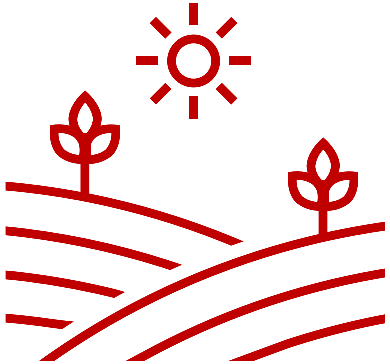
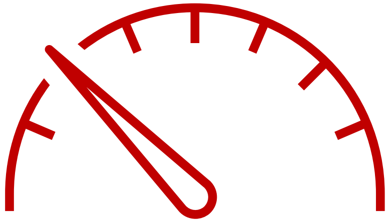
Spectrum Pricing Country Cases

RRS-25-Africa, Djibouti

10pp Higher Spectrum Costs Impact…





↓ **6pp**

Coverage

↓ **8%**

Speeds

How Policy Drives Prices

Pricing and design aspects

We find no material difference in prices between auctions and administrative assignments.

Specific design aspects and objectives of the regulator are more influential.

Reserve prices

Reserve prices were binding in case of 37% of assignments we examined.

Effectively, prices were set by regulators, rather than the market. Can worsen the winner’s curse,

Scarcity of spectrum

Operators who own less spectrum than the average paid higher price for additional spectrum.

Making sufficient spectrum available is an essential part of rational spectrum policy.

Spectrum Licensing Best Practices

- Commissioned several country case studies which aim to illuminate best practice in spectrum licensing globally
- Topics of focus include:
  - Transparent award processes
  - Extended licence durations
  - Defragmentation of bands
- The case studies can be found at:
  - GSMA, "Spectrum Licencing – Best Practice for Mobile Networks"
  - GSMA, "The Impact of Spectrum Set-Asides on 5G"

Countries included:

- Brazil
- Finland
- Germany
- India
- Nigeria
- Saudi Arabia
- South Korea
- Switzerland
- UK
- USA
- Austria
- Canada
- Colombia
- Spain*

GSMA

Spectrum Licensing Best Practice
Brazil

Long-term network investment incentives should provide significant benefits to the mobile market

Key lessons

- The aim of the 2021 auction for 700 MHz, 2300 MHz, 3500 MHz, and 26 GHz spectrum was to encourage market interest and to incentivise network investment.
- To achieve this, significant changes to licence terms were introduced based on public-private dialogue, including extended licence lengths, automatic renewals, and options to convert investment in underserved areas into payment reductions.
- The positive effects from the increased investment certainty and investment incentives were visible through vast market interest in the auctioned spectrum and immediate 5G network rollouts by successful bidders beyond licence requirements.
- However, with some spectrum remaining unsold in the auction, further adjustments to reserve prices may be required to support future growth.

Background

In 2019, the Brazilian senate agreed a package of amendments to the General Telecommunications Law (LGTT). The changes were based on a two-year dialogue with industry and were aimed at updating and modernising the legislation, by introducing longer spectrum licence terms, and automatic renewal of licences. Furthermore, the changes included incentives to promote investment in (rural) networks by allowing operators to own assets such as land and base stations compared to a prior requirement to return assets to public ownership.

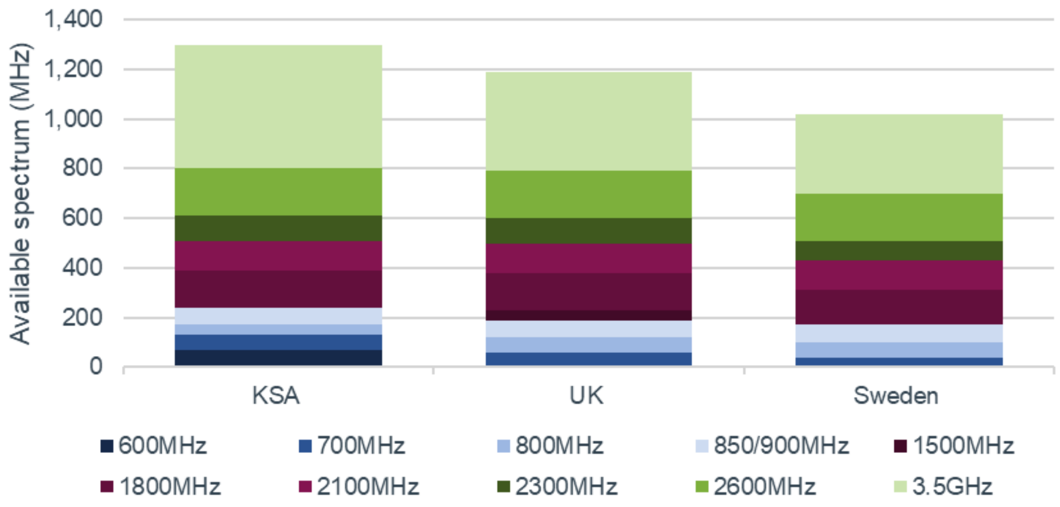
In 2021, Brazilian regulator Anatel launched the first multi-band spectrum auction for 700 MHz, 2300 MHz, 3500 MHz, and 26 GHz spectrum under the new legislation. The auction attracted strong interest from the market, as fifteen companies registered to participate in the auction. The bidders included the three national operators Claro, TIM and Vivo, a new entrant with wholesale ambitions – Winity Telecom – and a number of regional operators and other entrants.

Ultimately, eleven operators were able to acquire spectrum, with Claro launching 5G services using the 2300 MHz band one month after the auction.

Saudi Arabia – Continued Spectrum Supply

- CST has pro-actively reallocated spectrum from incumbent users to mobile
  - Frequent spectrum awards mean 1300MHz of spectrum is licensed to the three mobile operators (all below 4GHz)
- This policy's success is reflected in early 5G deployments by operators, high 5G adoption and a GDP contribution estimated by CST at 2.4%
- CST recently consulted on a new Spectrum Outlook. In this document, it lay out plans to award 1500MHz and 26GHz spectrum in the coming years

Comparison of IMT spectrum availability



National Transformation Plan 2020

- Following the publication of the National Transformation Plan 2020, CST moved away from administrative assignments
- A key objective of the Plan was to develop the digital economy
- Five spectrum auctions were planned between 2020-2023 – with the final auction delayed to 2024
- Awards have relied on best practice formats, such as clock or SMRA, granted 15-year licences, and allowed for spectrum trading

Spectrum allocation for mobile

- Amongst other things, CST has:
  - Reallocated 600MHz, 1800MHz, 2300MHz, and 2600MHz from incumbents (terrestrial TV and amateur radio)
  - Planned upgrades to radio altimeters to avoid interference in the 3800-4000MHz band
  - Prepared for band sharing with satellite deployments for low-power 4000-4200MHz deployments

Spectrum supply

- A total of 1300MHz is now licensed to Saudi Arabia's three national operators – an average of >430 MHz each
- This enabled 5G to be deployed in 2019, and CST estimates that spectrum availability contributes 2.4% to GDP
- Keeping this momentum, CST has recently consulted on plans to award spectrum in the 1500MHz and 26GHz bands

Spain – Long Licence Terms

- In June 2022, Spain's Ministry of Economic Affairs and Digital Transformation revised the General Telecommunications Law to provide for a one-time, 10-year extension of all existing spectrum licences
- All Spanish mobile operators applied to make use of this provision, extending existing licenses in six mobile bands until 2035-2048
  - No additional upfront fee was payable, only the current annual fees
- This process provides Spanish MNOs with long-term investment certainty, enabling a focus on expanding mobile infrastructure and 5G coverage

Licence extension timeline

Long licence terms

- A 2022 revision to Spain's General Telecommunications Law (LGTel) allows a one-off extension of up to 10 years on any existing spectrum licence – with no upfront fee
- This followed 40-year licence terms in the 2021/22 700MHz and 26GHz awards, highlighting a trend towards long licence terms

Straightforward renewal

- The four operators* requested extensions in the 800MHz, 900MHz, 1800MHz, 2100MHz, 2600MHz, and 3.5GHz bands
- A consultation was launched in May 2023, and extensions were granted in June 2024 with no objections from existing operators, potential entrants, or other market stakeholders

Investment benefits

- Longer licences help operators recover investments into capital-intensive network equipment via longer amortisation periods
- Avoiding the financial pressure and uncertainty of spectrum auctions frees up capital for network investment

Nigeria – Increasingly transparent auctions

- Nigeria is a Sub-Saharan leader in spectrum availability, with a history of making spectrum available through increasingly transparent processes
- The 3.5GHz auction in 2021 included large spectrum blocks to reduce fragmentation, plus rollout obligations to ensure efficient spectrum use
- The auction was also held in a very transparent manner
- However, some concerns remain, especially around high reserve prices and the efficiency of spectrum use

Transparent auction

- In previous auctions, spectrum has been non-transparently awarded to many bidders – some with no network infrastructure
- In 3.5GHz auction in 2021, NCC:
  - Provided round-by-round bid information
  - Invited industry body representatives to closely watch the procedure to ensure transparency

Efficient spectrum use

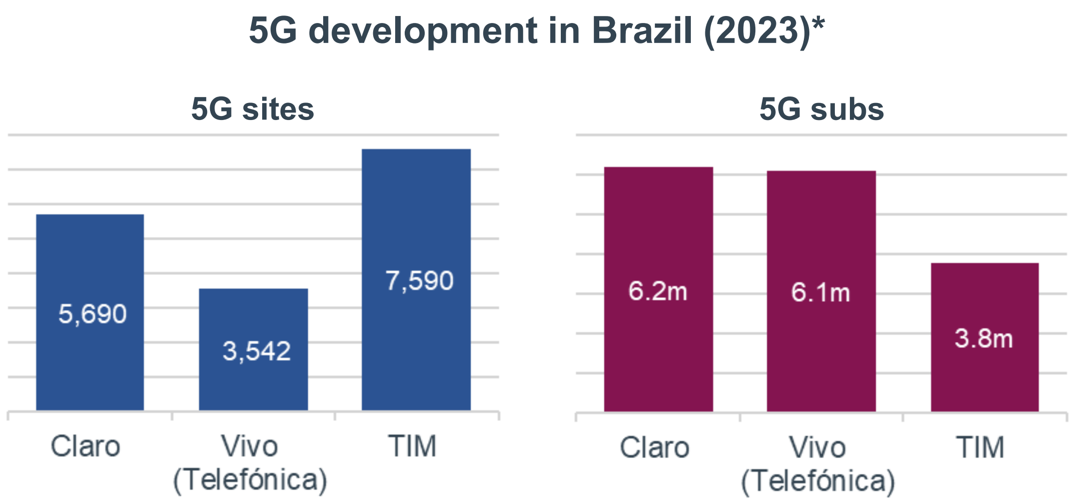
- The available 3.5GHz spectrum was split into two lots of 100MHz
- The winning bidders – Mafab and MTN – were required to deploy a 5G network within 12 months
- Mafab requested an extension and has only rolled out in limited areas – driving concerns around efficient spectrum use

Ongoing improvements

- Nigeria aims to continue improving spectrum award processes
- The National Broadband Plan 2020-2025 includes plans to:
  - Lower reserve prices
  - Clear the 700MHz and 2600MHz bands for mobile
  - Implement “use-it-or-lose-it” policies

Brazil – Network investment incentives

- The 2021 auction for 700MHz, 2300MHz, 3500MHz, and 26GHz spectrum aimed to incentivise network investment
- Legislative changes enabled extended licences, automatic renewals, and options to convert investment in underserved areas into reduced payments
- Positive effects included high market interest in the auctioned spectrum and immediate 5G network rollouts by successful bidders
  - Actual deployments exceeded licence requirements



Legislative changes prior to auction

- In 2019, the Brazilian senate agreed a package of amendments to the General Telecommunications Law (LGTT)
- Changes were based on two-year dialogue with industry, aimed at updating and modernising the legislation
- The 2021 multiband auction was the first under the changes to LGTT – there were 15 participants, 11 of which acquired spectrum

Investment incentives enabled by new legislation

- Licence terms extended to 20 years, granting a longer period to recover network investment
- Licences could be automatically renewed (if obligations fulfilled)
- Payments could be made annually over the licence term
- Cost of coverage obligations deducted from the auction price
- Bids over the reserve price could be converted into investment

Rapid deployment

- To meet licence conditions, the operators had to install 462 antennas in Sao Paulo within a year
- Anatel received approximately 1400 requests to approve antenna installations in the first year – more than 3× the requirement
- After launching 5G services just one month after the auction, Claro Brazil now has the fastest 5G network in Latin America**