NewStreet Research

Introducing SpectrumHub

NSR Global Spectrum Database

June 18, 2024

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SpectrumHub

Upgrading our Spectrum Insights

June 18, 2024

In February, we launched SpectrumHub, our global spectrum database and we are now delighted to upgrade this to **SpectrumHub 2.0**, which includes a suite of major new features:

- Latest global spectrum updates as of June 2024
- 12 more markets introduced with detailed historic pricing analysis
- Detailed analysis looking at spectrum renewal timetables and potential future costs in major markets
- Additional price points from key secondary market transactions in the US
- Detailed spectrum valuations for the US carriers based on actual prices paid and current market value
- Regional details of spectrum holdings and price paid for US and India
- Easier to view breakdown of historic spectrum auction details
- Additional information in spectrum holdings and price sections
- Other bug fixes and improvements

Clients who already have access to SpectrumHub will see these new features in the tool automatically this morning. Clients who would like access to SpectrumHub, please contact us.

SpectrumHub v2.0

NewStreet Research

1

Version 1.0

In February, we launched SpectrumHub 1.0 in the beta version.

We believe this new product provides a genuinely unique insight into the state of play of the global wireless spectrum market.

2

Version 2.0

Since the launch of SpectrumHub 1.0, we have had a lot of valuable client feedback and made some planned upgrades.

We are delighted to launch **SpectrumHub 2.0** with more detail on more markets, more detailed spectrum valuations (including secondary transactions) and more detailed renewal analysis.

3

Access & Trial

SpectrumHub, which sits outside our regular telecoms subscription, has been available for free during a **trial period until June 30th** and after that it will be put behind a **separate paywall**.

4

Broadband Insights

To complement SpectrumHub as part of our data analytics platform, we launched **Broadband Insights**, a bespoke and interactive map looking at US broadband connectivity.

For clients who haven't yet accessed this product, **please also contact Jose Anguis.**

Like SpectrumHub, this will be put behind a separate paywall shortly.

5

Next steps

For clients interested in accessing the full database directly, **please contact Jose Anguis**

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Source: New Street Research analysis

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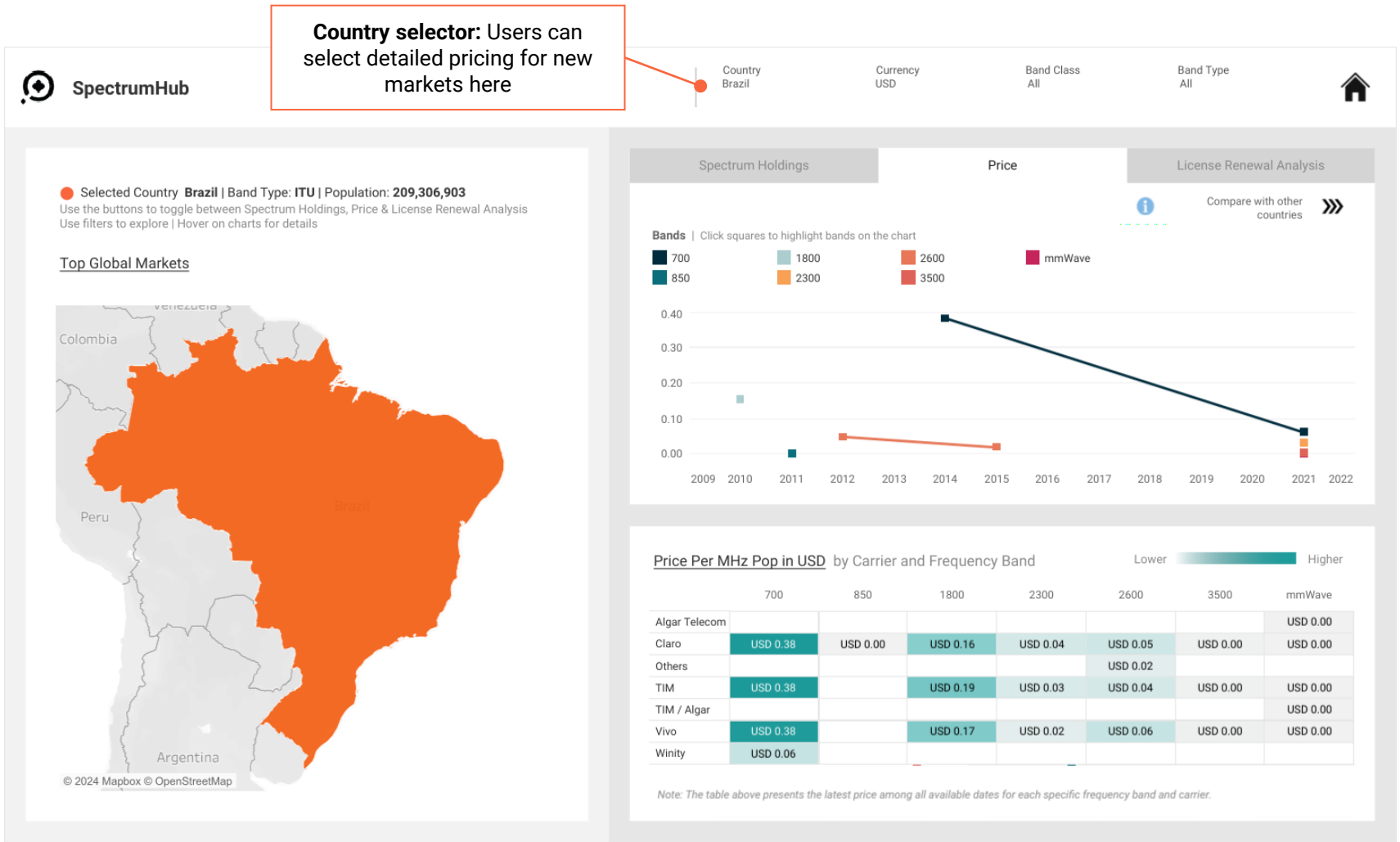
Introducing SpectrumHub v2.0

New features: More detailed pricing analysis included for 12 new markets

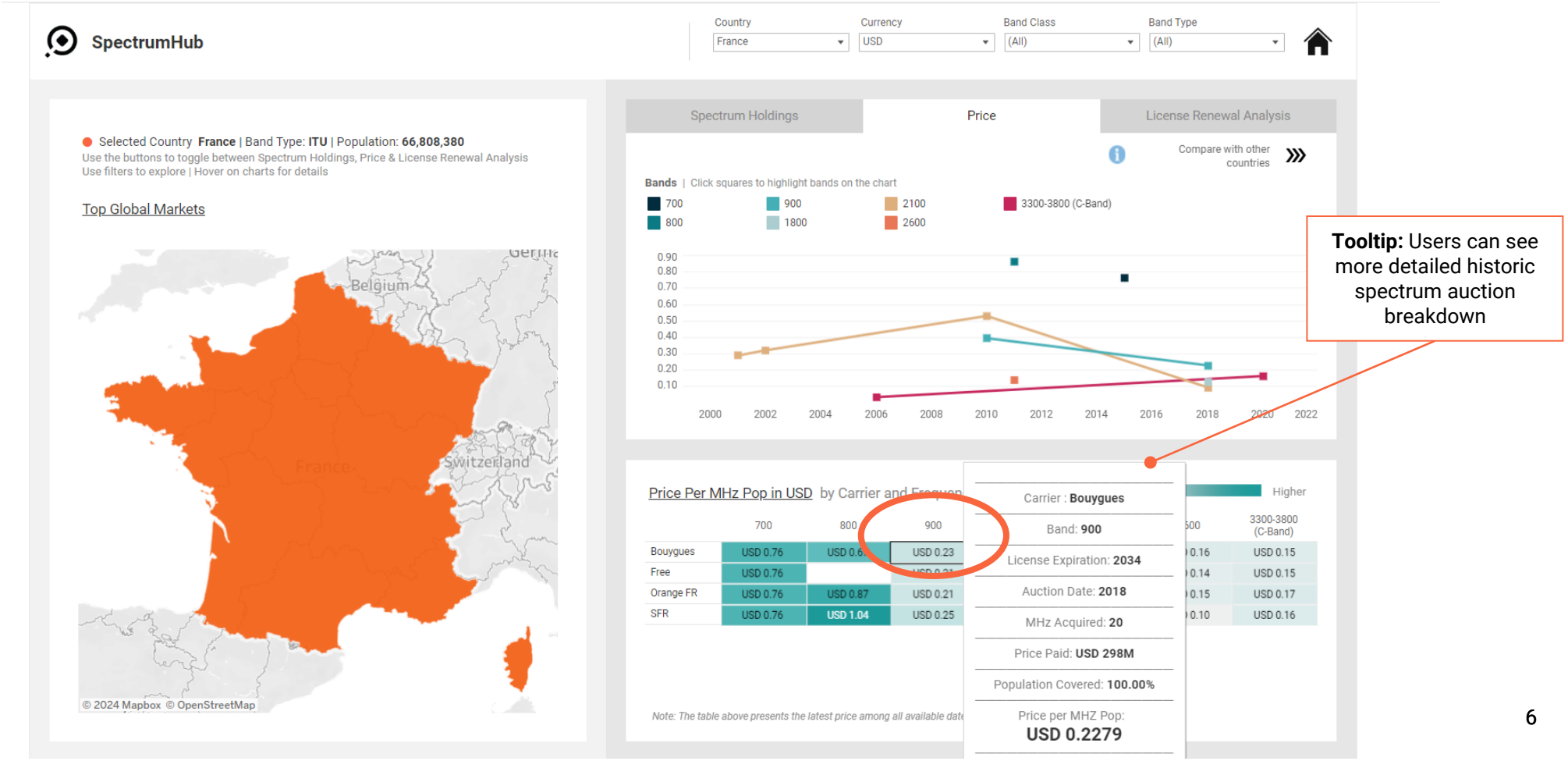
In SpectrumHub 1.0, we included detailed spectrum pricing analysis by carrier and by band over time for the US, Germany, France, Spain, Italy, the UK and India. In **SpectrumHub 2.0** we now include this for Belgium, Brazil, Colombia, Indonesia, Mexico, Netherlands, Nigeria, Portugal, South Africa, South Korea, Switzerland and Thailand, to overall cover 19 of the markets worldwide where spectrum prices/renewals have been most important.



	700	850	1800	2300	2600	3500	mmWave
Algar Telecom							USD 0.00
Claro	USD 0.38	USD 0.00	USD 0.16	USD 0.04	USD 0.05	USD 0.00	USD 0.00
Others					USD 0.02		
TIM	USD 0.38		USD 0.19	USD 0.03	USD 0.04	USD 0.00	USD 0.00
TIM / Algar							USD 0.00
Vivo	USD 0.38		USD 0.17	USD 0.02	USD 0.06	USD 0.00	USD 0.00
Winity	USD 0.06						

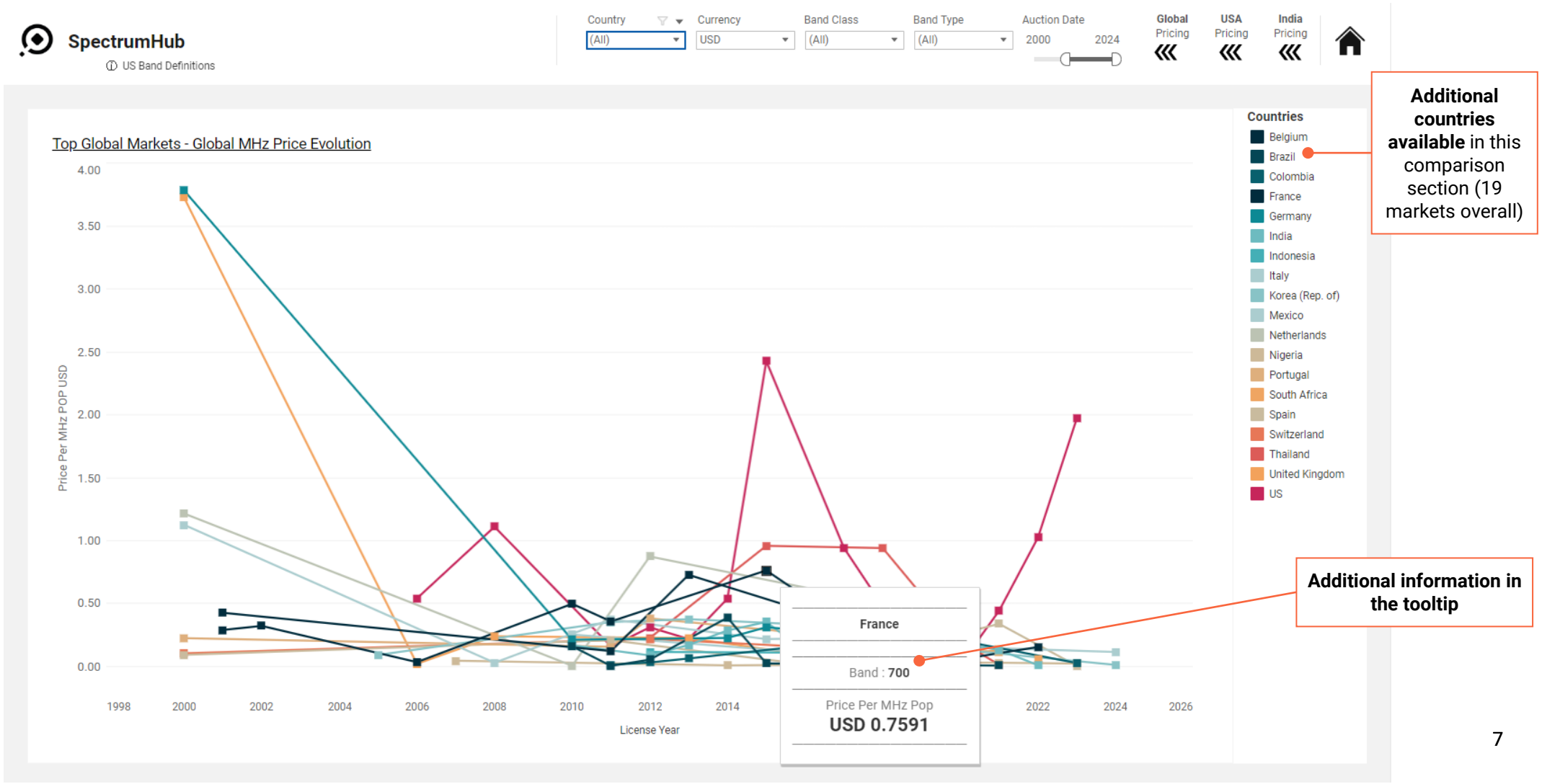
New features: Easier snapshot for each historic auction

In the price section for each market in SpectrumHub 2.0, by hovering the mouse over each historic auction, it is far easier to see the details of that specific auction, i.e., the total price paid in that auction, the total MHz, and therefore the implied price in that auction.



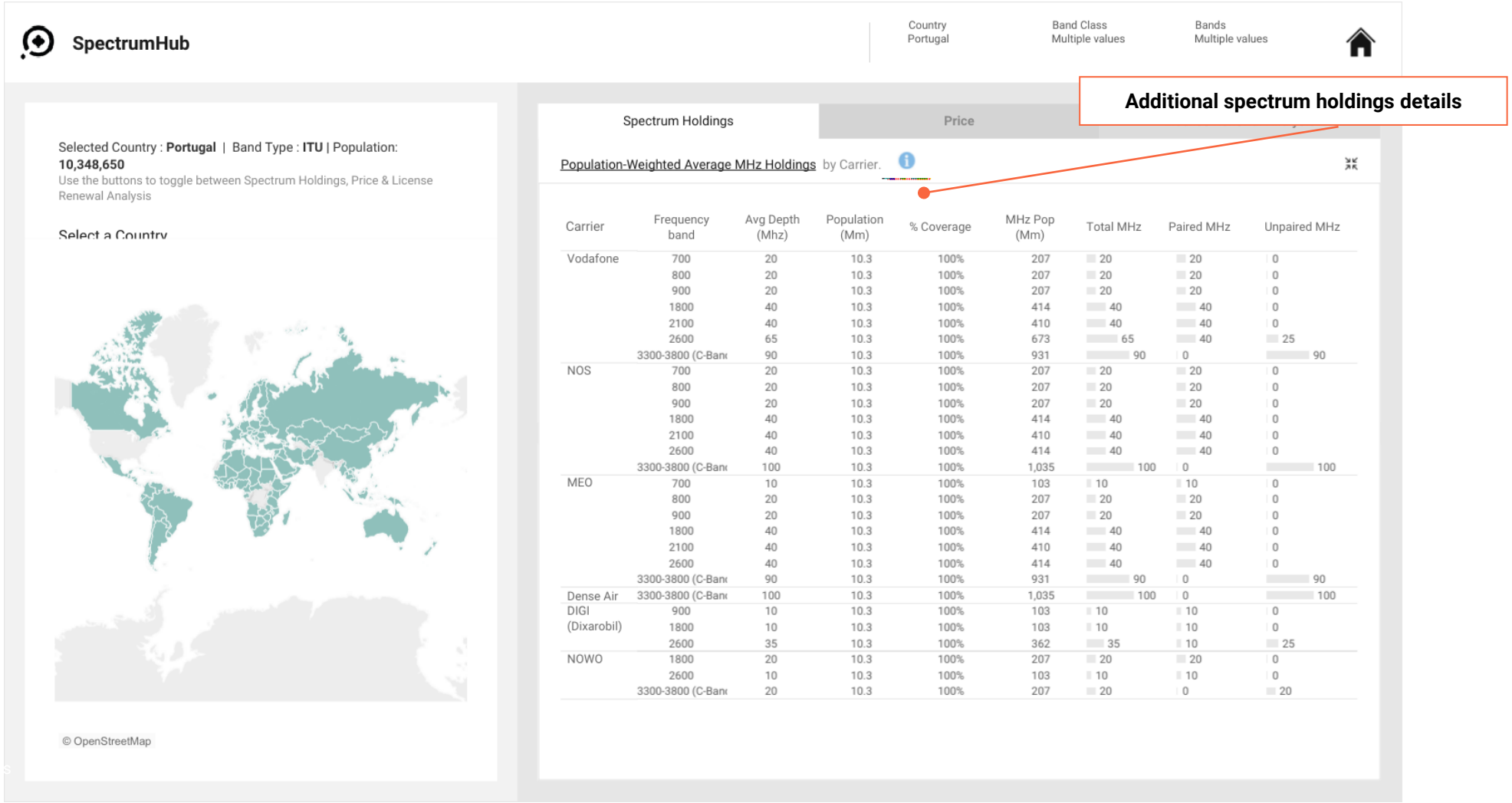
New features: More detailed available on global comparisons

Screenshot to come…..showing tooltip on the cross-market pricing analysis



New features: More details about the spectrum holdings at a glance available in the Worldwide section…

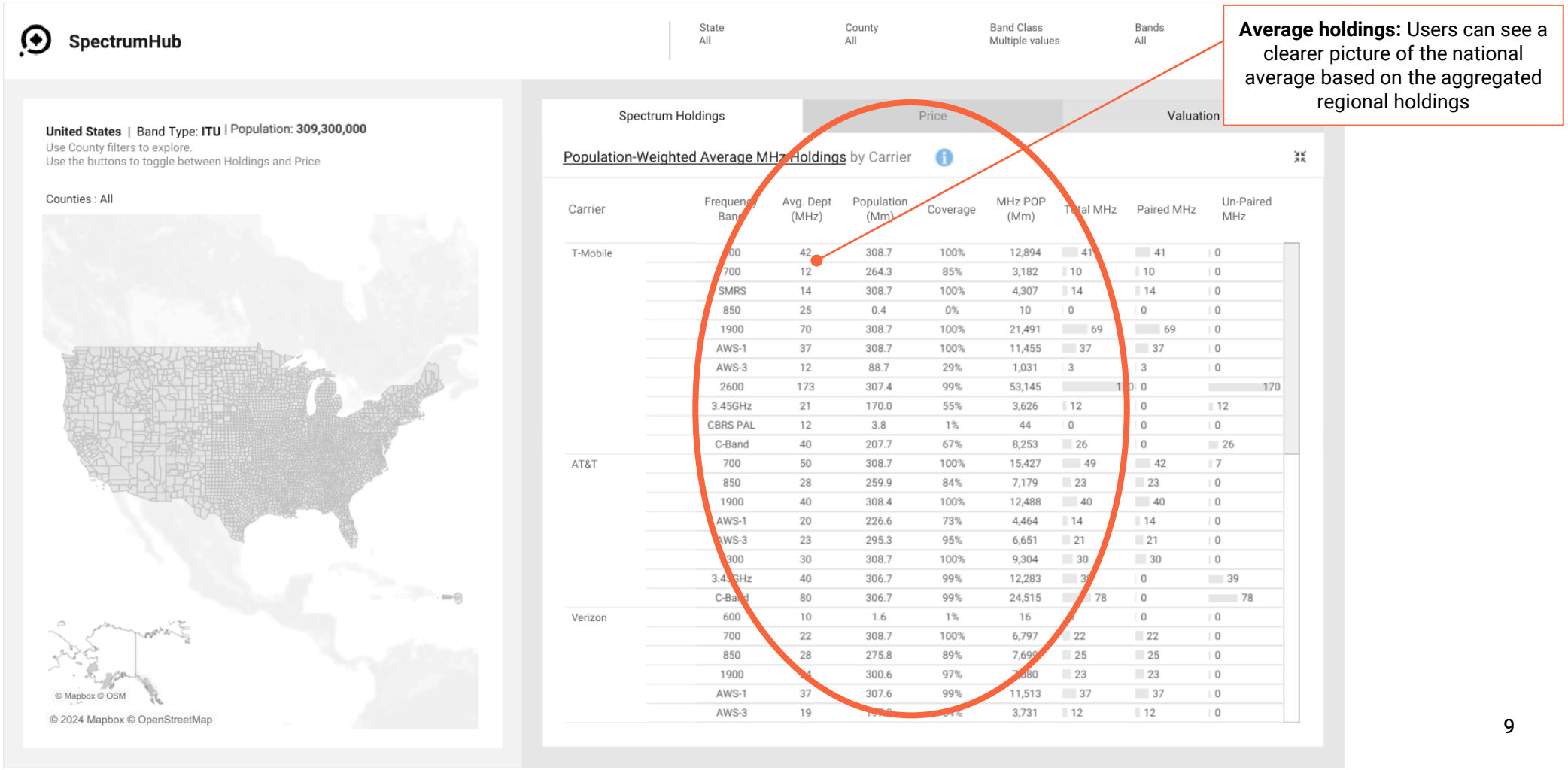
SpectrumHub 2.0 provides a broader overview of the average national holdings based with additional fields like average MHz depth, population covered, % of coverage and MHZ-Pop.



Carrier	Frequency band	Avg Depth (Mhz)	Population (Mm)	% Coverage	MHz Pop (Mm)	Total MHz	Paired MHz	Unpaired MHz
Vodafone	700	20	10.3	100%	207	20	20	0
	800	20	10.3	100%	207	20	20	0
	900	20	10.3	100%	207	20	20	0
	1800	40	10.3	100%	414	40	40	0
	2100	40	10.3	100%	410	40	40	0
	2600	65	10.3	100%	673	65	40	25
	3300-3800 (C-Banc	90	10.3	100%	931	90	0	90
NOS	700	20	10.3	100%	207	20	20	0
	800	20	10.3	100%	207	20	20	0
	900	20	10.3	100%	207	20	20	0
	1800	40	10.3	100%	414	40	40	0
	2100	40	10.3	100%	410	40	40	0
	2600	40	10.3	100%	414	40	40	0
	3300-3800 (C-Banc	100	10.3	100%	1,035	100	0	100
MEO	700	10	10.3	100%	103	10	10	0
	800	20	10.3	100%	207	20	20	0
	900	20	10.3	100%	207	20	20	0
	1800	40	10.3	100%	414	40	40	0
	2100	40	10.3	100%	410	40	40	0
	2600	40	10.3	100%	414	40	40	0
	3300-3800 (C-Banc	90	10.3	100%	931	90	0	90
Dense Air	3300-3800 (C-Banc	100	10.3	100%	1,035	100	0	100
DIGI (Dixarobil)	900	10	10.3	100%	103	10	10	0
	1800	10	10.3	100%	103	10	10	0
	2600	35	10.3	100%	362	35	10	25
NOWO	1800	20	10.3	100%	207	20	20	0
	2600	10	10.3	100%	103	10	10	0
	3300-3800 (C-Banc	20	10.3	100%	207	20	0	20

…and in the regional spectrum markets like the US and India

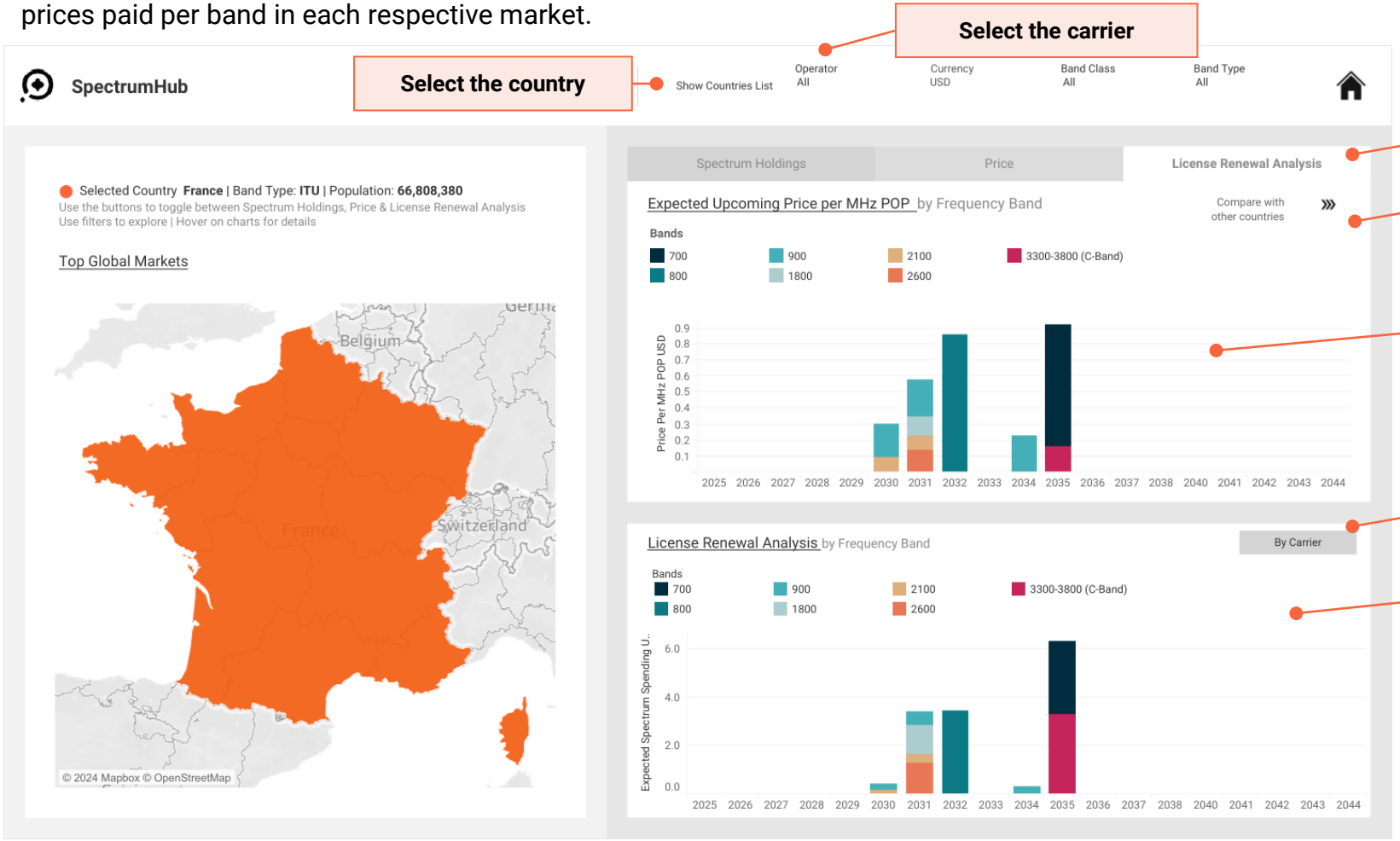
Like SpectrumHub 1.0, SpectrumHub 2.0 allows users to analyse spectrum holdings at a granular level by individual region for markets like the US and India including paired and unpaired spectrum. However, in SpectrumHub 2.0, we now provide more details of the average national holdings based on the aggregated regional holdings



Average holdings: Users can see a clearer picture of the national average based on the aggregated regional holdings

New features: New licence renewal analysis per country in more detail…

In the US, where spectrum is held on freehold, the value of spectrum holdings is more relevant. However, in most other global markets spectrum tends to be sold on a leasehold basis on 10–25-year terms and therefore operators can face expensive renewals. In SpectrumHub 1.0, we showed when the spectrum came due for renewal, but we now add in a new section to allow clients to be able to more easily map out future renewals in more detail, with future prices estimated based off the most recent prices paid per band in each respective market.



NEW Licence Renewal Analysis tab

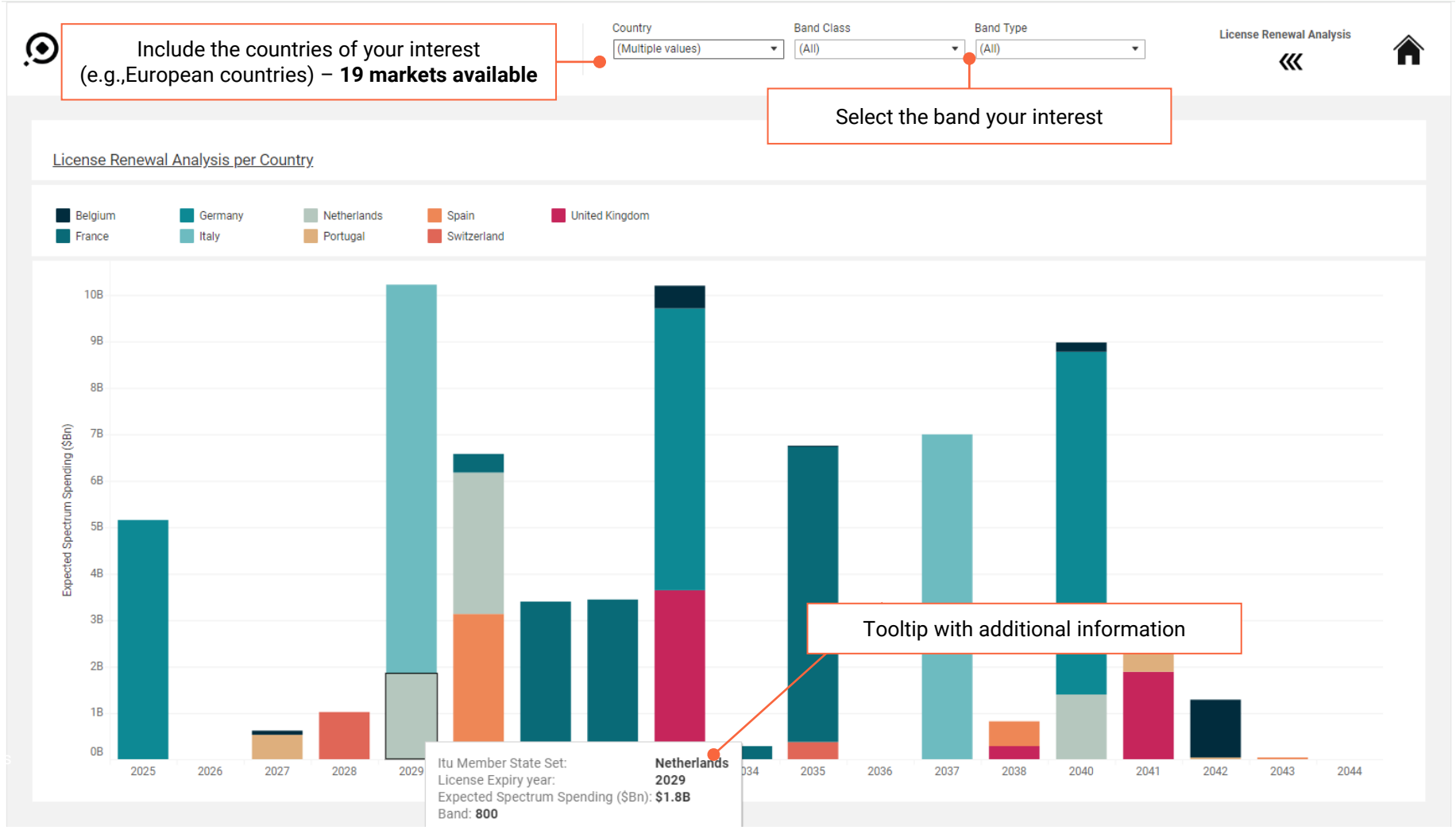
Click to compare with other countries

Expected upcoming prices per MHz-Pop per country: The top chart shows the expected price for each renewing band, and by year, based on the most recent price paid

Switch to the view by carrier

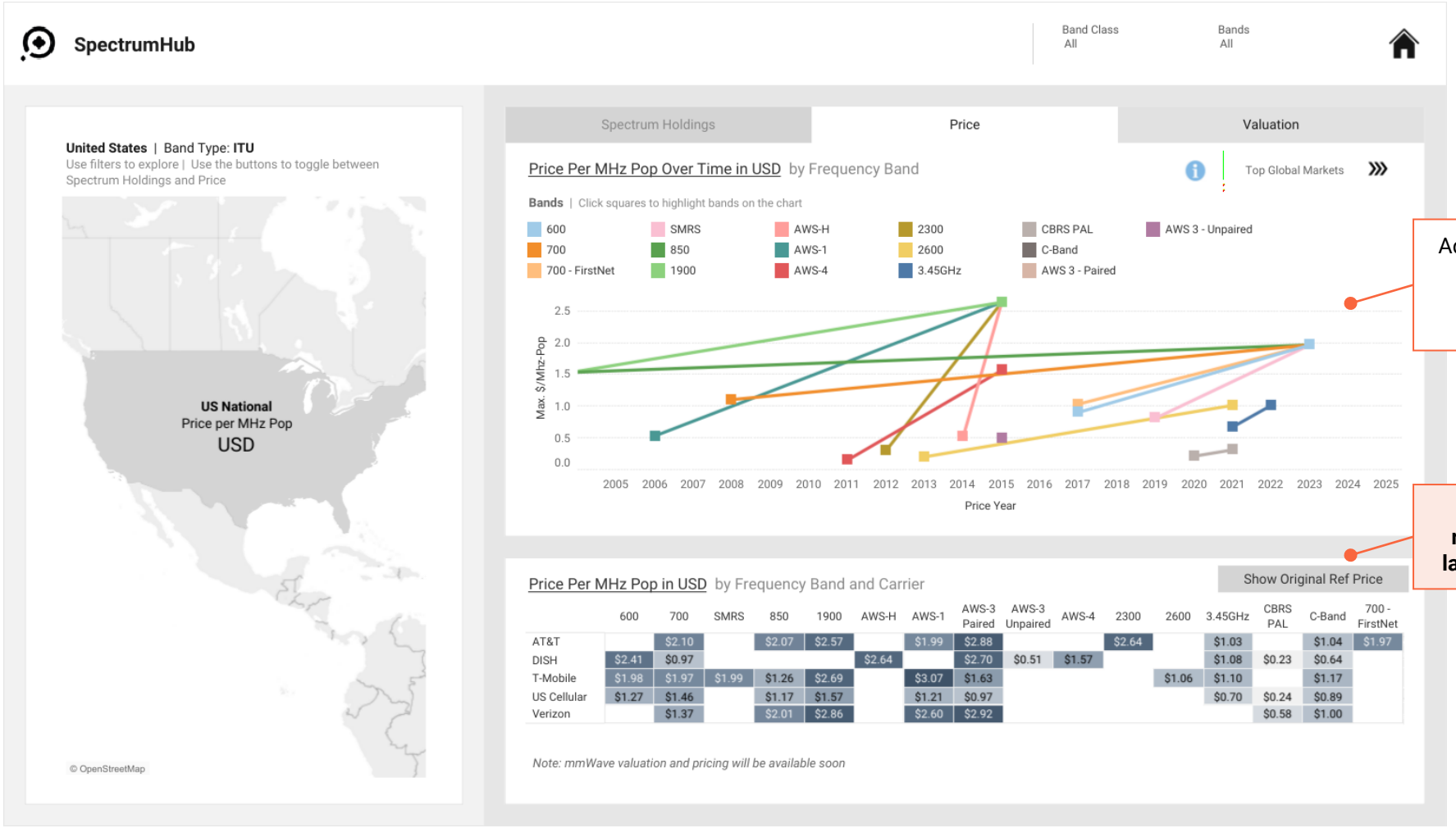
Expected upcoming cost: Based on renewals being done at historic costs, this allows users to see the expected total outlay by spectrum band and by carrier

…along with comparisons of expected spectrum renewal spending across different countries



New features: New pricing points in the US including secondary market transactions…

There was clear demand after SpectrumHub 1.0 to be able to see additional prices to original auction prices from secondary market transactions. We included what we believe are the most relevant ones. We also included a toggle to switch between the "Show Original Ref Price" and "Show Latest Ref Price" tables to be able to see how recent prices paid both market-wide and by carrier have changed over time.



Additional price points including not only auctions but other reference prices

Select by original reference price and latest reference price

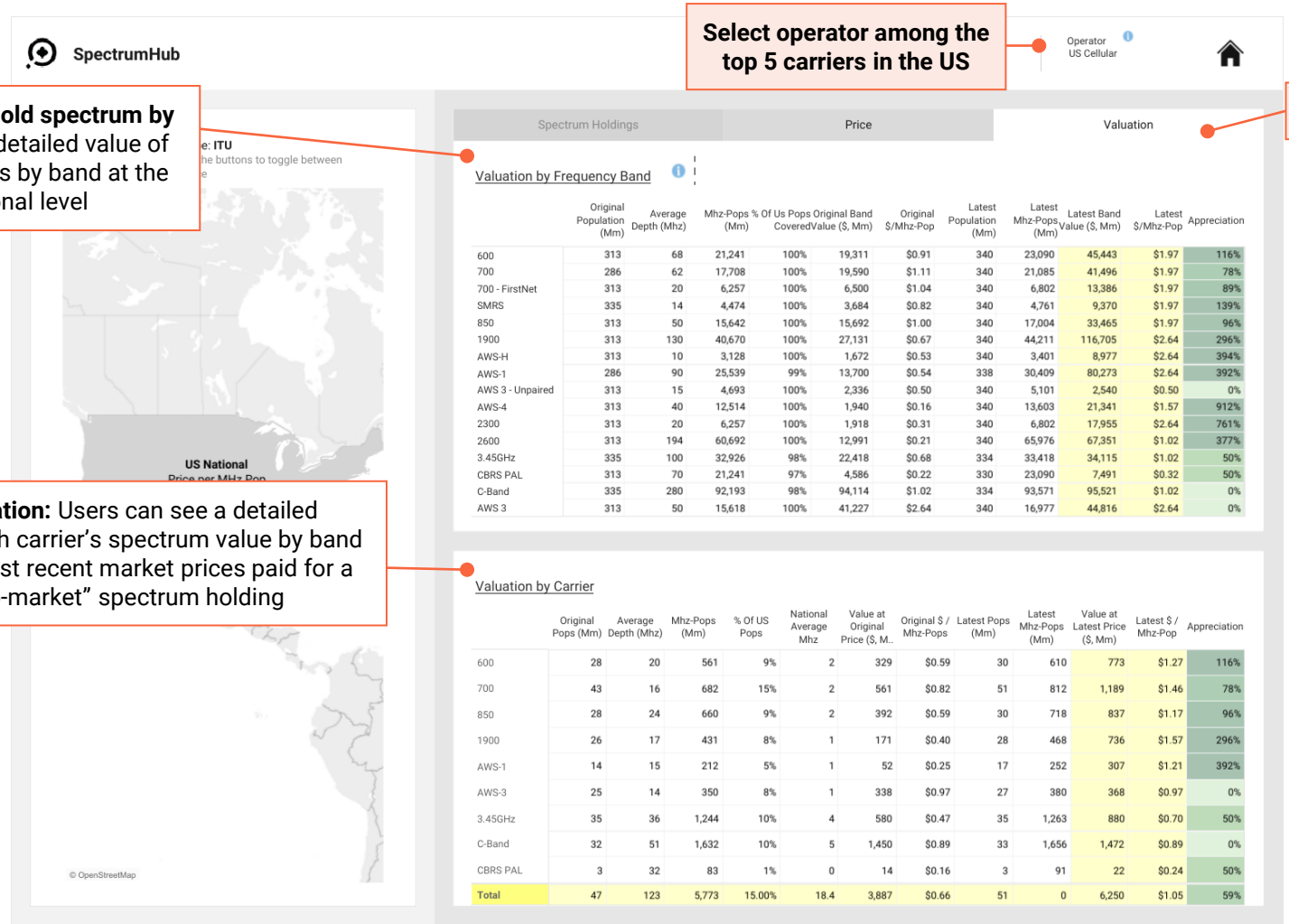
…and more details about MHz acquired, price paid, population and transaction type

Additional pricing points and additional important notes in the tooltip available

Expanded tooltip with additional information

New features: New spectrum valuation section in the US

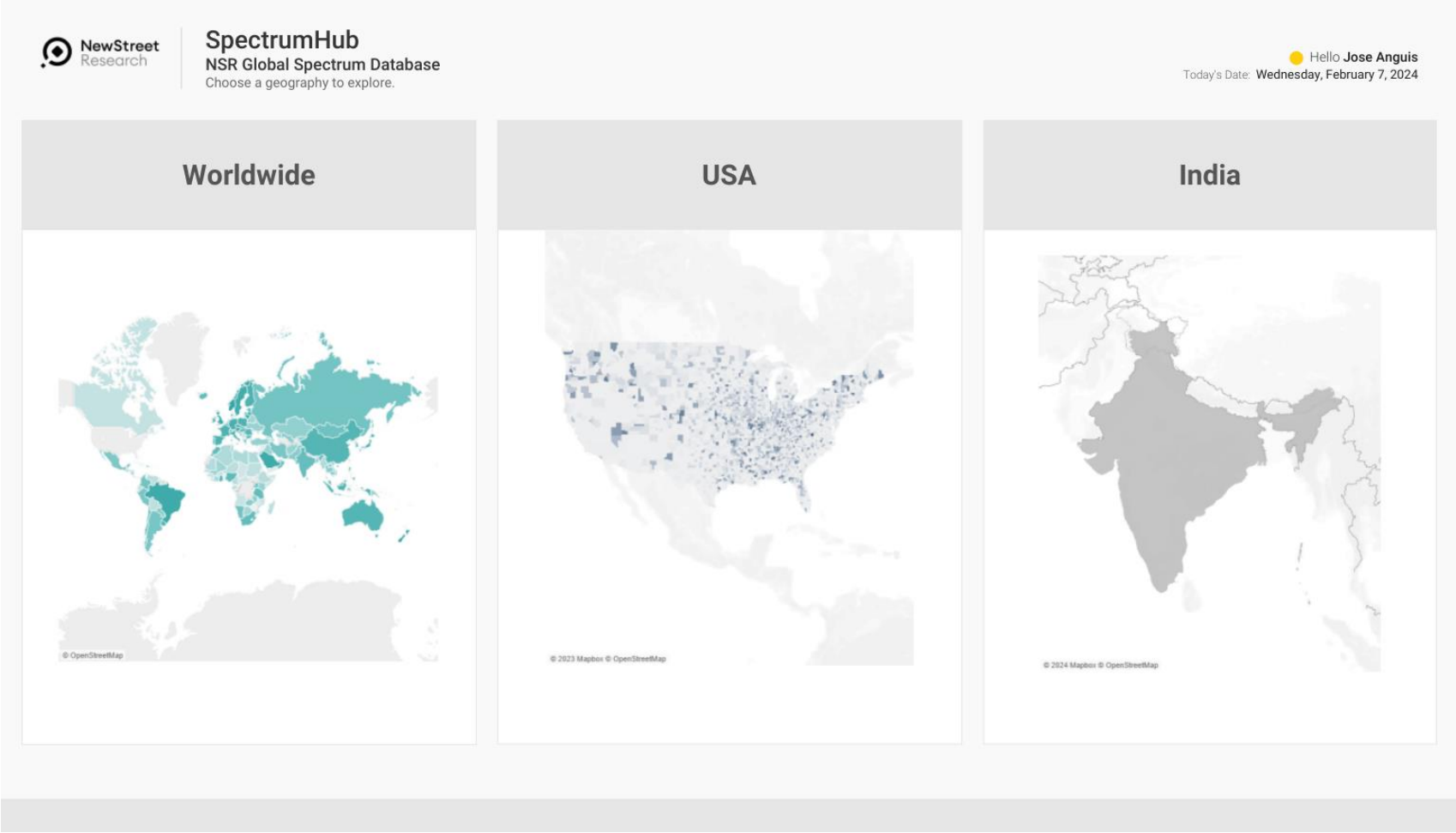
For a market like the US, where spectrum is awarded on a freehold basis, we are now very excited to be able to show the theoretical value of each carrier's spectrum based on both the initial price they paid for the spectrum, and then also the "revalued" price based on the most recent comparables for that spectrum band.



A reminder of the core SpectrumHub features

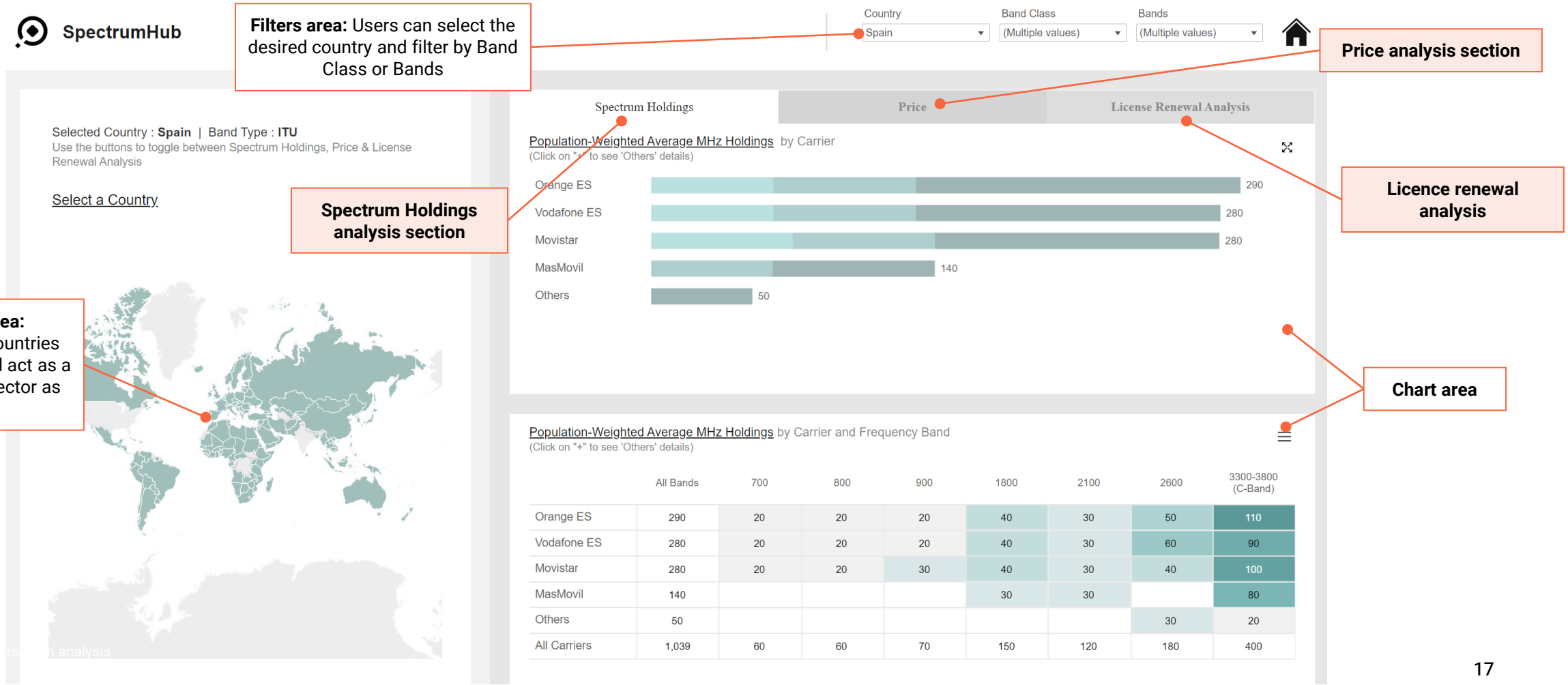
Three starting options: US, India and then everywhere else

Although we have added in a lot of new features into SpectrumHub 2.0, the core operating principles remain the same as the initial launch of **SpectrumHub**, which is structured in 3 big dashboards: US, India and Worldwide. The US and India remain split out as two markets with more detailed regional spectrum analysis, and for the rest of the world, users can then access all other countries separately.



Each of the three dashboards follows the same structure, with 3 clear differentiated sections

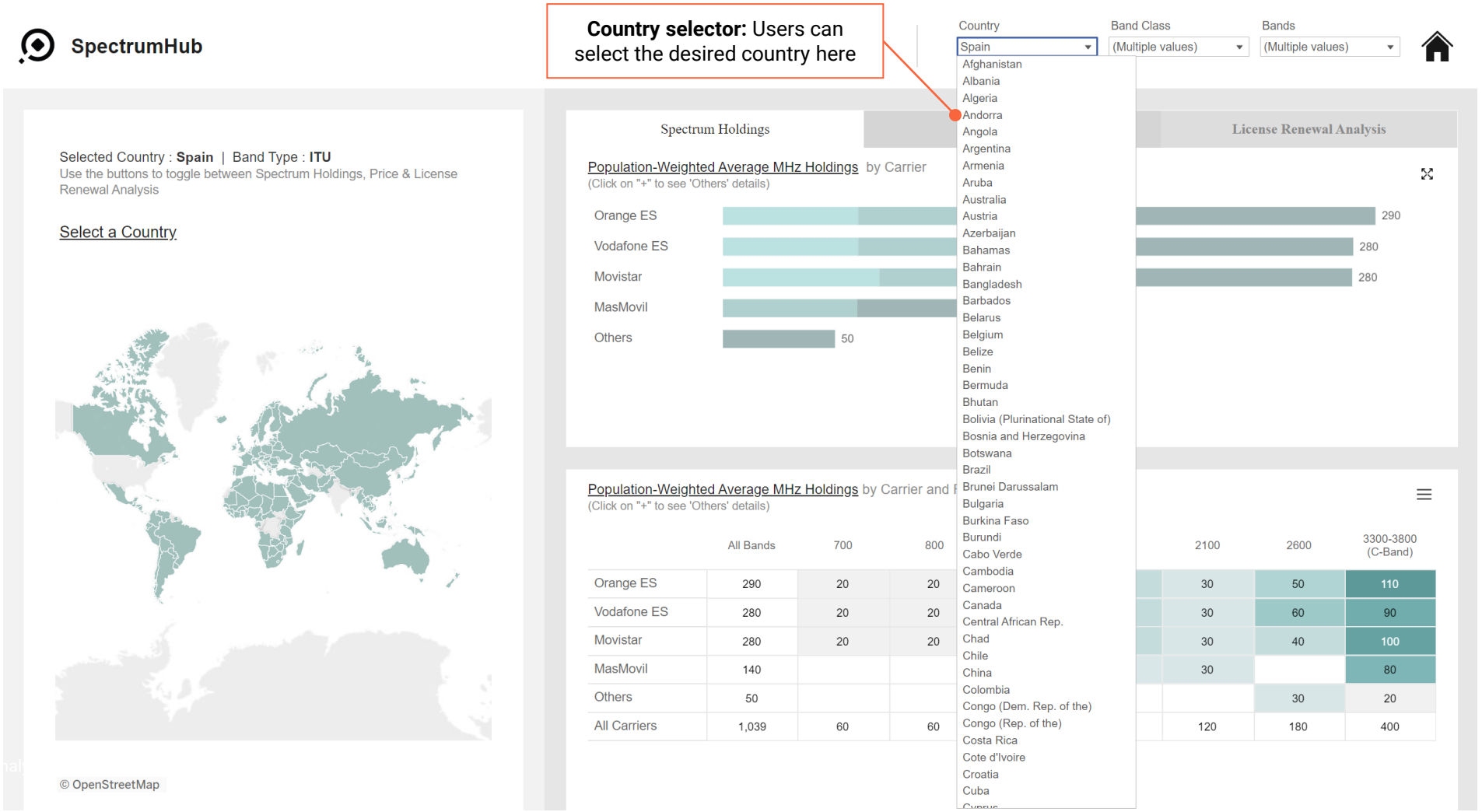
Each of the three dashboards has the same structure, consisting of three tabs containing the three main analyses (up from two in SpectrumHub 1.0). This features 1) Spectrum Holdings tab, which provides detailed MHz breakdowns by band and carrier for each country; and 2) Price tab, which offers $ per MHz population analysis by band and carrier for each of the countries, and pricing comparisons among different countries, and 3) Detailed analysis looking at either licence renewals, or spectrum valuations (in the US, where spectrum is freehold)



	All Bands	700	800	900	1800	2100	2600	3300-3800 (C-Band)
Orange ES	290	20	20	20	40	30	50	110
Vodafone ES	280	20	20	20	40	30	60	90
Movistar	280	20	20	30	40	30	40	100
MasMovil	140				30	30		80
Others	50						30	20
All Carriers	1,039	60	60	70	150	120	180	400

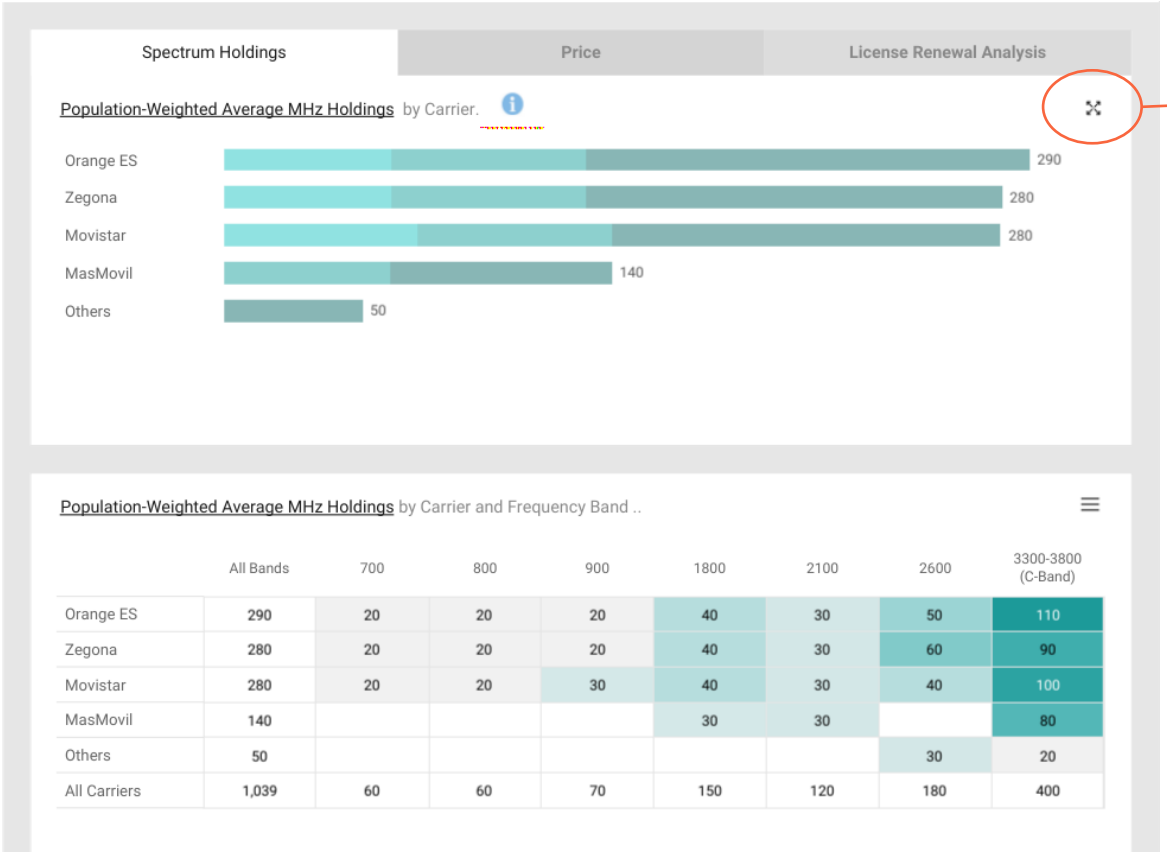
Complete global spectrum ownership mapped out

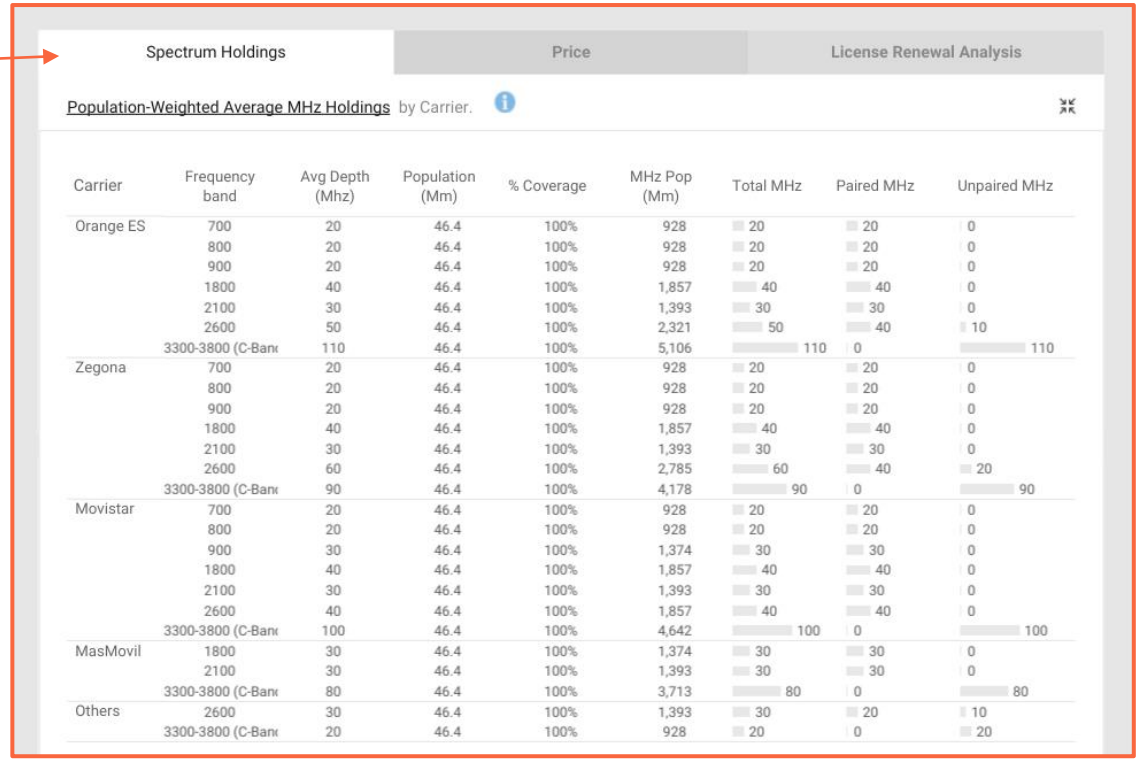
Clicking through to the Worldwide option, then offers a dropdown menu to allow users to pick out practically **any market globally** and to see who owns what spectrum and at which frequencies.



Spectrum holdings by carrier and band, and further subdivision of spectrum available

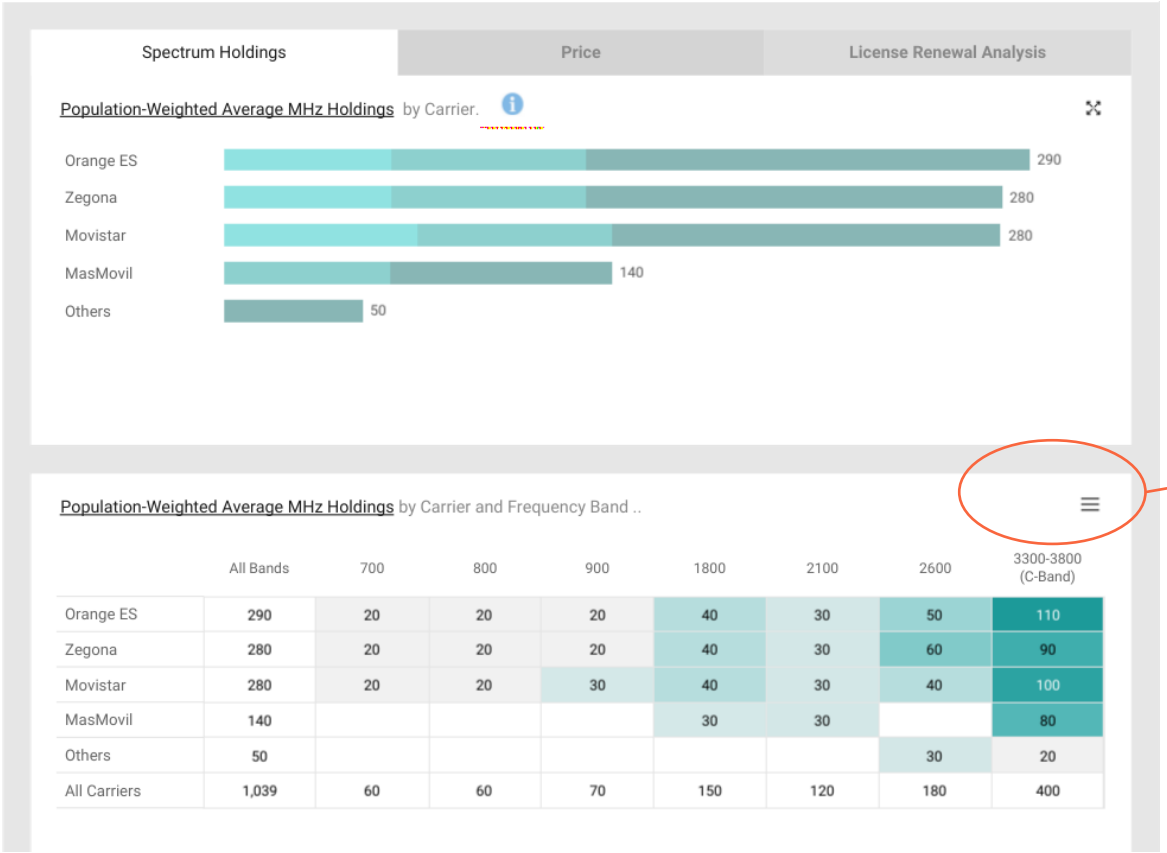
The top chart shows the total spectrum holdings by carrier. Users can access additional details by toggling the switch next to the chart, revealing a table that breaks down the spectrum holdings by paired (FDD) and unpaired (TDD) MHz for each band. This breakdown is crucial for understanding carriers' spectrum ownership across various frequencies.



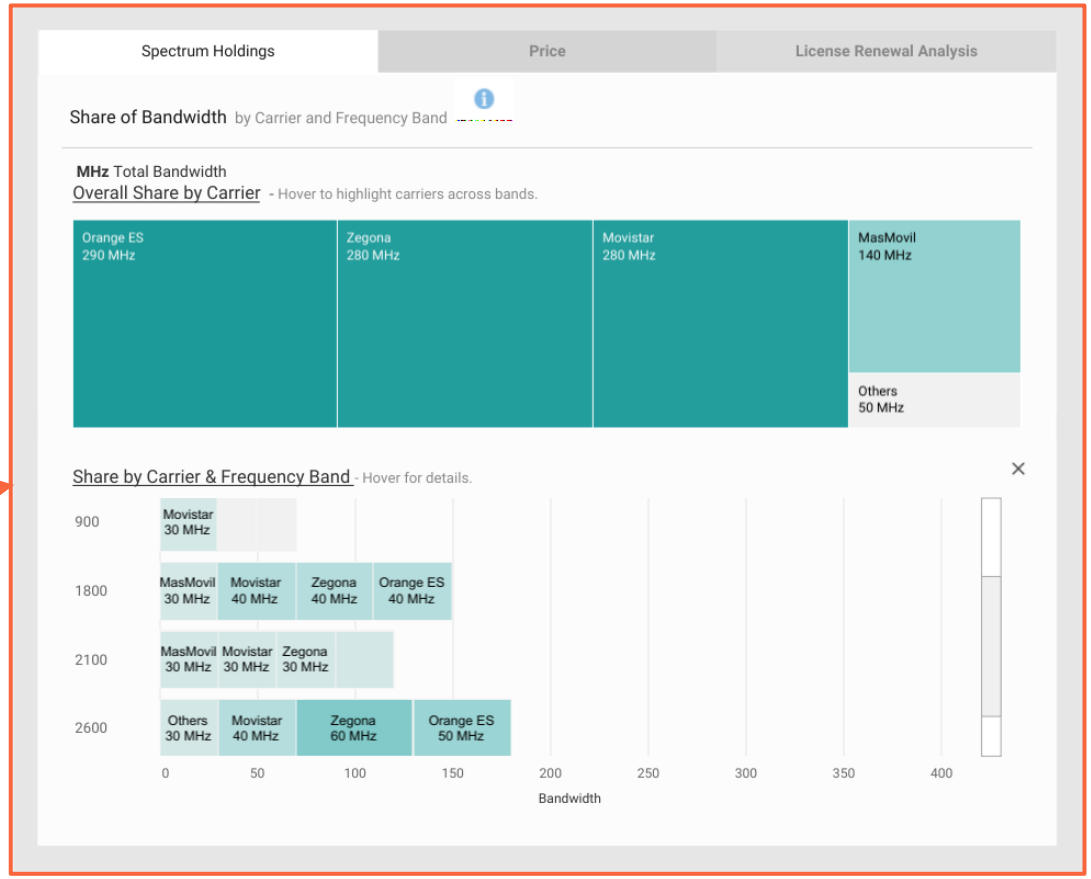


Graphical display of spectrum holdings also available

The bottom table displays the aggregate spectrum holdings of each carrier across different frequency bands. Users can visualize the same data graphically using the switch located above the table.

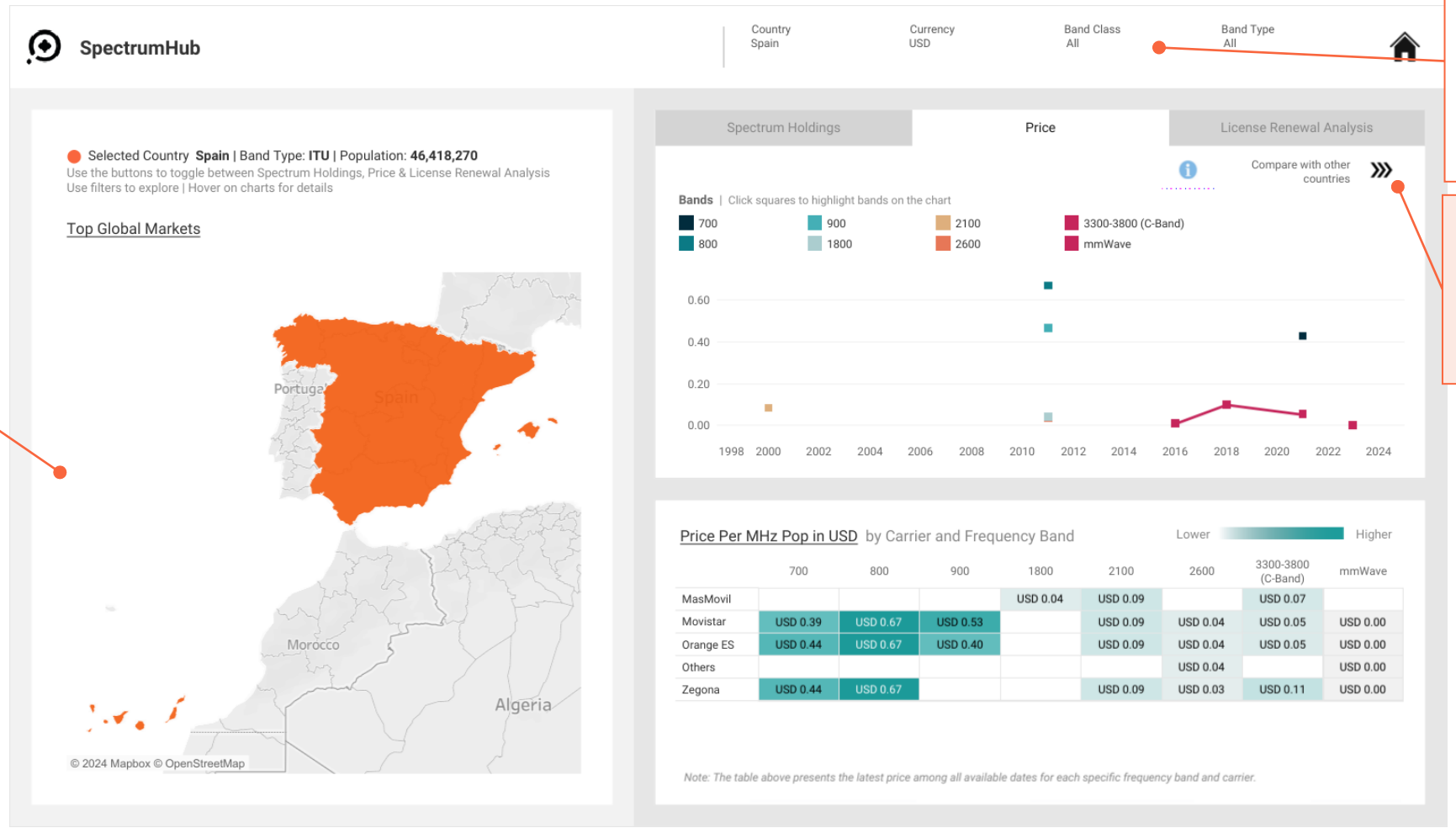


	All Bands	700	800	900	1800	2100	2600	3300-3800 (C-Band)
Orange ES	290	20	20	20	40	30	50	110
Zegona	280	20	20	20	40	30	60	90
Movistar	280	20	20	30	40	30	40	100
MasMovil	140				30	30		80
Others	50						30	20
All Carriers	1,039	60	60	70	150	120	180	400



SpectrumHub includes a price analysis section: a critical feature for financial investors

The price section delivers a detailed price analysis, encompassing historical pricing data (top chart) and most recent pricing data (bottom table) for each band and carrier.



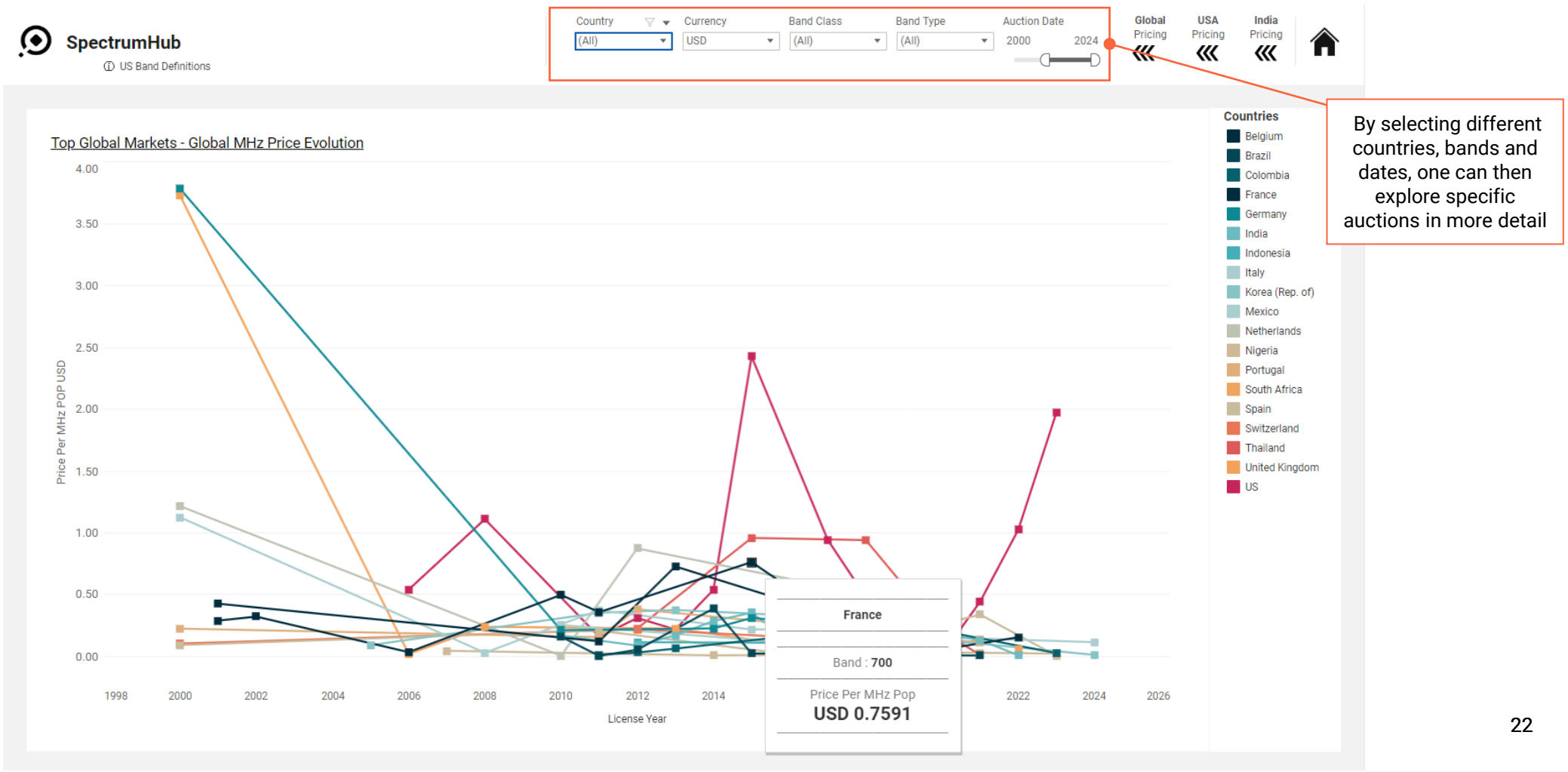
Filters area: One can select the country, choose between local currency or USD and filter by bands with these drop-down menus

Pressing "Compare with other countries" toggle, we open the cross-market pricing comparisons (see next slide)

The map highlights the selected country

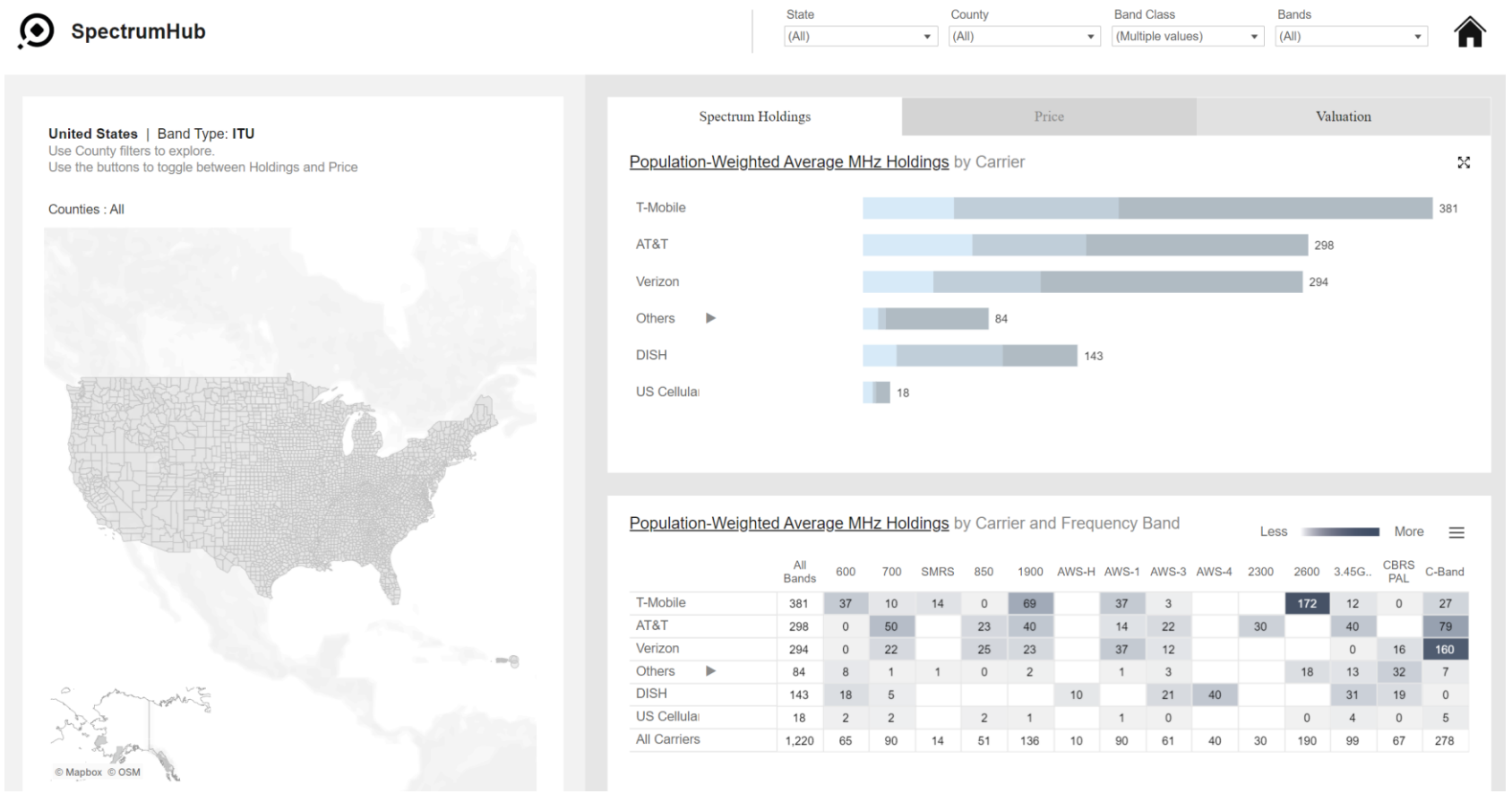
Price analysis can be done across different countries

The price section delivers a detailed price analysis, encompassing historical pricing data (top chart) and most recent pricing data (bottom table) for each band and carrier. While currently available for seven countries (Germany, Italy, Spain, France, UK, US and India), we are committed to expanding this feature to other countries in upcoming product versions.



In the US section, the national view displays spectrum holdings weighted by the total country population

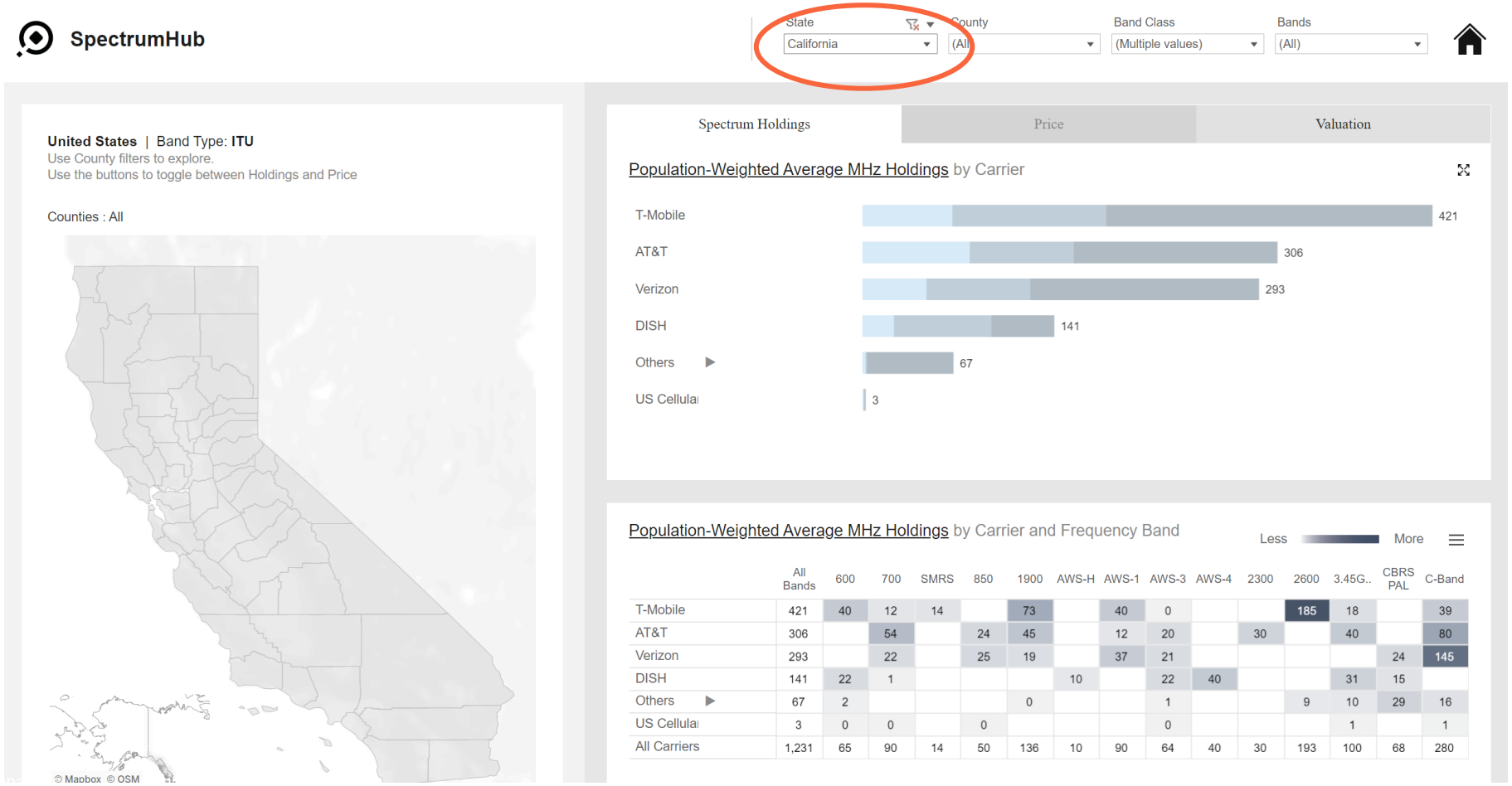
The structure of the US section mirrors that of the Worldwide dashboard. However, unlike the Worldwide dashboard, the US section includes views at both the county and state levels due to the unique characteristics of its licenses, which are at the market level rather than the national level. The national view displays a population-weighted average of spectrum by band and carrier. Thanks to this view, we can address questions such as the spectrum ownership of DISH and provide band-specific detail.



	All Bands	600	700	SMRS	850	1900	AWS-H	AWS-1	AWS-3	AWS-4	2300	2600	3.45G..	CBRS PAL	C-Band
T-Mobile	381	37	10	14	0	69		37	3			172	12	0	27
AT&T	298	0	50		23	40		14	22		30		40		79
Verizon	294	0	22		25	23		37	12				0	16	160
Others	84	8	1	1	0	2		1	3			18	13	32	7
DISH	143	18	5				10		21	40			31	19	0
US Cellular	18	2	2		2	1		1	0			0	4	0	5
All Carriers	1,220	65	90	14	51	136	10	90	61	40	30	190	99	67	278

SpectrumHub also offers a state-level perspective of the spectrum holdings in the US

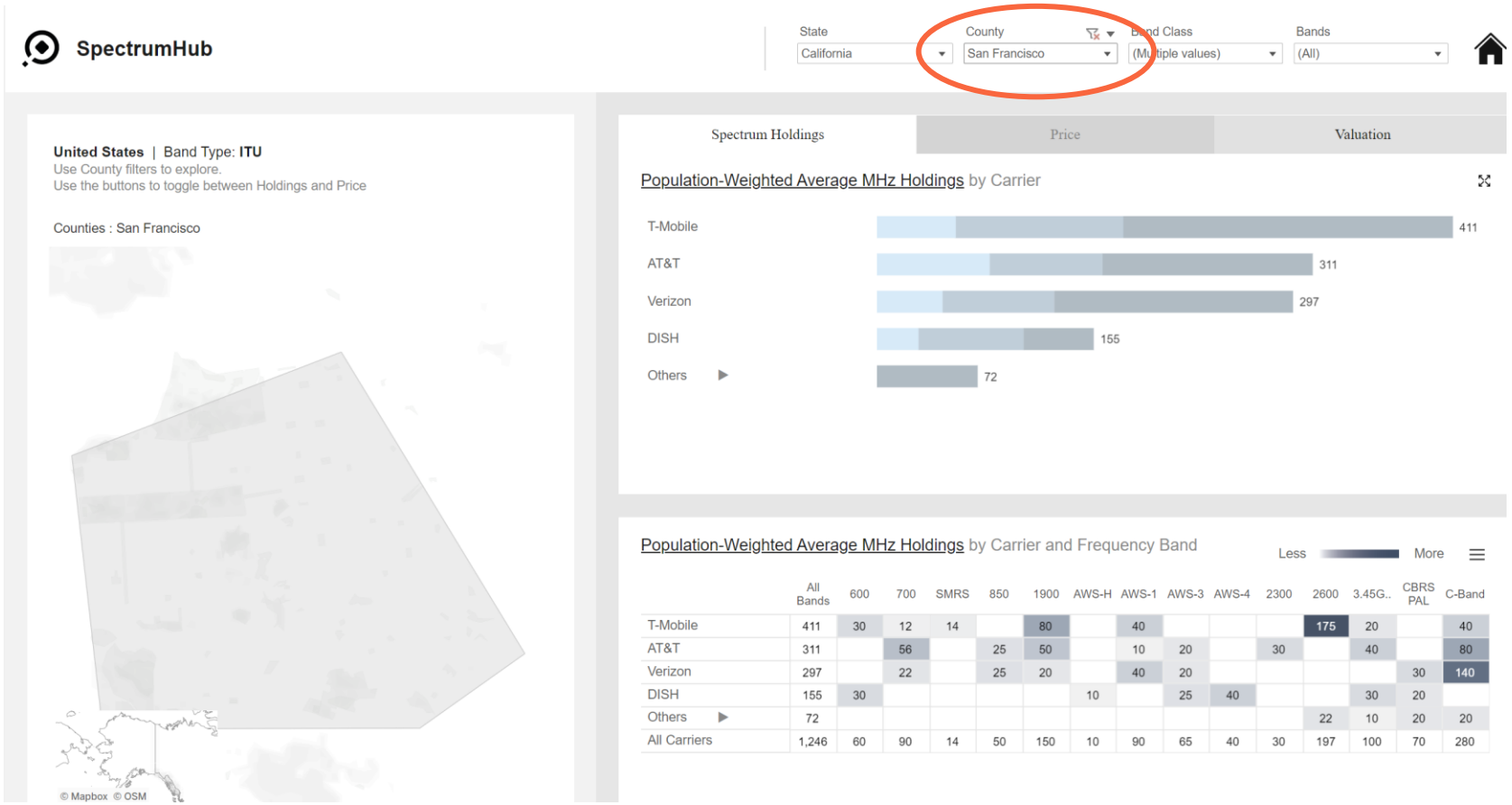
The state view displays a population-weighted average of spectrum by band and carrier in that specific state.



	All Bands	600	700	SMRS	850	1900	AWS-H	AWS-1	AWS-3	AWS-4	2300	2600	3.45G..	CBRS PAL	C-Band
T-Mobile	421	40	12	14		73		40	0			185	18		39
AT&T	306		54		24	45		12	20		30		40		80
Verizon	293		22		25	19		37	21					24	145
DISH	141	22	1				10		22	40			31	15	
Others	67	2				0			1			9	10	29	16
US Cellular	3	0	0		0				0				1		1
All Carriers	1,231	65	90	14	50	136	10	90	64	40	30	193	100	68	280

Users can also go further into individual counties for key holdings

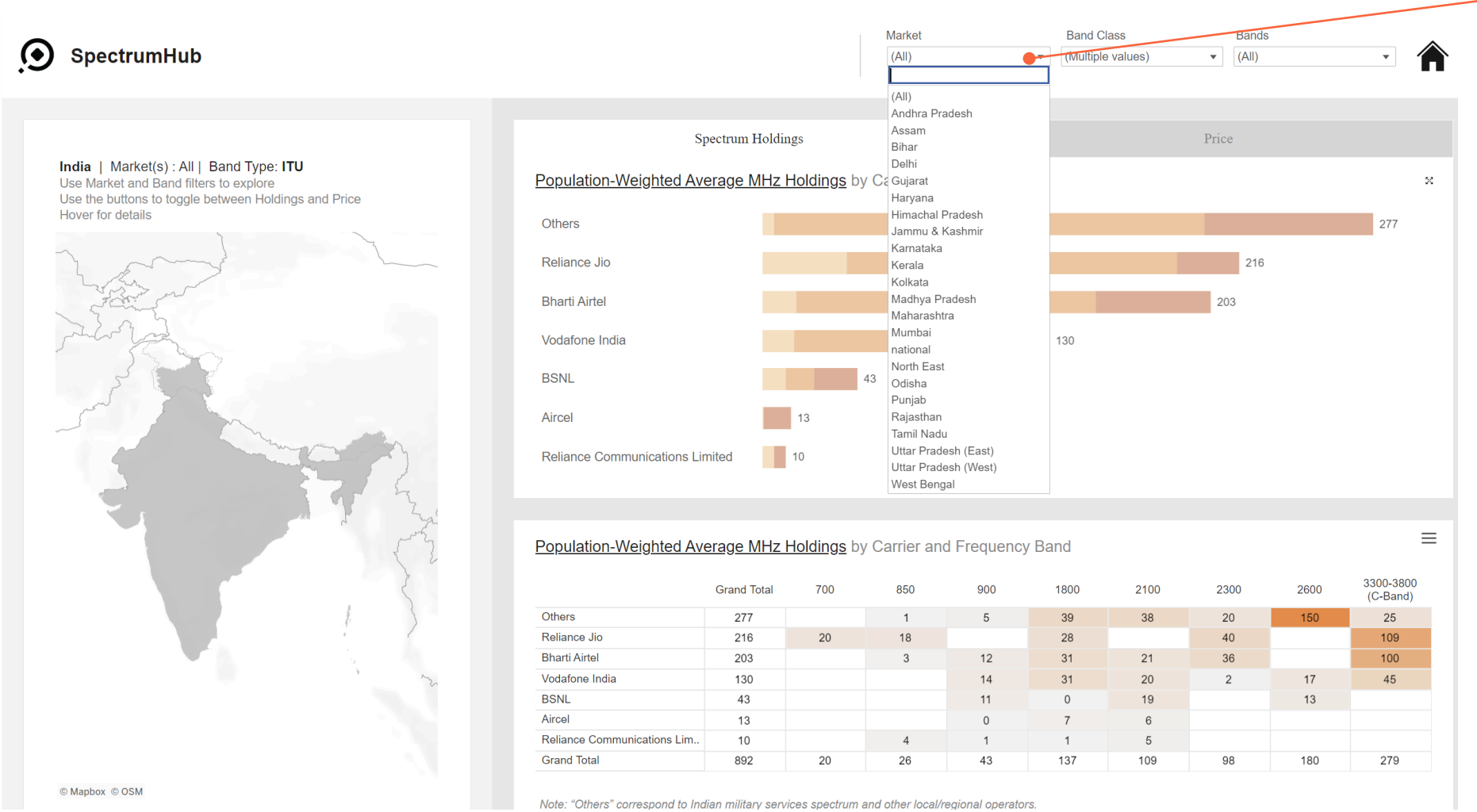
The county view displays a population-weighted average of spectrum by band and carrier in that specific county.



India section

As with the US, India offers a regional view alongside the national view due to the existence of telecom circles for spectrum licenses

Different spectrum circles can be selected



	Grand Total	700	850	900	1800	2100	2300	2600	3300-3800 (C-Band)
Others	277		1	5	39	38	20	150	25
Reliance Jio	216	20	18		28		40		109
Bharti Airtel	203		3	12	31	21	36		100
Vodafone India	130			14	31	20	2	17	45
BSNL	43			11	0	19		13	
Aircel	13			0	7	6			
Reliance Communications Lim..	10		4	1	1	5			
Grand Total	892	20	26	43	137	109	98	180	279

NewStreet Research

For those clients who don’t yet have access, but would like access to **SpectrumHub,** please contact Jose Anguis

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