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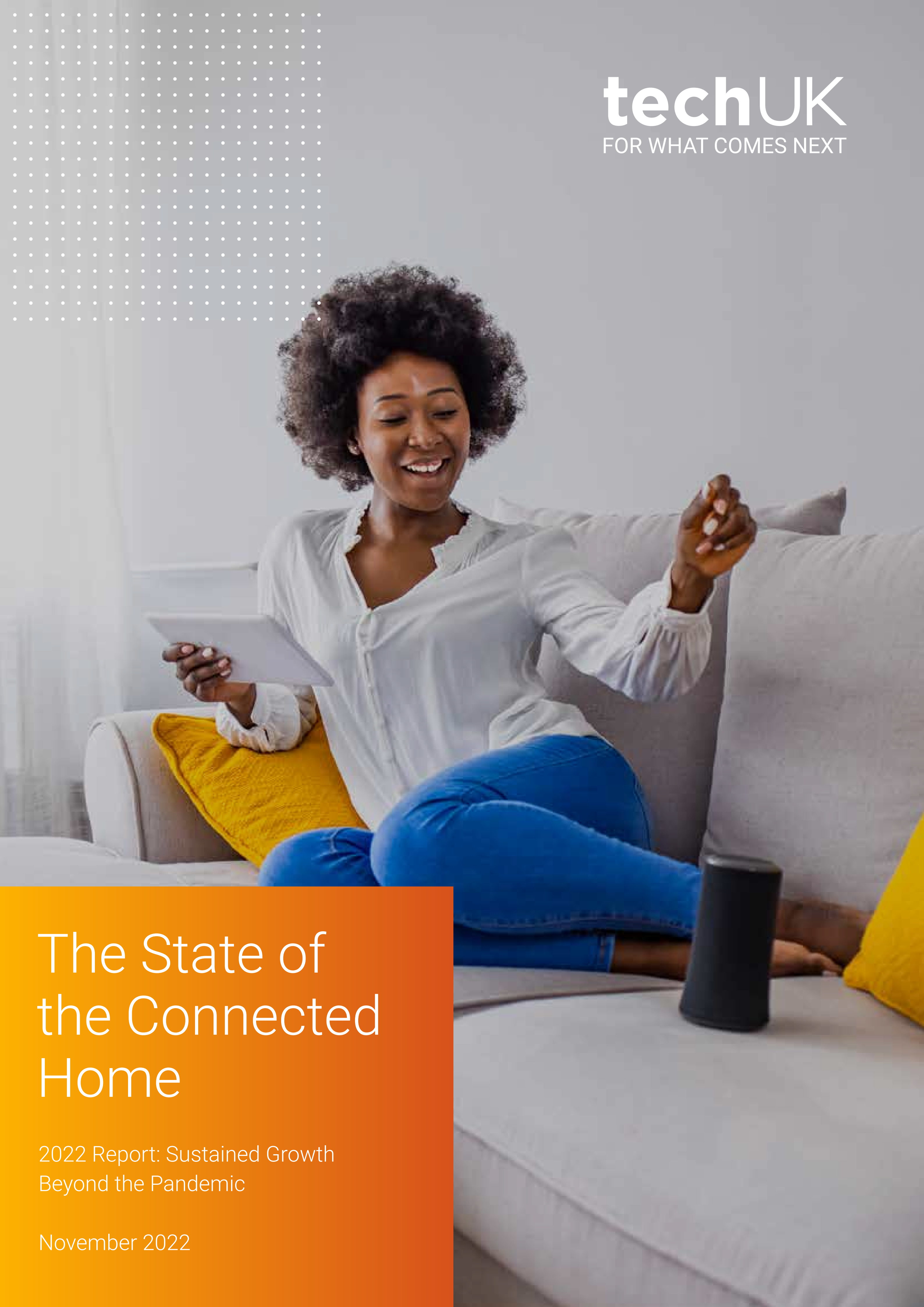

The State of the Connected Home

2022 Report: Sustained Growth Beyond the Pandemic

November 2022

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1.Overview

This is the sixth edition of our annual State of the Connected Home report, which surveys a nationally representative sample of 1,000 adults across the UK to ask about their awareness, interest, and ownership of a range of connected or 'smart' home products. The results of the survey are interpreted alongside GfK Market Intelligence point-of-sale data derived directly from consumer-facing retailers in order to provide an overview of the current state of the market. This year's report contains sales data from April 2021 to March 2022 and consumer attitudes drawn from fieldwork conducted in April 2022. We thank GfK for their ongoing collaboration on this project.

Whereas our 2021 edition highlighted how the Covid-19 pandemic instigated a rapid increase in adoption of connected home devices, this year's report finds the market to be stabilising yet nevertheless still growing in value. While the rapid growth levels of the preceding year are understood to have been driven by the unique circumstances of the pandemic and subsequent lockdowns, continued strong sales figures and steady increases in levels of consumer awareness around connected homes suggest that the market can continue to generate new demand beyond the pandemic.

What particularly stands out to us this year is the product diversification of the market – whereas some established connected home categories are showing signs of maturity, we are seeing higher levels of growth in new product areas. As awareness around connected homes increases, consumers have greater interest and confidence in purchasing devices beyond the entertainment domain that serve a much wider range of functions such as home security and energy management.

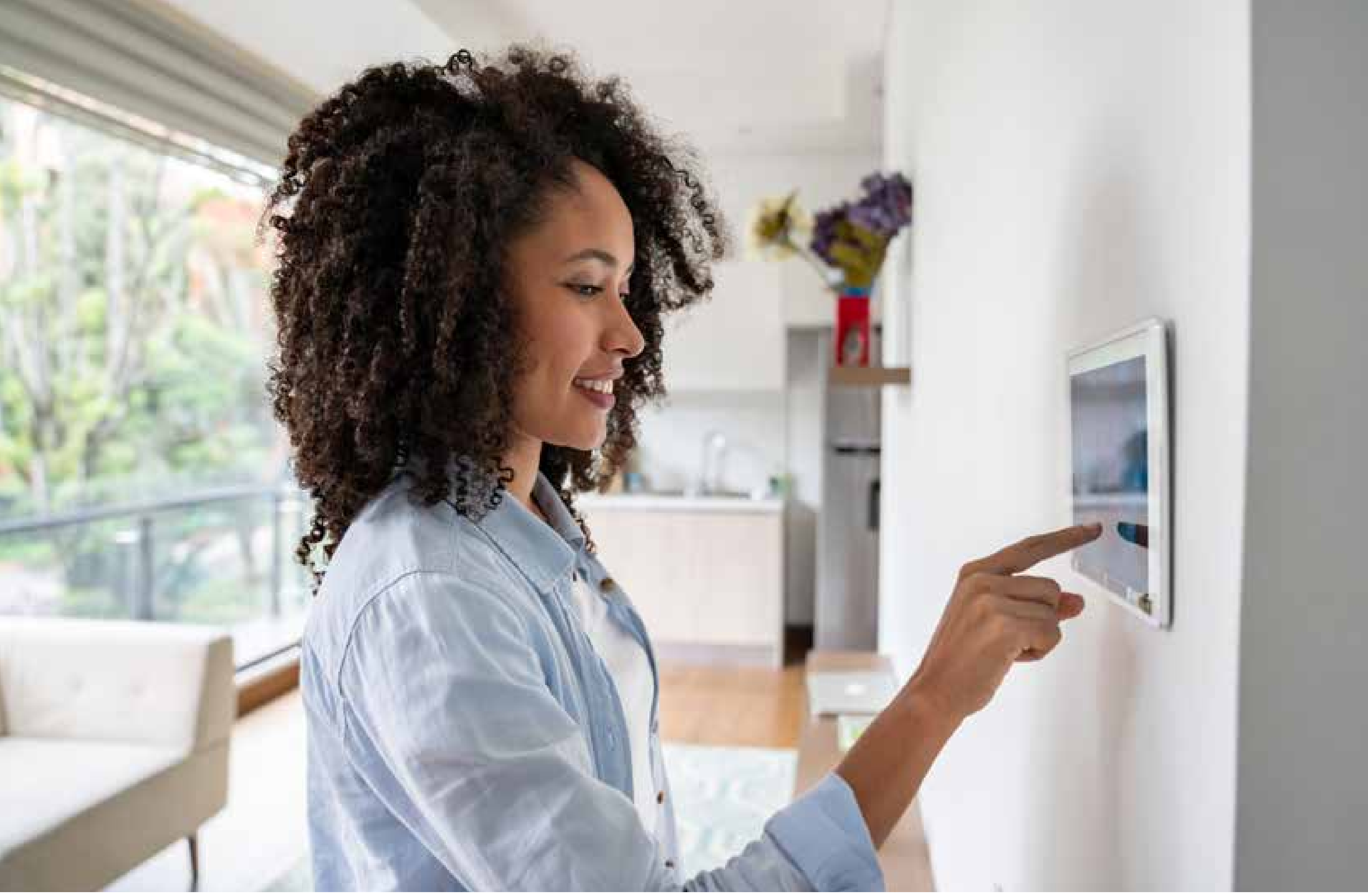
This report is a flagship project of techUK's <u>**Connected Home Group**</u>, the community of techUK members interested in accelerating the adoption of connected home technologies. In addition to raising awareness around the multiple benefits and use cases of connected home tech, the Group also engages with policymakers to develop a regulatory environment that increases consumer trust and supports national policy objectives while providing space for innovation and differentiation.

2. The Connected Home Market in 2022

Our report covers five major product categories for connected home technologies: smart domestic appliances, entertainment devices, energy and lighting systems, health monitors, and home security apparatus.

Survey coverage: product list for 2022

Smart Domestic Appliances	• Smart kettle/smart coffee maker • Smart refrigerator • Smart washing machine • Smart oven/hobs
Smart Entertainment	• Smart speakers (e.g. Google Home/Amazon Echo) • Smart TV
Smart Energy & Lighting	• Smart thermostat • Smart plugs • Energy management service/app • Smart lighting (smart lamps)
Smart Health Monitors	• Smart monitor for specific health conditions • Smart fitness & activity tracker • Smart connected scales • Smart connected toothbrush
Smart Security & Control	• Smart/connected alarm system • Motion camera sensors for external doors/windows • Internal cameras for baby, pets or security • Smart access control (digital keys) • Smart doorbell • Smart detectors (for smoke and gas leak)

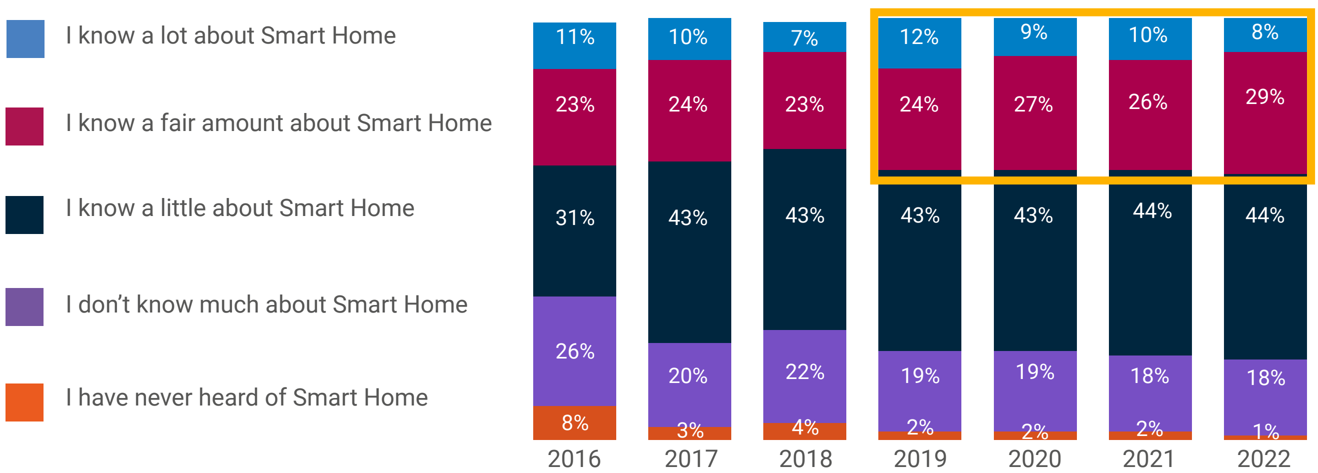


2.1 Consumer awareness of connected home technology

‘Connected home’ or ‘smart home’ technology is now an established market in the United Kingdom – over the past few years we have seen consistently that around 4 out of 5 people state that they have some level of knowledge around smart homes. In 2022 the exact figure sits at 81%, which is one percent higher than 2021 and a further percentage point higher than 2020. We have come a long way from 2016 when only 66% of adults in the UK had any knowledge of smart homes.

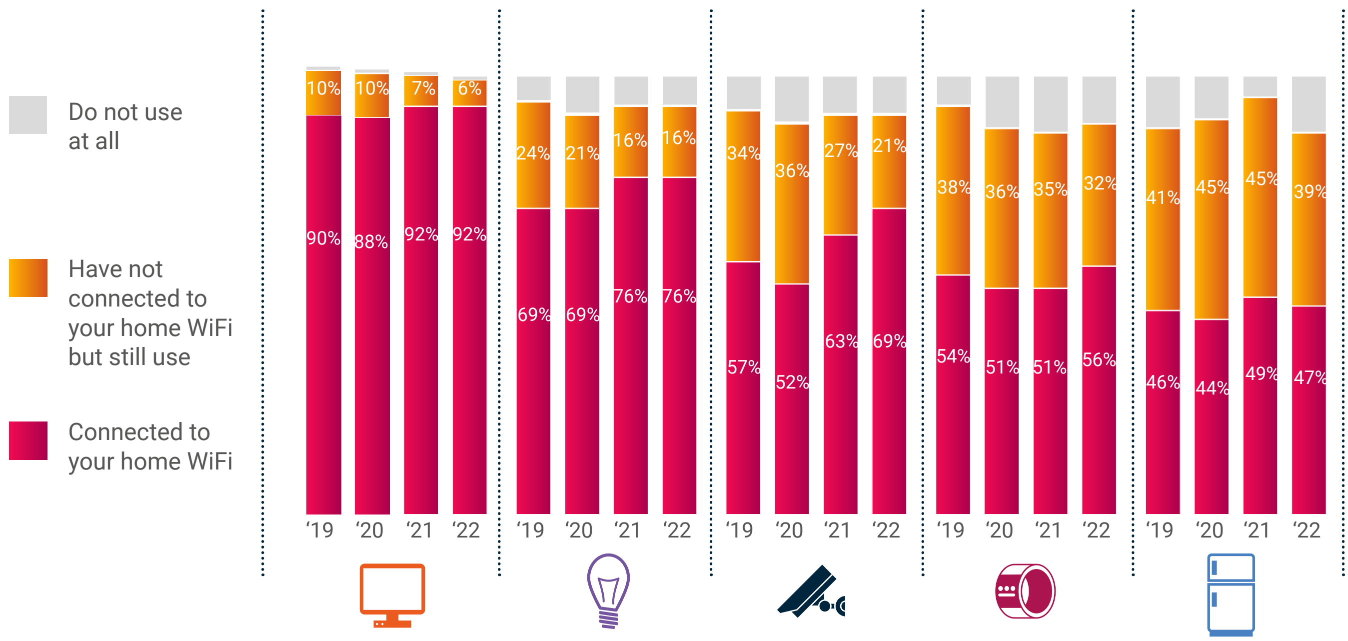
Another positive sign for the market is the percentage of people claiming to have high or very high levels of knowledge around connected home technology, as these are the people who are most likely to drive adoption of new product categories and functions. This figure now stands at 37% which, again, is slightly higher than previous years.

More than a third of consumers feel they know a lot/a fair amount about the smart home technology - consistent from 2019 onwards



Relatedly, across all connected product categories we see an increase in the percentage of users who report that they have connected their devices to their home WiFi. This reflects increasing consumer understanding of what connected technologies do and how to use them – we are seeing fewer people who own connectable devices but haven't connected them, particularly for health-related wearables and security devices.

This year has seen a further increase in smart products being connected to WiFi, most notably for health/wearables and security.



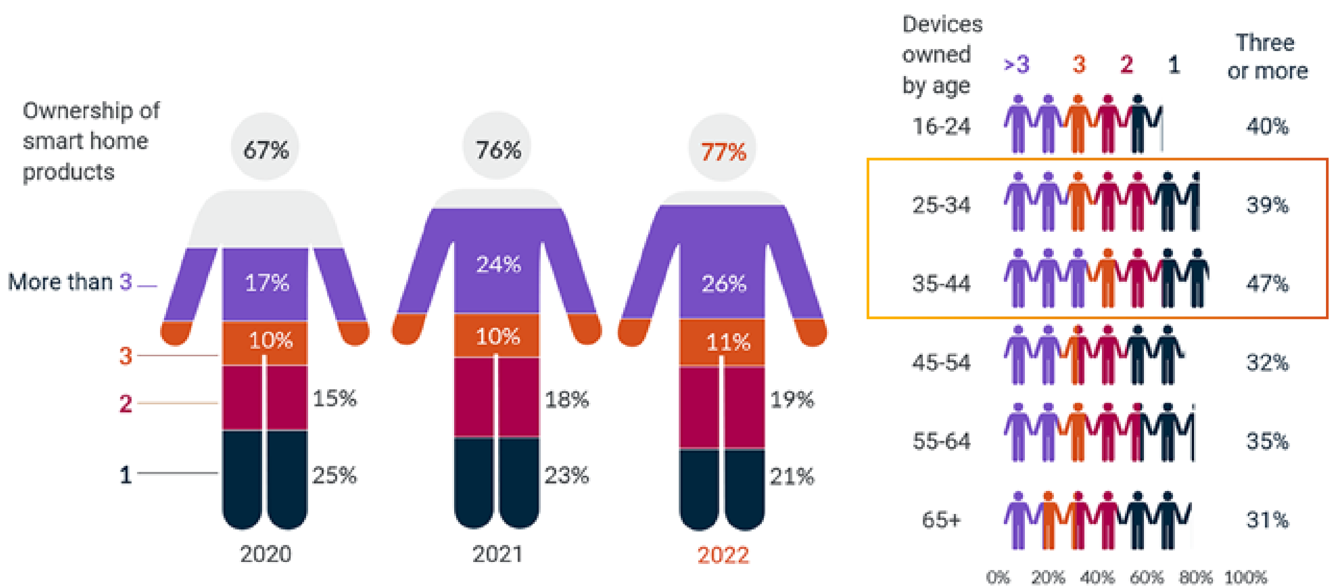
2.2 Adoption levels

Overall, 77% of adults in the UK own at least one connected home device – this figure was only 67% prior to the pandemic, and has grown by one percentage point since 2021 – this aligns with our consumer awareness data.

We are also seeing a growing proportion of the population who can be described as 'advanced adopters' of connected home technology (owning more than 3 connected home devices). This figure now sits at 26% of all respondents, compared to 24% in 2021 and just 17% in 2020.

Interestingly, the data suggests that connected home technologies are being adopted by all age demographics. While adoption and advanced adoption levels are highest among 25-45s, the survey finds that levels of ownership for over 65s are largely aligned with national averages. Our data suggests that a sizeable segment of over-65s are quite likely to invest in connected home technology, which may be driven by some relative affluence and higher rates of home ownership among this demographic.

3 in 4 consumers own at least one smart home product; highest among 25-45s



Case Study: Amazon’s partnership with Royal National Institute of Blind People (RNIB)

Amazon started working with Royal National Institute of Blind People (RNIB) in 2018 when a member of Amazon’s devices team met a customer with sight loss who told them how Alexa helps them live a more independent life. This conversation led to a meeting between Amazon and RNIB, and Amazon has since launched a number of features to help the blind and partially sighted community.

Features include :

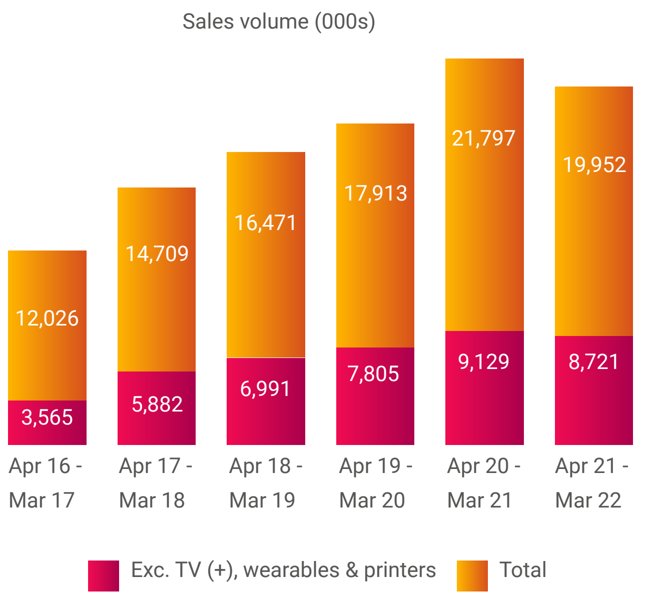
1. the ability for Alexa users to access information from RNIB using their voice - like how to register as sight impaired, practical tips and information on how to protect eyesight, and advice about supporting someone who is blind or partially sighted
2. the ability to call the RNIB Helpline with a voice command via Alexa
3. access to thousands of audio books for free by saying, “Alexa, open RNIB Talking Books,”
4. Alexa users can access the RNIB Letter to Santa service using their voice, an initiative which was launched for Christmas 2021.

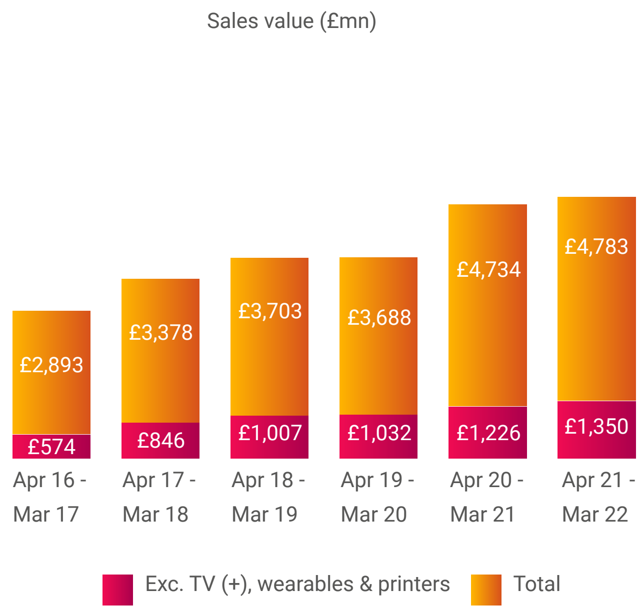
Amazon also sponsored the RNIB See Differently Awards in 2022 and supported the RNIB’s ‘World Upside Down’ campaign which involved a takeover of London’s Piccadilly Circus screens. Amazon displayed an upside down image of an Echo device to give an insight into the difficulties of social distancing for blind and partially sighted people.

2.3 Size of the market

The size of the market can be described in terms of volume (number of devices sold) or value (total price of all devices sold). Market size and value estimates below are taken from GfK's retail panels which track sales of connected home devices via key consumer channels. Some sales that take place through other retail channels (particularly B2C or trade channels) are not captured, therefore these figures represent a minimum estimate.

Unit sales have dipped post-Covid, but value is still in growth and the long-term trend remains positive





Total volume down ~8% year on year, but up 11% on the year to Mar-20.
Narrower definition down ~4% vs. Mar-21, and up 12% on Mar-20.

Total value up 1% year-on-year and up 30% on the year to Mar-20.
Narrower definition grew 10% vs. Mar-21, and up 31% on Mar-20.

From April 2021 to March 2022 there were almost 20 million connected devices sold in the UK – this figure has declined from the 21.7 million that were sold in the previous 12 months where there was particular uptake in adoption due to the pandemic. While the market is down 8% in terms of volume in the last year, it is up by around 15% on the year before and comfortably outperforms any year prior to the pandemic.

In terms of value, the UK market was worth approximately £4.78 billion in 2021-2 – this is an increase on the previous year despite fewer devices being sold. Approximately 45% of consumers report that they would be willing to pay at least a little bit more for a smart product over an equivalent non-smart product, and this growing consumer awareness of the benefits of smart home technology supports a greater willingness to pay for higher-end devices. A variety of factors are also contributing to the rising average value per unit across the smart home market:

1. There is real inflationary pressure on the supply side with resource constraints and rising shipping costs.

2. Robust sales of smart TVs are a key contributor to both volume and value. Supported by the increasing prevalence of voice recognition in new model ranges, smart TVs account for more than a fifth of market volume (4.4 million units) and nearly half of value (£2.3 billion).

3. Further emergence of smart Major Domestic Appliances (e.g. washing machines, dishwashers, fridge-freezers), which are 'big ticket' items that add a lot of value to the market. These products have been growing over time and often attract high prices – the average price of a smart fridge freezer, for example, is well over £1,000 (3x the average for a fridge freezer); for washing machines, there is a premium of about 25% for a smart device over a non-smart one.

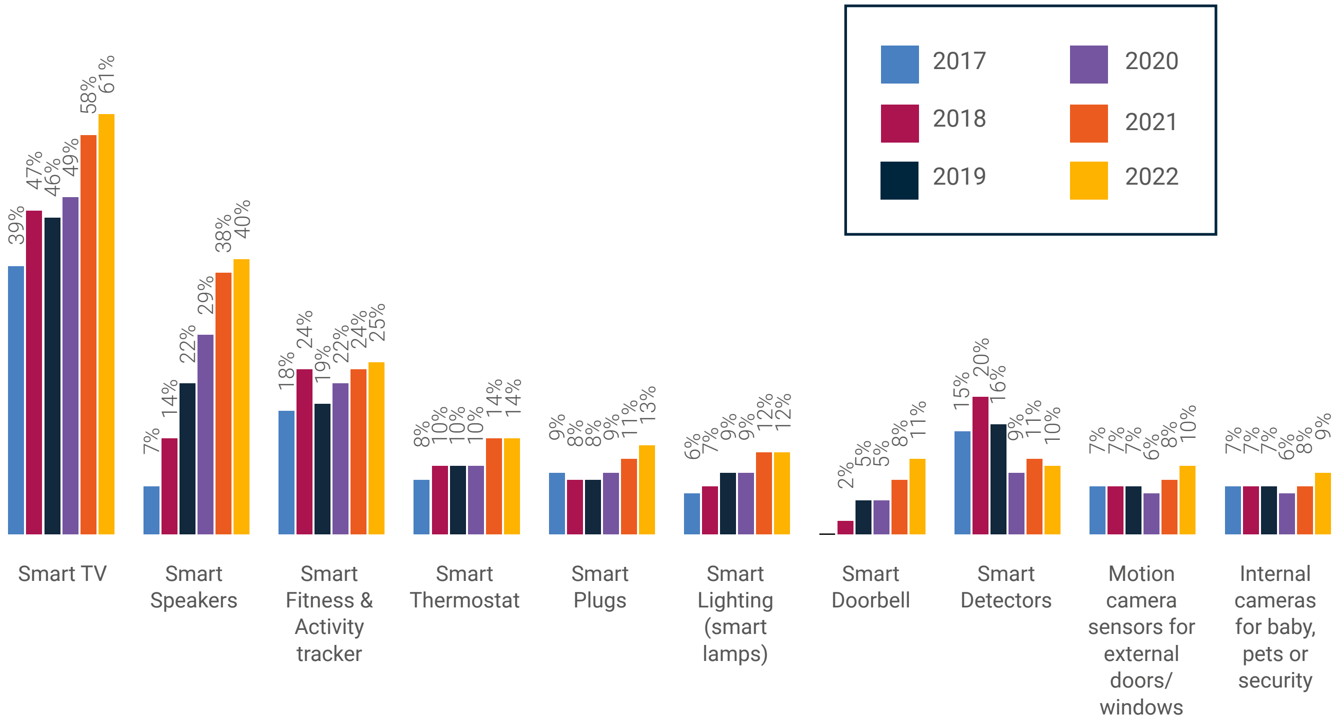
2.4 Product diversification

This year's findings suggest that we are approaching a 'third wave' of connected technology adoption that encompasses a much greater diversity of devices and functionality than we have seen in the past. The first wave was driven primarily by smart TVs, which are now present in a majority of homes, and then the second wave by a rapid increase in ownership of smart speakers and wearables. While these three product categories still account for the greatest proportion of sales in the market, the rate of growth has slowed as they approach a more mature phase of market penetration.

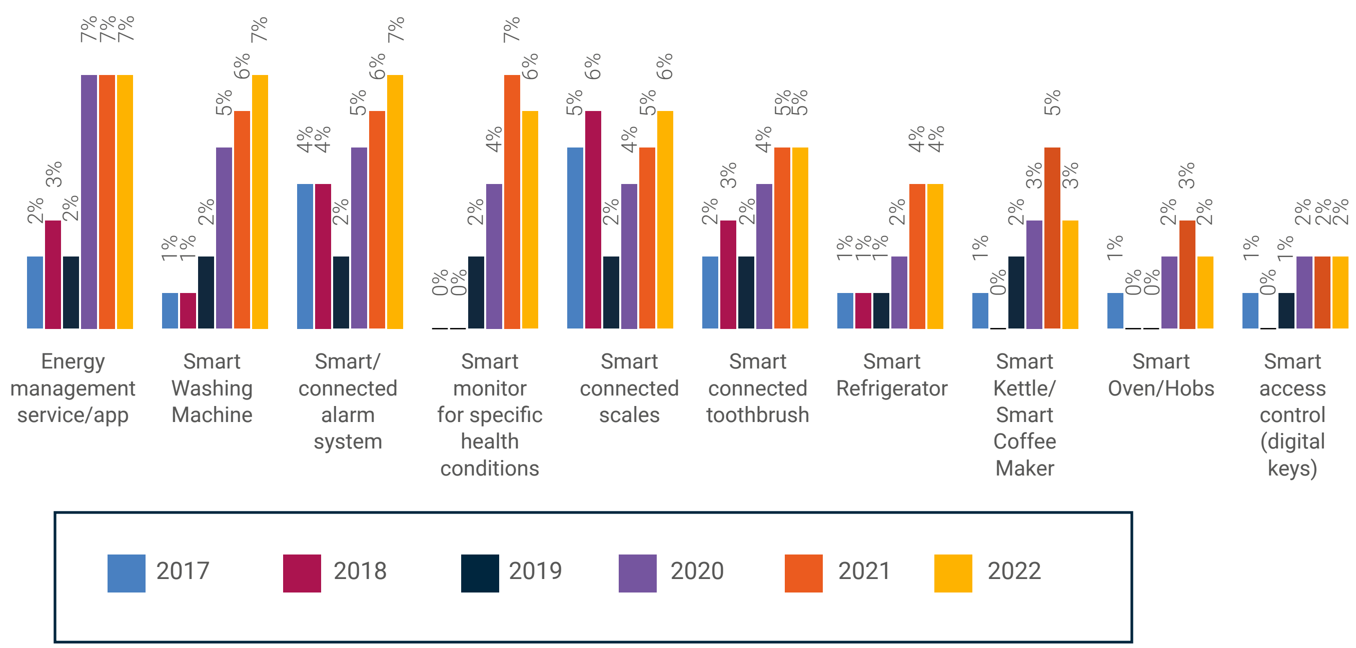
Market segments that were previously quite niche are now becoming more mainstream. Our data shows healthy levels of growth across multiple categories, including kitchen appliances (discussed above), personal care, home safety, security and energy management. In contrast to kitchen appliances, security and home/energy management devices, while growing in volume, tend to be lower value. Compared to before the pandemic, we now see considerably higher rates of ownership across:

- *Smart appliances* (washing machines, refrigerators) – reaching 11% ownership in 2022, up from 8% in 2020
- *Smart security devices* (cameras, alarm systems, smart doorbells) – at 29% ownership, rising from 19% in 2020
- *Smart devices that support more efficient energy usage* (thermostats, plugs, lighting) – 27% ownership, from 20% in 2020

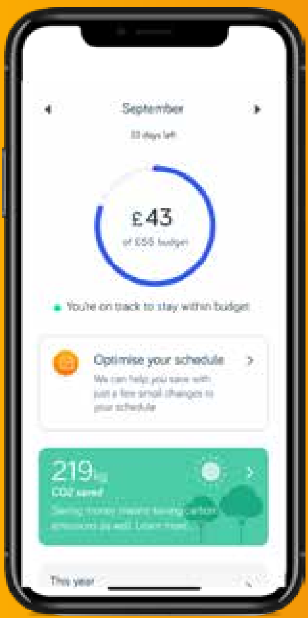
Ownership of smart speakers has increased fivefold in the last five years, but growth has slowed in the last year and smart TVs continue to be a strong household product



Slow growth in uptake across a number of other categories, including kitchen appliances



Case Study: Hive Heating app that helps consumers save on their energy bills



Hive Heating Plus is a monthly subscription that works with Hive Thermostat and is designed to help customers save money on their heating bills, whilst making their home more efficient and lowering their carbon footprint.

The app monitors a customer's past usage to calculate how much they are likely to spend on heating and allows the customer to set up a monthly budget. The app helps them stick to this budget by sending personalised tips and weekly push notifications to alert customers if they are on track, under, or risk going over budget.

With Heating Plus customers are also able to access all their historical heating data, including their total usage of the day, the week, and the year. They are also able to work out their carbon savings using the Carbon Calculator, as well as the carbon savings of the entire Heating Plus community.

There is also a Heating Efficiency Monitor which tracks how your home heats and cools and can alert the customer if it detects there is a problem with heating efficiency. It will then notify the customer and guide them through simple steps to fix any issues detected.

Schedule Assist is an innovative new feature which has been designed to better understand a customer's home and calculate how much a user's schedule will cost them over the year. The feature also simulates what changes a customer can make to their schedule and the savings this will generate. This is completely personalised to a customer's home, and the feature will only include tips that will save the customer money. With Schedule Assist, users have been saving an average of £26 a month on their energy bills during the winter.

Hive Heating Plus works with any Hive Thermostat and is available within the Hive App.

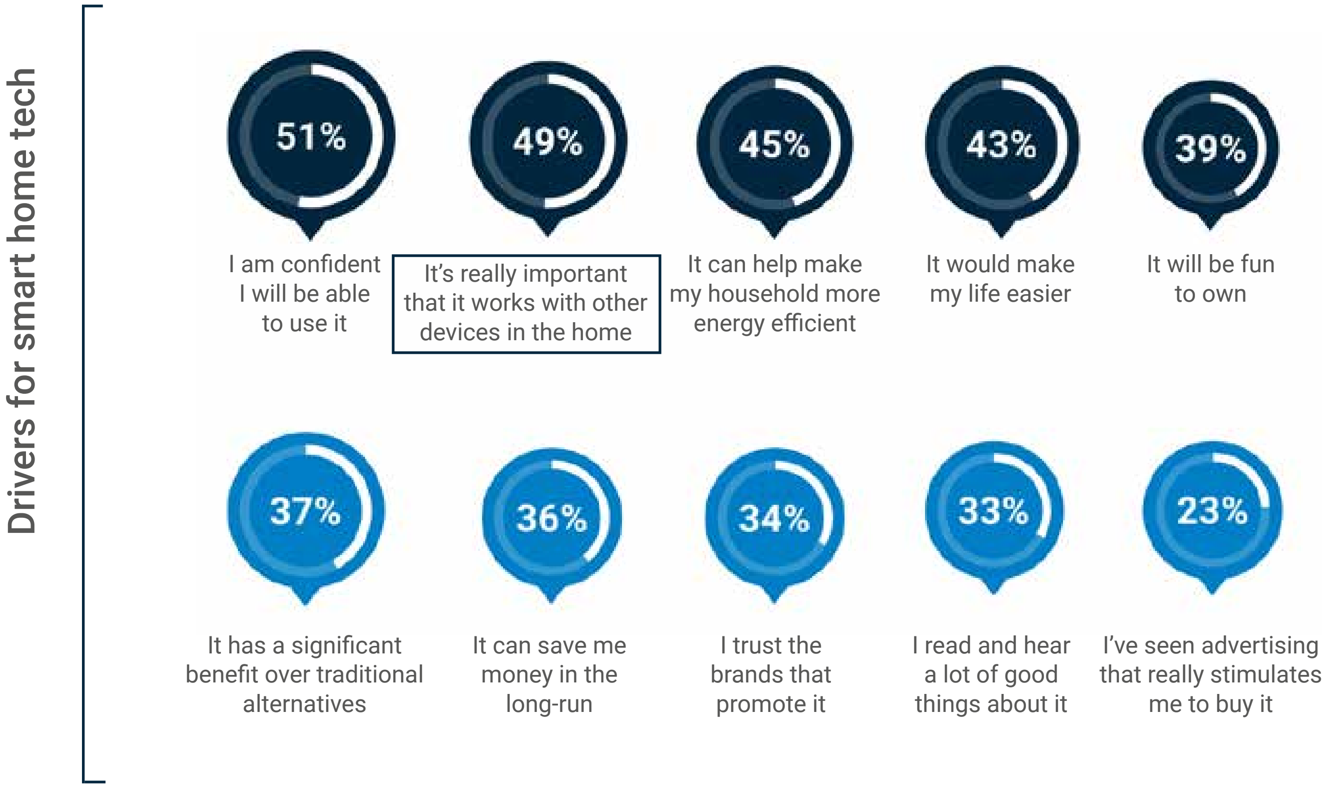
2.5 Adoption drivers and barriers to adoption

When asked to identify device characteristics that are important to them, consumers responded similarly to previous years and prioritised ease of use, interoperability, and convenience.

This year we added an additional option around the potential for connected home devices to help make households more energy efficient – this attribute scored well among respondents as the third most important criteria. This is no surprise given both the rising cost of energy and increased focus on environmental sustainability and the Net Zero journey after COP26.

The need for interoperability is increasingly recognised by consumers

How well does each statement apply to the category?



In terms of how connectivity capabilities impact consumer choice, the survey data confirms that, as with previous years, smartphones are far and away the most popular way for people to control other smart devices within their homes. Around three quarters of consumers consider smartphone connectivity to be either 'essential' or 'quite important' when considering purchasing a new connected home device.

Interestingly, despite the high adoption of smart speakers in the UK and their ability to connect to other smart devices, smart speakers are rarely being used as hubs to control smart homes and the vast majority of connected home products are not being connected to or used in tandem with smart speakers. Smart speakers are mostly utilized for entertainment, news, and information.

In terms of barriers to adoption, consumers were most likely to identify price, privacy and security concerns as factors that made them less inclined to purchase connected home devices. A self-professed lack of understanding about some types of technology was also significant, particularly in the segments of smart security & energy-related products.

Barriers to Smart Home products: 2022

	Total					
I think the cost to purchase products in this category would be too high	**57%**	62%	57%	58%	53%	54%
I would be concerned about personal privacy	**46%**	51%	53%	49%	54%	47%
I don't know enough about this category	**42%**	48%	40%	39%	43%	42%
I am concerned about this technology and the impact on security in my home	**37%**	37%	41%	35%	39%	31%
I don't believe this technology could meet my needs/expectations	**28%**	33%	24%	27%	28%	29%

3. Regulatory Landscape

We believe that robust regulatory frameworks that are aligned with international standards and emerging best practices can play a positive role in moving the industry forward and developing consumer trust. Over the past twelve months we have seen some significant legislative and regulatory developments that are important to the development of the connected home market:

- **Product-level cybersecurity.** The UK Government has played a leading role in strengthening the resilience of Internet of Things (IoT) devices and networks through a series of interventions promoting the Secure-by-Design agenda. This began in 2017 with the development of the Voluntary Code of Practice for Consumer IoT Devices and culminating in the Product Security and Telecommunications Infrastructure Bill. The Product Security and Telecommunications Infrastructure Bill draws upon the widely-recognised international standard EN 303 645, thus meeting industry calls for international alignment while ensuring that products available on the UK market provide strong levels of protection to consumers against cyber threats.

- **UK Product Safety Review.** The government issued its Call for Evidence Response relating to the UK Product Safety Review in November 2021. The government recognised the need for greater clarity around connected consumer devices, including product liability, and the need to align product safety rules with new cybersecurity requirements (see above). Overall the commitment to a pro-innovation, outcomes-focused and risk-based approach is encouraging and we look forward to continue working with the government in developing this framework.

- **Reforms to UK data protection laws.** In July 2022, the Government published the Data Protection and Digital Information Bill, outlining reforms to the UK's data protection regime which builds on the key elements of the existing UK General Data Protection Regulation (UK GDPR). We welcome the Bill, which maintains the core principles of the GDPR such as transparency, fairness, purpose limitation, data minimisation, data accuracy and accountability which ensures that all personal data is collected, processed and shared in ways that uphold consumers' privacy and data rights. The Bill also strikes a sensible balance between reform and maintaining good data flows with key international partners, such as EU, which is vital given that many connected home companies manufacture for European or global markets – to diverge significantly from the EU's data protection model would add additional costs to consumers in the UK.

4. Policy Recommendations

Additional ways through which the government can support the connected homes market and realise the benefits that they offer to consumers include:

- **Collaborate with industry on industry-led accreditation and certification schemes.** A great example is the DCMS 'Grant Programme for Consumer IoT Assurance Schemes' which supported the development of SafeShark, a collaboration between DTG and Connect Devices to create a BSI-backed assurance scheme that provides independent certification against the criteria set out within the upcoming Product Security and Telecommunications Infrastructure Bill.
- **Adopt interoperability and connectivity standards.** Adoption of international standards and best practices as a precondition of market access not only supports policy priorities within the identified areas, but also supports the development of the industry by preventing bad actors from coming onto the market and establishing baseline levels of standards that connected tech products adhere to. Government should work alongside industry, via standards development committees, to identify and adopt relevant standards relating to device interoperability - several techUK members have been involved in developing the Matter connectivity protocol to ensure that smart home devices made by different manufacturers can work across different ecosystems and interact seamlessly with one another. There is also a need for common standards across connectivity networks so that devices can connect to one another or to the cloud via standardised wireless networks and can seamlessly transition between private networks in the home and public networks outside.

- **Harmonise regulation to meet environmental aims.** The UK should seek to harmonise regulation on eco-design and the repair/reuse of connected home tech to lower the cost to consumers. If the UK diverges from international rules, manufacturers will need to design and store different products for the UK market. This represents an unnecessary cost which makes devices cost more, therefore blunting the energy savings opportunity. Increasing consumer awareness of how to use connected home technology for energy efficiency benefits is also key here - consumers should be encouraged to actively use the smart features of connected devices and benefit from future interlinkages with their energy provider.

- **Mandate connected home tech in new-builds and social housing.** Given the proven energy and cost savings presented by adopting smart appliances, smart thermostats and connected home tech should be in every social home, government building, and new-build property. Property developers have resisted this, but given that digital tech saves money and energy for end users (particularly relevant for public sector estates and social-rent tenants), this should be mandatory within buildings.

5. Conclusions

The Connected Home market in the UK has now reached the point where most people have some level of familiarity with connected home devices and have at least one in their home.

Around one quarter of the population are 'advanced adopters' that have more than three types of connected home device in their homes, and we are starting to see increasing interest and adoption in a wider range of product categories.

In addition to the well-established entertainment domain, smart and connected technologies are delivering significant benefits to consumers by helping them to improve their energy efficiency, live healthier lifestyles, and protect their homes.

While year-on-year comparisons are skewed by the particularities of the pandemic, overall market trends are positive across all product categories.

Nonetheless, our survey has highlighted the persistence of a range of barriers that can prohibit adoption. Whereas price is largely a commercial consideration and differentiator between brands, we believe that both industry and policymakers can do more to address consumer concerns around privacy, cyber security and interoperability.

It will also be important to address persistent gaps in consumer understanding of how to use connected home devices - these gaps can be addressed through a range of measures including accessible marketing and education campaigns that emphasize the tangible consumer benefits of smart and connected home devices, as well as integration of connected home devices into new buildings.

In particular it is important to support consumers in using connected home devices to improve their energy efficiency, which is going to be an important factor in addressing the cost of living crisis and meeting our Net Zero commitments.

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About techUK

techUK is a membership organisation that brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. We collaborate across business, Government and stakeholders to fulfil the potential of technology to deliver a stronger society and more sustainable future. By providing expertise and insight, we support our members, partners and stakeholders as they prepare the UK for what comes next in a constantly changing world.

About GfK

In a world of data overflow, disruption and misuse, picking up the right "signal from the noise" is key to success. GfK is the unparalleled, always-on, AI-powered intelligence platform and consulting service for the consumer products industry, globally – and we are revolutionizing real-time access to critical knowledge. Together with our attention to detail and advanced AI, we provide world-class, independent analytics that deliver not just descriptive data but also actionable recommendations – helping to boost sales, as well as organizational and marketing effectiveness.

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