

Mediatique

Ownership and use of audio-enabled devices in 2035

A report for the devices working group (BBC/DRUK)

June 2021

Summary of key findings

- The trends affecting the take up of audio-enabled devices are wide ranging – consumers are becoming more technologically enabled as their familiarity with connected devices grows and streaming improves; broadcasters, manufacturers and policy makers are reviewing their own strategies in response to these trends
- The changing picture of device ownership responds to and helps drive changes to consumer behaviour – higher penetration of internet-connected devices enables a mixed economy of provision and consumption; live radio suffers as a result of increased competition for consumer attention, whilst consumption of audio content delivered over IP is by definition favoured
- Based on our observation of these dynamics and our future hypotheses we forecast that take up of audio enabled devices will be dramatically changed by 2035, with particularly high penetration of smart technologies (e.g., smart TVs & smart speakers):
 - We forecast that smart speaker penetration will grow to 62% by 2035 and smartphone penetration will likewise increase to 89%, up from 83% in 2020; take up of DAB radios in cars will rise to 77%, reflecting the mandating of DAB in all new cars from the beginning of 2021
 - Standalone DAB household penetration will fall to 32% in response to declining set sales; AM/FM household penetration will fall to 15%, down from 33% in 2020
- These take up forecasts will have implications for listening of all audio content and live radio: hours spent listening to all audio content will increase, while gross radio hours will fall from the levels observed in 2020:
 - Total audio hours per week will increase to 1.53m in 2035, up from 1.38m in 2020; live radio hours will decline from 979,000 per week to 760,000, a fall of almost 25%
 - 40% of all radio hours will be delivered over IP in 2035, up from 14% in 2020 – the majority of these hours will be delivered via a smart speaker, taking 65% share of all IP radio hours
- Despite these significant changes, the forecasts also confirm that in spite of increased competition AM/FM and DAB in the home will both remain relatively resilient in terms of take up and radio consumption
- Future changes to policy are unlikely to effect material changes to outcomes given the rapidity of change already witnessed

1. **Introduction and scope**
2. Current device trends
3. Future drivers of change and evidence
4. Forecasts and scenarios
5. Appendix:
 - I. Glossary and definitions
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Mediatique is providing forecasts of the take up and usage of audio-enabled devices to 2035, to inform industry preparations for the Digital Radio and Audio Review

- DCMS is undertaking a review and consultation around future dynamics in radio and audio markets in light of significant changes to listening behaviour
- Mediatique was commissioned by the BBC and commercial radio partners to consider how the ownership and usage of audio-enabled devices in and outside the home will change over the next 15 years, in order to inform a response to the DCMS review
- The objective of our work was three-fold:
 - To understand how device penetration will change by 2035 absent any major regulatory or industry intervention;
 - To understand the drivers of changing listening behaviours and identify which will have the greatest impact on usage; and
 - To consider how certain alternative regulatory scenarios might alter our base-case outcome
- This report is structured as follows:
 - We provide an overview of the current state of ownership and usage in all audio-enabled listening devices, including differences by listener age
 - We thereafter identify and evaluate the key drivers that will affect device ownership and use over time; this includes a review of key evidence
 - We then provide a forecast of take up and use for identified devices, and consider how these might change under a number of specified scenarios of regulatory intervention
- Our work is informed by a detailed review of secondary research, our internal analysis and modelling and insights from primary research with stakeholders in the audio markets
- The forecasts and analysis in this report are those of Mediatique and should not be inferred to represent the views of the BBC and its commercial partners
- Note that the present report constitutes an update on our forecasts from 2019 (subsequently revised in 2020); differences are reviewed in detail in the main report

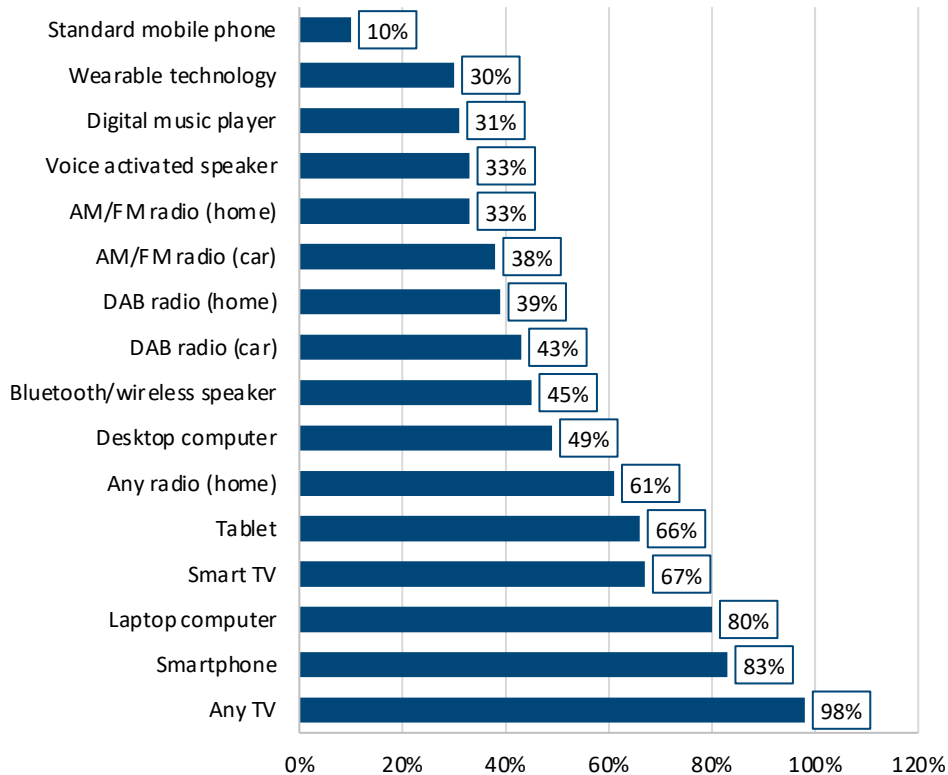
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Devices through which consumers can access audio content have proliferated since 2016 – increases in device penetration have continued apace in recent years

- Device penetration grew across most categories from 2016, with most significant changes in voice-activated speakers, now in a third of all UK homes, wearable technology (+200%), smart TVs (+56%) and Bluetooth or wireless speakers (+55%)
- Smartphone and tablet penetration growth has slowed, whilst that of digital music players and desktop computers has continued to decline

Device take up, Q1 2020, %

Source: MIDAS, Ofcom Technology Tracker.



Selected device take up change, 2016 vs. 2020, %

Source: MIDAS, Ofcom Technology Tracker.

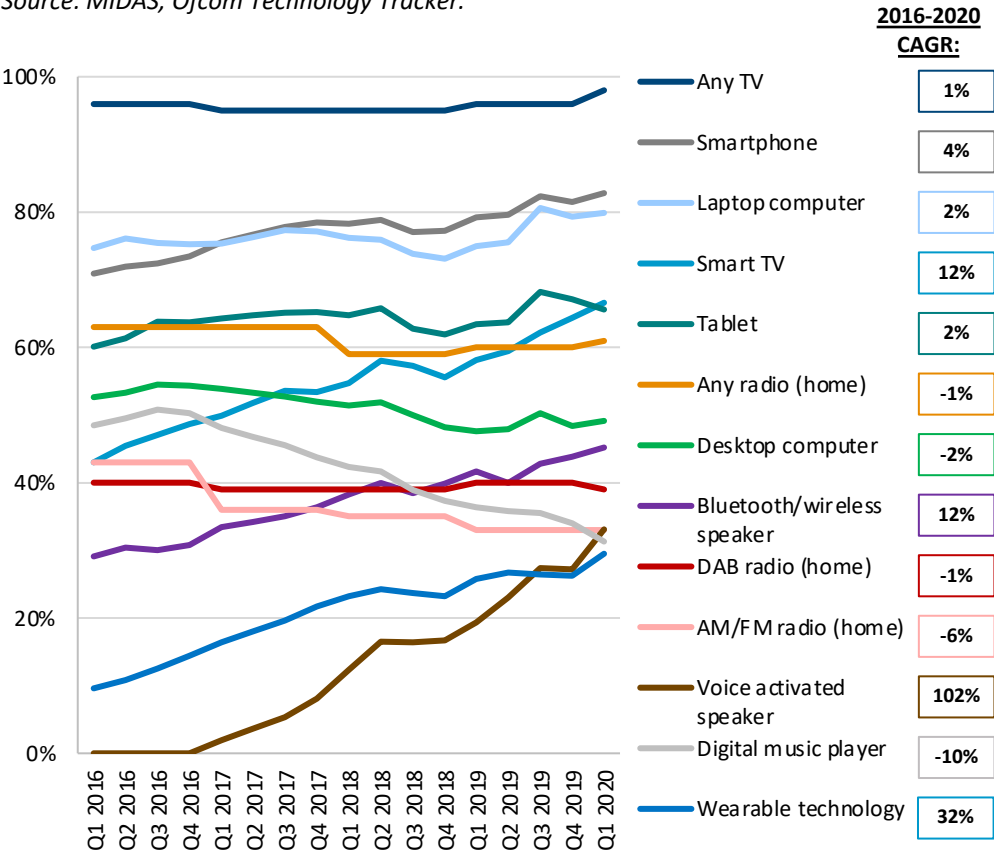
Device	Q1 2016	Q1 2020	% change
Any TV	96%	98%	+2%
Smartphone	71%	83%	+17%
Laptop computer	75%	80%	+7%
Smart TV	43%	67%	+56%
Tablet	60%	66%	+10%
Any radio in the home	63%	61%	-3%
Desktop computer	53%	49%	-8%
Bluetooth/wireless speaker	29%	45%	+55%
Voice activated speaker	0% (2% in 2017)	33%	+1550% since 2017)
Digital music player	49%	31%	-37%
Wearable technology	10%	30%	+200%

Growth trends since 2016 show sustained smart and connected device take up across all demographics

- Voice activated speakers, wearable technology, smart TVs and wireless speakers were the fastest growing categories, with some categories (laptops, tablets, radios, TVs) remaining flat, suggesting further growth is unlikely
- Evidence is emerging that older demographics are ‘catching up’ with younger cohorts in connected device penetration

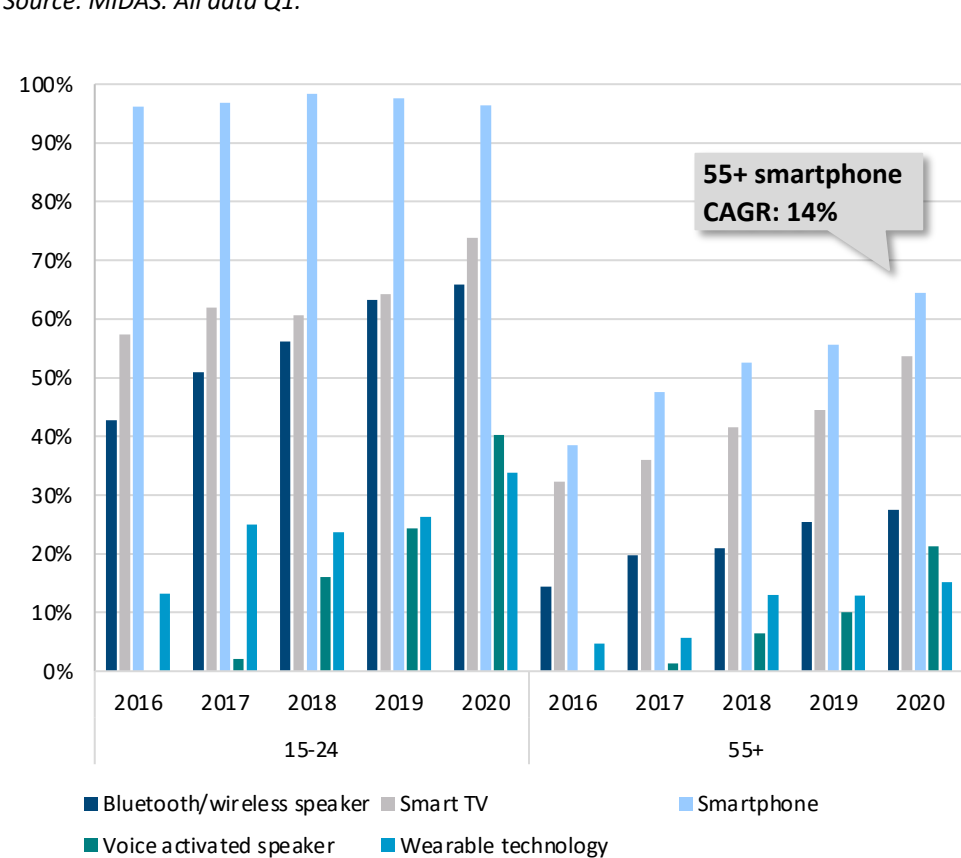
Device penetration, 15+, Q1 2016-Q1 2020, %

Source: MIDAS, Ofcom Technology Tracker.



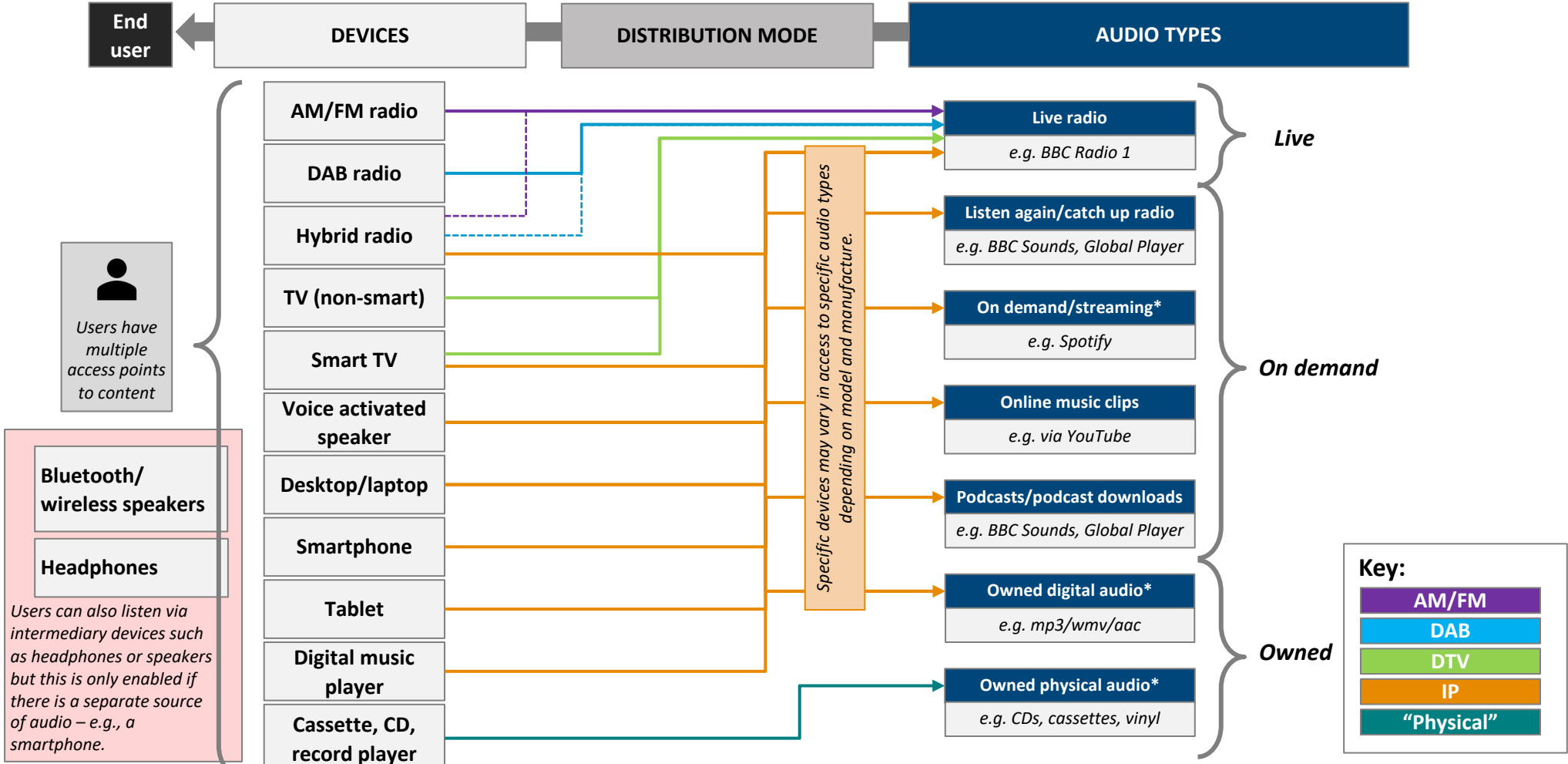
Connected device take up, 15-24s/55+s, 2016-2020

Source: MIDAS. All data Q1.



Connected devices enable access to services in addition to live radio – leading to a mixed economy in delivery (IP alongside broadcast) and services (radio and non-radio)

- The types of devices a consumer owns will dictate the categories of audio they can listen to and the mode of transmission
- IP enables a range of audio listening (catch-up, streaming, podcasts, etc) but live radio listening still predominates with 88% weekly reach – on-demand/streaming is the next biggest category at 31%

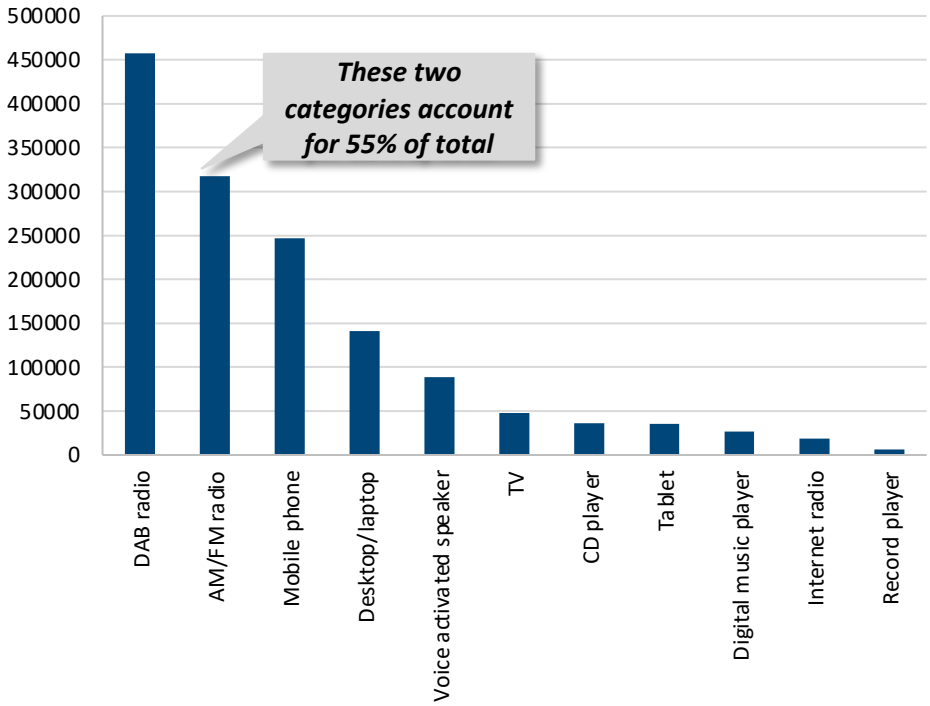


Device usage for audio categories is not equal – not only are some devices used more than others, but the kinds of audio listened to varies by device

- DAB and AM/FM radio sets still account for the majority of listening, with smartphones, computers, voice-activated speakers and TVs the next most popular devices
- Live radio accounts for almost all audio listening on radio sets and TVs and over 60% on voice-activated speakers

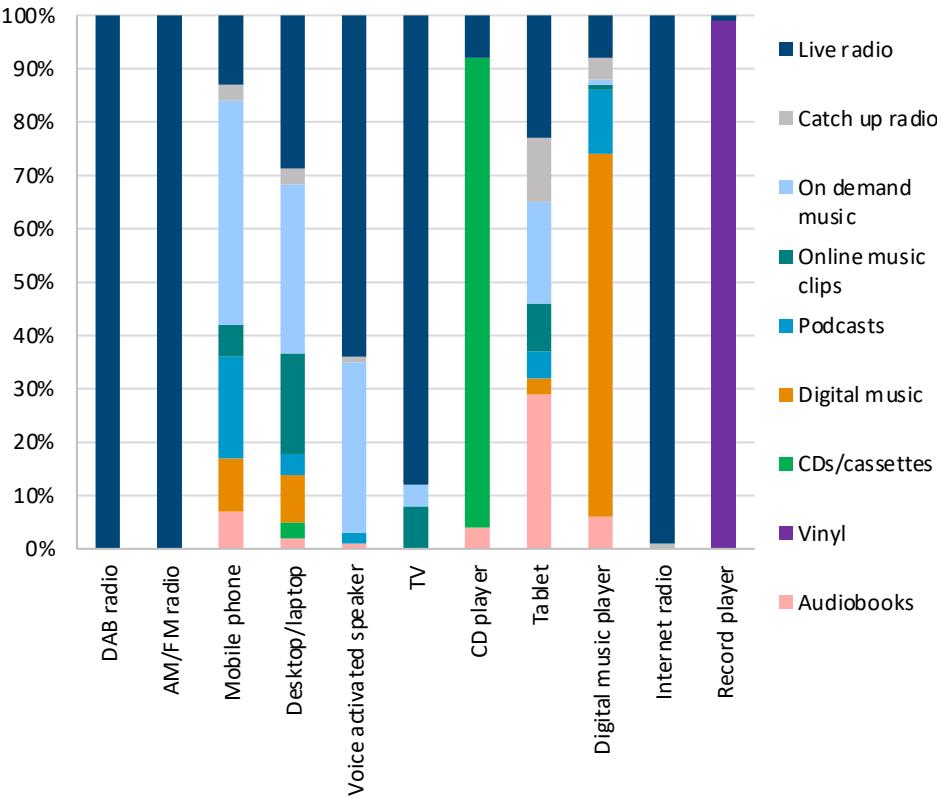
Total audio hours by device, 15+, Q1 2020

Source: MIDAS.



Total audio hours by device and type, Q1 2020

Source: MIDAS.



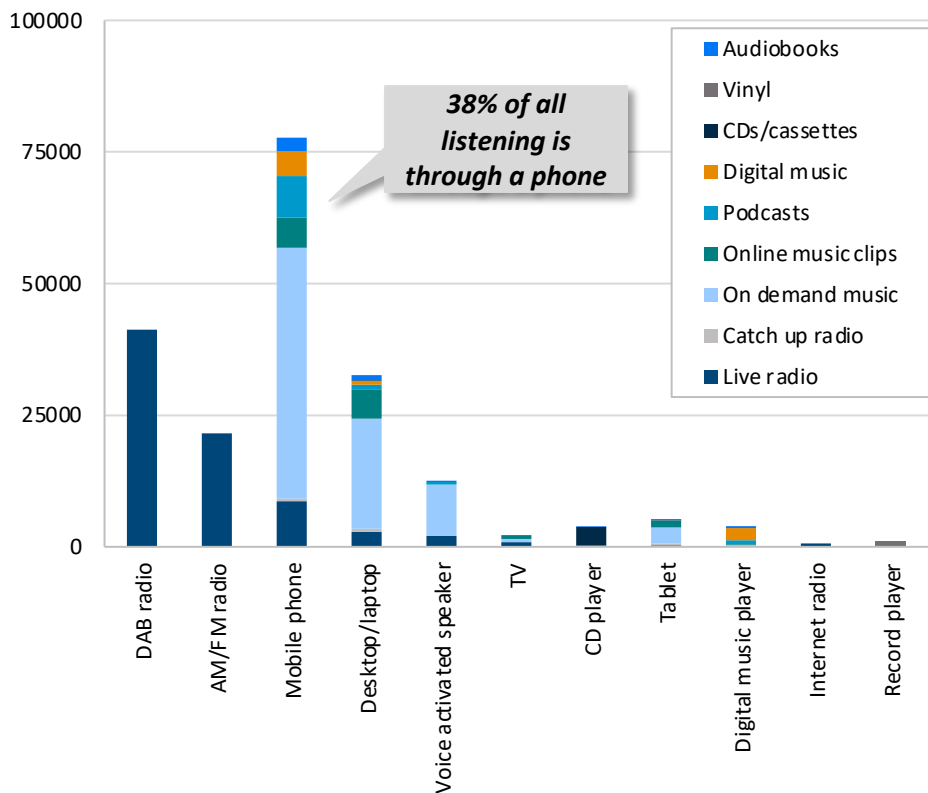
We use the above to exclude certain categories (CD/record players and wearable tech) from our device forecasts. We also exclude bluetooth and wireless speakers as these require a 'hub' to play audio content and are therefore already captured elsewhere (usually either a smartphone, computer or voice-activated speaker). Mobile phone includes smartphones. TV includes smart TVs.

By demographic, there are stark differences in device usage and categories of audio listened to, with 55+ listening to more audio overall and more live radio on radio sets

- Younger cohorts listen to a wider range of audio content, in particular on demand (streamed) music, podcasts and digital music
- Older cohorts are much heavier listeners, but the majority of listening time is spent with live radio (85% of total hours) and especially on traditional radio sets

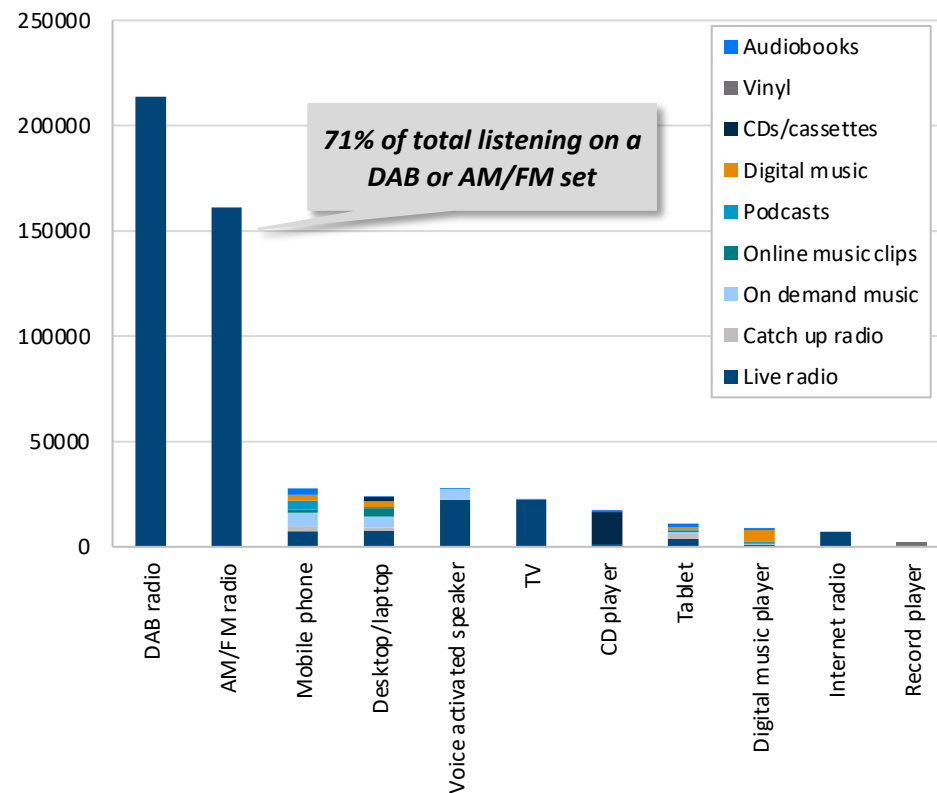
Total audio hours by type and device, 15-24s, Q1 2020

Source: MIDAS.



Total audio hours by type and device, 55+, Q1 2020

Source: MIDAS.

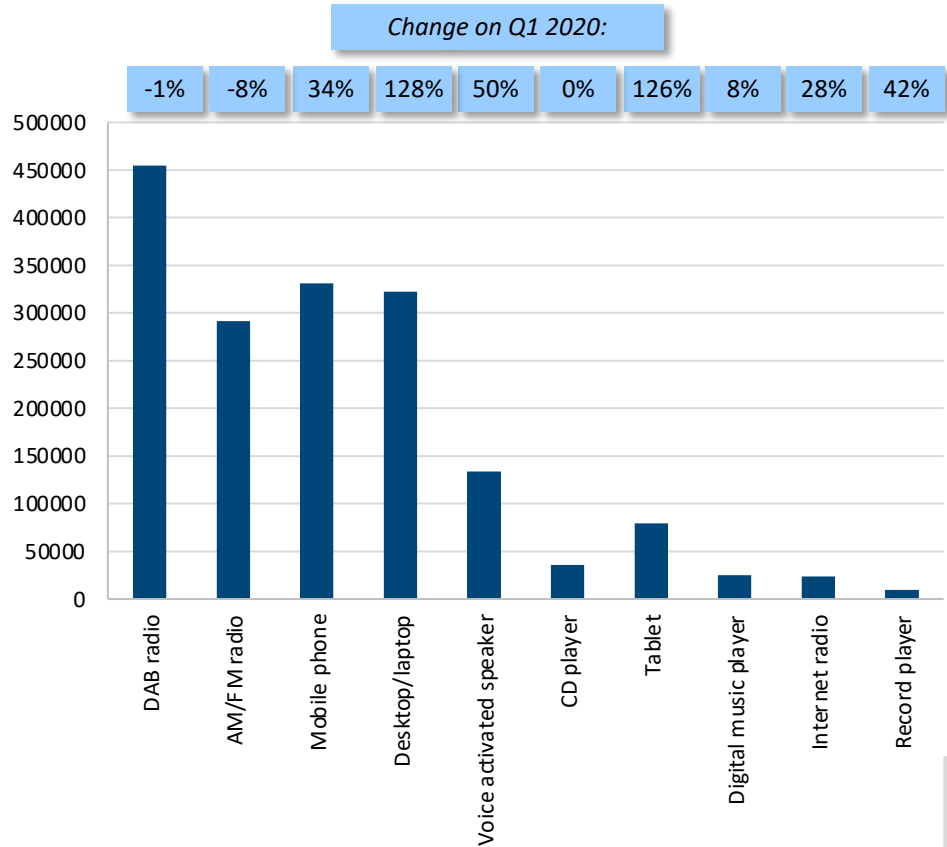


The Covid-19 lockdowns meant total hours of listening increased, but share of hours stayed relatively in line with data from the beginning of the year

With the majority of the UK population required to stay at home, overall audio hours rose in Q4 2020: the greatest increase was in listening via devices in the home (desktop/laptop, voice-activated speakers, mobile phones) at the expense of DAB and AM/FM radio hours – likely due to sharp drop in vehicle usage over the period

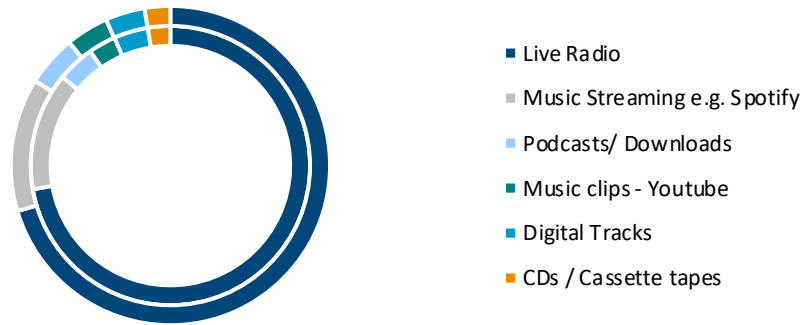
Total audio hours by device, 15+, Q4 2020

Source: MIDAS.



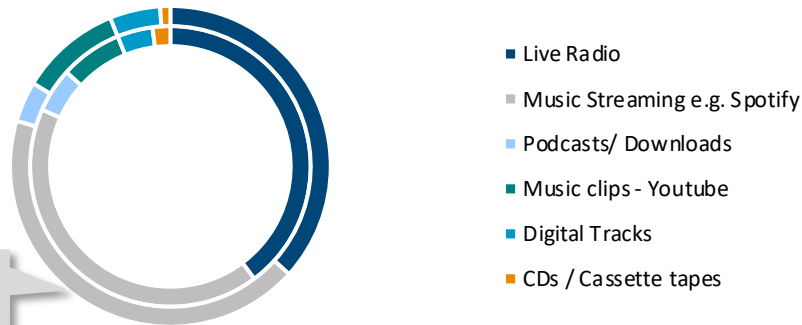
Share of audio hours, 15+, Q1 2020 vs Q4 2020

Source: MIDAS. Q1 = inside, Q4 = outside.



Share of audio hours, 15-24s, Q1 2020 vs Q4 2020

Source: MIDAS. Q1 = inside, Q4 = outside.



99% of 15-24s claim they have ever used on demand services

In summary, the audio landscape is changing due to the prevalence of connected devices, which enable new forms of audio; however, live radio remains dominant

Changes to audio market dynamics

<p>Increased take up of connected devices</p>	<ul style="list-style-type: none"> ▪ The UK consumer possesses a range of (increasingly IP-connected) devices in the home through which live radio and new forms of audio content can be accessed ▪ The fastest growing category is voice-activated speakers which have already had a substantial impact on how consumers access content with significant headroom for further take up ▪ Penetration of devices such as tablets, computers and radio sets has stayed relatively flat since 2016 ▪ There is some evidence that older demographics are starting to catch up with younger cohorts on take up of smart devices, with smartphones and Bluetooth/wireless speakers growing at a faster rate in the over-55s than among 15-24s (<i>albeit</i> from lower bases)
<p>Changes in consumer behaviour and preferences</p>	<ul style="list-style-type: none"> ▪ Live radio remains the largest listening category by hours – although there is significant variation among age groups: live radio accounts for 38% of listening for 15-24s but 85% for 55+ ▪ Younger demographics are much heavier users of on-demand or streamed content, although growth in these categories is seen across all age groups
<p>Short to medium-term impacts of Covid-19</p>	<ul style="list-style-type: none"> ▪ The Covid-19 lockdowns changed the ways in which consumers accessed audio content – greater in-home listening at the expense of in-car listening, across multiple devices (e.g., smart speakers, phones) ▪ Overall listening hours grew as the ‘stay at home’ UK population had more opportunities for listening, although shares of audio types were relatively flat against the beginning of 2020 – live radio accounted for 67%, a 2-percentage point drop from the first quarter ▪ Lock-down restrictions may have acted as an accelerant of previously observable trends in audio landscape – including bringing forward purchases of connected equipment (even among demos resistant in the recent past) and greater emphasis on home entertainment

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The future landscape of audio devices will be driven by a range of supply-side and demand-side dynamics

Drivers of change in the audio market

Improved network speeds and capacity

- Increasing connectivity and faster fixed broadband speeds in the home and out of the home (including 5G) will unlock greater streaming capacity; IP delivery is also a key catalyst for the launch of new audio services and the disaggregation of audio content from legacy routes to market (e.g., AM/FM)

Hardware & device take up

- The shift toward IP in the manufacture of audio devices will make *anytime-anywhere* usage more possible, as well as creating new forms of search and navigation, including voice, which may disrupt traditional channels/outlets, and enabling curation/personalisation and tailored advertising, driven by data

Audience behaviour & preferences

- Audiences continue to embrace the functionality offered by connected devices and the range of audio services that they enable (in particular, smart speakers and other smart devices with headroom for further growth); habits and attitudes towards different types of audio will affect outcomes – particularly as younger demographics age, taking some of their preferences with them into subsequent life stages and as older audiences adopt digital behaviours

Broadcaster strategies

- Audio broadcasters may revise corporate strategies in multiple directions, including the potential closure of expensive AM/FM/DAB stations in favour of IP-only distribution, and a pivot to digital advertising models and more personalisation of content, typified by collecting, deploying and monetising consumer data

Supplier strategies

- New-entrant competitors (Amazon, Apple, Google) are seeking to own the entire value-chain – pushing their own content or content delivery systems via own hardware: phones, smart speakers, smart TVs, etc; they are also looking to extract revenue from both third-party suppliers seeking access to users and from users directly; manufacturers and retailers may also consider scaling down the availability of radio devices to reflect reducing sales and margins

Public policy

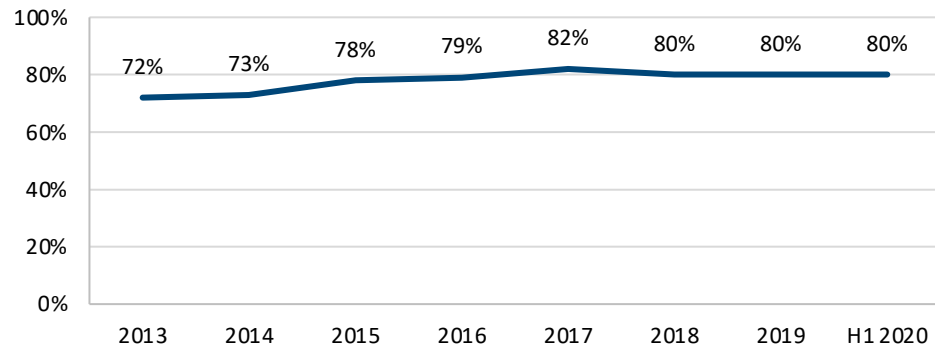
- Policy makers may consider changes to the future of DAB/analogue, coverage, prominence/ access rules and device mandates (in the home and in vehicles) which may affect both manufacture of devices and the availability of audio types – these potential policy shifts form part of our scenarios

Future take up will be enabled by improvements in home broadband; a preference for connected devices is already clear from recent sales data

- Broadband in the home – at increasing average speeds – will enable further take up of connected devices
- 5G will facilitate mobile streaming over IP – this may encourage more consumers to switch to new audio forms
- It may also see listening outside of the home face greater competition from other audiovisual content (i.e., where users can stream video via their smartphones more quickly)

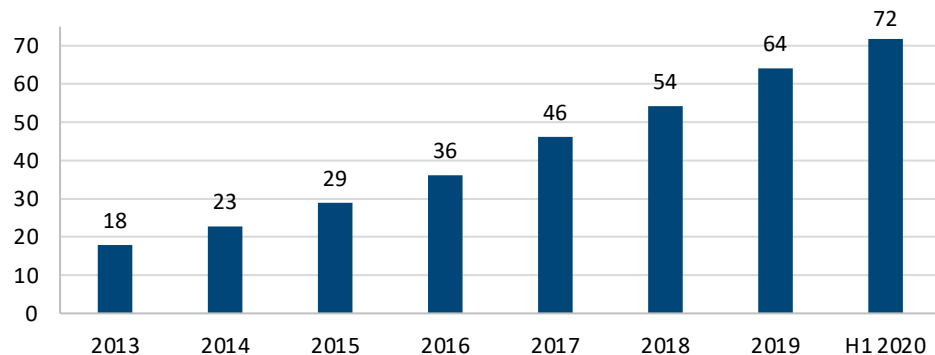
UK household fixed broadband take up, 2013 – 2020

Source: Ofcom.



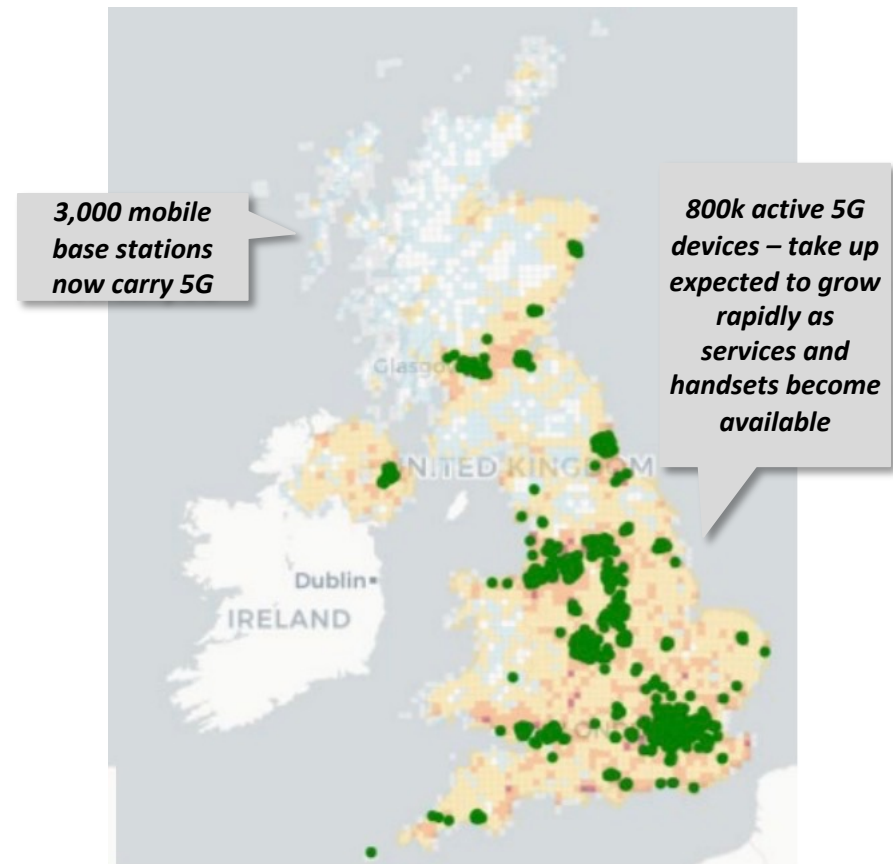
Average fixed broadband download speed, 2013 – 2020

Mbit/s. Source: Ofcom.



5G base stations in the UK, Dec 2020

Source: Ofcom.

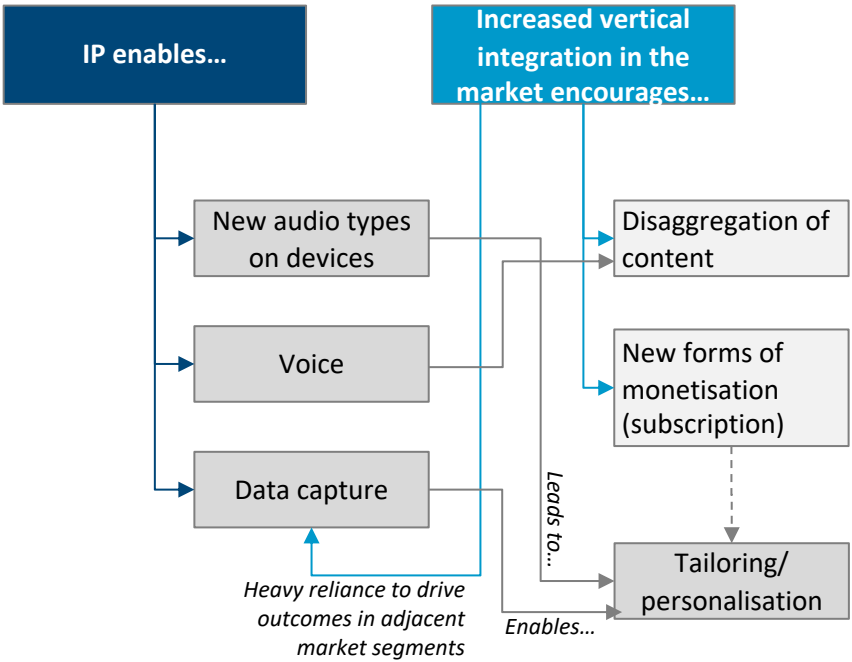


Use of IP means devices can supply consumers with more services and service providers with new means of monetisation

- Connected devices will likely continue to displace retail sales of radio sets using traditional technologies (AM/FM/DAB)
- In 2019, 2.1m smart audio systems were sold, against 2.5m radio sets (all types)
- However, sales of hybrid radio sets remain relatively low – possibly as they are already being superseded by voice-activated speakers and other smart audio systems (see *Appendix II. Retailer Review* for an analysis of set availability)

Main trends in audio devices

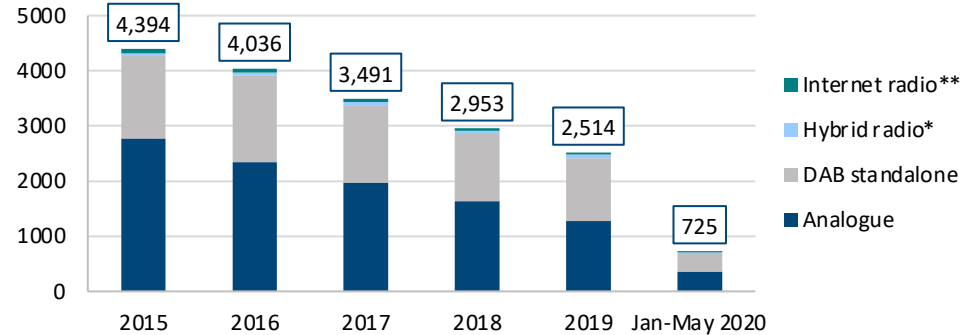
Source: Mediatique.



Outcomes: single-purpose devices (AM/FM and DAB radio sets) have to compete against connected devices that are increasingly tailored to a consumer's preferences, and which can be monetised in new ways (including monetisation of access, and the premium for digital advertising (from better data collection))

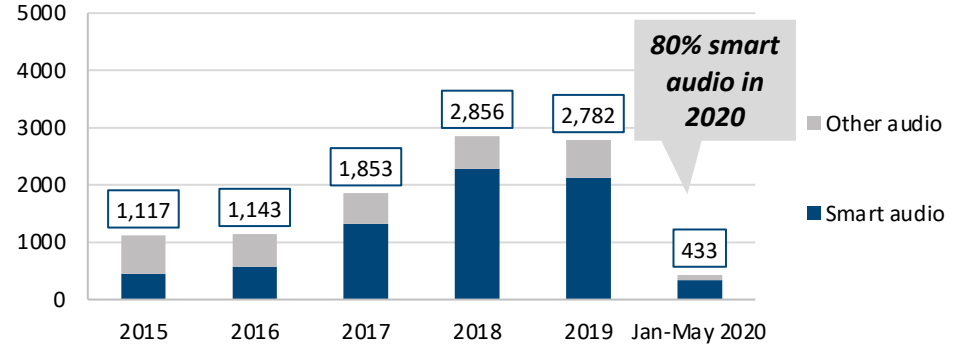
Sales of radio sets by type, in 000s, 2015-2020

Source: GfK. * DAB/internet. ** FM/internet (no DAB).



Sales of home systems by type, in 000s, 2015-2020

Source: GfK.



80% smart audio in 2020

Consumer research qualitatively confirms consumer purchasing intention and rationale – these do not diverge from observed purchasing behaviours

- Younger audiences are unlikely to consider purchasing a radio unless it is accompanied with smart functionality
- AM/FM-only listeners remain a stubborn cohort, placing a high emphasis on device functionality and quality
- All respondents would be willing to adapt their home listening if the analogue signal were to be switched off

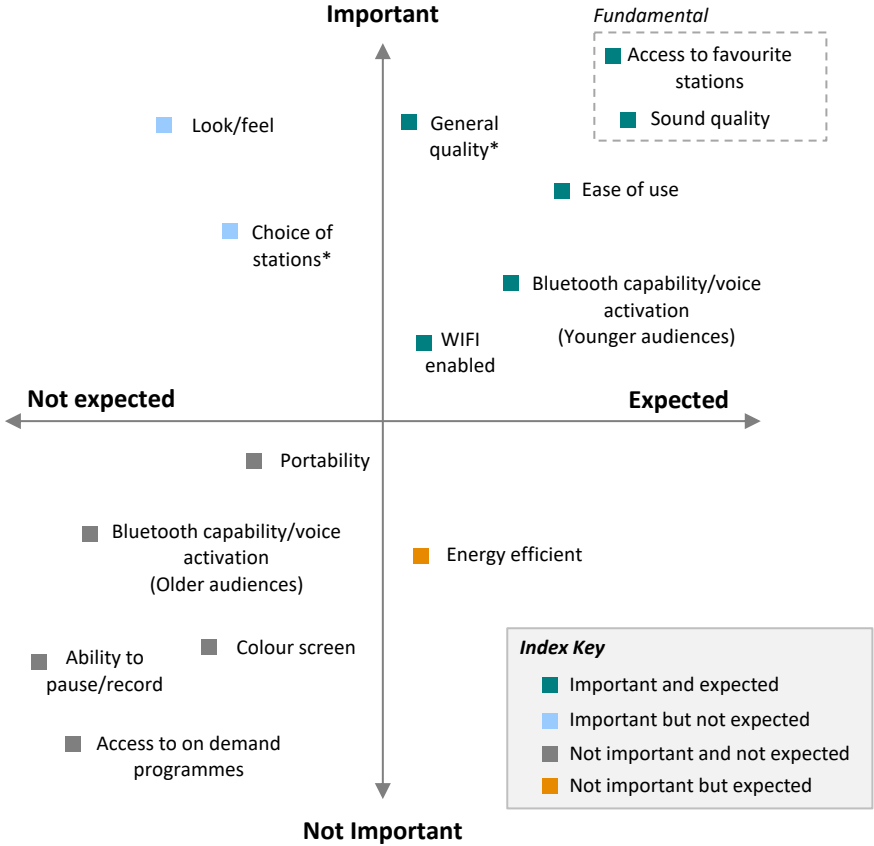
Indicators of consumer demand, radio devices

Source: PwC Research.

<p>“AM/FM only listeners remain happy with radio device provision...”</p>	<ul style="list-style-type: none"> ▪ This is despite acknowledging that there are newer and objectively ‘better’ devices available – desire to switch remains low unless mandated to do so; <i>we return to this point below</i>
<p>“It is hard for younger audiences to see the relevance and/or need for a radio specific device...”</p>	<ul style="list-style-type: none"> ▪ With so many other devices available, listening to radio on a specific device is not an embedded behaviour, and other devices are already preferred; behaviours are now unlikely to change
<p>“Current radio device owners need a catalyst to encourage them to purchase a DAB/Smart Radio”</p>	<ul style="list-style-type: none"> ▪ If devices continue to work and function, consumers see little requirement to upgrade – digital switchover, or AM/FM radios breaking would be sufficient catalysts to deliver this change
<p>“If there were to be a digital switchover, in home AM/FM only listeners would be open to purchasing a new device”</p>	<ul style="list-style-type: none"> ▪ Younger audience behaviours would be relatively unchanged as they are already using digitally enabled devices – AM/FM listeners could be retained via DAB if functionality was communicated

‘Important’ & ‘Expected’ index of radio device features

Source: PwC Research.



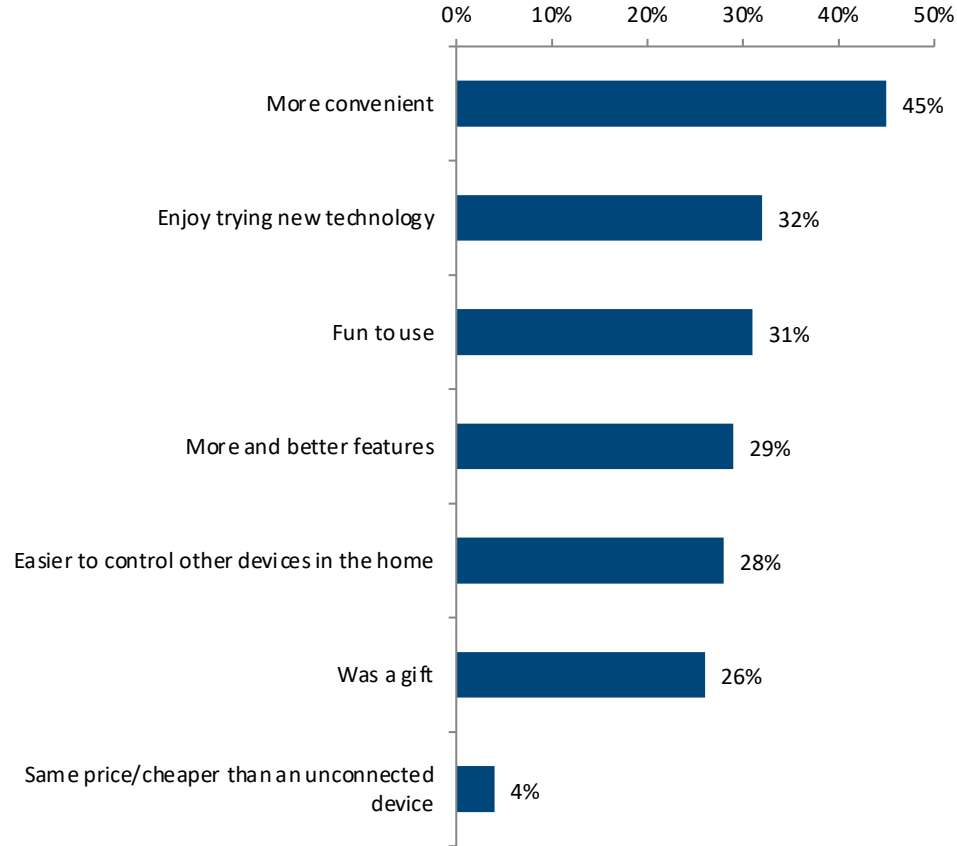
* Survey responses were regarding consumers’ AM/FM and DAB preferences; “Choice of Stations” and “General quality” therefore compares AM/FM DAB sets, rather than DAB/DAB+

Growth of smart speakers in particular has been strong and is likely to continue, with buyers citing greater convenience and a range of uses in the home

- Almost half of buyers claimed they bought a smart speaker as a more convenient option
- Smart speaker usage outcomes are varied – they are not bought exclusively to listen to radio content, but their capacity to do so means that radio consumption as a share of total smart speaker use is clearly a significant outcome

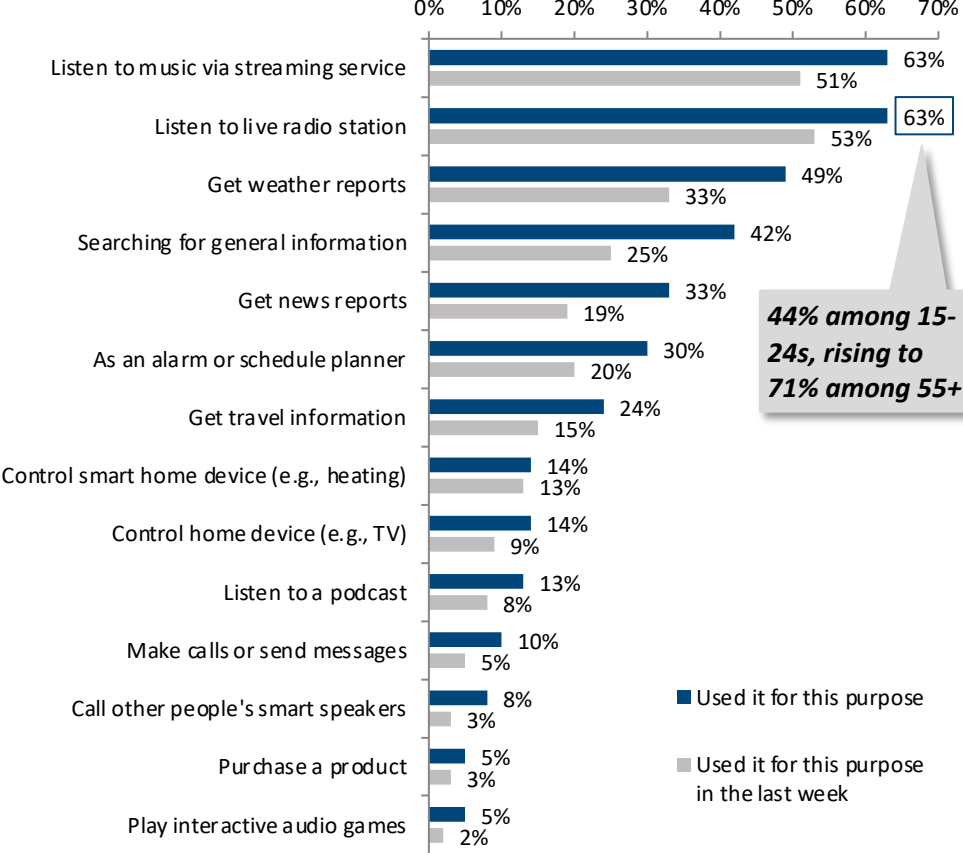
Why did you buy a smart device?

%. Source: Ofcom Technology Tracker, 2020.



Which of these do you use your smart speaker for?

%. Source: Ofcom Technology Tracker, 2020.

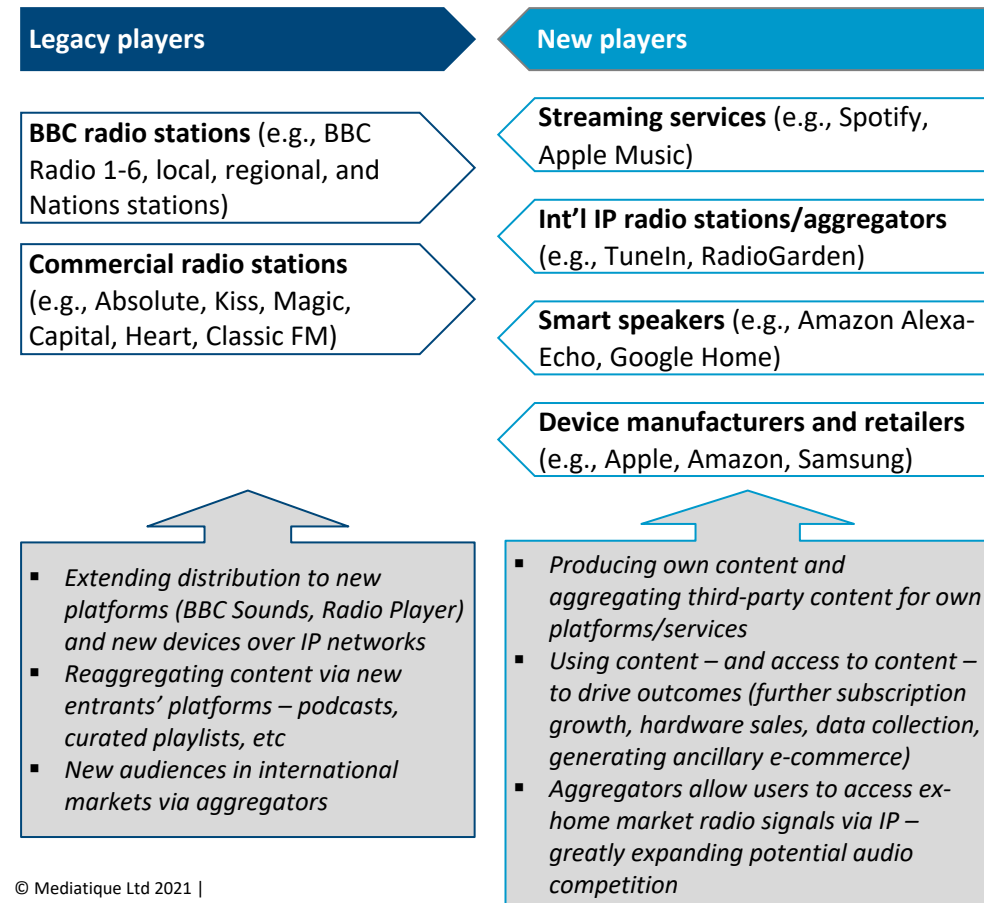


Traditional stations must now compete against increasingly integrated global audio players – and may re-consider utility of broadcasting in reaching all audiences

- Almost all legacy radio stations transmit via IP on top of AM/FM and/or DAB – this may lead some to consider the future of broadcast stations given high costs of simulcast and differential in costs between broadcast and IP
- New entrants less focused on radio – producing and aggregating content to drive outcomes across the value chain, including hardware sales for connected devices

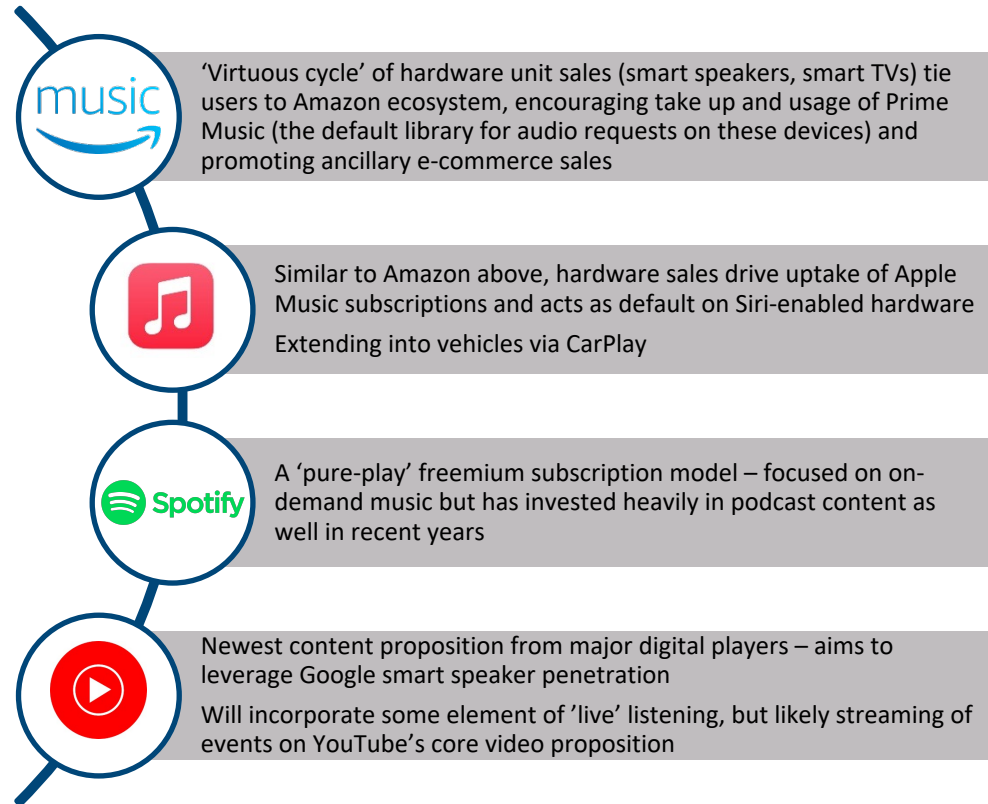
Scope of competition in audio distribution market

Source: Mediatique.



Selected corporate strategies of new players

Source: Mediatique.



Public policy options will continue to influence coverage, access and prominence of all radio distribution technologies – including DAB

- A few AM services have closed in recent years as alternative routes to market emerged – these were mostly BBC AM stations
- Licences of analogue commercial stations expiring in 2022 were recently extended for ten years on the condition relevant services are on a national, local or small-scale DAB multiplex and commit to a digital future

AM/FM and DAB public policy developments in the UK

Source: Mediatique.

Commercial radio licences renewed for ten years (2020)

- Analogue commercial radio licences due to expire by 2022 were extended for 10 years by DCMS – original eight-year proposals were extended by a further two years in light of Covid-19
- Stations will still have to commit to a digital future by being on a national, local or small-scale DAB multiplex in exchange for the extension

Small-scale DAB multiplex licences (2021)

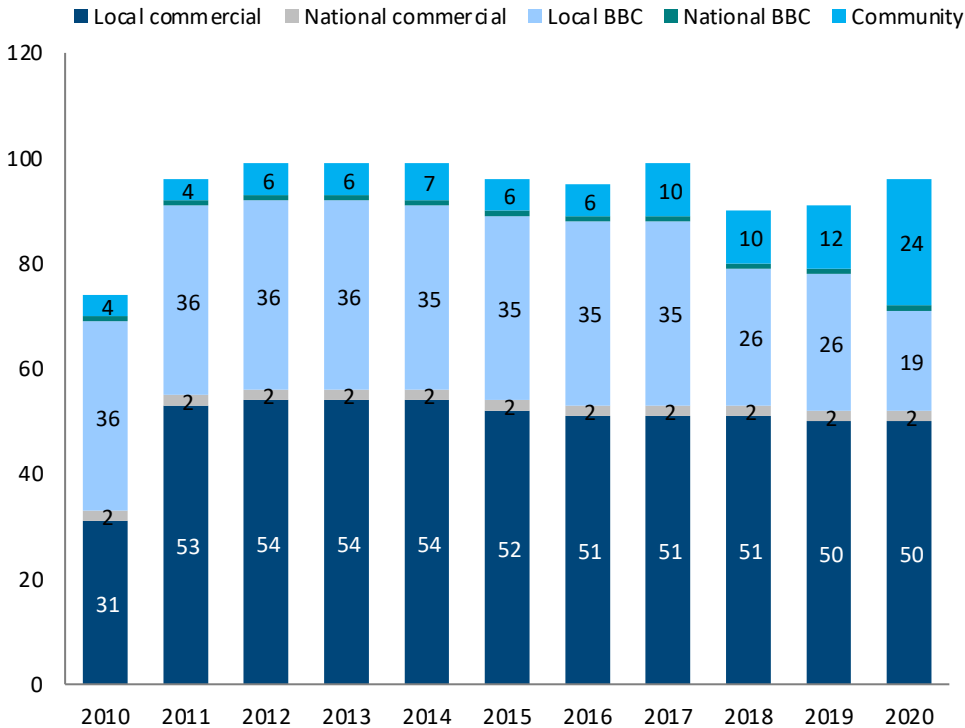
- In Feb 2021, Ofcom announced the first ever awards of small-scale DAB radio multiplex licences
- Five licences were awarded following a competitive process, with potential for up to 200 to launch across the UK over a period of 10 years

Ofcom Media Nations (2020)

- “On January 2020, the BBC announced that it would close 18 medium wave transmitters, thereby reducing AM coverage for BBC Radio Wales and BBC Radio Scotland, BBC Radio Norfolk and BBC Radio Cumbria, and close down the AMMW simulcasts of six BBC local radio stations in England.
- “The commercial sector has also continued to reduce AM MW broadcasts. In January 2020 Ofcom approved a request by talkSPORT to reduce its AM MW coverage by 2.4% of the UK population...”

AM stations in the UK, by category

Source: Ofcom.



For the car, the Government has mandated DAB fitments which may uphold live radio listening at the expense of streamed/on-demand

- Announced mandate for DAB installation in new cars ('fortress radio') may slow consumer migration to IP-connected audio types in the car (although ability to connect portable devices to car speakers/systems will mitigate this)
- % of newly registered cars with DAB/DAB+ available will grow from 93% in 2019 to 100% by the beginning of 2021 – this may have a small impact on migration to IP-enabled devices and audio usage

AM/FM and DAB public policy developments in the UK

Source: Mediatique.

Government mandates DAB radio to be standard in new cars (2020)

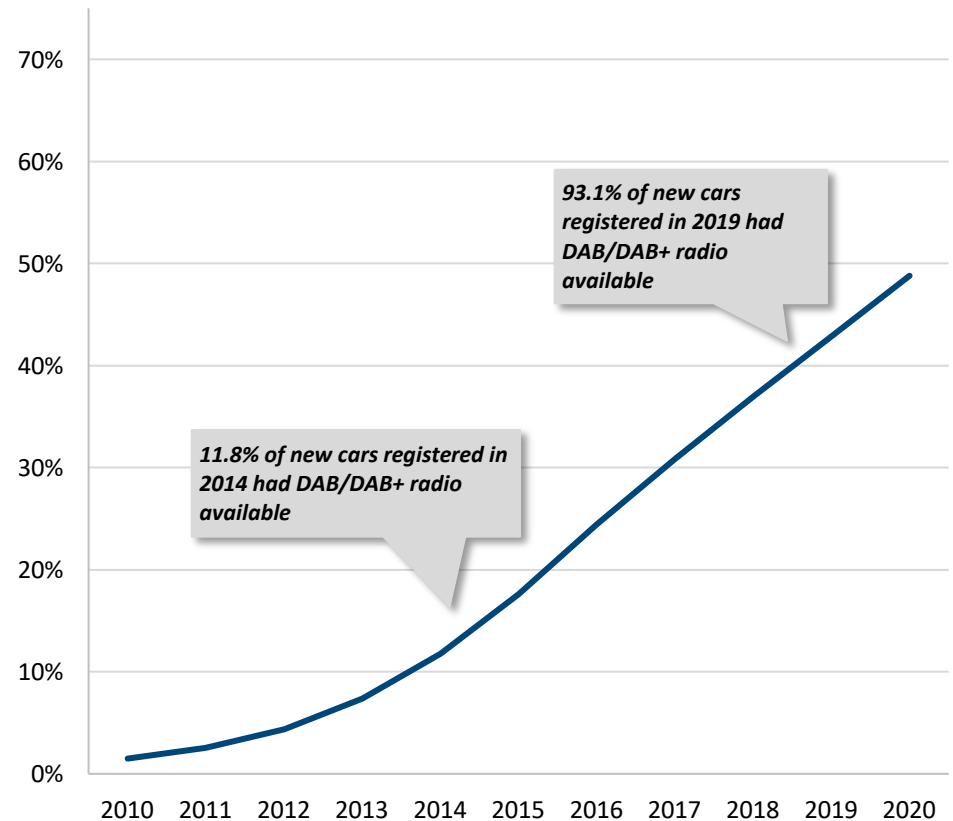
- Regulation specifies fitment of digital terrestrial broadcasting hardware, rather than IP enabled; all car manufacturers had to meet the requirement by 31st December 2020
- Regulations bring UK in line with aspects of the European Electronic Communications Code ('EECC'), which covers vehicles
- Mandate will bring percentage of new cars fitted with digital radio as standard to 100%, up from 93% in 2019

Ofcom licensing plans for small-scale DAB (2020)

- In line with DAB fitment in cars, Ofcom announced in 2020 plans to licence 'small-scale DAB', technology allowing a low-cost route for smaller commercial/community music stations to broadcast digitally
- Technology allows stations to use inexpensive equipment to get on air for less money than previously possible and broadcast to a relatively small geographic area
- DAB-enabled cars will thus be increasingly able to receive signal from this group – licence advertisement has begun in 25 local UK areas

Total cars on the road with DAB/DAB+, 2010-2020

Source: SMMT, Mediatique.



Across Europe, digital listening is growing but some of the biggest markets – France, Germany, Denmark – have not announced set date for AM/FM switch off

- Most countries, aside Norway and Switzerland, are employing a ‘wait-and-see’ policy, while assisting digital listening through the implementation of EECC rules in new cars and launching commercial digital stations
- DAB+ only is the norm outside mixed DAB/DAB+ in UK, Norway and Sweden, but DAB+ does not appear to be a material driver of digital radio take up or listening in the home or in cars

Selected country comparators: DAB radio, 2020

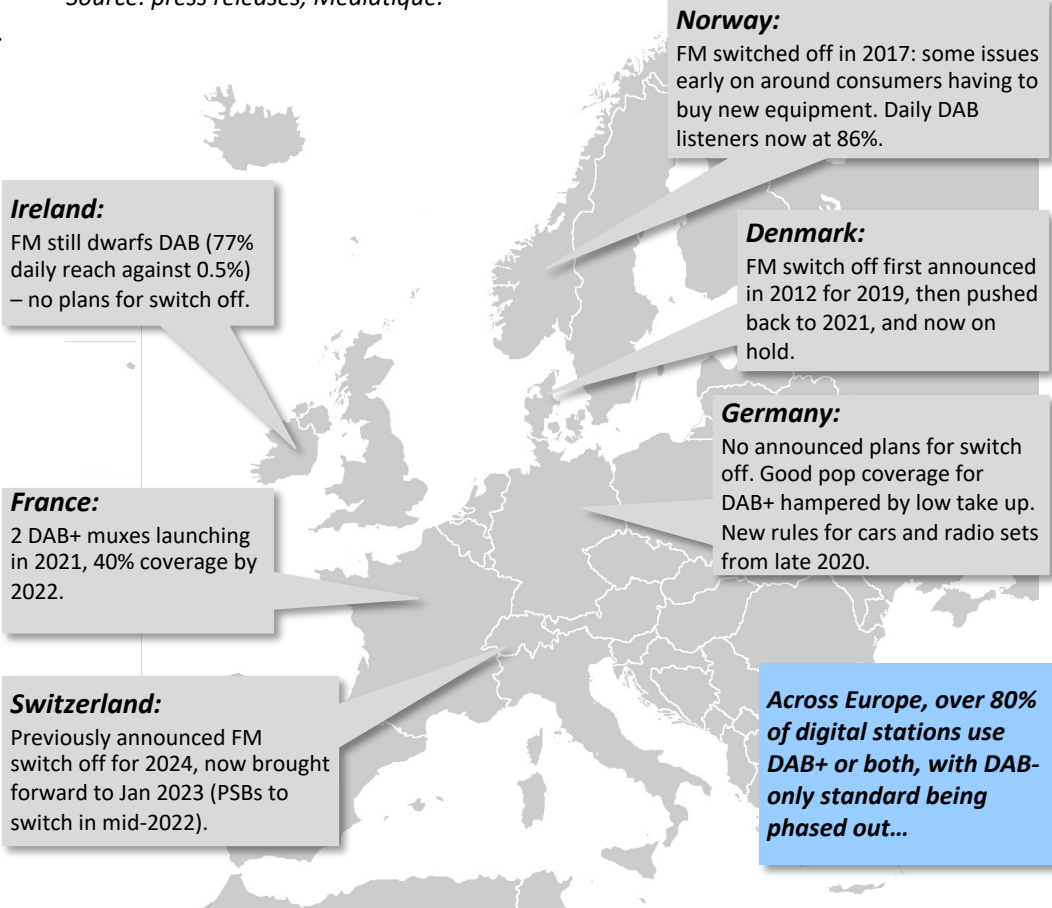
Source: WorldDAB, Mediatique. Data refers to 2020 or latest year available.
 Difference in UK DAB on slide 6 compared to here is function of source (WorldDAB vs Ofcom).

Country	Pop. coverage	DAB+ services	New cars with DAB+/DAB+	Household take up
Denmark	98%	183	37%	34%
France	25%	166	59%	13%
Germany	98%	270	54%	25%
Ireland	52%	10	Data not available	17%
Italy	84%	136	90%	8%
Netherlands	95%	112	56%	24%
Norway	100%	213*	100%	73%
Switzerland	100%	124	99%	Data not available
UK	97%	56**	94%	67%

* Norway also has 2 DAB-only stations. ** The UK also has 495 DAB-only stations.
 † Subject to EECC rules going forward.

European FM, DAB and DAB+ outcomes

Source: press releases, Mediatique.



The future drivers of change are built into our device take up and usage models (updated since we last reported to the BBC and its commercial partners)

Summary of predicted changes and impact on model

Summary of changes

Technology

- Households are increasingly connected to fast broadband
- Individuals now have easy access to a range of connected devices (e.g., smartphones & smart speakers)

Audience behaviour

- Sales of traditional and hybrid radio sets are falling – younger demographics are unlikely to purchase ‘traditional’ radio set
- Valued traits in devices are multi functionality and connectivity

Policy & policy response

- Mandatory fitment of DAB radios in cars has been active policy since the beginning of 2021
- Analogue commercial radio licences due to expire by 2022 were given a ten-year extension by DCMS in 2020

Entry and competition

- Manufacturers of smart devices also manage their own music and content services – their increasing influence directs consumers away from audio consumption on AM/FM and DAB devices

Impact on model

Technology

- Adjustments made to ‘end point’ assumptions for a number of smart devices: smart speakers, smart TVs and smartphones
- Necessary adjustments to consumption as a result of higher device take up

Audience behaviour

- Confirmed radio set take up not coming from younger demographics
- Radio listening a likely outcome from smart speaker penetration – radio is not its exclusive use, but on the spectrum of speaker activity

Policy & policy response

- Certainty that the car (i.e., ‘fortress radio’) will be almost exclusively DAB (as opposed to AM/FM) by 2035
- Consumption of AM/FM will remain until at least 2032 – the above confirms take up/listening will be in the home and not the car

Entry and competition

- Radio disfavoured as own content and platforms are promoted on affiliated smart devices

DAB outputs are particularly sensitive to set sales and replacement cycles – we expect sales to decline in the period to 2035, but numbers will remain substantial nonetheless

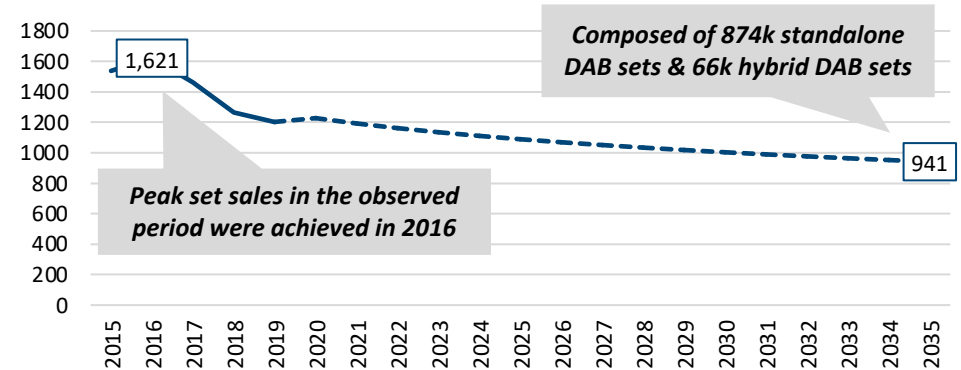
- Trendline analysis suggests DAB set sales (standalone and hybrid) will decline at a CAGR of -1.5% to 2035
- By 2023, the standalone DAB replacement cycle will outstrip forecast sales of standalone DAB sets – set sales will never exceed the quantum of annual replacement sets after this point

Mediatique forecasting methodology

- Our forecast for DAB take up in the home relies on forecast set sales from 2020 to 2035:
 - We estimated the number of DAB sets in UK households; we assumed that the replacement cycle of a DAB set is 10 years, and therefore 10% of total sets are replaced each year
 - By using year on year forecasts for set sales and replacement sets, we estimated the yearly change in total sets in UK households i.e., if the quantum of replacement sets is higher than forecasted sets sold, then total DAB take up will decline
 - For hybrid DAB sets, we used an identical methodology as above – we also assumed that the ratio of ‘new hybrid homes’ (i.e., households that do not have access to a DAB hybrid set) will grow post-2030 as AM closes, larger stations migrate from FM to DAB, and AM/FM listeners follow suit
- The outputs confirm that standalone DAB will decline materially by 2035

Forecast DAB & hybrid DAB set sales*, 000s, 2015 - 2035

Source: GfK, Mediatique



Standalone DAB take up, yoy change, 2015-2035

Source: GfK, Mediatique

	2020	2025	2030	2035
Forecast standalone DAB sets sold (per year)	1,167	1,025	937	874
Forecast standalone DAB replacement sets (per year)	1,119	1,094	1,049	991
Total standalone DAB take up (m)	11.0	10.9	10.4	9.8
Total standalone DAB take up (%)	39%	37%	35%	32%

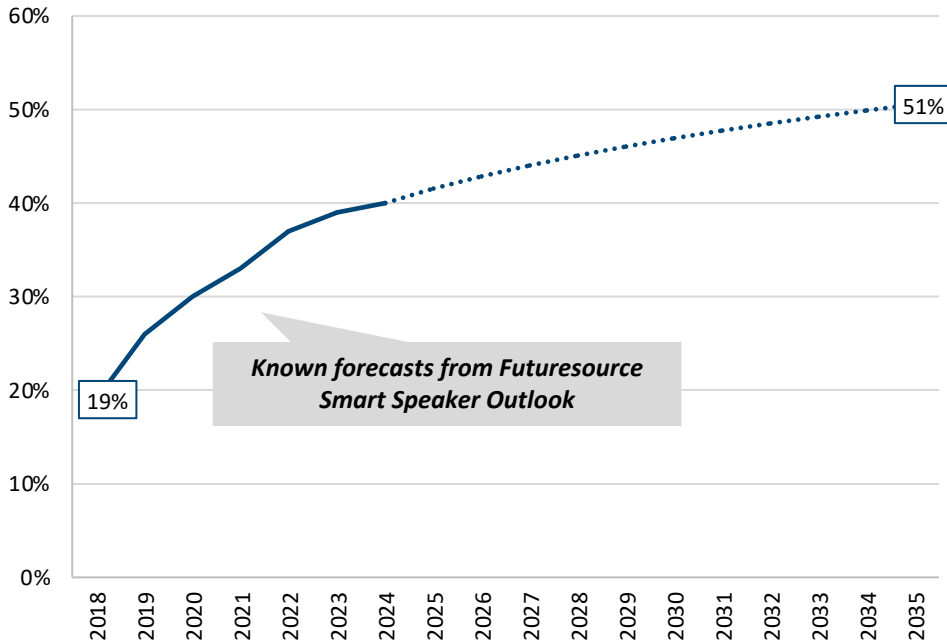
* For the purpose of this chart, we have grouped DAB & hybrid DAB set sales together to highlight declining sales for the reception mode overall

We were asked by the working group to revisit our smart speaker outcomes in the context of other published forecasts, set sales and market dynamics

- Analysis of Futuresource’s *hypothetical* trendline to 2035 suggests an end point of circa 51%, less aggressive than our base
- Smart speakers continue to be marketed aggressively by Amazon/Google; Covid has confirmed their importance in the home
- Analysis suggests caution in making a direct link between set sales and household take up – market dynamics are a factor

Futuresource - indicative take up forecast, 2018 - 2035

Source: Futuresource, Mediatique. Indicative trend line using Futuresource forecast to 2024.



We note that Futuresource’s report was published in July 2020; in the context of the Covid-affected year since it was published, and fast changing assumptions regarding take up and penetration, it is reasonable that Futuresource may have revised its forecasts, as we have done, in the period since. We include them here to provide an indicative comparison only.

- Analysis of industry forecasts confirms Mediatique’s revised outcome is at the higher end of the range – we estimate Futuresource’s end point in 2035 would be circa 51%
- The commentary accompanying these analyses is instructive for understanding sales’ relationship with household take up – while they continue to be marketed aggressively, there is a high chance of multiple ownership intra household, a high rate of technological development, and their future role is unclear

Futuresource – caveats to forecast device sales

Source: Futuresource, Mediatique.

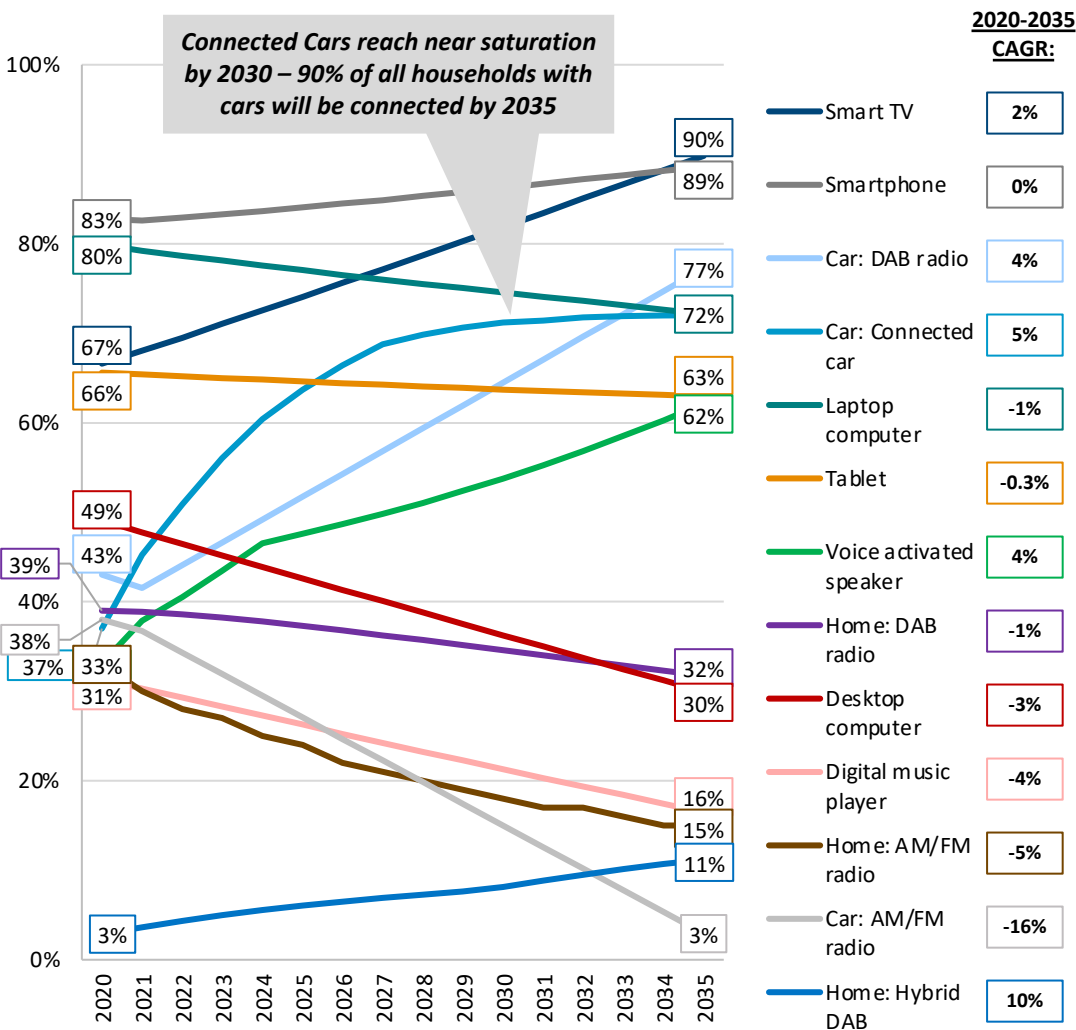
Futuresource caveats to sales	Details
Multiple ownership <i>Set sales to already-enabled homes</i>	Multiple ownership of smart speakers is already high – Futuresource estimate that the average number of smart speakers per home was 1.6 in 2019, growing to 2.3 by 2024
Technological development <i>Repeat purchases likely to access the latest tech</i>	Device is still relatively nascent, with improvements being made often – Futuresource cite that “over half of owners...would pay more for a better sounding device.”
Future role is in question <i>Potential to be usurped by other devices in the home</i>	The role played in navigation, voice activation and search may become less important as voice assistance is more integrated into home appliances, TVs and soundbars

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We expect strong growth in take up of connected devices (smart TVs, smart speakers) and DAB in cars, although there will be continued differences between age groups

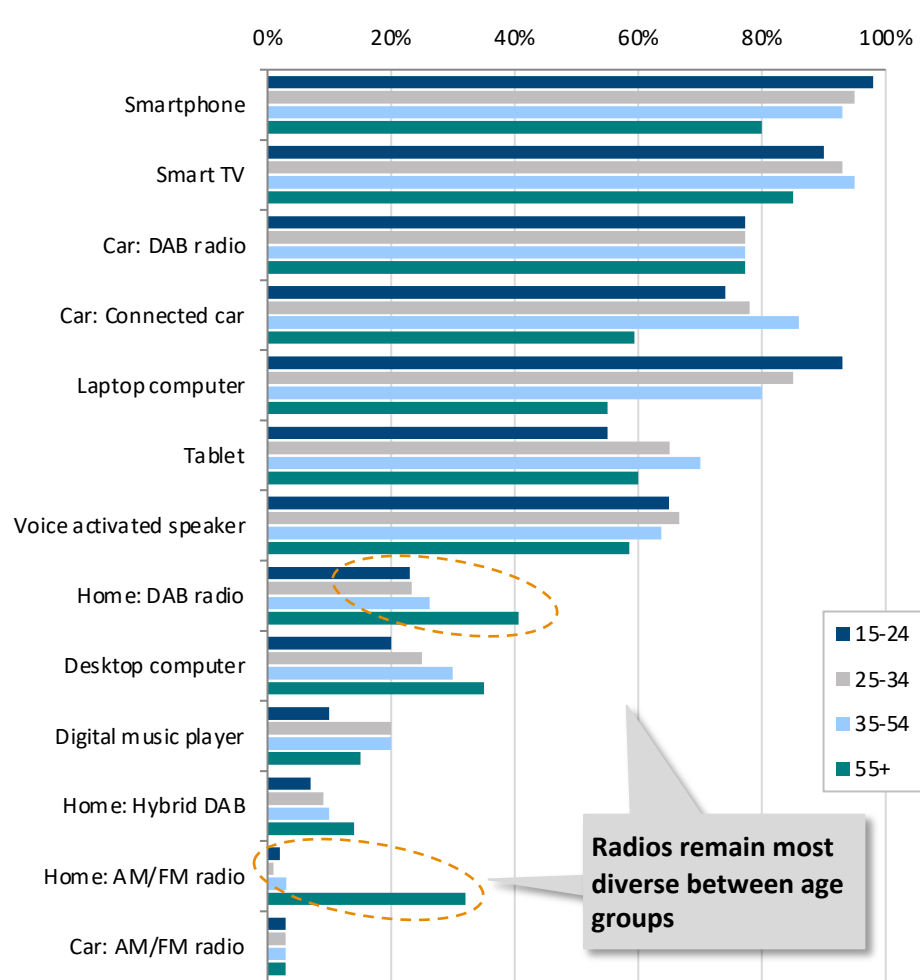
Device take up, 2020-2035, % households

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



Device take up by age group, 2035

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



Starting positions for device penetration in 2020 refer to Ofcom 'Household take up' definition rather than '15+ Individuals take up' as used by others (e.g., RAJAR)

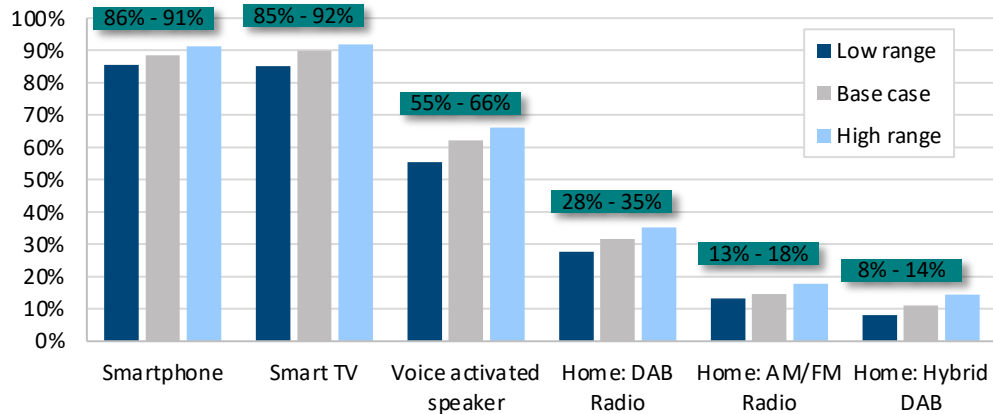
We have also forecast several other categories not pictured here in order to aid our usage forecasts. These are: any TVs and any radio in the home.

In addition to our base case, we included a range of take up outcomes to highlight that there is a degree of uncertainty when forecasting over such a long period

- Smartphones and smart TV outcomes have a relatively narrow range – younger demographics have reached near maturity
- More than other devices, there is a chance that smart speakers will be affected by marketing and distribution strategies
- Take up of hybrid DAB sets will likely hinge on take up of connected devices – it occupies a middle ground

Device take up, 2035, ranged outcomes, % households

Source: Mediatique



Device Take up, 2035, rationale for ranged outcomes

Source: Mediatique.

Device	Low range	High range
Smart-phone	<ul style="list-style-type: none"> Lower adoption across all demographics; declines in older age groups potentially evidence of digital behaviours not retained 	<ul style="list-style-type: none"> Younger demographics reached near maturity in base case – high range driven by greater take up by older demographics
Smart TV	<ul style="list-style-type: none"> Take up falls across all demographics – potentially driven by longer than forecast replacement cycle, i.e., smart TVs taking longer to reach ‘new’ homes 	<ul style="list-style-type: none"> Smart TVs already near ubiquity in three youngest demographics base case – 55+ the only demographic with credible room for higher range
Voice activated speaker	<ul style="list-style-type: none"> Declines across all demographics – all susceptible to potential changes to marketing and distribution strategies, both crucially important to smart speaker take up 	<ul style="list-style-type: none"> Small increases across all demographics, reflecting already high base case – assume that continued marketing and inclusion in bundles affects all demographics
Home: DAB Radio	<ul style="list-style-type: none"> Declines for all demographics – greatest among older where 2035 take up is higher 	<ul style="list-style-type: none"> Younger demographics remain unlikely to commit to DAB even in high range; older demographics have more scope from higher base
Home: AM/FM Radio	<ul style="list-style-type: none"> Minimal change among younger age groups - base case low already Greater declines in 55+, but still not large given commitment to AM/FM 	<ul style="list-style-type: none"> Little change in younger age groups – small scope for increased take up, even in high range Room for higher range in older demographics
Home: Hybrid DAB	<ul style="list-style-type: none"> Minimal difference for younger demographics – low take up already Greater change among older age groups 	<ul style="list-style-type: none"> Younger demographics unlikely to be dissuaded from connected devices, even in high range – more likely in older demographics

Device take up, 2035, demographic adjustments

Source: Mediatique - % point changes refer to changes to base case by demographic

	15-24	25-34	35-54	55+	15-24	25-34	35-54	55+
Smartphone	-3.0%	-5.0%	-3.0%	-2.5%	0.0%	0.0%	2.0%	5.0%
Smart TV	-5.0%	-3.0%	-5.0%	-5.0%	0.0%	0.0%	0.0%	5.0%
Voice activated speaker	-7.4%	-6.6%	-3.7%	-8.6%	2.6%	3.4%	1.3%	6.4%
Home: DAB Radio	-2.0%	-2.3%	-2.3%	-5.6%	2.0%	4.2%	3.7%	4.4%
Home: AM/FM Radio	-0.6%	-0.6%	-1.0%	-2.2%	0.9%	1.4%	2.5%	5.3%
Home: Hybrid Radio	-2.0%	-1.5%	-2.5%	-4.0%	1.5%	1.0%	5.0%	3.5%

Low range

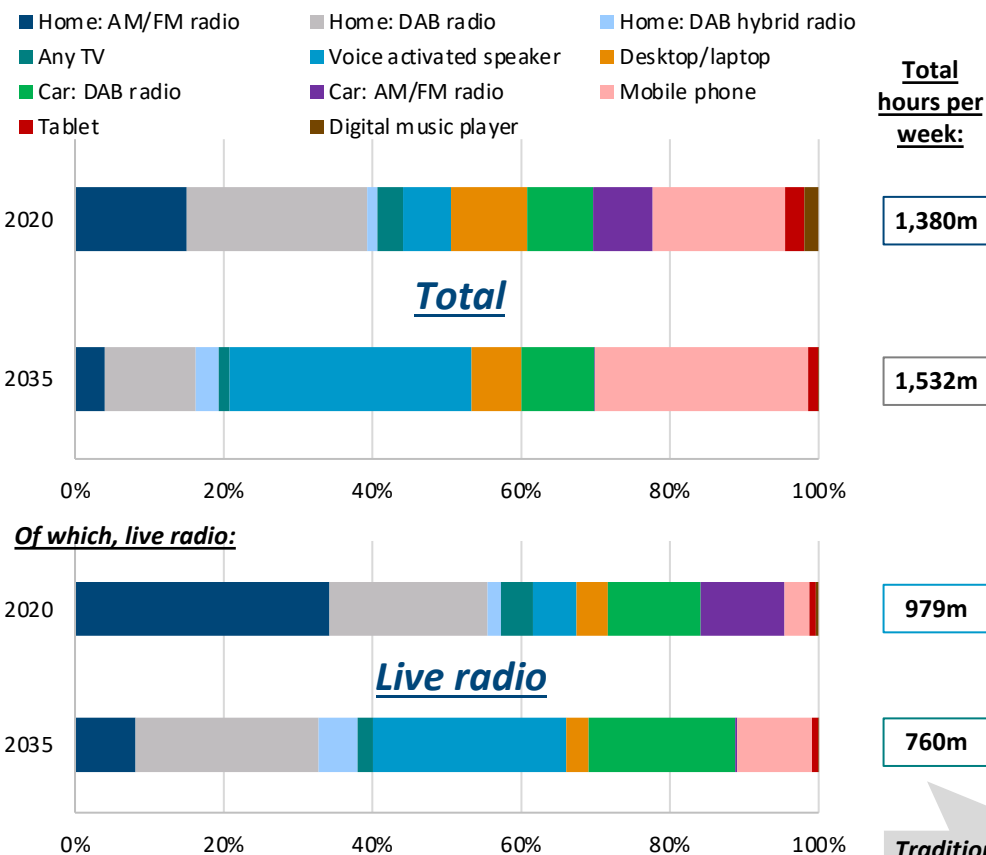
High range

Device usage will be based on overall penetration and changes to consumption patterns within each device category

- AM/FM in the home loses share to DAB with total radio down moderately
- Voice activated speakers and car DAB likewise grow – at the expense of desktops/laptops, tablets, digital music players and, for vehicles, car AM/FM

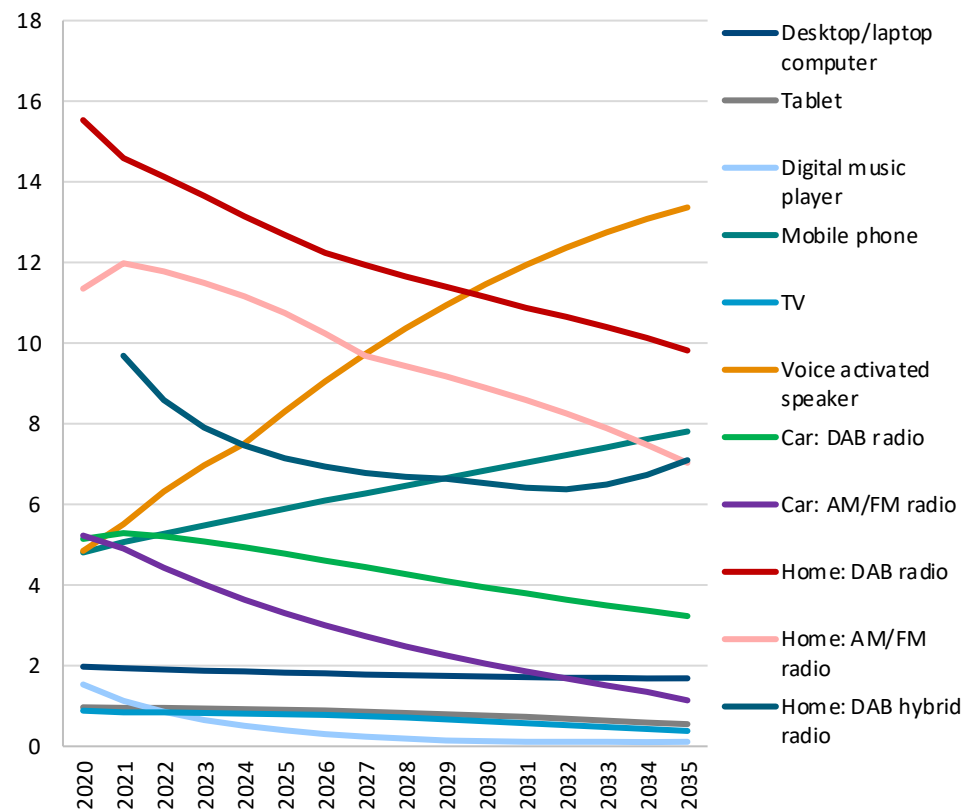
Total and live radio hours by device, 15+, 2020 vs. 2035

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



Av. hours per week of enabled indivs, 15+, 2020-2035

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



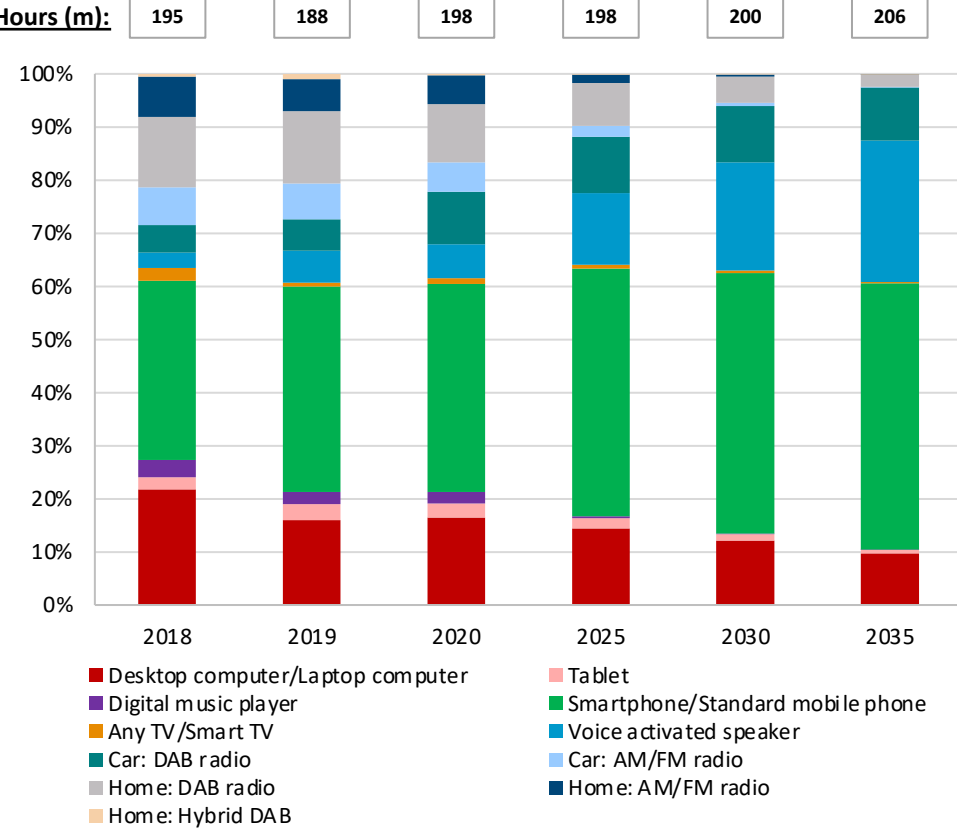
Traditional distribution 53% of all radio hours, down from 79%

Audio consumption for 15-24s will be dominated by smart speakers and smartphones in 2035 – 55+ consumers will retain attachment to traditional audio devices

- Smartphones and smart speakers will represent over 75% of 15-24 audio consumption in 2035
- Even to 2035, a rump of AM/FM listening in the home will remain for 55+ consumers
- Smart speaker share of total audio consumption will be roughly 25% for both youngest and oldest demographics

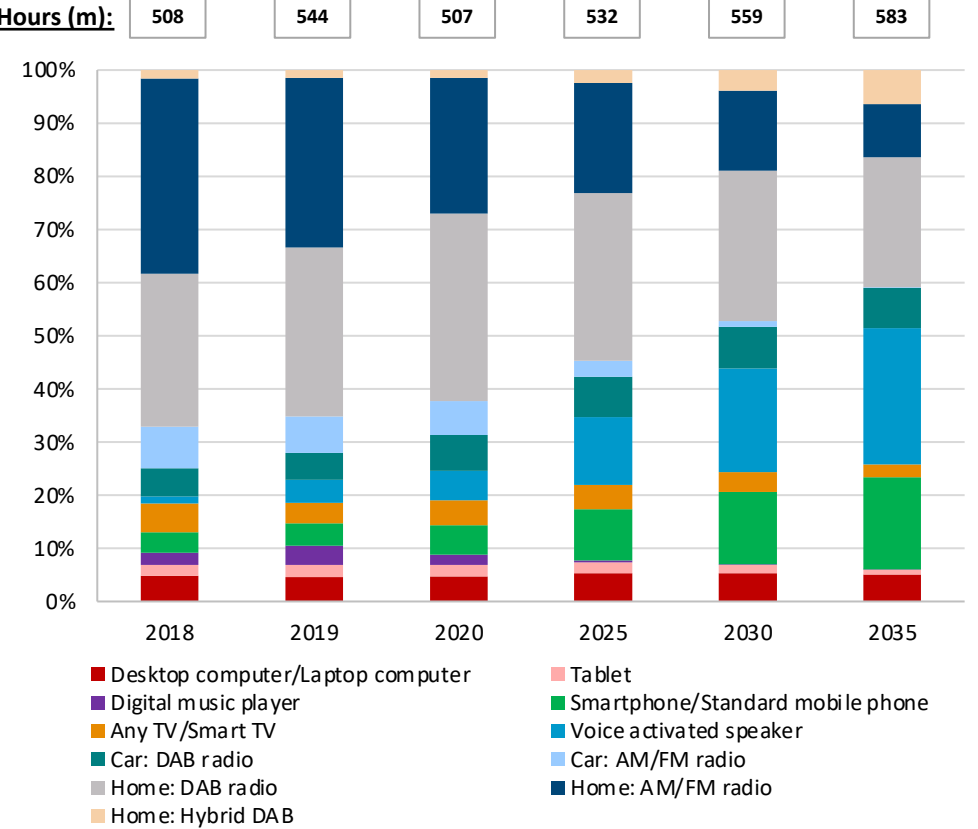
Share of total audio consumption by device, 15-24

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



Share of total audio consumption by device, 55+

Source: MIDAS, Ofcom Technology Tracker, Mediatique.

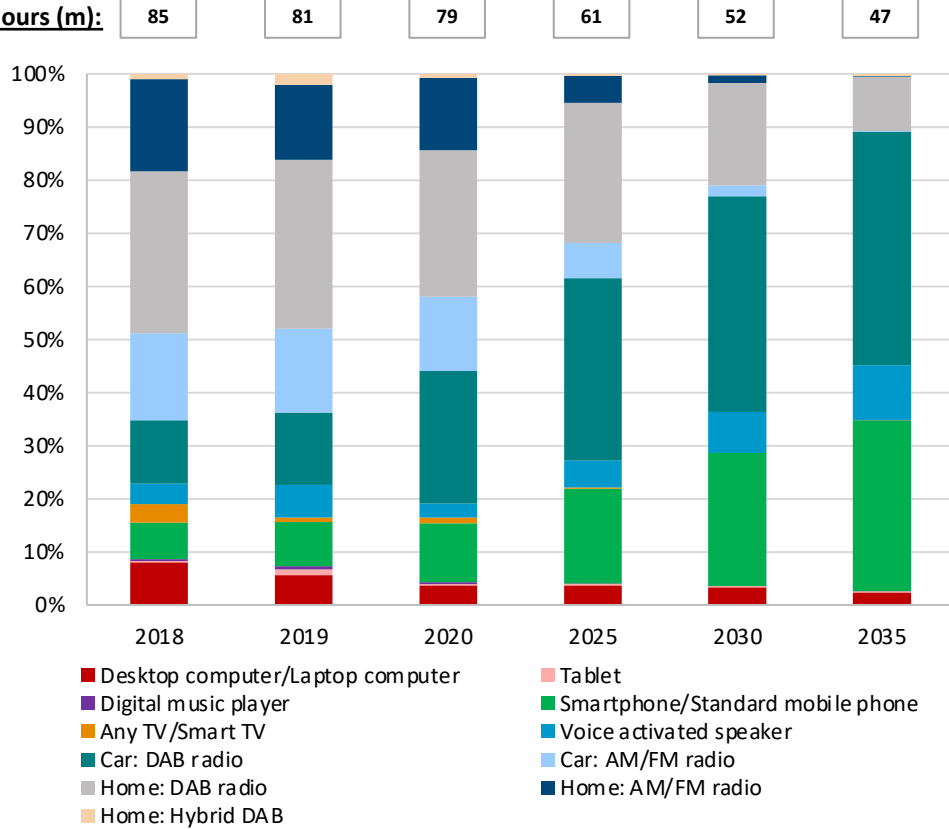


Devices used to listen to live radio will be less diverse in 2035 than currently – this is true across all demographics

- 54% of 15-24 live radio listening will come from DAB radios (in the home and the car), with smartphones and smart speakers accounting for the majority of the rest of radio listening
- 55+ use of smart speakers will outstrip younger demographics at 24% of live radio listening, although a rump of AM/FM listening will remain for this cohort in 2035

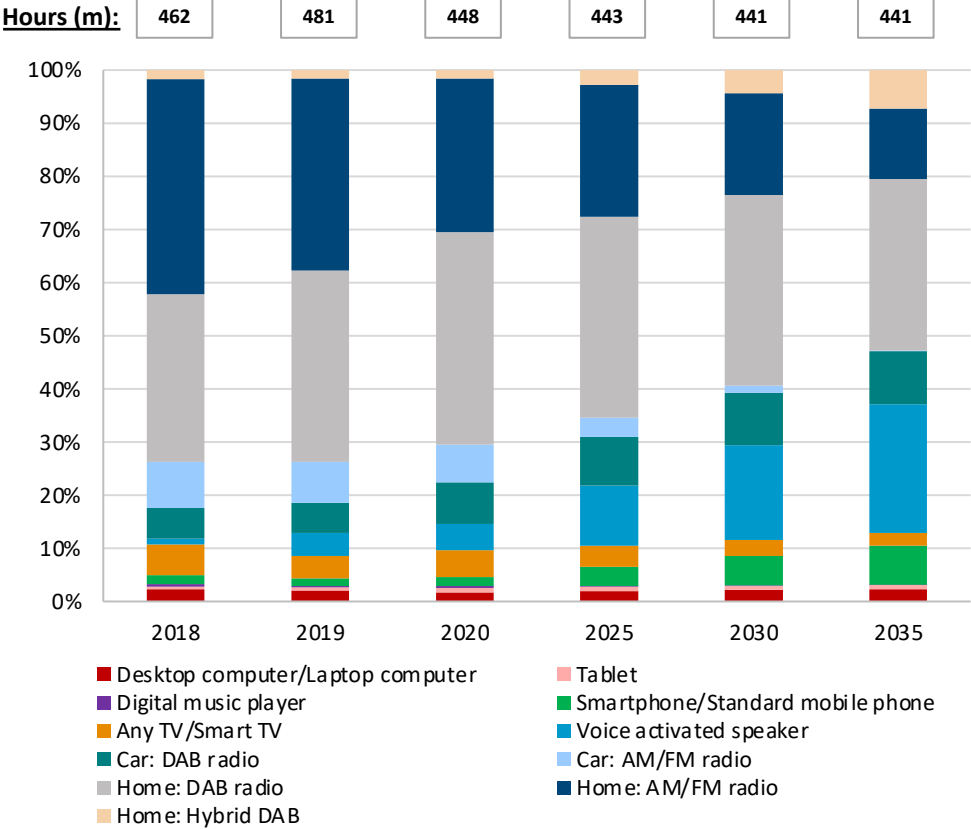
Share of live radio consumption by device, 15-24

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



Share of live radio consumption by device, 55+

Source: MIDAS, Ofcom Technology Tracker, Mediatique.



Higher penetration of smart speakers and smartphones will likely benefit IP delivery of radio, contributing further to AM/FM decline and slowing growth of DAB

- IP share of live radio listening will grow to 40% in 2035, up from 14% in 2020
- AM/FM share of radio listening will fall to 8% in 2035, with DAB accounting for 44% of live radio listening across demographics
- Smart speakers will represent nearly two thirds of all IP radio listening – smartphones will contribute a quarter

- In 2019 we forecast the share of total radio hours that would be delivered by different platforms over the forecast period
- The key dynamics observed then remain true today: AM/FM listening is declining, offset by increasing use of the DAB platform and a migration of listening to IP
- Since 2019 (and 2020 when we provided an update to share of listening on radio platforms), we have revised our forecasts for smart device take up
- Necessarily this has had an impact on the number of live radio hours listened to on smart devices, IP’s share of live radio listening – further affecting AM/FM, DAB and DTV’s share of live radio listening – and total live radio hours
- *Overleaf we present more detailed analyses of forecast outcomes – confirming the effects of changes made in the period since 2019*

2035 share of live radio listening, by delivery platform

Source: Mediatique.

	AM/FM	DAB	DTV	IP
62% penetration* (2021 base case)	8%	44%	2%	40%

Hybrid DAB in the home will deliver 5% of radio listening in 2035

2035 share of IP listening – IP listening by device

Source: Mediatique.

	Smart speaker	Smartphone	Tablet	PC
62% penetration* (2021 base case)	65%	25%	2%	7%

* In both tables refers to forecast penetration of smart speakers in 2035.

Our audio device take up and usage forecasts have been revised since 2019 – we made these changes in response to newly available data and Covid-induced impacts







- Our forecast for IP’s share of live radio listening (40% in 2035) is up from 26%, our original forecast from 2019
- Smart speakers’ forecasted share of IP in 2035 has increased ten percentage points since 2019 – from 55% to 65%
- Assumptions regarding demographics’ share of live radio listening remain unchanged

Summary of changes to radio listening outcomes - 2035

Source: Mediatique

Live Radio Listening, by platform	AM/FM	DAB	DTV	IP	Details – rationale for change
50% penetration* (2019 base case)	13%	57%	4%	26%	<ul style="list-style-type: none"> ▪ Smart speaker take up higher than originally forecast in 2019 ▪ Smart speaker usage higher than originally forecast in 2019 ▪ Evidence of Covid accelerating trends - higher penetration and usage disfavours other delivery modes (AM/FM & DAB) ▪ <i>Hybrid DAB (not included in 2019) takes 5% share of radio in 2035</i>
60% penetration* (2020 sensitivity)	10%	52%	3%	35%	
62% penetration* (2021 base case)	8%	44%	2%	40%	
IP Radio Listening, by device	Smart speaker	Smartphone	Tablet	PC	Details – rationale for change
50% penetration* (2019 base case)	55%	32%	4%	10%	<ul style="list-style-type: none"> ▪ Higher smart speaker penetration – as confirmed above – will disfavour other devices’ share of IP listening ▪ Of IP devices, smart speakers are most comparable to radio sets despite being multi functional (e.g., stationary and kept in the home; significantly more radio listened to than other IP devices)
60% penetration* (2020 sensitivity)	64%	26%	2%	8%	
62% penetration* (2021 base case)	65%	25%	2%	7%	
Share of Radio Listening, by demog.	15-24	25-34	35-54	55+	Details – rationale for change
2019 base case	6%	7%	27%	59%	<ul style="list-style-type: none"> ▪ No changes made to assumptions regarding share of live radio listening by demographic ▪ <i>2021 outputs derived from separate model to 2019 – as discussed with the working group – included here to reiterate no material changes to Mediatique assumptions</i>
2021 base case	6%	8%	28%	58%	

In addition to our base case, the BBC asked Mediatique to model three alternative scenarios using sensitivities around receiver policy and mandated FM switchover

Scenario	Hypotheses	Induced behaviour	Take up <i>Impact</i>	Listening <i>Impact</i>
1) All radio receivers mandated to receive DAB+ from 2025	<ul style="list-style-type: none"> ▪ <u>Radio set take up:</u> The combination of new stations, accessibility and potentially a publicity campaign could provide a ‘bump’ to standalone DAB set take up ▪ <u>Listening:</u> Marginally higher listening for existing DAB users to account for additional stations now accessible to them 	<ul style="list-style-type: none"> ▪ <u>Consumers:</u> Likely a small increase in standalone DAB take up – impact of newly accessible stations may also extend listening time for DAB users ▪ Immaterial for motivations for purchase and behaviours relating to other devices 		
2) All DAB receivers mandated to receive DAB+ from 2024	<ul style="list-style-type: none"> ▪ <u>Radio set take up:</u> Take up behaviours so engrained that this should not materially affect take up: AM/FM users are stubborn and wedded to devices; younger demographics are not attracted to radio sets because of limited functionality (i.e., <i>just</i> radio listening) ▪ <u>Listening:</u> As above – marginally higher listening for existing DAB users accounting for more stations 	<ul style="list-style-type: none"> ▪ <u>Consumers:</u> Limited change to take up and behaviours; reasons for smart device take up/listening are so diverse and removed from radio set purchase that net impact is insignificant – DAB+ not significant enough to ‘move the dial’ for other analogue users 		
3) FM broadcasts switched off in 2030	<ul style="list-style-type: none"> ▪ <u>Radio set take up:</u> Majority of AM/FM users will migrate to DAB/hybrid DAB (familiarity and relative simplicity to use); a minority will migrate to IP ▪ <u>Listening:</u> Small short-term decline in number of listening hours as listeners ‘fall through the cracks’; radio users will listen to radio for longer; users that do not migrate to DAB will likely be mopped up by IP 	<ul style="list-style-type: none"> ▪ <u>Consumers:</u> Significant proportion of AM/FM users purchasing DAB set is likely – users unlikely to upgrade/migrate unless forced to ▪ Assume non-migrators already IP-enabled enough (e.g., phone, smart speaker) not to materially affect device take up 		

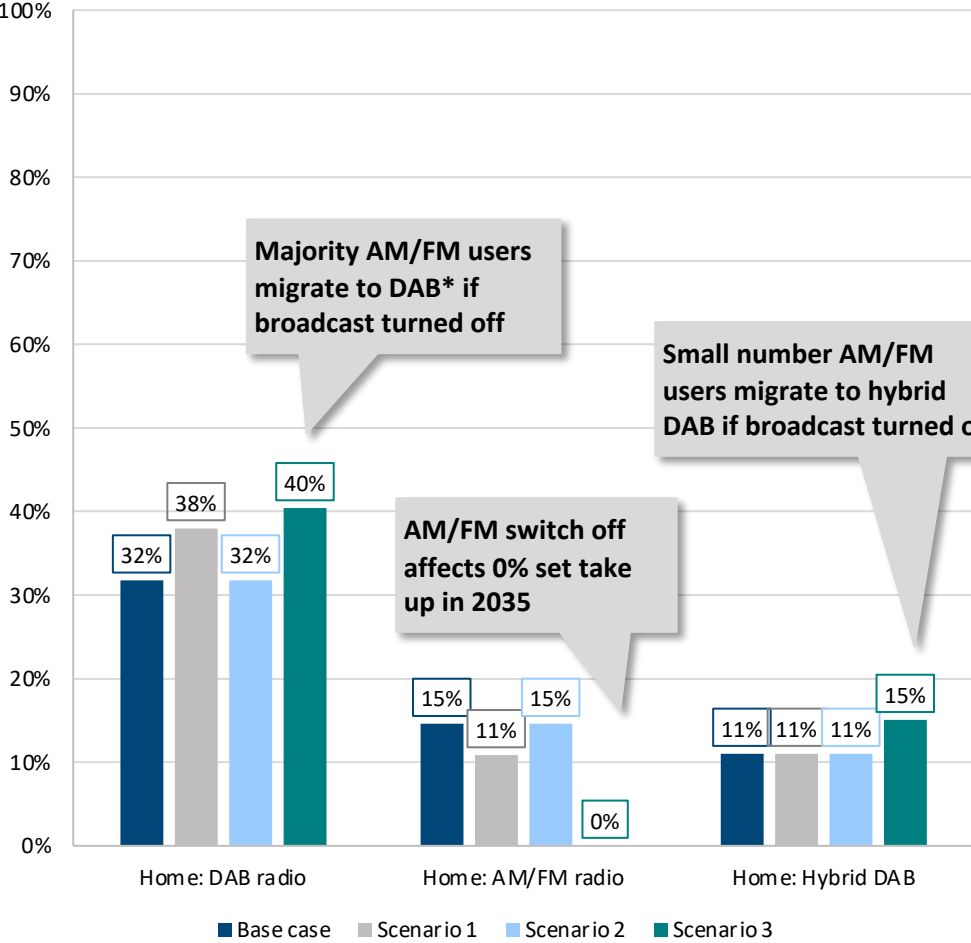
Hypotheses informed by industry benchmarks and territory analysis (territories where AM/FM broadcast has been fully turned off)

Operator behaviour also possible here (e.g., abandoning analogue transmission)

The three scenarios have little to no impact on take up of smart devices – take up of DAB, hybrid DAB and AM/FM in the home are most affected by scenarios 1 and 3

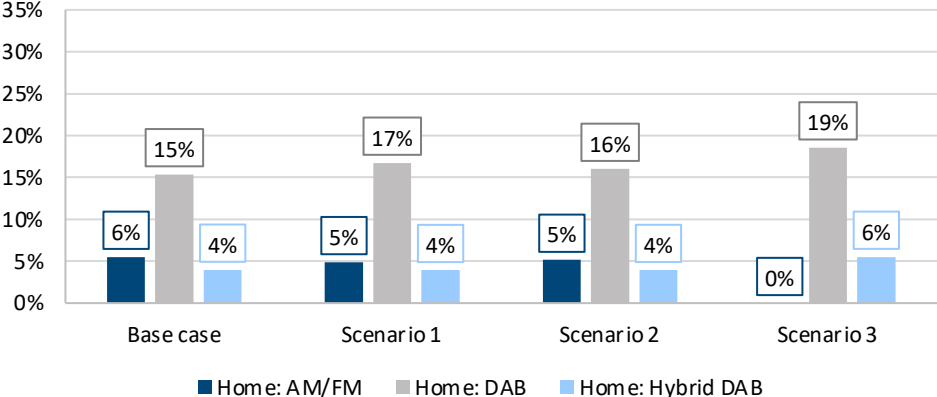
Device take up in 2035, 15+, by scenario

Source: Mediatique.



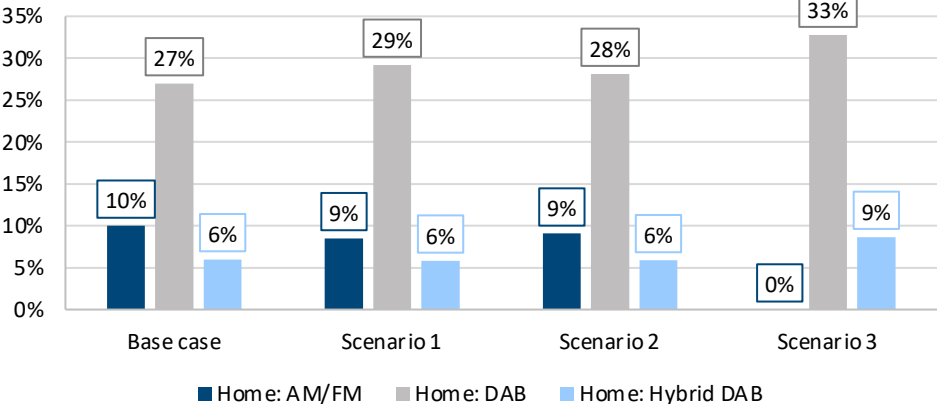
Share of all audio by device, 15+, by scenario

Source: Mediatique.



Share of live radio by device, 15+, by scenario

Source: Mediatique.



* In Scenario 3, we assume a minority of AM/FM users will already have DAB/hybrid DAB sets and/or will choose to listen to radio over devices that are IP enabled (e.g., smart speakers and smartphones).

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The BBC and Bauer also asked Mediatique to contribute a list of glossary definitions to accompany its full report

Glossary and definitions

Wearable technology	<ul style="list-style-type: none"> ▪ Electronic devices that can be worn as accessories; invariably devices will connect to another device carried on the user’s person (e.g., smartphones) and can be used to monitor health, time, communicate, and stream A/V content ▪ Because wearable technology requires a hub device (i.e., a smartphone from which to tether to), we do not classify them as ‘audio-enabled’ devices in and of themselves
Bluetooth/Wireless Speakers	<ul style="list-style-type: none"> ▪ Portable speakers that pair with smartphones, tablets, laptops and computers via Bluetooth connectivity ▪ As above, because Bluetooth speakers require a hub device to produce A/V content, we do not classify these as ‘audio-enabled’ devices in and of themselves
Connected Cars	<ul style="list-style-type: none"> ▪ Vehicles capable of using phones, tablets and/or laptops as hub devices for broadcasting audio whilst in transit – connection to the third-party device can be via Bluetooth or wired, the latter integrating the device into the vehicle’s software
Smart/IP-enabled device	<ul style="list-style-type: none"> ▪ Electronic devices that are internet enabled (e.g., smart speakers and smartphones) ▪ Differ from ‘dumb’ phones, TVs and speakers because the devices can natively connect to the internet, rather than being internet enabled by connection to a secondary device (e.g., an Amazon Fire Stick that by-passes a smart TV’s connectivity or connects via a ‘dumb’ TV)
‘IP delivered’ or ‘Delivered over IP’	<ul style="list-style-type: none"> ▪ A/V content delivered over the internet rather than traditional distribution modes (e.g., AM/FM and DAB) ▪ Forecast higher take up of smart devices and changes to consumer behaviours will contribute to IP distribution being a more significant delivery mode by 2035
Hybrid DAB Radio	<ul style="list-style-type: none"> ▪ Radio sets able to receive digital broadcast services (DAB) and services delivered over IP ▪ Diversifies listening activities available to the end user: users remain able to listen to broadcast radio (as on a standalone DAB set) but also have access to services delivered over IP (e.g., streaming services, playback radio)

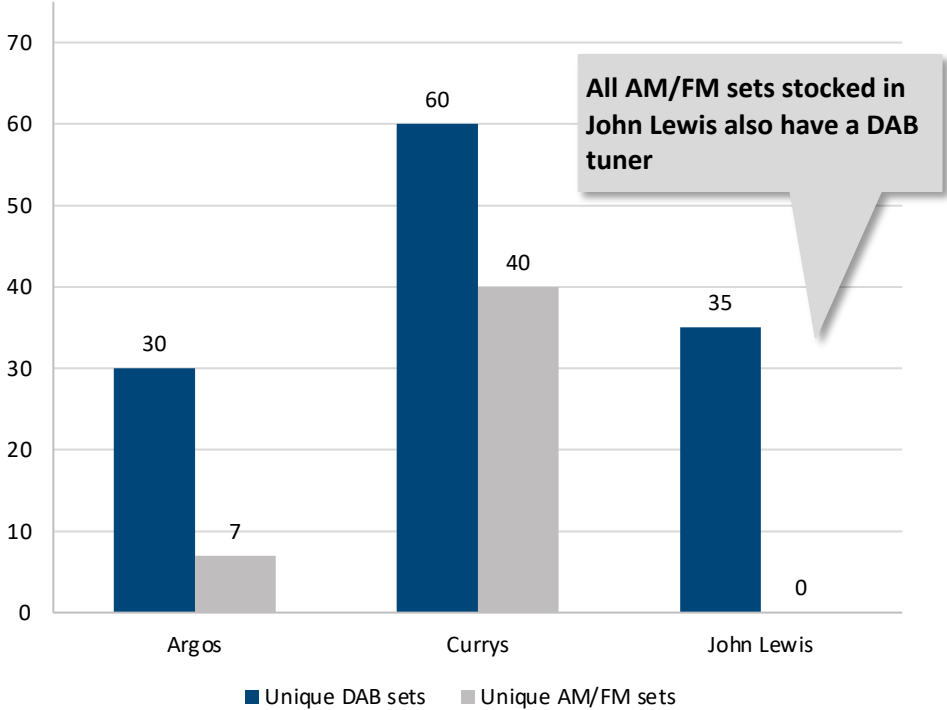
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Mediatique’s review of three major UK retailers suggests that availability of AM/FM and DAB sets remains high even in the wake of declining sales

- The three retailers stock a wide range of AM/FM and DAB sets – although availability is not indicative of sales, it does suggest that consumer demand is significant enough to warrant stock with variable price points and types of functionality
- A higher proportion of sets in John Lewis are hybrid DAB sets and Currys has the largest range (both DAB & AM/FM)

Unique* DAB & AM/FM sets by retailer, 2021

Source: Mediatique



DAB sets, by retailer, 2021

Source: Mediatique

	Argos	Currys	John Lewis
Unique brands	4	18	6
Unique sets	30	60	35
DAB+ (%)	25%	72%	86%
Hybrid DAB (%)	3%	9%	31%
Average RRP	£79.89	£69.14	£250.91

Retailer strategies, radio sets - analysis

Source: Mediatique

Argos	<ul style="list-style-type: none"> ▪ Non-premium range; half of unique sets retail at under £50 ▪ Stocks Bush own brand and three others, including Roberts ▪ Emphasis on ‘classic’ and ‘retro’ radio designs
Currys	<ul style="list-style-type: none"> ▪ Widest range of all three retailers – 18 unique brands ▪ Addresses car market – stocks both AM/FM & DAB radios
John Lewis	<ul style="list-style-type: none"> ▪ Premium – higher proportion of ‘all-in-one’ hi-fi units ▪ No standalone FM radios – all AM/FM radios have DAB incorporated, no entry level sets. Least expensive set priced at £39.99

*The gross number of sets available at each retailer is greater than shown above; we choose to review the number of unique sets to eliminate duplicate sets from our analysis (e.g., models available in multiple colourways and therefore artificially inflating the outcome)

Mediatique Ltd

65 Chandos Place
London WC2N 4HG
UNITED KINGDOM

Telephone: +44 (0)20 7836 5050

www.mediatique.co.uk

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