

Market Survey: Fixed Wireless Access CPE

Survey Results, July 2022

Confidential Report for GSA
4G-5G FWA Forum Members

Introduction

- The purpose of the GSA 4G-5G FWA Forum is to educate the industry about the fixed wireless access (FWA) market. There are currently no agreed market definitions, there is a lack of market information and no consensus about the volume of FWA device shipments and FWA installed base globally
- The annual GSA FWA CPE market survey aims to address this issue. It was first conducted in 2021 and this report presents the findings of the 2022 survey, where data was collected from April to June 2022. A total of 26 CPE vendors from the GSA 4G/5G FWA Forum answered the survey
- The results present the aggregate answers of those 26 CPE vendors. We estimate that this is a significant representation of the market for 3GPP-based 4G and 5G FWA devices
- Participants in the survey were: Asiatelco Technologies, Askey, BEC Technologies, Casa Systems, Changhong, Da Ta Technologies, Esound Technology, Gongjin Mobile Communication/T&W, GosuncnWelink Technology, Green Packet, Huawei, Intelbras, Jatou Technology, Jointelli, MeiG Smart Technology, MiWire, Mobot Mobile, Nokia, Notion InfoTech, Oppo, SMAWave, TCL, TigerCel, Tozed Kangwei, Wavetel and WNC.

Executive Summary

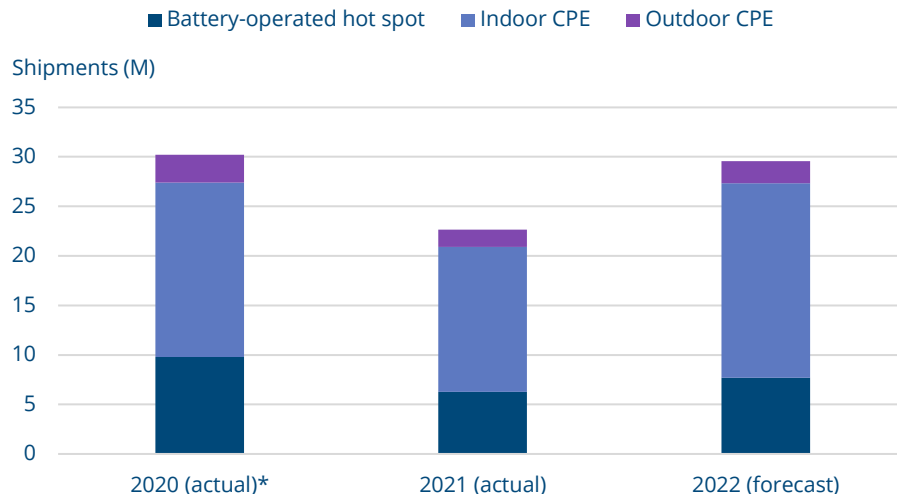
- On aggregate, respondents' sales volumes fell 25% year-on-year from 2020, while more than half of respondents saw volumes increase over the same period
- The decline came from battery-operated hot spots, which fell 36% annually after a surge in demand during the Covid-19 pandemic
- The component shortage, which hit volumes in 2021, is now easing, with 18 out of 22 respondents expecting no or minor component shortage in 2023
 - More respondents switched to outsourcing chipsets and modules in 2021 than they had planned to a year prior. There is a desire to source chipsets from more companies
- Shipments of FWA 5G devices grew 162% in 2021, despite a total market decline, to represent 16% of shipments. By 2022, vendors expect more than a quarter of product portfolios to be 5G. Vendors are continuing to adjust their 5G CPE to support Wi-Fi 6
 - Millimetre-wave-capable devices remain a small proportion of 5G FWA shipments, but more respondents are planning to introduce the technology, although some have delayed plans

Executive Summary

- Shipment growth is expected to speed up again in 2022 compared with 2021, with the mean growth expected to be about 30%. Most of the growth is being driven by FWA CPE devices, which are expected to eclipse 2020 volumes
- Of all form factors, there is strong consensus that window-mounted, flexible indoor and outdoor CPE and self-installation apps are growing. Hybrid fibre/DSL CPE has a more mixed expectation
- "Connecting the unconnected" is seen as the most important trend for 2022. "Government broadband" and "5G launch" plans are not expected to be as significant in comparison with 2021
- Most respondents think prices of 5G CPE devices will still take a couple of years to reach parity with those of 4G CPE. Prices may also be affected by inflation, with 15 out of 22 respondents expecting minor inflation effects in 2023

Combined Device Shipments

- 22.7 million shipments were recorded across all respondents for 2021. Total shipments fell 25% year-on-year from 2020, across the sample. This figure is not representative of the total market size as the sample does not represent the full market
- FWA CPE declined less than the total shipments, by 20%, compared with battery-operated hot spots, which fell 36% year-on-year
 - Battery-operated hot spots witnessed a correction in 2021 after experiencing a surge in demand in 2020 as a result of the pandemic
- Shipment growth is expected to accelerate again in 2022 compared with 2021:
 - 33.3% growth for 4G and 5G FWA CPE, above the levels of 2020, once supply chain issues ease
 - 22.9% growth for battery-operated hot spots. Despite this, the devices are not expected to return to the levels of 2020
- Indoor CPE to represent 63% of volumes shipped from 2020 to 2022



*2020 is lower than reported in 2021 FWA survey, owing to a change in the companies surveyed

	Device shipments (M)				YoY growth (%)	
	2020	2021	2022 (forecast)	Total 2020-2022	2021	2022 forecast
Battery-operated hot spot	9.8	6.3	7.7	23.8	-36.1%	22.9%
Indoor CPE	17.6	14.6	19.6	51.8	-16.9%	34.2%
Outdoor CPE	2.8	1.8	2.2	6.8	-36.8%	25.9%
Total shipments	30.2	22.7	29.5	82.4	-25.0%	30.4%
FWA CPE (indoor and outdoor)	20.4	16.4	21.9	58.6	-19.6%	33.3%

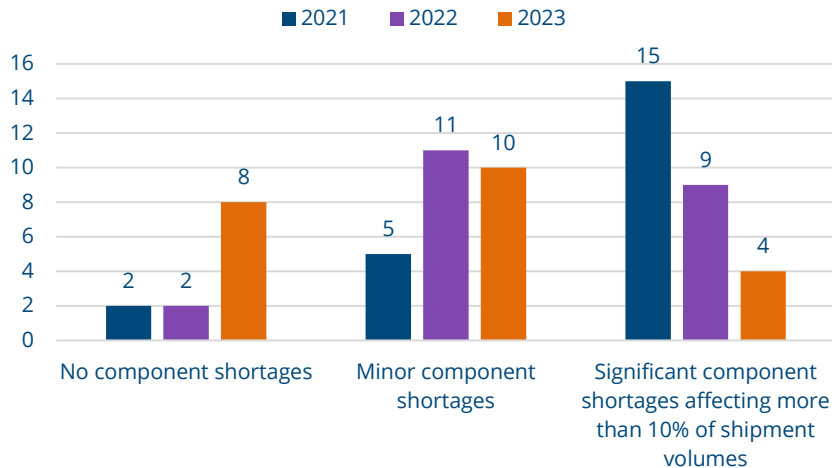
Sample: 2021 FWA survey, 25 respondents; 2022 FWA survey, 26 respondents

Impact of Component Shortage and Inflation

- Significant component shortage impact is easing: 18 out of 22 respondents expect no or minor component shortages in 2023
- Increasing minor inflation effects, with 15 out of 22 respondents expecting minor inflation in 2023

Impact of component shortage, count of vendors

Sample: 2022 FWA survey, 22 respondents

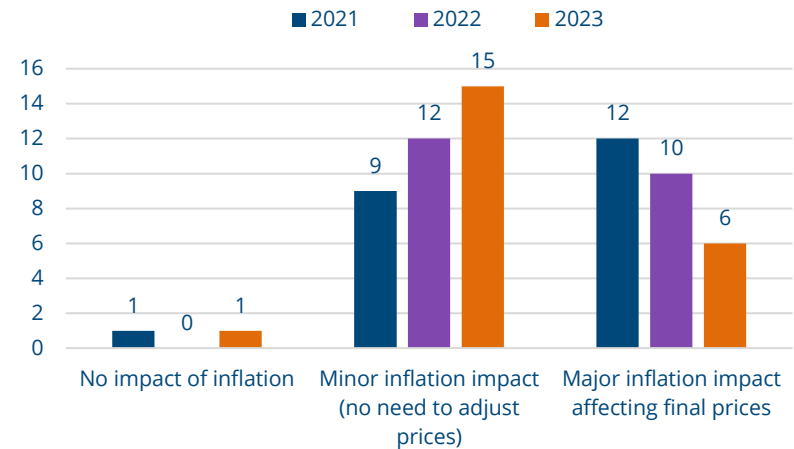


Questions:

1. Has your company been affected by component issues in 2021?
2. Is your company experiencing component issues in 2022?
3. Do you expect your company to be affected by component shortages in 2023?

Impact of inflation, count of vendors

Sample: 2022 FWA survey, 22 respondents



Questions:

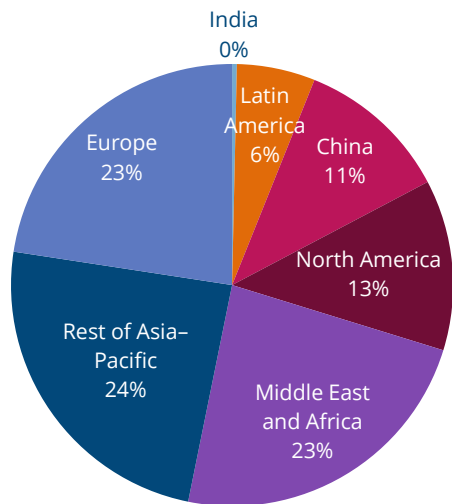
4. Did your company perceive inflation pressures during 2021 as a result of Covid-19, or workforce and/or component shortages?
5. Is your company experiencing inflationary pressures during 2022?
6. Do you expect your company to be affected by inflationary pressures in 2023?

Device Shipments by Region

- Europe and North America have expanded their share of shipments

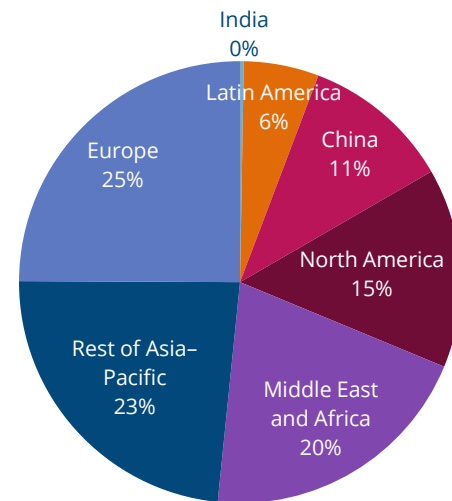
How did your 2020 shipments break down by region? (percentage of total device shipments)

Sample: 2021 FWA survey, 25 respondents



How did your 2021 shipments break down by region? (percentage of total device shipments)

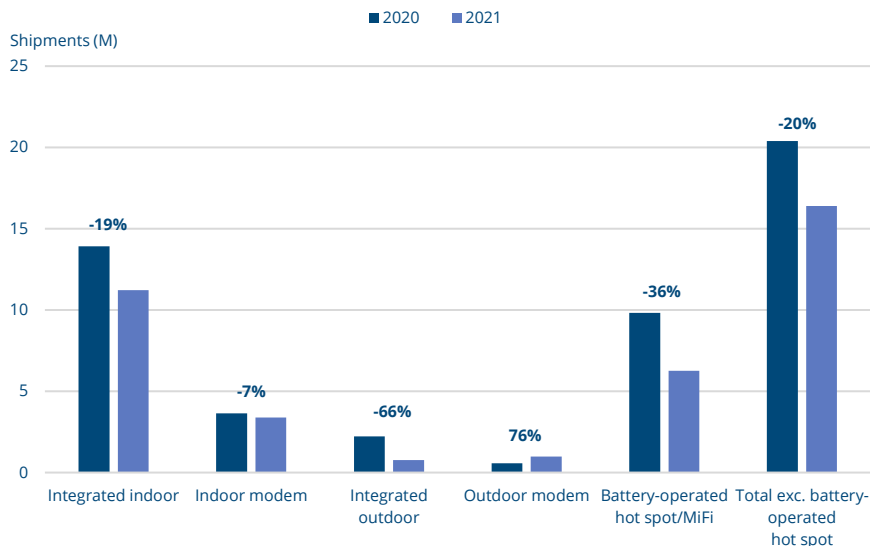
Sample: 2022 FWA survey, 26 respondents



Device Shipments by Type

4G and 5G FWA CPE unit shipments by form factor

Sample: 2021 FWA survey, 25 respondents; 2022 FWA survey, 26 respondents



Vendor shipments split by 4G/5G FWA CPE, unit shipments by form factor (2021)

Sample: 2022 FWA survey, 26 respondents

Device shipments (M)			
Vendors	Battery-operated hot spots	CPE	Total
Battery-operated hot spots only	0.00	0.00	0.00
Battery-operated hot spots and CPE	6.26	13.24	19.51
CPE only	0.00	3.15	3.15
Total	6.26	16.40	22.66

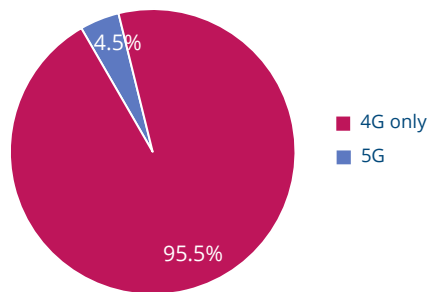
- Derived from cross analysis of shipments by vendors and form factor
- "Battery-operated hot spots only" means vendors that only sold the battery-operated hot spot form factor
- "Battery-operated hot spots and CPE" means vendors that sold both form factors
- "CPE only" means vendors that only sold the CPE form factor

5G Device Shipments

- FWA 5G shipments grew 162% in 2021, despite the total market decline
- By 2022, more than a quarter of shipments are expected to be 5G

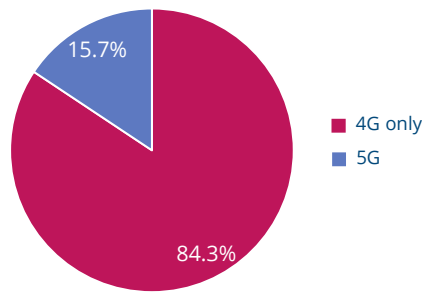
Breakdown of 2020 shipments by technology

Sample: 2021 FWA survey, 25 respondents



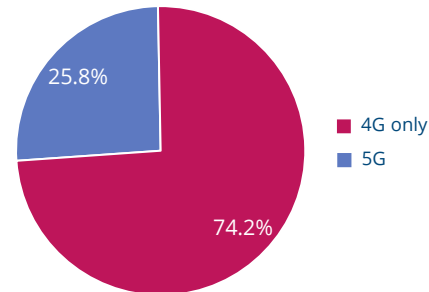
Breakdown of 2021 shipments by technology

Sample: 2022 FWA survey, 26 respondents



Breakdown of 2022 shipments (forecast) by technology

Sample: 2022 FWA survey, 26 respondents



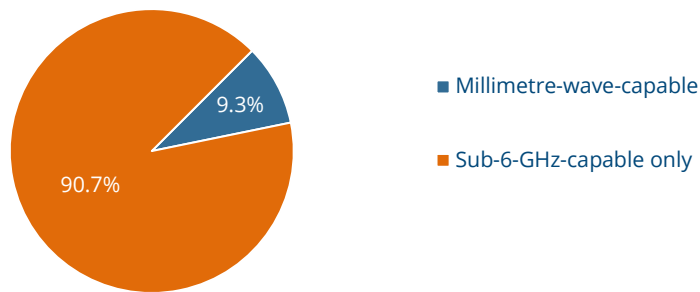
	Shipments (M)			YoY growth (%)	
	2020	2021	2022 (forecast)	2021	2022 (forecast)
Total device shipments	30.2	22.7	29.5	-25.0%	30.4%
4G-only shipments	28.8	19.1	21.8	-34%	14%
5G shipments*	1.4	3.6	7.6	162%	114%

Millimetre-Wave 5G Device Shipments

- Millimetre-wave-capable devices remain a small proportion of 5G FWA shipments

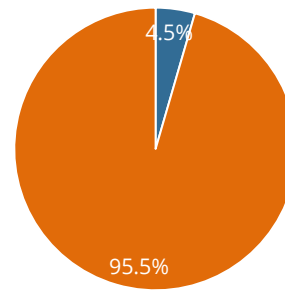
What percentage of your 5G device shipments in 2020 were millimetre-wave-capable?

Sample: 2021 FWA survey, 25 respondents



What percentage of your 5G device shipments in 2021 were millimetre-wave-capable?

Sample: 2022 FWA survey, 26 respondents



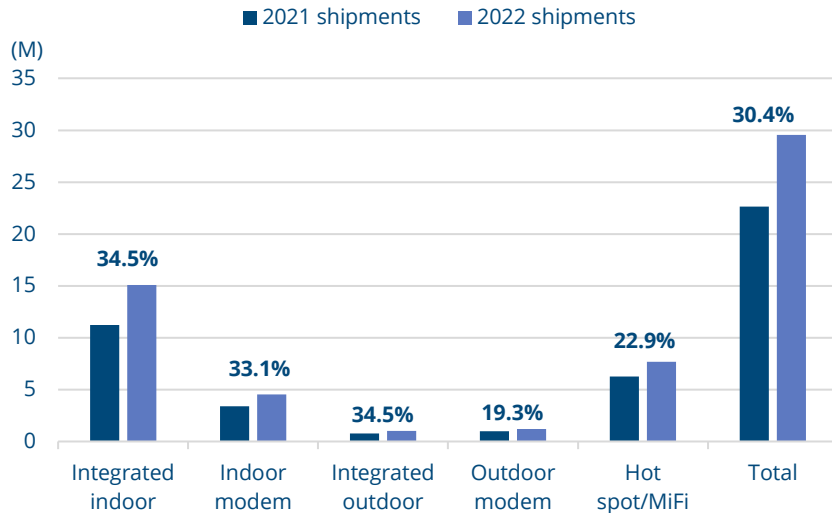
	Shipments (M)		YoY growth (%)
	2020	2021	2021
Total device shipments	30.2	22.7	-25%
5G shipments*	1.4	3.6	162%
Millimetre-wave-capable shipments	0.13	0.16	27%

Future Device Shipments

- 2022 is expected to see about 30% growth year-on-year, with most of the growth being driven by FWA CPE

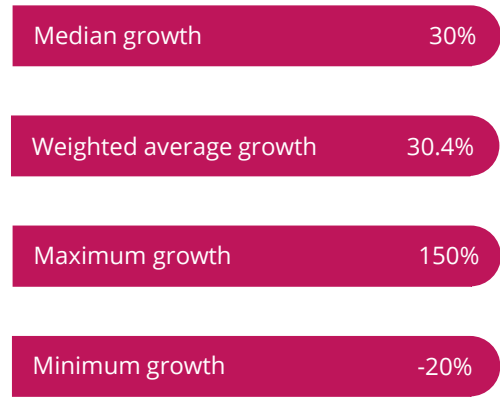
What do you expect the growth percentage will be in your shipments in 2022 for these form factors?

Sample: 2022 FWA survey, 26 respondents



What is your best estimate of the growth of the market for 4G and 5G FWA devices in 2022?

Sample: 2022 FWA survey, 24 respondents
(two answered just "positive" growth)

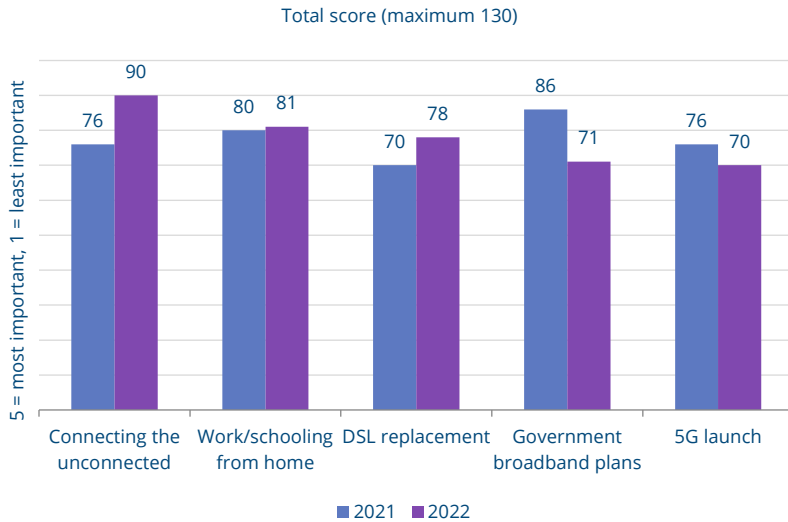


Market Trends

- "Connecting the unconnected" is the most important trend for 2022; "government broadband" and "5G launch" plans not as important as in 2021

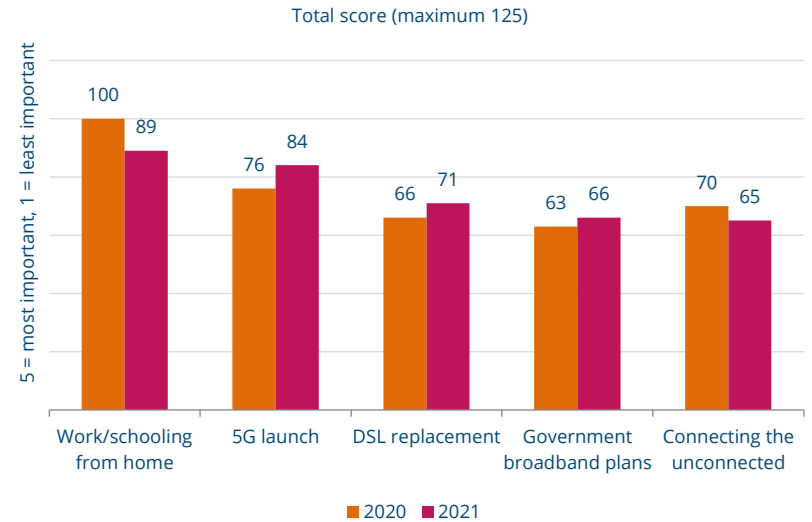
Please rank the following 2021 and 2022 trends in order of importance to the CPE industry

Sample: 2022 FWA survey, 26 respondents



Please rank the following 2020 and 2021 trends in order of importance to the CPE industry

Sample: 2021 FWA survey, 25 respondents

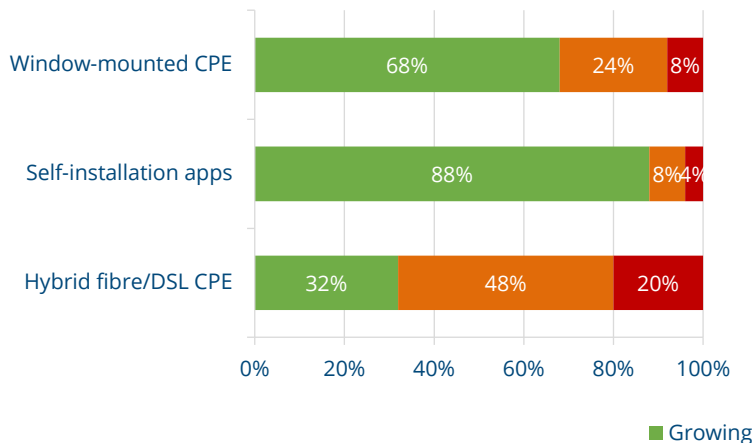


Future Device Shipment Trends

- Strong consensus that window-mounted, flexible indoor and outdoor CPE and self-installation apps are growing
- Hybrid fibre and DSL CPE has a more mixed expectation, with over 50% predicting this form factor will flatten or decline

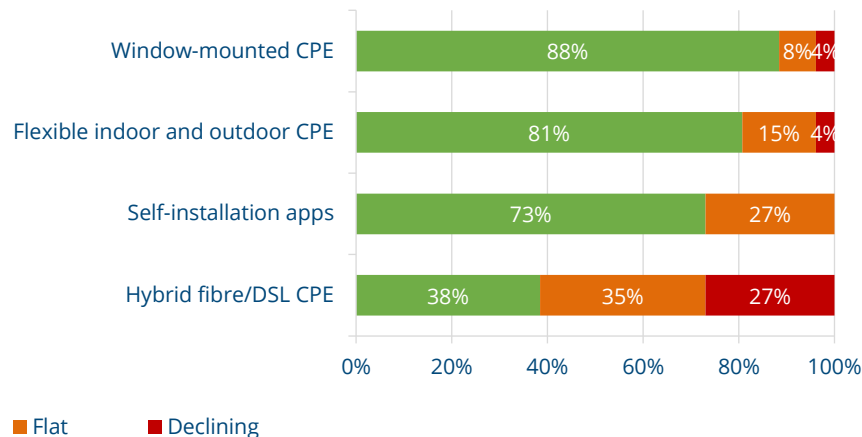
How do you think the market will change in 2021 for the following form factors?

Sample: 2021 FWA survey, 25 respondents



How do you think the market will change in 2022 for the following form factors?

Sample: 2022 FWA survey, 26 respondents

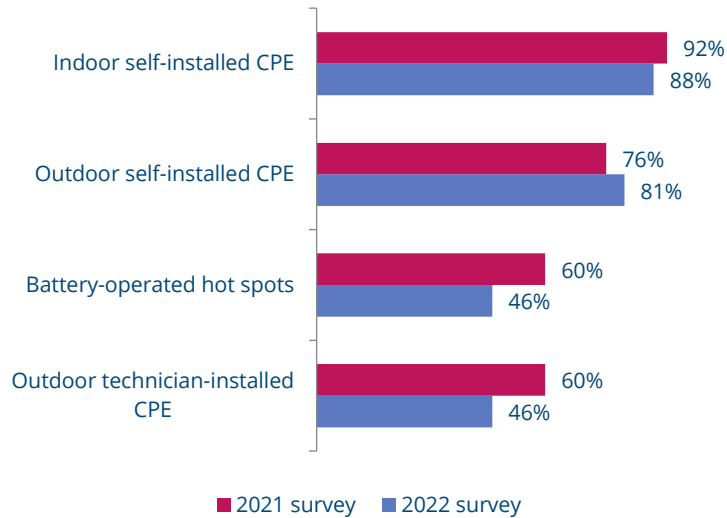


Product Road Map

- 65% of vendors to introduce 4G FWA in 2022, down from 96% in 2021
- Indoor and outdoor self-installed CPE are the most popular answers

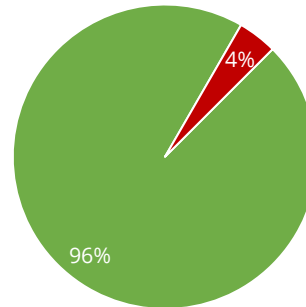
Which of the following are on your road map?

Sample: 2022 FWA survey, 26 respondents; 2021 FWA survey, 25 respondents



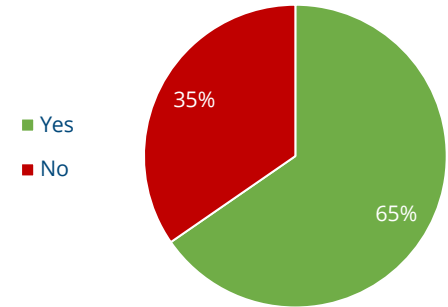
Do you plan to introduce new 4G FWA products to your portfolio in 2021?

Sample: 2021 FWA survey, 25 respondents



Do you plan to introduce new 4G FWA products to your portfolio in 2022?

Sample: 2022 FWA survey, 26 respondents

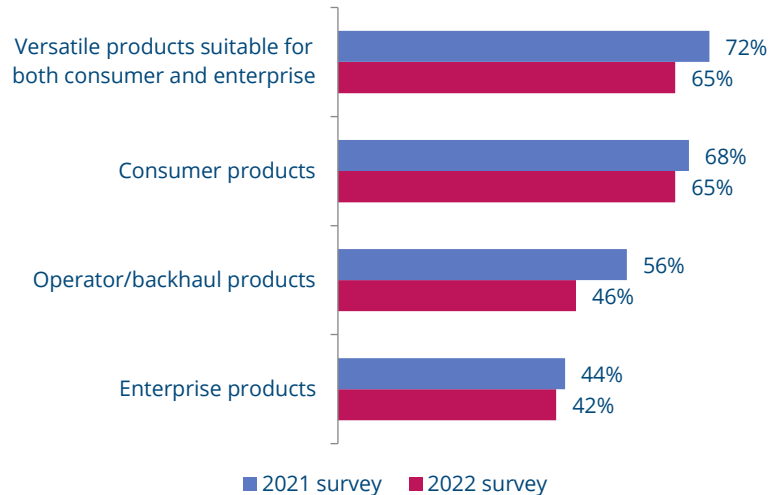


Product Road Map

- More respondents are planning on introducing 5G millimetre wave, although some are holding back until later years

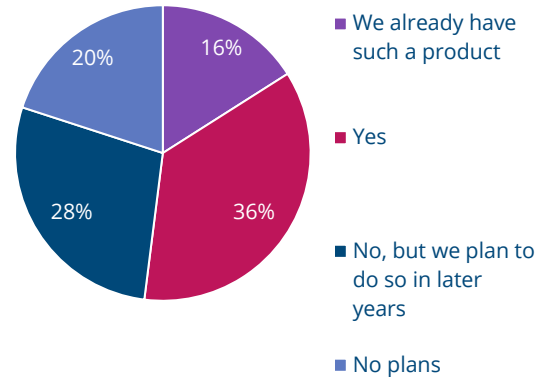
Which of the following are a focus for your future product development?

Sample: 2022 FWA survey, 26 respondents; 2021 FWA survey, 25 respondents



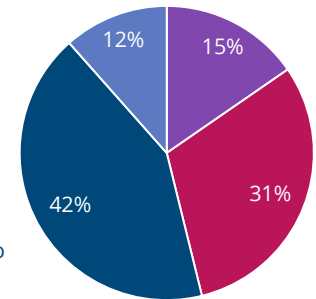
Will you be introducing a 5G millimetre-wave (FR2) device into your portfolio in 2021?

Sample: 2021 FWA survey, 25 respondents



Will you be introducing a 5G millimetre-wave (FR2) device into your portfolio in 2022?

Sample: 2022 FWA survey, 26 respondents

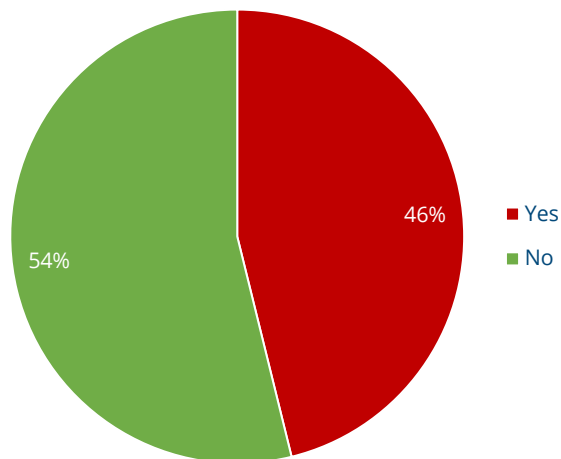


Product Road Map

- Almost all respondents with plans to introduce 5G millimetre-wave products in 2022 are considering support for extended range (PC1/PC5)

Do you plan to introduce 5G millimetre-wave FR2 products supporting extended range (PC1/PC5) in your portfolio during 2022?

Sample: 2022 FWA survey, 26 respondents

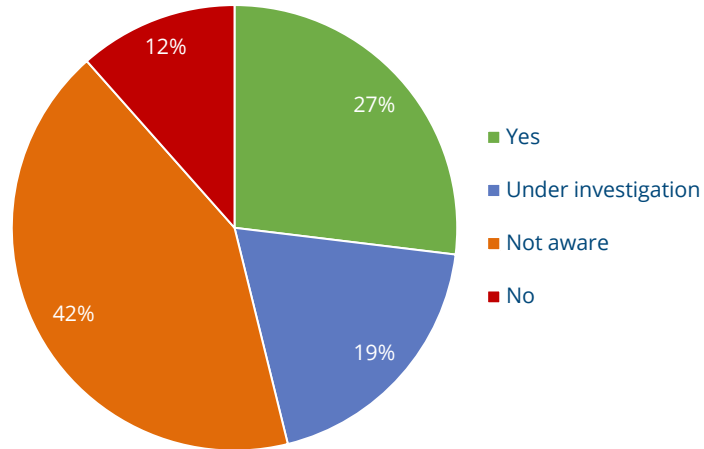


Product Road Map

- Most respondents are unaware of the Broadband Forum's 5G-RG vision

Do you have plans to introduce CPE that supports 5G-RG as defined by the Broadband Forum?

Sample: 2022 FWA survey, 26 respondents

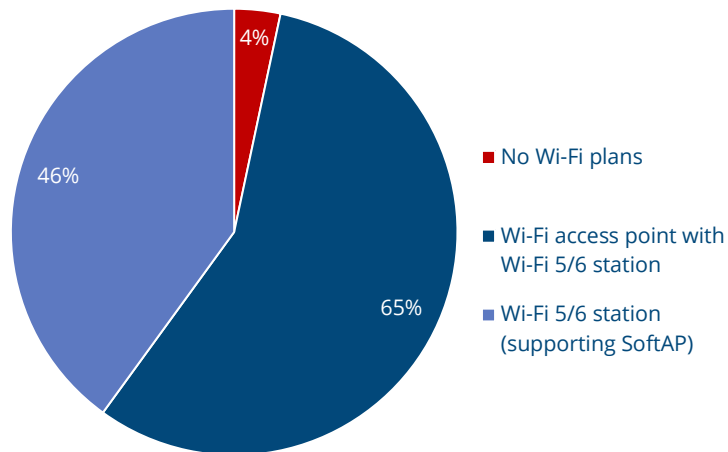


Product Road Map

- Almost half of vendors have plans for Wi-Fi 5/6 stations supporting software-enabled access points (SoftAP)

What are your future 5G CPE products' Wi-Fi 5 and 6 chipset solutions?

Sample: 2022 FWA survey, 26 respondents

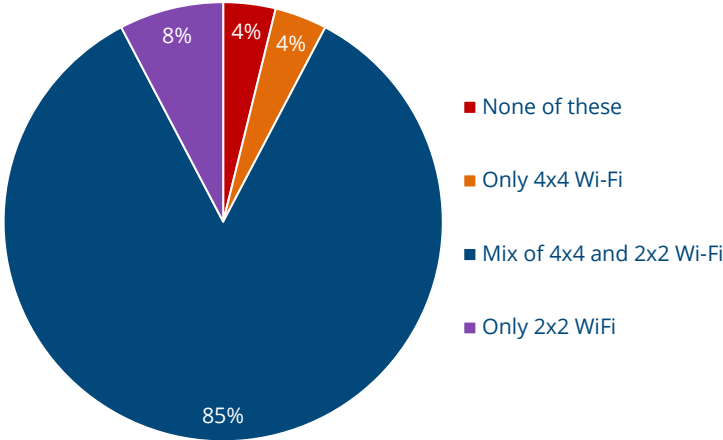


Product Road Map

- Most vendors are choosing a mix of Wi-Fi; a minority is choosing 4x4 only

What are your future 5G CPE products' Wi-Fi capabilities?

Sample: 2022 FWA survey, 26 respondents

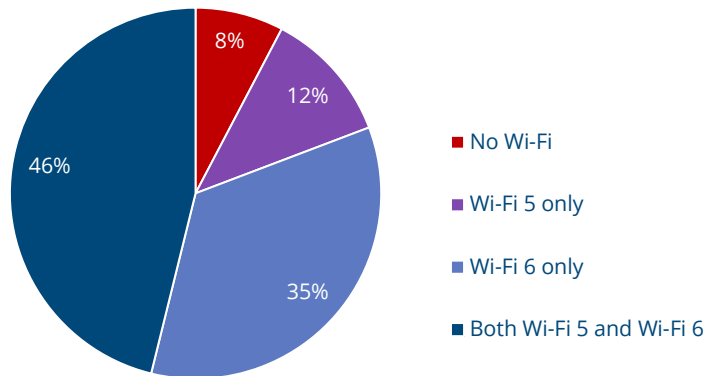


Wi-Fi in 5G Devices

- Vendors are looking to continue transitioning their 5G CPE to Wi-Fi 6 products
- This is up from 81% of vendors whose products currently support Wi-Fi 6, to 97% planning to introduce such capability

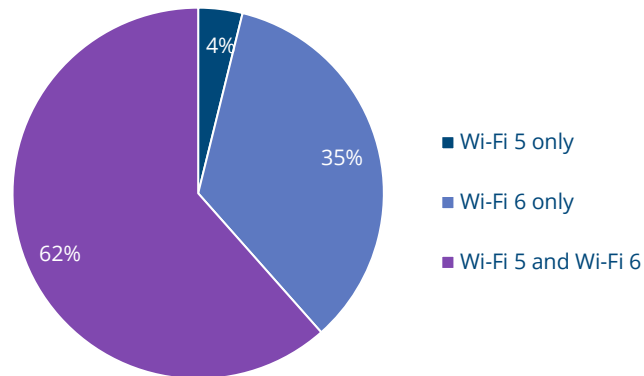
What are your current 5G CPE products' Wi-Fi capabilities?

Sample: 2022 FWA survey, 26 respondents



What are your future 5G CPE products' Wi-Fi capabilities?

Sample: 2022 FWA survey, 26 respondents



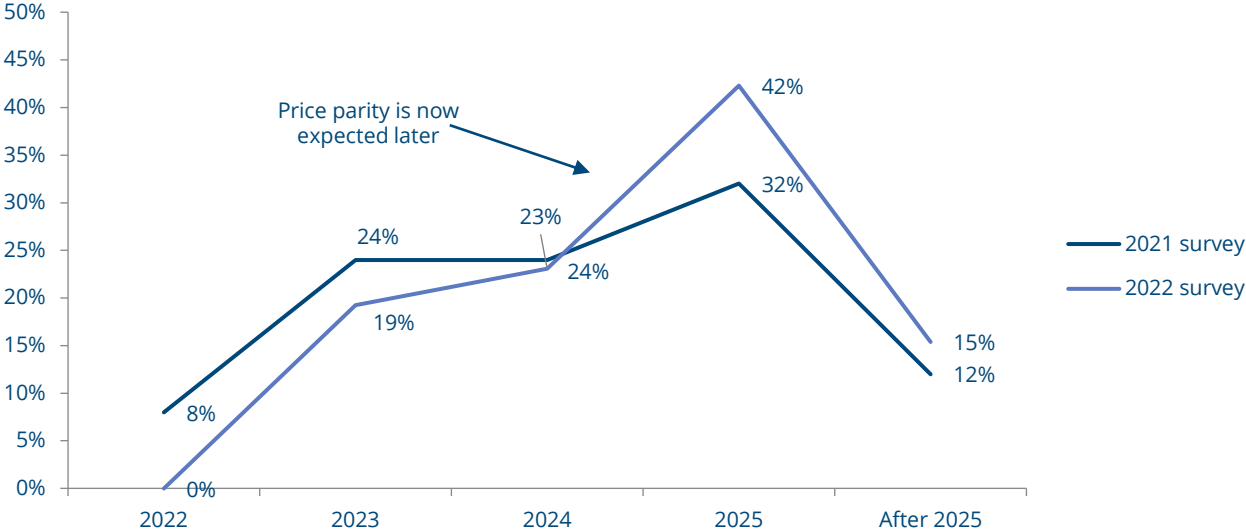
Note: no respondent selected "no Wi-Fi"

Price Trends

- Majority of vendors think 5G CPE prices will still take a couple of years to reach parity with those of 4G CPE. Compared with the previous survey, respondents now expect parity later

When do you think 5G CPE will reach the price levels of 4G CPE today?

Sample: 2022 FWA survey, 26 respondents

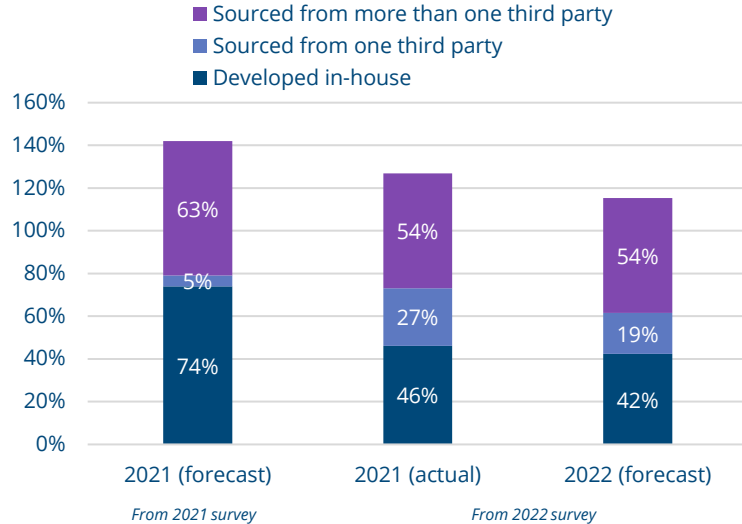


Modules and Chipsets

- More respondents switched to outsourcing chipsets and modules in 2021 than they had planned to a year prior
- There is a desire to source chipsets from more companies in the future

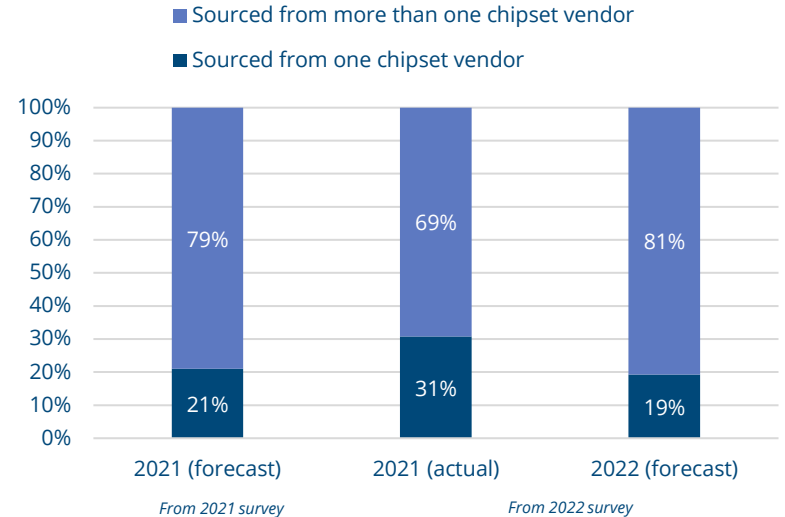
What is your current module strategy, and what is your module strategy for 2022? (multiple choice — in-house and third-party sourcing are not mutually exclusive)

Sample: 2021 FWA survey, 25 respondents; 2022 FWA survey, 26 respondents



What is your current chipset strategy, and what is your chipset strategy for 2022?

Sample: 2021 FWA survey, 25 respondents; 2022 FWA survey, 26 respondents



Global mobile Suppliers Association

The Industry Voice of the
Global Mobile Ecosystem

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