% weekly, 17% never or not available). Other services used include:

- ABC TV (9% daily, 13% weekly, 22% never or not available)
- National Indigenous TV (9% daily, 11% weekly, 21% never or not available), and
- Indigenous Community TV (8% daily, 12% weekly, 24% never or not available).

7. User configuration of TVs and CTV devices in the home

Key findings

- **The majority (67%) of respondents who acquired a TV in the last 12 months have connected one or more CTV devices to that TV**

Of these CTV devices, gaming consoles and Google Chromecasts were the most frequently connected CTV devices. Common reasons given for connecting a CTV device included wanting to enhance the operation of the TV or access particular apps or services not available through their TV. These findings suggest a high level of familiarity with the uses of CTV devices among the population.

- **The vast majority (89%) of respondents have connected their TV to the internet**

This suggests that streaming television is now an overwhelmingly popular practice among those Australians who have recently acquired a new TV. Younger Australians, those living in metropolitan areas and those with higher incomes are more likely to connect their TV to the internet. This reflects the preference among these groups for watching television online.

- **Three quarters (76%) of respondents have a free-to-air antenna**

76% of respondents indicated that they had an internal or external antenna at home, or both. In contrast, 18% of respondents said they do not have a free-to-air antenna at home and 6% were unsure. The most common reason given for not connecting the TV to an antenna was the ability to stream content (47%), followed by housing-related barriers (16%), disinterest in free-to-air television (14%), and using a set-top box to access free-to-air television (11%).

This Section explores how TVs are configured in the home to access free-to-air and on-demand television services.

The following questions are addressed:

1. To what extent are consumers connecting their TVs to free-to-air antennas?
2. To what extent are consumers connecting their TVs to the Internet?
3. To what extent are consumers connecting CTV devices to their TVs?
4. Why is connection important to consumers and their content consumption?

Smart TVs access content primarily via 2 means. One option is to receive over-the-air broadcast television via a free-to-air antenna, which may be an internal antenna (rabbit ears) or external (mounted on the roof). These antenna-enabled forms of television access are referred to in the report as *free-to-air* television. Alternatively, an internet connection may be used to access streaming apps (SVODs and BVODs) that broadcast content live or on-demand, which is referred to as *streaming*.

How the TV is configured in the home, and whether or not the TV is connected to a broadcast antenna, shapes what kind of content the TV can access. A TV that is connected only to a free-to-air antenna (but not to the internet) can only receive free-to-air television, as opposed to streaming content from apps. A TV that is connected both to a free-to-air antenna and to the internet can potentially receive both free-to-air *and* streaming content, greatly enlarging the scope of services available to the user.

Having both a free-to-air antenna and an internet connection gives the user a choice when seeking to access broadcaster content; they may use either linear free-to-air channels or the free BVOD apps (ABC iView, SBS On Demand, 7Plus, 9Now, 10Play) which offer both linear and on-demand functionality. They may also use SVOD and other paid apps that require a direct payment from the user.

Importantly, these distribution models vary in terms of:

- costs to the consumer (including data costs and exposure to advertising);
- environmental impact (including energy use and carbon footprint); and
- potential contribution to network congestion, in the case of online distribution.

Another consideration is whether consumers are using CTV devices to augment the capabilities of old or dysfunctional smart TVs. For example, connecting an inexpensive Chromecast or a Fire TV device, and using that device as the user interface for streaming, is a useful way to extend the life of a smart TV that is no longer providing access to streaming services via its built-in apps.

To understand these downstream effects, it is therefore important to consider how users are configuring their TVs at home.

7.1 Most TVs are connected to a free-to-air antenna

In the national consumer survey of Australian adults who had purchased a TV in the last 12 months, the survey asked respondents several questions about free-to-air antennas.

Table 14: Free-to-air connectivity and configuration at home among survey respondents who acquired a TV in the last 12 months

Connectivity	
Have an external aerial / antenna at home	65%
Have an internal aerial / antenna at home	7%
Have both an antenna and external aerial / antenna at home	4%
No aerial / antenna at home	18%
I don't know / I'm not sure	6%
	100%
Configuration	
Aerial / antenna is connected to TV	77%
Aerial / antenna is not connected to TV	18%
I don't know / I'm not sure	5%
	100%

Source: RMIT consumer survey (n=1441)

When asked the question "Does your home have a free-to-air TV aerial / antenna?", 76% of the sample indicated that they had an antenna at home (**Table 14**). 65% of these respondents have an external antenna, while 7% have an internal antenna and 4% indicated they have both an internal and an external antenna. In other words, more than 3 quarters of Australian adults have the capacity to access free-to-air television via an antenna. In contrast, 18% of respondents said they do not have a free-to-air antenna at home, while 6% were unsure.

When asked the question, "Is your TV currently connected to a free-to-air TV aerial / antenna?", 77% of respondents answered yes, with 18% answering no and 5% unsure. The slight difference between this result (77% connected to FTA antenna) and the previous question (76% have antenna at home) may be due to misunderstanding of the survey question.

The survey found that younger Australians and those living in metropolitan areas are more likely not to have an antenna connected to their TV. For example, 32% of 18-24-year-old respondents do not have an antenna compared to only 11% of those aged 65 or over. The median age of respondents without a free-to-air antenna was 42, 10 years younger than the median age for the overall sample (52).

Ability to stream is the main reason given for not connecting the TV to an antenna

The survey asked those respondents whose TVs are not connected to free-to-air antennas to explain the reason for this in their own words. Their responses were then coded by the research team to produce a category breakdown (**Figure 33**).

The most common reason given was the ability to stream content. 47% of respondents without a free-to-air antenna connected indicated that the ability to stream negates the need for an antenna:

"I don't need it because I get free TV via apps using the internet"

16% of consumers who do not have a free-to-air antenna connected cite housing-related barriers, such as the inability to access signals in a particular room due to infrastructural limitations:

"The aerial port isn't near where we have the tv now so we stream everything"

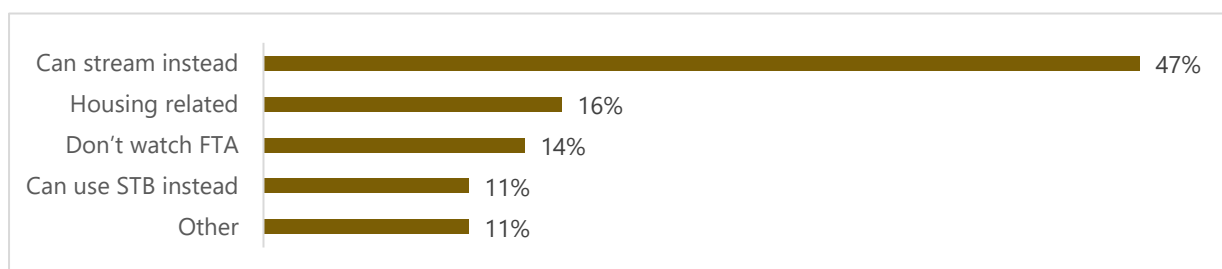
The third most-cited reason was a general disinterest in free-to-air television (14%):

"Don't care for free to air telly"

The ability to use a set-top box to access free-to-air television (11%) was another important factor:

"Unnecessary [when] using a Telstra box or Hubbl"

Figure 33: Reasons given by survey respondents who do not have a FTA antenna connected to their TV



Source: RMIT consumer survey (n=258)

The 16% of respondents without a free-to-air antenna connected who told us they are unable to access free-to-air television due to housing-related issues are worth noting here. These respondents may have no alternative but to stream content they could otherwise access over the air. The analysis revealed that this group are more likely to watch BVOD apps often or very often (44%, compared to 36% for all respondents) and SVOD apps often or very often (76%, compared to 65% for all respondents).

Additionally, some demographic differences were observed in the analysis of reasons why people do not have an antenna connected. For example, men are much more likely than women to respond that they use a set-top box to access free-to-air TV (18% male, 4% female). In contrast, women are more likely than men to note housing-related factors as the reason why they do not have an antenna connected (20% female, 13% male).

Age is also a factor here. The survey found that the likelihood of mentioning housing-related issues as a reason for not having a free-to-air antenna connected increases with age.

7.2 Most TVs are connected to the internet

A further consideration is whether consumers are connecting their TVs to the internet.

The first step in the analysis was to establish the internet capability of respondents' TVs. Of the survey respondents who had acquired a TV in the last 12 months, 95% had a smart TV (i.e., a TV that can connect to the internet), reflecting the extremely high penetration of smart TVs in Australian retail stock. An additional 2% of respondents indicated they had acquired a non-internet-connected TV and 3% were unsure whether their TV was smart.

The next step was to determine how many of these TVs are currently connected to the internet. 89% of survey participants who had purchased a TV in the last 12 months advised that their TV is connected to the internet. This figure was higher at 93% among respondents with smart TVs.

Again, this suggests the vast majority of Australians who have smart TVs were using them as intended – i.e., as internet-connected devices. The very high proportion of TVs connected to the internet likely reflects ever-growing consumer familiarity with streaming television services and evolving TV interface designs that require or strongly encourage users to connect to the internet during device setup.

The survey also found that the likelihood of **not** connecting the TV to the internet increases among the following cohorts:

- Australians aged 65+ (19% of respondents aged 65+ have not connected their TV to the internet compared to 7-14% amongst other age groups);
- low-income Australians (17% of low-income respondents have not connected their TV to the internet compared to 7% of higher-income earners); and
- nonmetropolitan Australians (14% of nonmetropolitan respondents have not connected their TV to the internet compared to 9% of metropolitan residents, consistent with findings from DITRDCA's *Television and Media Survey 2023*).

It is vital to note that the survey findings may overstate the prevalence of TVs being connected to the internet due to the online survey method which does not capture internet non-users or mobile-only internet users.

7.3 Connecting the TV to a CTV device is common

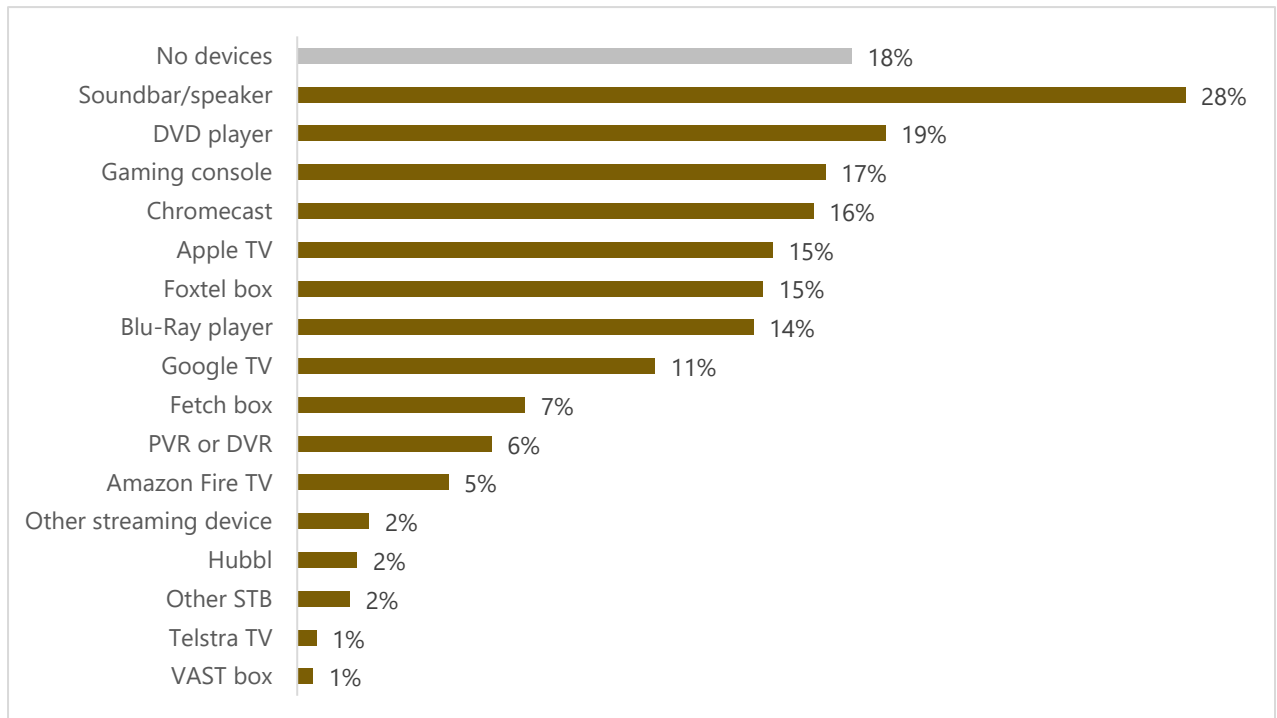
CTV devices are popular in Australian homes. 67% of respondents who had acquired a TV in the last 12 months had connected a CTV device to the TV.

The median number of CTV devices, excluding soundbars, connected to new TVs was 2.

As illustrated in **Figure 34**, the CTV devices most commonly connected to the TV were gaming consoles (17%), Chromecast (16%), Foxtel set-top boxes (15%), Apple TV (15%), and Google TV (11%).

Only 1% of respondents had connected a VAST set-top box to their TV.

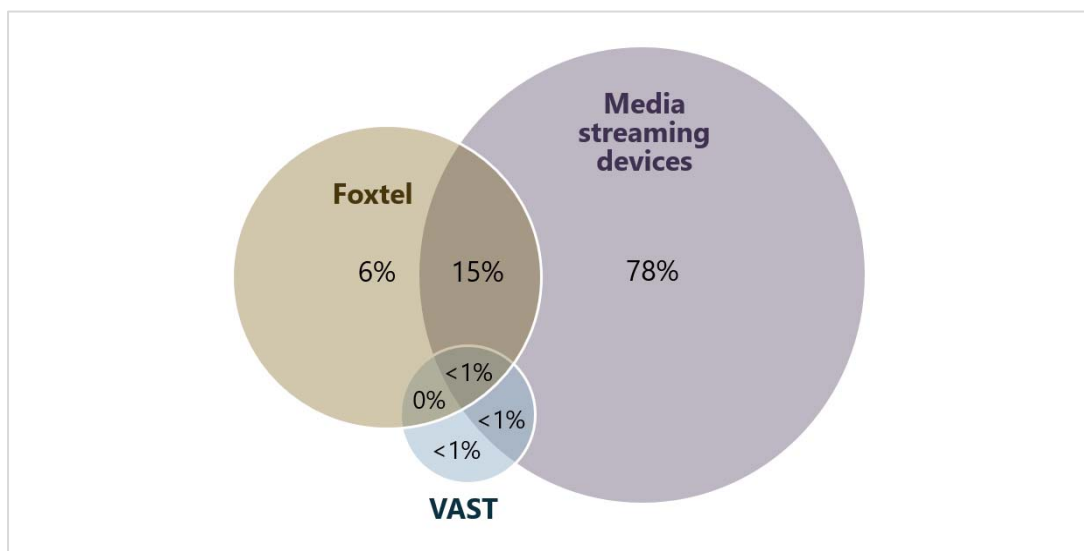
Figure 34: Devices connected to new TVs



Source: RMIT consumer survey (n=1317)

CTV devices have various capabilities, however media streaming is by far the most popular use of CTV devices. **Figure 35** shows the proportion of respondents' TVs that are connected to different types of media streaming devices and set-top boxes. The overwhelming majority of devices connected are media streaming devices, such as Google TV, Apple TV, and Chromecast. Many respondents are using more than one device simultaneously, as shown in the intersections below.

Figure 35: CTV devices connected to respondents' TVs



Source: RMIT consumer survey (n=1317)

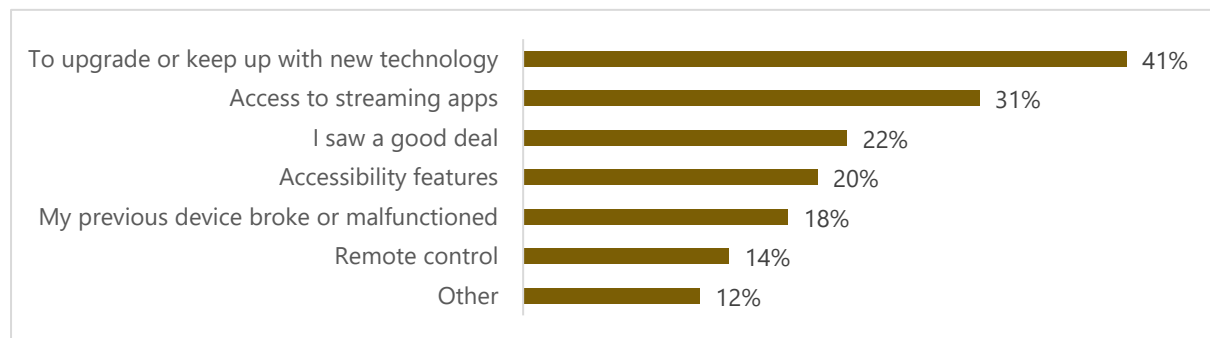
The survey also asked whether respondents were connecting CTV devices to non-TV display screens (e.g., monitors and projectors). This seems to be a marginal practice. Of the consumers who had bought a CTV device in the last 12 months, 7% connected it to a computer monitor and 4% connected it to a projector, compared to 93% who connected it to a TV (noting that some respondents had connected their CTV to multiple screens).

Consumers use CTV devices for many reasons

Consumers may use CTV devices for multiple reasons, including to enhance the operation of the TV by enabling access to streaming content (e.g., upgrading a “dumb” TV to a smart TV), or to access particular apps or services not available through their existing smart TV.

As shown in **Figure 36**, the survey found that the most common reason given for purchasing a CTV device was to “upgrade or keep up with new technology” (41%), to get “Access to streaming apps” (31%), followed by “I saw a good deal” (22%). (Respondents could select any reasons that apply.)

Figure 36: Reasons for buying a CTV device



Source: RMIT consumer survey (n=651)

8. Device lifespans

Key findings

- **The average lifespan of a TV in Australia is around 6 years**

The average reported lifespan for the consumer survey respondents' last TV was around 6 years (5.98 mean). However, there is considerable variation here. The most commonly reported lifespans were 10 years or more (19%), 5 years (17%) and 3 years (10%). An additional 9% of respondents reported that their last TV is still in use.

- **CTV devices are commonly used to extend the life of older TVs**

Popular media streaming devices such as Google TV and Apple TV are often used to equip ageing TVs with up-to-date smart capabilities, thus extending the lifespan of some TVs (see **Section 7**).

- **Business practices in consumer electronics are placing downward pressure on device lifespans**

The lifespan of TVs is likely to be further restricted by the tendency among TV manufacturers to provide software updates for only a limited number of years after purchase.

- **Short device lifespans have mixed policy implications**

The desire of consumers to upgrade their devices regularly helps to reduce the number of older, less capable devices, including non-DVB-T2-capable TVs, in circulation. Yet unnecessary upgrades may also have a negative environmental impact, due to resources required for device manufacturing and supply, and create e-waste during device disposal.

As TVs become software devices, their lifespan as commodities is changing. This Section considers how frequently users upgrade their TVs and the reasons why they do so.

The time between acquisition and disposal of a device is referred to as the device lifespan.

Until relatively recently, the TV was considered to be an investment in an asset (i.e., a consumer durable) that was expected to have a reasonably long useful life, subject to normal wear and tear and maintenance. TVs could be expected to last almost a decade or more – and were priced accordingly as long-term investment goods.

Over the last few decades, however, this situation has been changing for several reasons:

- Retail prices of TVs have fallen substantially due to declining production costs and increased competition among manufacturers and their suppliers. As a result, consumers are paying less for their TVs than previously, reducing the upfront investment required and increasing the frequency with which they can upgrade or turn over their devices;
- The emergence of internet-enabled smart TVs also means that TVs are now reliant on software prone to bugs, faults and obsolescence over time, meaning that consumers may wish to upgrade their TV to improve the user experience; and
- Upgrade cycles driven by marketing of new features such as picture and sound improvements and AI features create additional reasons for consumers to upgrade their TVs (i.e., advances in technology tend to shorten the useful lives of existing TVs).

Given these trends, it is important for policymakers to have information about TV lifespans, replacement and upgrading. These issues are relevant to a number of policy areas, including:

- environment (e.g., the ecological impact, including carbon emissions and e-waste, of TV manufacturing and supply, and the disposal of TVs not repurposed within the household);
- trade (e.g., the economic contribution of consumer electronics markets in Australia); and
- broadcast policy (e.g., changing capabilities and standards of installed device fleets in Australia due to replacement and upgrade cycles).

The role of CTV devices is also relevant here because CTV devices may in some cases be used to extend the life of a TV that is no longer performing as expected – for example, as a result of software bugs or app obsolescence.

8.1 Device lifespans vary considerably between users

A first step is to understand how frequently Australians replace their TVs. Here, previous research provides useful insights. For example, the *Television Consumer Survey* (DITRDCA 2022) included a question on the age of the respondent's main TV set. The survey found that the average age of the TV was 4.5 years:

- 27% of respondents indicated their set was less than 2 years old;
- 37% indicated it was between 2 and 5 years old;
- 27% indicated it was between 5 and 10 years old; and
- 9% indicated it was greater than 10 years old. It found that men and sports viewers were more likely to have a newer TV than women and non-sports viewers respectively.

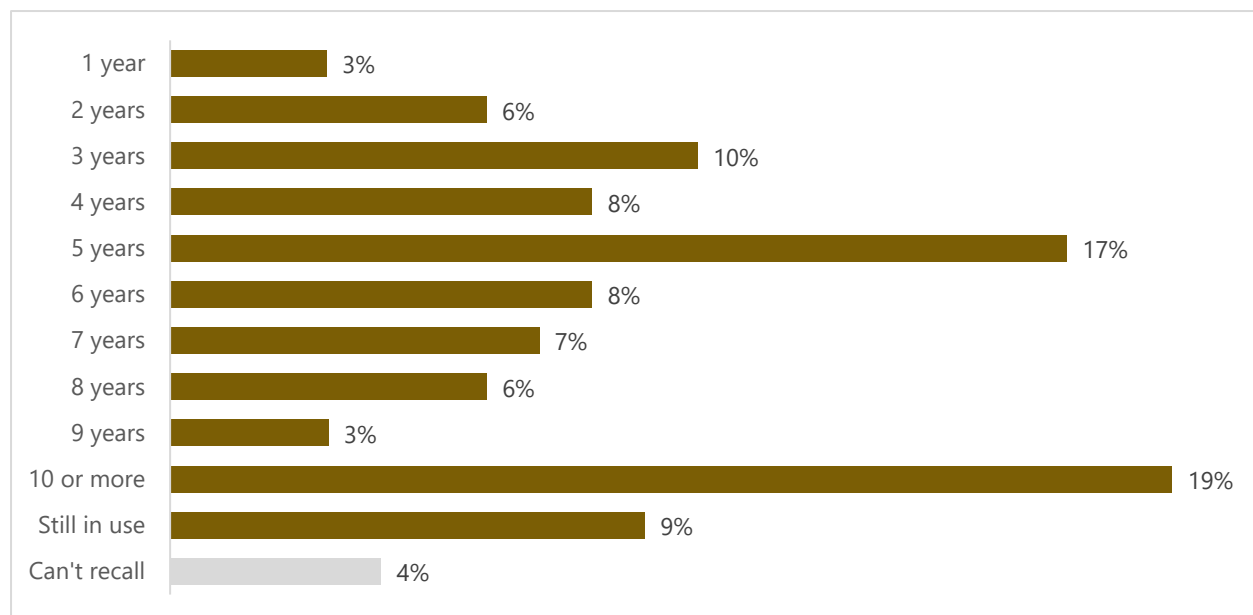
Researchers have also looked at device turnover of smart TVs specifically. A nationally representative survey of Australian smart TV users conducted in 2023 by RMIT found that almost half (48%) of respondents had purchased their device within the last 2 years and only a quarter (22%) of respondents had a smart TV older than 5 years (Lobato, Scarlata, and Schivinski 2023). Given the relative novelty of the smart TV as a household device, this higher proportion of newer devices is to be expected.

The RMIT study also looked into the drivers of upgrading smart TVs. It found that the average software lifespan of a smart TV (i.e., guaranteed delivery of software updates) is around 3.6 years, which may explain the relatively higher turnover rates of smart TVs compared to all TVs as described in the DITRDCA report.

Building on these existing studies, the consumer survey focused on consumers who had purchased a TV in the previous 12 months. While the lifespan of these TVs is not something the survey could directly address, the survey included a question about the respondent's *last* TV ("Thinking back to your last TV before this one, how long did you own it for?").

The results (**Figure 37**) suggest the majority of respondents owned their previous TV for around 6 years. Importantly, 19% of respondents had owned their previous TV for more than 10 years and 9% were still using their old TV.

Figure 37: Lifespan of respondents' last TV



Source: RMIT consumer survey (n=1441)

It is challenging to predict the lifespan of TVs sold in Australia as this depends on evolving norms among device suppliers, consumers, and retailers. However, factors likely to shape device lifespans include:

- changes in TV manufacturing practice, notably the reliance of smart TVs on software updates that are only provided for a limited number of years after purchase;
- changing consumer expectations about how devices should operate (e.g., responsiveness, speed, access to latest services and content); and
- marketing by retailers and manufacturers that encourages device upgrades due to new features and innovations.

These various factors may place downward pressure on device lifespans. Conversely, the use of CTV devices to bridge capability gaps in smart TVs (as discussed in **Section 7**) may have the opposite effect and *increase* lifespans of those smart TVs. For example, a Google TV or Apple TV streaming device can be added to the smart TV when the TV's operating system software is no longer supported, or when apps needed by the user are no longer being maintained for those TVs.

While the use of CTV devices for this purpose will help to mitigate the e-waste harms associated with TV disposal, it should be noted that CTV device production and distribution also has an environmental impact.

9. Conclusion

This report examined the capabilities, availability and consumption of TVs and CTV devices in Australia, using technical specifications analysis, availability analysis, and a nationally representative online consumer survey. Data collection took place in Q2-Q3 2024.

Overall, the research established that:

- over 900 TVs from 30 different manufacturers were supplied on the Australian market at the time of the study;
- the majority (63%) of these TVs supplied on the Australian market are DVB-T2-capable according to their technical specifications; and
- the vast majority (88%) of TVs acquired by Australian consumers in the 12 months to July 2024 are also DVB-T2-capable according to their technical specifications.

Users of these DVB-T2-capable TVs are therefore very likely to be able access DVB-T2 television broadcasts.

Potentially non-DVB-T2-capable TVs

However, 37% of the TV models supplied in Australia at the time of the study – and a smaller proportion (12%) of the TVs acquired in Australia in the 12 months to July 2024 – do not have DVB-T2 capability according to their published technical specifications.

These TVs are generally in the sub-\$1000 price bracket and are produced by lesser-known consumer electronics brands.

There is considerable uncertainty regarding these TVs' actual capabilities, which may be higher than what is stated in their technical specifications (see Section 1.6). As a result, the report does not take a view as to whether these TVs would be able to receive DVB-T2 broadcasts. The report's contribution is instead to note the existence of this potentially non-DVB-T2-capable segment of the market, which requires further investigation – including technical testing – to assess potential impacts on Australians' access to DVB-T2 broadcasts.

The consumer survey provided further context on the consumption of potentially non-DVB-T2-capable TVs. It found that low-income consumers are more than twice as likely to acquire a potentially non-DVB-T2-capable TV (21% of low-income respondents have a potentially non-DVB-T2-capable TV compared to 9% for other income groups). Additionally, consumers of potentially non-DVB-T2-capable TVs are also somewhat more likely to be nonmetropolitan (16% of nonmetropolitan respondents have a potentially non-DVB-T2-capable TV compared to 11% of metropolitan respondents), aged 65+ (16% of respondents aged 65+ have a potentially non-DVB-T2-capable TV compared to 10%-12% for other age groups), and to not have a university degree (16% of respondents without a university degree have a potentially non-DVB-T2-capable TV compared to 8% of respondents with a university degree).

As television broadcasters consider transitioning to DVB-T2 transmission, it is important that potential impacts on this cohort of Australians – who may already be disadvantaged in terms of media access – are carefully scoped.

CTV devices

The report also considered the role of CTV devices in providing television access. It found that the vast majority (86%) of CTV devices supplied on the Australian market – and a smaller proportion (72%) of the CTV devices acquired by Australian consumers in the 12 months to July 2024 – are not DVB-T2-capable. These CTV devices are mostly media streaming devices that do not contain a TV tuner.

However, a subset of CTV devices (including some set-top boxes, Fetch and Hubbl) do contain DVB-T2 tuners. These devices and others like them may therefore play a role in bridging any capability gaps. The report found that approximately 14% of the CTV devices supplied on the market contain a DVB-T2 tuner as do 28% of the CTV devices acquired by survey respondents in the 12 months to July 2024.

Availability

The report also considered the availability of both TVs and CTV devices across Australia, with reference to availability data sourced from retailers' websites (Section 3. Availability of TVs and CTV devices). Overall, consumers in the major cities were found to have access to the greatest range of TVs, with 34% of models available in-store, 44% from another store, 77% through home delivery, and 88% through an online-only retailer.

Availability declined outside the major cities, with consumers in remote and very remote areas of Australia having a much lower level of access (21% of TV models available in store, 12% from another store, 45% through home delivery, and 34% through an online-only retailer). In this respect, the availability of TVs follows the same geographic pattern as other bulky goods that are more costly and complex to distribute to regional and remote areas of Australia.

The availability of CTV devices was found to be much less geographically restricted due to the small size and weight of those devices, which means they can be delivered easily through Australia Post.

Remote First Nations communities experience constraints on device access. Section 6.3 considered the availability of TVs, CTV devices and VAST equipment in remote First Nations communities. It found that remote First Nations communities are not well served by the existing consumer electronics retail system and rely instead on community stores to supply TVs and CTV devices. TVs sold at these stores often cost significantly more than they would in metropolitan areas. The restricted supply, high equipment and internet data costs, and more frequent repair needs of TVs and CTV devices in remote First Nations communities mean that policy approaches must be designed in consultation with First Nation communities to ensure they are responsive to communities' needs.

In summary, this report has assessed some of the hardware challenges that may be associated with a potential transition to DVB-T2 broadcasting in Australia. The high purchase rate of DVB-T2-capable TVs and the widespread use of CTV devices provides government with flexible policy options. In particular, the high proportion of smart DVB-T2-capable TVs supplied on the Australian market enables the government to consider a wider range of options for potential broadcasting reform than would have otherwise been possible, since owners of those smart TVs will have the ability not only to receive DVB-T2 broadcasts, but also to access the content of those broadcasts via the internet. However, the report has also identified potential access gaps that will require careful attention in coming years to ensure the benefits of a potential transition to a DVB-T2 broadcasting standard are equitably distributed in Australia.

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Appendix A: Locations selected to assess the availability of TVs and CTV devices

As noted in **Section 1.2** and discussed further in **Section 3.1**, the methodology used to assess the availability of TVs and CTV devices across Australia, and capture the diversity of the markets for those products involved:

- selecting a sample of 32 retail stores operated by the major retail store chains that sell consumer electronic equipment in Australia (JB Hi-Fi, Good Guys, Harvey Norman) and major “online-only” retailers (Kogan and Appliances Online), as well as 27 stores operated by smaller independent retailers (Bing Lee, Retravisson, Betta and VideoPro); and
- obtaining information from their websites on the availability of each of the TVs and CTV devices they advertise to consumers located in regions of varying degrees of remoteness as set out in the Australian Statistical Geography Standard (ASGS):
 - capital cities and other major cities;
 - inner regional areas;
 - outer regional areas; and
 - remote/very remote regional areas;

The sample of retail stores included in the analysis of availability is described in the table below:

Category	ASGS Remoteness classification	Locations captured in sample	Stores captured in each postcode
Capital cities incl. greater metropolitan area	Major cities	Greater Sydney, NSW Greater Melbourne, VIC Greater Brisbane, QLD Greater Perth, WA Greater Adelaide, SA Canberra, ACT Greater Hobart, TAS Greater Darwin, NT	1 JB Hi-Fi 1 Harvey Norman 1 Good Guys 1 independent Appliances Online Kogan
Other major cities	Major cities	Geelong, VIC Lake Macquarie, NSW Townsville, QLD Newcastle, NSW	1 JB Hi-Fi 1 Harvey Norman 1 Good Guys 1 independent Appliances Online Kogan
Inner regional	Inner regional Australia	Ballarat, VIC Bunbury, WA Singleton, NSW Devonport, TAS	Where available: 1 JB Hi-Fi 1 Harvey Norman 1 Good Guys 1 independent Appliances Online Kogan

Outer regional	Outer regional Australia	Mandurah, WA Philip Island, VIC Burnie, TAS Griffith, NSW Thuringowa, QLD Naracoorte, SA Palmerston, NT	Where available: 1 JB Hi-Fi 1 Harvey Norman 1 Good Guys 1 independent Appliances Online Kogan
Remote	Remote Australia + Very remote Australia	Bourke, NSW Wentworth, NSW Emerald, QLD Mount Isa, QLD Orbost, VIC Mildura, VIC Geraldton, WA Broome, WA Kalgoorlie, WA Katherine, NT Tenant Creek, NT Ceduna, SA Roxby Downs, SA Flinders, TAS King Island, TAS	Any stores operating in postcode

A subsample of these retailers were then called in both metropolitan and regional areas to:

- verify the online availability data for a selection of TVs and CTV devices they advertise; and
- obtain further information from retailers, particularly those in the more remote regions of Australia, on the key factors that influence the availability of the TV and CTV models they advertise.

The results of that telephone audit confirmed the accuracy of the information that retailers provide on their websites regarding the availability of the TVs and CTV devices they advertise for sale.

Appendix B: List of popular CTV devices

MEDIA STREAMING DEVICES

Apple	Apple TV 4K WiFi 64G
Apple	Apple TV 4K Wi-Fi + Ethernet 128GB
Google	Chromecast with Google TV (HD)
Google	Chromecast with Google TV (4K)
Amazon	Amazon Fire TV Stick Lite - 1st Gen
Amazon	Amazon Fire TV Stick 4K - 2nd Gen
Amazon	Amazon Fire TV Stick 4K Max - 2nd Gen
Amazon	Amazon Fire TV Cube - 3rd Gen

GAMING/MEDIA STREAMING DEVICES

Microsoft	Xbox Series S 512GB
Microsoft	Xbox Series S 1TB
Microsoft	Xbox Series X
Sony	PlayStation PS4 500GB
Sony	PlayStation PS5 Slim Digital
Sony	PlayStation PS5 Slim
Nvidia	Nvidia Shield TV
Nvidia	Nvidia Shield TV PRO
Nintendo	Nintendo Switch - OLED model
Nintendo	Nintendo Switch Console
Nintendo	Nintendo Switch Lite

SET-TOP BOX/MEDIA STREAMING DEVICES

Foxtel	iQ4
Foxtel	iQ5
Foxtel	Hubbl 4K Streaming Box
Telstra	Fetch TV Mini
Telstra	Fetch TV Mini 4K
Telstra	Fetch TV Mighty

VAST SATELLITE DECODERS

Altech	Altech DSD 5000
SatKing	SatKing 980

Appendix C: Consumer survey instrument

Note: response options randomised except where ordering logic applies; questions are single-answer multiple choice questions unless indicated

1. What year were you born?

Dropdown selection: 1904-2007

2. Please select your gender identity.

Female

Male

Non-binary or gender diverse

Gender identity is not listed here

3. Have you bought or acquired any of the following items in the last 12 months?

Note: Please proceed only if you helped to choose the product or know the product well enough to answer questions about it.

Please select all that apply.

Smart doorbell

Air fryer

Smartphone

TV

Toaster

Laptop

TV streaming device or set-top box

Jetski

Motorbike

None of the above

[IF all selected, END SURVEY. IF TV OR TV streaming device or set-top box is NOT selected END SURVEY]

↓ **DISPLAYED FOR THOSE WHO SELECTED TV FOR Q3** ↓

4. How many working TVs do you have at home?

Hover definition (TV): A large-screen device (excluding monitors, laptops, and phones) used for watching programs through broadcasting stations and/or built-in apps

Free text (number)

↓ **DISPLAYED FOR THOSE WHO SELECTED TV STREAMING DEVICE OR SET-TOP BOX FOR Q3** ↓

5. How many working streaming devices or set-top boxes do you have at home?

Hover definition (streaming devices or set-top boxes): e.g. Apple TV, Google TV, Google Chromecast, set-top box, VAST TV box, Foxtel iQ4, Foxtel iQ5, Foxtel Now

Free text (number)

↓ **DISPLAYED FOR ALL PARTICIPANTS** ↓

6. What is your current residential post code?

Free text (number)

↓ **DISPLAYED FOR THOSE WHO SELECTED TV AND TV STREAMING DEVICE OR SET-TOP BOX
FOR Q3** ↓

7. You told us that in the last 12 months you acquired a TV and a streaming device. We will first ask you some questions about your TV, followed by some questions about your streaming device.

↓ **DISPLAYED FOR THOSE WHO SELECTED TV FOR Q3** ↓

8. The following questions refer to the TV that you most recently purchased or acquired. Please select the statement that best describes you. 'In the last 12 months I...'

Hover definition (TV): A large-screen device (excluding monitors, laptops, and phones) used for watching programs through broadcasting stations and/or built-in apps

Bought a new TV

Bought a second-hand or refurbished TV

Received a new TV as a gift

Received a second-hand or refurbished TV as a gift

Hired a TV from an electronics rental service other (please specify)

9. Please select the brand of your TV.

Akai

Bauhn

Blaupunkt

Chiq

EKO

FFalcon

Hisense

Hitachi

JVC

Kogan

LG

Linsar

Loewe

Metz

Monster

NCE

Philips

Polaroid

Samsung

Sharp

Sony

TCL

Toshiba

Other (please specify)

I don't know / I'm not sure

10. Please enter your TV model number (if known).

Hover instruction (finding model number): The model number can be found on the back of the TV (if easily accessible) or in the user manual. Alternatively, you can use the remote control to access the Settings menu of your TV and find the model number there.

Free text entry

11. Please select your TV's screen size.

32 inches or below

33-40 inches

41-50 inches

51-60 inches

61-70 inches

71-80 inches

81 inches or higher

Other (please specify)

I don't know / I'm not sure

12. Please select your TV's resolution.

Hover definition (resolution): The clarity and sharpness of the video/image displayed on screen

Standard definition (SD)

1080p (HD)

4K (UHD)

8K or above

Other (please specify)

I don't know / I'm not sure

13. Please select your TV's screen type.

QLED

LCD

LED

Mini-LED

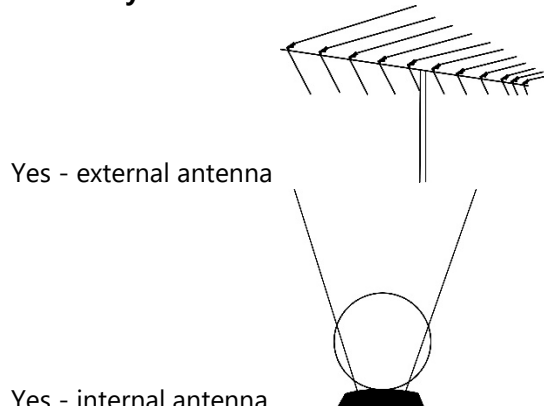
OLED

QD Mini-LED

Other (please specify)

I don't know / I'm not sure

14. Does your home have a free-to-air TV aerial / antenna?



Yes - external antenna

Yes - internal antenna

Yes - both internal and external antenna

No I don't know / unsure

15. Can your TV connect to... - The internet

Yes

No

I don't know / I'm not sure

16. Can your TV connect to... - A device via Bluetooth

Yes

No

I don't know / I'm not sure

17. Is your TV currently connected to... - The internet

Yes

No

I don't know / I'm not sure

18. Is your TV currently connected to... - A free-to-air TV aerial / antenna

Yes

No

I don't know / I'm not sure

19. [DISPLAY IF NO] What is the reason your TV is not connected to a free-to-air aerial / antenna? Please explain in your own words

Free text entry

20. Is your TV currently connected to... - A device via Bluetooth

Yes

No

I don't know / I'm not sure

21. What devices, if any, are connected to your TV?

Please select all that apply

Sound bar / speaker

Gaming console

Fetch box

Foxtel box

Hubbl

DVD player

Blu-Ray player

Google Chromecast

Google TV

Apple TV

Amazon Fire TV

VAST box *Hover definition (VAST box): Viewer Access Satellite Television*

Personal video recorder (PVR) or digital video recorder (DVR)

Other set-top box (please specify)

Other streaming device (please specify)

No devices are connected to my TV

[If gaming console selected] **22. Which gaming console do you have?**

Xbox

Playstation

Nintendo

Other gaming console (please specify)

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A NEW TV OR BOUGHT A SECOND HAND TV** ↓

23. How much did your TV cost (in \$AUD)?

Free text entry (number)

24. Please select which statement best describes your TV purchase.

I paid full price for the TV

I received a discount / TV was on sale

I don't know / I'm not sure

↓ **DISPLAYED FOR THOSE WHO SELECTED HIRED A TV** ↓

25. How much do you pay per month to hire the TV (in \$AUD)?

Free text entry

↓ **DISPLAYED FOR THOSE WHO SELECTED RECIEVED A NEW OR SECOND HAND TV AS A GIFT** ↓

26. Do you know the price paid for the TV gifted to you?

Yes (please enter price in \$AUD)

I don't know / I'm not sure

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A NEW TV** ↓

27. Where did you buy your TV?

Harvey Norman

Good Guys

JB Hifi

Officeworks

Appliances Online

Kogan

Amazon

Joyce Mayne

Bing Lee

Domayne

Retravisision

Big W

Other retailer not listed here (please specify)

I don't know / I'm not sure

28. Did you buy the TV in-store or online?

In-store

In-store - home delivery

Online - click and collect

Online - home delivery

Was your selected TV available / in stock when you made your purchase?

Yes - it was in stock
 No - I had to wait
 I don't know / can't recall

29. Did this impact your purchase decision?

Yes - this was important to me
 No - this did not factor into my decision
 I don't know / can't recall

30. [DISPLAY IF No - I had to wait] How long did your TV take to arrive?

A few days
 Within a week
 1-2 weeks
 3-4 weeks
 More than 4 weeks

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT SECOND HAND OR REFURBISHED TV** ↓

31. Where did you buy the TV?

Ebay
 Facebook Marketplace
 Direct from previous owner
 Trading Post
 A local store
 Gray's
 Other (please specify)
 I don't know / can't recall
 Where did you buy the TV? – Other

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A NEW OR SECOND HAND TV** ↓

32. What was the reason(s) you bought a new TV?

To upgrade or keep up with new technology
 My previous TV broke or malfunctioned
 I saw a good deal
 To add more TVs to the household
 Buying my first TV
 I couldn't get all the channels on my old TV
 I couldn't get all the streaming apps on my old TV
 Accessibility features *Hover definition: Accessibility features are designed to make the TV easier to use, including for people living with disabilities. Examples of accessibility features include captions, audio description, text-to-speech, voice-over, zoom, and gesture interaction*
 What was the reason(s) you bought a new TV? – Other (free text entry)

33. When buying a new TV, which of the following features are important to you?

Please order your top 3 features from 1 to 3 (where 1 is the most important, 2 is the next most important, and 3 is your third most important).
 Smart / internet-enabled
 Price

Resolution and picture quality *Hover definition (resolution): The clarity and sharpness of the video/image displayed on screen*

Screen size

Easy to use

Provides access to free-to-air television through an antenna/satellite

Audio or sound quality

Has the latest streaming apps

Refresh rate (hertz rate)

Type of lighting (back-lit or edge-lit)

34. Which of the following did you consult when buying your TV?

Please select all that apply

Word of mouth/personal recommendations

Looked at TVs in store

Tried out TVs in store using remote control

Spoke to retail staff in store / online

Retailer website

Manufacturer website

Reviews (please specify which website/publication)

Other

None of the above

35. Please select the statement(s) that best describe your situation.

Please select one answer only.

When buying the TV, I had a particular TV model in mind

When buying the TV, I had a particular brand in mind

When buying the TV, I had a particular screen size in mind

When buying the TV, I had a particular feature in mind

None of the above

36. Did you end up buying the TV you initially had in mind?

Yes - I bought the TV I initially had in mind

No - I bought a different TV

37. [DISPLAY IF NO – I bought a different TV] Why did you end up buying a different TV?

Please select all that apply

The retailer showed me a better option

The TV I wanted was out of stock / not available in store

I found a different TV at a better price

I don't know / can't recall

↓ **DISPLAYED FOR ALL PARTICIPANTS WHO SELECTED TV FOR Q3** ↓

38. How satisfied are you with the following aspects of the TV?

Please select one answer only in each row [Options are: Very dissatisfied, dissatisfied, Satisfied, Very Satisfied, Don't know/unsure]

Ease of use

Accessibility features [*hover definition as above*]

Remote control

Access to streaming apps [*hover definition: Applications like Netflix or Stan where video can be streamed*]

Access to free-to-air channels
 Picture quality
 Sound quality
 Connectivity – ports
 Connectivity - wifi, bluetooth, phone
 Energy efficiency

39. Does your TV offer all the apps and channels you need? Please explain in your own words.

Free text entry

40. Thinking back to your last TV before this one, how long did you own it for?

1 year
 2 years
 3 years
 4 years
 5 years
 6 years
 7 years
 8 years
 9 years
 10 years or more
 TV is still in use

↓ **DISPLAYED FOR THOSE WHO SELECTED TV STREAMING DEVICE OR SET-TOP BOX FOR Q3** ↓

41. The following questions refer to the streaming device or set-top box you most recently bought or acquired. Please select the statement that best describes you. 'In the last 12 months I...' Hover definition (streaming devices or set-top boxes): e.g. Apple TV, Google TV, Google Chromecast, set-top box, VAST TV box, Foxtel iQ4, Foxtel iQ5, Foxtel Now

Bought a new device
 Bought a second-hand or refurbished device
 Received a new device as a gift
 Received a second-hand or refurbished device as a gift
 Hired a device from an electronics rental service
 Other (please specify)

42. Please select your device from the list below.

Amazon Fire TV
 Google TV
 Hubbl
 Google Chromecast
 Apple TV
 Fetch
 Personal video recorder (PVR) or digital video recorder (DVR)
 BluRay player
 Xbox
 PlayStation
 Nintendo Switch
 VAST box
 Other gaming device (please specify)
 Other streaming device or set-top box (please specify)

43. What is your device connected to?

TV
 Computer monitor
 Projector
 Other screen
 Device not currently connected

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A NEW OR SECOND HAND STREAMING DEVICE OR SET-TOP BOX** ↓

44. How much did you pay for the device (in \$AUD)?

Free text entry (number)

45. Was the device discounted or on sale when you purchased it?

I paid full price
 I received a discount / device was on sale
 I don't know / can't recall

↓ **DISPLAYED FOR THOSE WHO SELECTED HIRED STREAMING DEVICE OR SET-TOP BOX** ↓

46. What is the price per month for the hired device (in \$AUD)?

Free text entry

↓ **DISPLAYED FOR THOSE WHO SELECTED RECEIVED A NEW OR SECOND HAND STREAMING DEVICE OR SET-TOP BOX AS A GIFT** ↓

47. Do you know the price paid for the device gifted to you?

Yes (please enter price in \$AUD)
 I don't know / I'm not sure

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A NEW STREAMING DEVICE OR SET-TOP BOX** ↓

48. Where did you buy the device?

Harvey Norman
 Good Guys
 JB Hifi
 Officeworks
 Appliances Online
 Domayne
 Joyce Mayne
 Kogan
 Amazon
 Other retailer not listed here (please specify)
 Second-hand or refurbished
 I don't know / I can't recall
 Other retailer not listed here

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A SECOND HAND STREAMING DEVICE OR SET-TOP BOX** ↓

49. Where did you buy the device?

Ebay
 Facebook Marketplace
 Direct from previous owner
 Trading post
 A local store
 Gray's
 Other (please specify)

↓ **DISPLAYED FOR THOSE WHO SELECTED BOUGHT A NEW OR SECOND HAND STREAMING DEVICE OR SET-TOP BOX** ↓

50. Did you buy the device in-store or online?

In-store
 In-store - home delivery
 Online - click and collect
 Online - home delivery
 I don't know / can't recall

51. Which of the following did you consult when buying your device?

Please select all that apply

Looked at devices in store
 Tested device in store *Hover definition (Tested device in store): Interacted with the TV using the remote*
 Spoke to retail staff in store / online chat
 Retailer website
 Manufacturer website
 Reviews (please specify where)
 Word of mouth/personal recommendations
 Other (please specify)
 None of the above

52. When buying the device, which of the following were most important to you?

Please order your top 3 features from 1 to 3 (where 1 is the most important, 2 is the next most important, and 3 is your third most important).

Price
 Resolution and picture quality *Hover definition (resolution): The clarity and sharpness of the video/image displayed on screen*
 Easy to use
 Has the latest streaming apps
 Other (please specify)

53. When you were looking for your new device, did you have a particular one in mind?

Please select one answer only.

When buying the device, I had a particular model in mind
 When buying the device, I had a particular brand in mind
 None of the above

54. Did you end up buying the device you initially had in mind?

Yes - I bought the device I had in mind

No - I bought a different device

55. [DISPLAY IF NO – I BOUGHT A DIFFERENT DEVICE] Why did you end up buying a different streaming device?

The retailer showed me a better option

The device I wanted was out of stock / not available in store

I found a different device at a better price

Another reason (please specify)

I don't know / can't recall

56. What was the reason(s) you bought a new streaming device?

Please select all that apply.

To upgrade or keep up with new technology

Accessibility features *Hover definition: Accessibility features are designed to make the TV easier to use, including for people living with disabilities. Examples of accessibility features include captions, audio description, text-to-speech, voice-over, zoom, and gesture interaction*

My previous streaming device broke/malfunctioned

I saw a good deal

Access to streaming apps *Hover definition (access to streaming apps): Applications (like Netflix or Stan) where video content can be streamed*

Other (please specify)

↓ **DISPLAYED FOR ALL PARTICIPANTS WHO SELECTED TV STREAMING DEVICE FOR Q3** ↓

57. How satisfied are you with the following aspects of your streaming device?

[options: Very dissatisfied, Dissatisfied, Satisfied, Very Satisfied, I don't know/unsure]

Accessibility features *Hover definition: Accessibility features are designed to make the TV easier to use, including for people living with disabilities. Examples of accessibility features include captions, audio description, text-to-speech, voice-over, zoom, and gesture interaction*

Remote control

Access to streaming apps *Hover definition (access to streaming apps): Applications (like Netflix or Stan) where video content can be streamed*

58. We will now ask you some questions about the TV your streaming device is connected to. Please select your TVs brand.

Akai

Bauhn

Blaupunkt

Chiq

EKO

FFalcon

Hisense

Hitachi

JVC

Kogan

LG

Linsar

Loewe

Metz
Monster
NCE
Philips
Polaroid
Samsung
Sharp
Sony
TCL
Toshiba
Don't know / unsure
Other (please specify)
My streaming device is not connected to a TV

59. Approximately how old is the TV?

1 year old
2 years old
3 years old
4 years old
5 years old
6 years old
7 years old
8 years old
9 years old
10 years old
11 years old
Don't know / unsure

56. Please select your TV's screen size.

32 inches or below
33-40 inches
41-50 inches
51-60 inches
61-70 inches
71-80 inches
80 inches or higher
Other (please specify)
I don't know / I'm not sure

57. Please select your TV's resolution. *Hover definition (resolution): The clarity and sharpness of the video/image displayed on screen*

Standard definition (SD)
1080p (HD)
4K (UHD)
8K or above
Other
I don't know / I'm not sure

58. Please select your TV's screen type.

LED
Mini-LED
OLED

QD Mini-LED
 Plasma
 CRT
 Other (please specify)

59. Can your TV connect to the internet (e.g. for streaming)?

Yes
 No
 I don't know / I'm not sure

60. How satisfied are you with the following aspects of the TV?

[options: Very dissatisfied, Dissatisfied, Satisfied, Very Satisfied, I don't know/unsure]

Ease of use

Accessibility features Hover definition: Accessibility features are designed to make the TV easier to use, including for people living with disabilities. Examples of accessibility features include captions, audio description, text-to-speech, voice-over, zoom, and gesture interaction

Remote control

Access to streaming apps

Access to free-to-air channels

Picture quality

Sound quality

Connectivity – ports

Connectivity - wifi, bluetooth, phone

Energy efficiency

61. Do you find your TV sufficiently accessible for your needs? Please explain in your own words.

Free text entry

↓↓↓ **QUESTIONS DISPLAYED FOR ALL PARTICIPANTS (TV AND CTV)** ↓↓↓

62. How often do you use your TV to do the following?

[options: Never, Rarely, Sometimes, Often, Very Often]

Watch live free-to-air TV channels (e.g., ABC, SBS, 7, 9, 10)

Watch live free-to-air TV multichannels (e.g., 7mate, 10Bold, 9Gem, ABCNews, SBS Viceland)

Use broadcast video-on-demand apps (e.g., ABC iview, SBS On Demand, 9Now, 7Plus, 10Play)

Watch free video streaming services (e.g. YouTube, Twitch, Tubi)

Use online subscription services (e.g. Netflix, Binge, YouTube Premium)

Play games on the TV

Use the TV to watch content from your laptop, phone, or other device

Watch DVDs, Blu-Rays, or other physical media

Display photos, art, or relaxation scenes

Listen to music or radio

Use your TV for video calls (e.g., Zoom, Skype)

63. Does your household have fixed home internet?

Yes - NBN

Yes - 5G fixed wireless broadband *Hover definition (5G...): Internet connection delivered without wires/cables*

Yes - ADSL *Hover definition (ADSL): Internet delivered through telephone lines*

Yes - cable

Yes - other (please specify)
 No - I do not have fixed home internet
 I don't know / I'm not sure

64. How satisfied are you with the quality of your home internet connection?

Very unsatisfied
 Dissatisfied
 Satisfied
 Very satisfied
 Don't know / unsure

65. Please select the statement that best describes you.

I do not feel confident using technology
 I feel somewhat confident using technology
 I feel very confident using technology

66. What type of dwelling do you live in?

House Townhouse / unit
 Low-rise apartment *Hover definition (Low-rise apartment): An apartment building with 1-3 storeys*
 High-rise apartment *Hover definition (High-rise apartment): An apartment building with more than 9 storeys*
 Other (please specify)

67. Please select the statement that best describes your housing situation.

Property owner without a mortgage
 Property owner with a mortgage
 Renter - state or territory housing authority
 Renter - private landlord
 Other (please specify)
 Prefer not to say

68. How many people live in your household (including yourself)?

I live alone
 2
 3
 4
 5
 6
 7
 8
 9
 10 or more

69. Which statement best describes your household?

Couple living alone
 Couple with non-dependent child or children
 Couple with dependent child or children
 Couple with dependent and non-dependent child or children
 Single parent with non-dependent child or children
 Single parent with dependent child or children
 Single parent with dependent and non-dependent child or children
 Related adults sharing house / apartment / flat

Non-related adults sharing house / apartment / flat
Other (please specify)

70. What is the level of the highest qualification you have completed?

Postgraduate degree level (including masters, doctoral or other postgraduate degree)
Graduate diploma and/or graduate certificate level 3
Bachelor degree level Advanced diploma and/or diploma level
Certificate III and/or IV level Year 12 level Year 11 or below
Certificate I and/or II level Year 9 and below
Other (please specify)
I don't know / I'm not sure
Prefer not to say

71. Before tax or other deductions, what is the total annual household income from all sources for you and your family or others living with you? Please include any pensions and allowances, and income from interest or dividends...

Nil Less than \$7,800 per year (\$1 - \$149 per week)
\$7,800 to \$15,599 per year (\$150 - \$299 per week)
\$15,600 to \$20,799 per year (\$300 - \$399 per week)
\$20,800 to \$25,999 per year (\$400 - \$499 per week)
\$26,000 - \$33,799 per year (\$500 - \$649 per week)
\$33,800 to \$41,599 per year (\$650 - \$799 per week)
\$41,600 to \$51,999 per year (\$800 - \$999 per week)
\$52,000 to \$64,999 per year (\$1,000 - \$1,249 per week)
\$65,000 to \$77,999 per year (\$1,250 - \$1,499 per week)
\$78,000 to \$90,999 per year (\$1,500 - \$1,749 per week)
\$91,000 to \$103,999 per year (\$1,750 - \$1,999 per week)
\$104,000 to \$155,999 per year (\$2,000 - \$2,999 per week)
\$156,000 or more per year (\$3,000 or more per week)
I don't know / I'm not sure
Prefer not to say

72. Do you speak a language other than English at home?

Yes
No
Prefer not to say

[DISPLAY IF YES] **73. What is the main other language you speak at home?**

Mandarin
Arabic
Cantonese
Vietnamese
Italian
Greek
Other (please specify)
Prefer not to say

About Sapere

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For more information, please contact:

John Wallace

Email: jwallace@thinkSapere.com

Wellington	Auckland	Sydney	Melbourne	Canberra	Perth
Level 9 1 Willeston Street PO Box 587 Wellington 6140 P +64 4 915 7590	Level 8 203 Queen Street PO Box 2475 Shortland Street Auckland 1140 P +64 9 909 5810	Level 18 135 King Street Sydney NSW 2000 P +61 2 9234 0200	Level 5 171 Collins Street Melbourne VIC 3000 P +61 3 9005 1454	GPO Box 252 Canberra City ACT 2601 P +61 2 6100 6363	PO Box 1210 Booragoon WA 6954 P+61 8 6186 1410

www.thinkSapere.com

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