

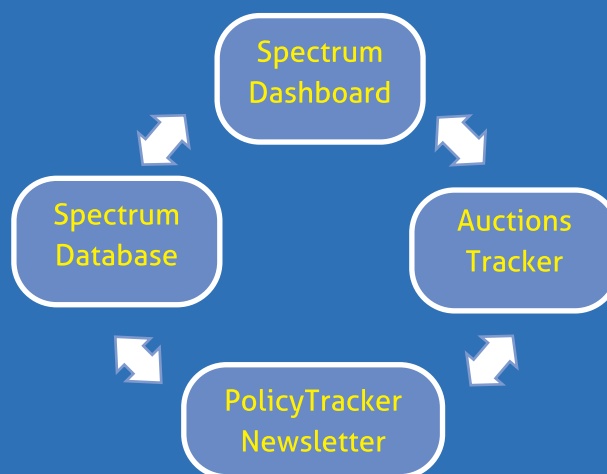
Spectrum Research Service

The latest briefings,
data and analysis of
spectrum policy



Regular
updates by
email

The leading authority for 4G and 5G spectrum



Features:

- Regularly updated research notes
- Comprehensive spectrum database
- Tracking of upcoming auctions
- Reporting from PolicyTracker newsletter
- Analysis of vendors, operators and OTT players
- Country reports

All material
searchable
online

200 graphs
and
diagrams

PolicyTracker

Spectrum Research Service

PolicyTracker

What does it do?

The PolicyTracker Spectrum Dashboard tracks the latest developments in spectrum policy, giving concise briefings in real time as well as detailed analysis of the key debates.

The Spectrum Dashboard brings together statistics from our comprehensive worldwide spectrum database, reporting from our renowned newsletter, and in-depth analysis from our experts.

What does it cover?

- **Bands:** Analysis and statistics on current mobile bands and those proposed for 5G
- **Operators:** Summary of spectrum holdings, plans and policies for leading operators
- **Vendors:** An overview of vendors' plans for 4G and 5G
- **OTT players:** Analysis of the "non-traditional" actors in the telecoms market
- **Countries:** summary of spectrum usage and the policy context in the larger economies.
- **Research Notes:** Timely analysis of the latest trends and hot topics

How does it work?

Every week you will receive several emailed updates. Some will be short Research Briefs and every month there will be a Research Note on an emerging issue, a company or a country.

Both the Research Briefs and Research Notes are always accessible via our online Spectrum

Dashboard. This has full search facilities and allows you to cross-reference with articles in our newsletter and statistics from our database.

Research Briefs cover two topics:

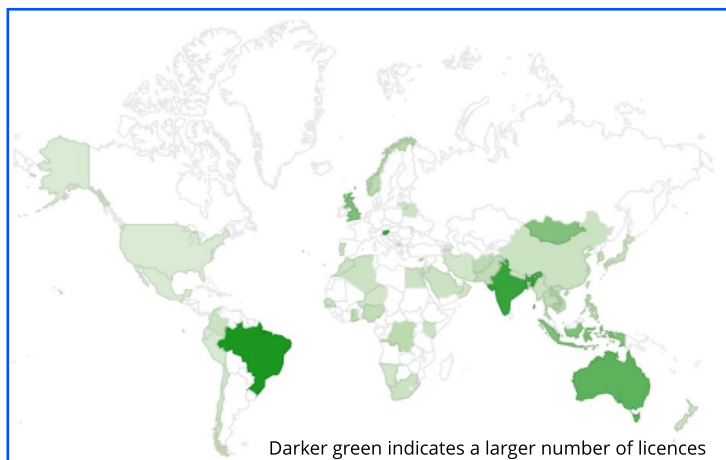
- **Auctions:** Regular updates on spectrum release around the world, tracking the process from its initial stages to the conclusion. This allows users to predict when bands will become available.
- **Important policy developments:** Brief explanation of a notable trial, launch, announcement or policy statement.

Includes access to our spectrum database giving information on thousands of licences and allocations.

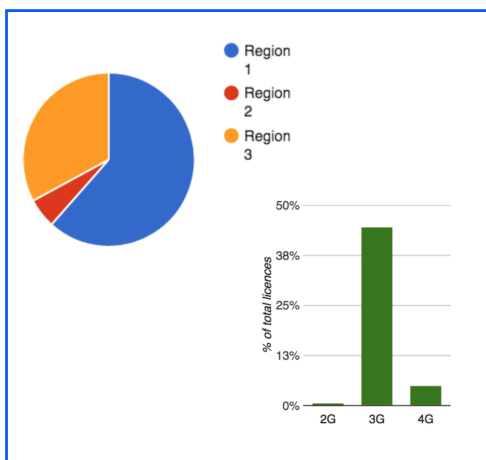


Detail from the Spectrum Dashboard bands pages

Use of 2 GHz in the major economies



Use of 2 GHz by region and technology



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Bands

Analysis and statistics on current mobile bands and those proposed for 5G

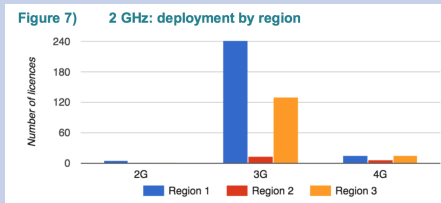


Figure 83) Possible 5G bands in 20-30 GHz

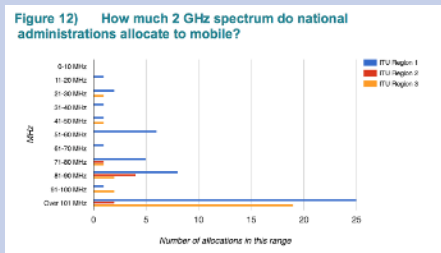
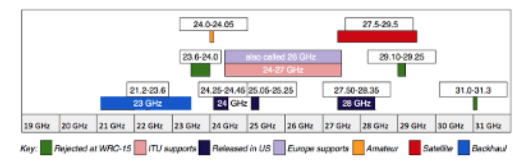
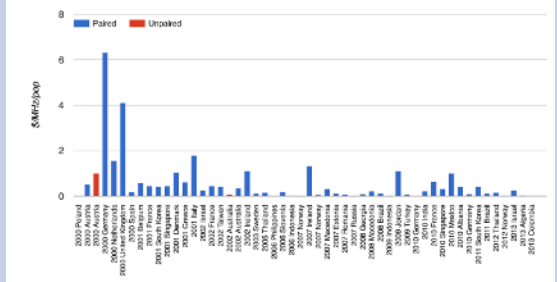


Figure 13) 2 GHz pricing since 1995



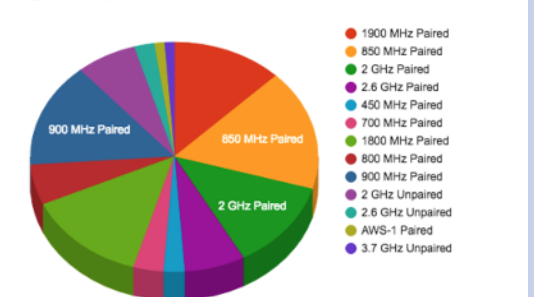
Operators

Summary of spectrum holdings, plans and policies for leading operators

Figure 100) Telefonica global spectrum licences



Figure 101) Which bands does the Telefonica Group use?



Countries

Summary of spectrum usage and the policy context in the larger economies

Figure 115) Spectrum allocated to current mobile services in China

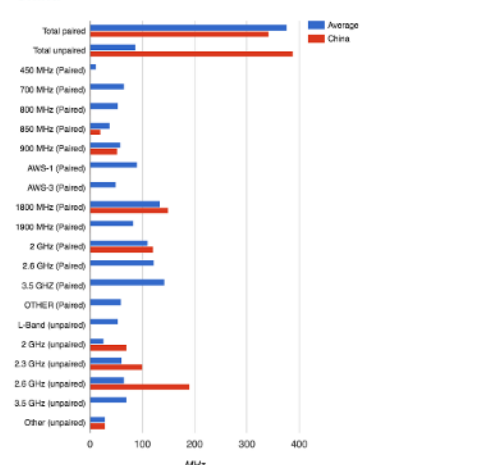


Figure 114) National mobile licence holders

Licensee	Band	Duplex	MHz
China Mobile	1900 MHz	Unpaired	20
China Mobile	2 GHz	Unpaired	15
China Mobile	2.3 GHz	Unpaired	50
China Mobile	2.6 GHz	Unpaired	60
China Mobile	900 MHz	Paired	40
China Telecom	2 GHz	Paired	30
China Telecom	2.6 GHz	Unpaired	20
China Telecom	850 MHz	Paired	20
China Unicom	1800 MHz	Paired	40
China Unicom	2 GHz	Paired	30
China Unicom	2.3 GHz	Unpaired	20
China Unicom	2.6 GHz	Unpaired	20
China Unicom	900 MHz	Paired	12

Shows operators with sub-3 GHz mobile licences covering 40% of country or more.

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Spectrum Database

Comprehensive global data on mobile licences and allocations. Includes:

- \$/MHz/pop data
- national allocations for the major mobile bands
- Group data by country or operator
- Use the raw data for your own analysis

Country	Rank	Operator	Technology
Algeria	1	Djezzy	GSM-900/1800 MHz (GPRS, EDGE)2100 MHz UMTS, HSPA
Algeria	2	Mobilis	GSM-900/1800 MHz (GPRS, EDGE)2100 MHz UMTS, HSPA
Algeria	3	Ooredoo(formerly Nedjma)	GSM-900/1800 MHz (GPRS, EDGE)2100 MHz UMTS, HSPA
Angola	1	Unitel	GSM-900/1800 MHz (GPRS, EDGE)2100 MHz UMTS, HSDPA1800 MHz LTE
Angola	2	Movicel	GSM (GPRS, EDGE)900 MHz UMTS, HSDPA1800 MHz LTE
Bahrain	1	Batelco	GSM-900 (GPRS, EDGE)2100 MHz UMTS, DC-HSPA+1800 MHz
Bahrain	2	Zain(formerly MTC-Vodafone)	GSM-900/1800 MHz (GPRS, EDGE)2100 MHz UMTS, HSDPA1800 MHz
Bahrain	3	Viva	GSM-900/1800 MHz (GPRS, EDGE)2100 MHz UMTS, DC-HSPA+
Benin	1	MTN	GSM-900/1800 MHz
Benin	2	Moov	GSM-900 MHz/UMTS, DC-HSPA+
Benin	3	Glo	GSM-900/1800 MHz
Benin	4	Libcom	GSM-900 MHz
Benin		BBcom	GSM-900/1800 MHz
Botswana	1	Mascom	GSM-900/1800 MHz UMTS, HSPA+
Botswana	2	Orange	GSM-900/1800 MHz UMTS, HSPA+

	Year of issue	Duration (years)	Band	Once-off	Currency	
Hong Kong	Hutchison (Three)	2014	15 2 GHz	USD 470,400,000	HKD	6,860.00
Hong Kong	Hutchison (Three)	2011	15 900 MHz	USD 1,100,000,000	HKD	6,860.00
Hong Kong	Smartone	2014	15 2 GHz	USD 510,000,000	HKD	6,860.00
Hong Kong	Smartone	2011	15 850 MHz	EUR 875,000,000	HKD	6,860.00
India	Aircel	2014	20 1800 MHz	EUR 2,039,000,000	INR	1,008,337.00
India	Aircel	2010	2 GHz	EUR 64,934,600,000	INR	1,008,337.00
India	Aircel	2010	2.3 GHz	EUR 34,380,100,000	INR	1,008,337.00
India	Augere	2010	2.3 GHz	EUR 1,246,600,000	INR	1,008,337.00
India	Bharti Airtel	2014	20 1800 MHz	EUR 99,080,200,000	INR	1,008,337.00

Auctions Tracker

Searchable online database of hundreds of upcoming auctions around the world

Email alerts so you never miss an update

Or use form below to search in detail and sort your results.

Auction Name	<input type="text"/>
Band	<input type="text"/>
Auction starts	<input type="text"/>
Auction Status	<input type="text"/>
Location	<input type="text"/>
Region	<input type="text"/>
Paired	<input type="text"/>
Sorting	<input type="text"/>
Sort by	<input type="text"/>
Search	<input type="text"/>

Why buy this service?

- Unparalleled resource for spectrum managers and mobile industry professionals
- Leading authority on current mobile frequencies and candidate bands for 5G
- Comprehensive licensing and pricing data
- Insight into stakeholder policies and priorities
- Tracking of upcoming spectrum release
- Analysis of trends shaping spectrum policy

Who should subscribe?

- Regulators
- Government departments
- Mobile network operators
- Technology vendors
- Satellite operators
- Broadcasters
- Investors

To find out more

For a free trail please contact Martin Sims on +44 (0)20 7100 2875 or sales@policytracker.com

Terms and conditions for use of the Research Service are available here: www.policytracker.com/about/

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Research Service content

Bands

The Research Service contains detailed research notes on all the proposed 5G bands, as well as the frequencies used for 4G and earlier generations:

- 2 GHz
- 1800 MHz
- 900 MHz
- 850 MHz
- 800 MHz
- 700 MHz
- 600 MHz
- 450 MHz
- 2.6 GHz
- L-band
- 2.3 GHz
- 3.5 GHz

In each band the analysis is complemented by graphs and tables showing:

- Deployment by region
- Percentage usage by region and technology
- Map of global usage of the band
- Number of licences issued in this band
- When do licences expire?
- Amount of spectrum allocated in this band
- MHz/pop pricing since 1995

Vendors and OTT players

Analysis of spectrum policy approaches of the leading vendors and OTT players, ranging from Ericsson and Cisco to Google and Microsoft.

Datasets

- 3000 mobile licences with technologies used, frequencies, duration, coverage and pricing
- National allocations for all the mobile bands: with figures for each individual band
- Band-by-band spectrum holdings for national operators in over 110 countries
- MHz per pop pricing based on historic currency data and geographic coverage

Countries

The Spectrum Database has data on over 110 countries and the Research Service contains detailed reports on the biggest economies, namely:

- China
- India
- United States
- Brazil
- Japan
- Germany
- France
- United Kingdom
- Italy
- Canada

For each country there are powerful graphics showing spectrum allocations in the major mobile bands, national mobile licence holders and all licensed mobile operators.

Operators

Detailed analysis of the top ten global operators, with interactive graphics showing:

- Map of the operator's global licences
- Which bands does the operator use?
- When will the operator's licences expire