

# The Impact of Set-Asides on 5G

21<sup>st</sup> June 2023



# For the benefit of industry

Mobile allows people-to-machine and machine-to-machine communication on a global scale. By integrating people and IoT, it increases efficiency and drives industrial progress.



# AT&T to Bring Elevated Wireless Experience to DFW Airport

We're modernizing and expanding DFW Airport network to support airport operations and provide reliable, high-capacity connectivity.

share    

Subscribe to AT&T news



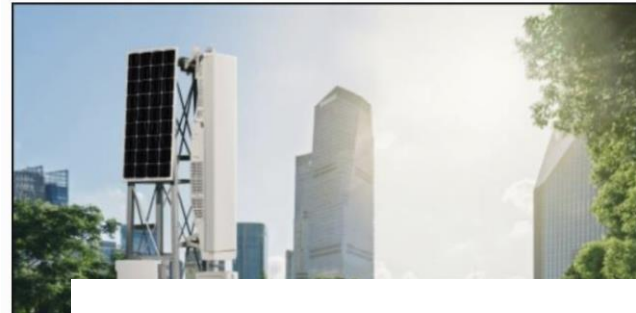
# Port of Hamburg is ready for 5G

## Operators and ecosystem players are vying to address private 5G opportunity

June 19, 2023



The debate over whether or not enterprises should have access to dedicated spectrum in India has been heated.



# Airtel partners Tech Mahindra to deploy captive private network at Mahindra's Chakan Facility

## Puerto Bahía digitalizará su terminal portuaria con soluciones de Claro y Nokia

Sharon Durán — May 10, 2023

CLARO COLOMBIA COLOMBIA NOKIA

# Reti private 5G di Tim, l'azienda salentina Ilmea tra le prime in Italia a dotarsene





Da due anni, l'impresa con sede nel piccolo villaggio di Boncore, frazione di Nardò, investe sistemi di efficientamento della produzione in ottica Industria 4.0



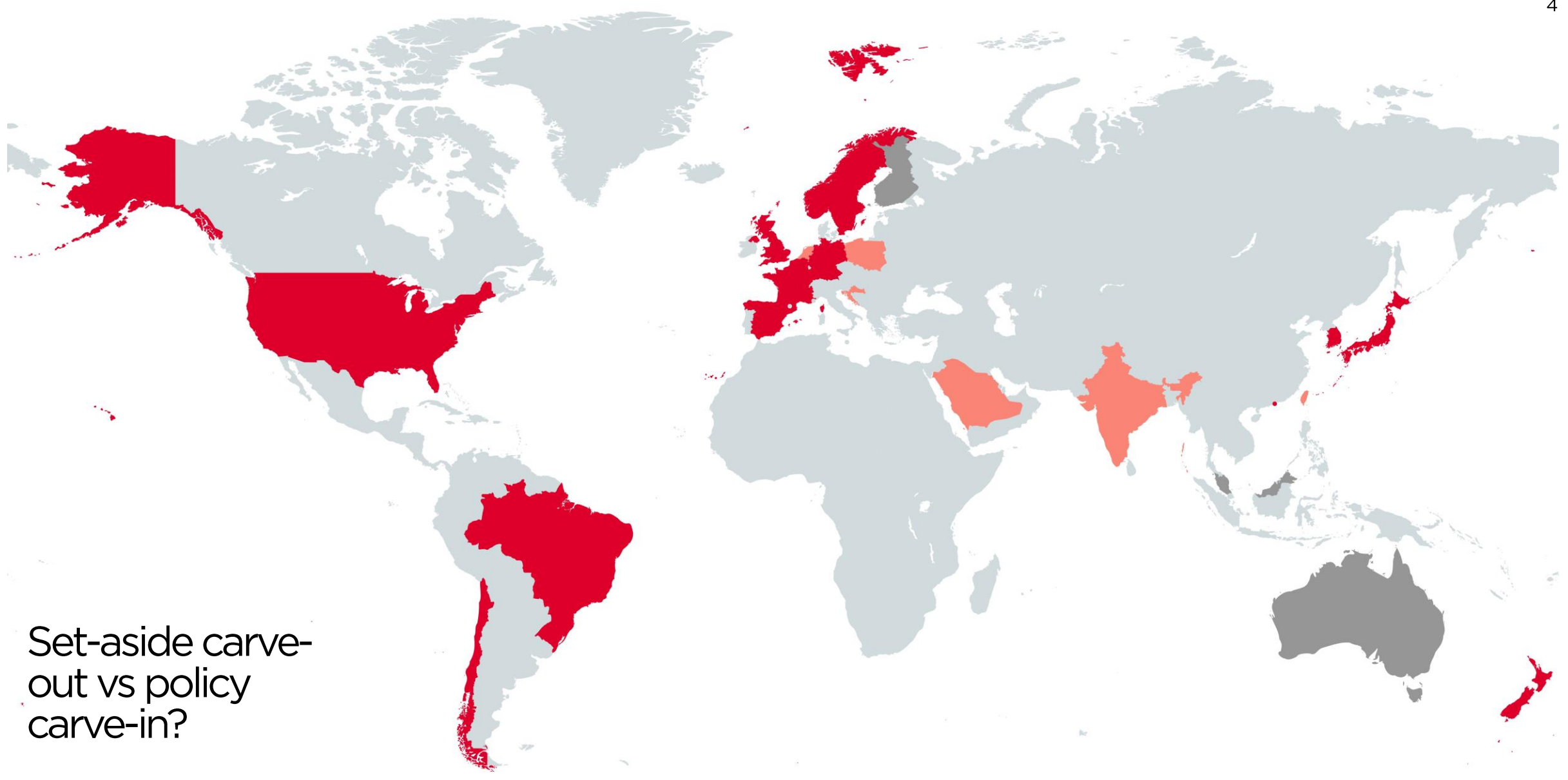
Guangzhou Metro 5G + Smart Metro

“5G technology facilitates the digital development of the traditional urban rail transit industry by driving the transformation from the traditional multi-layer, complex and fixed network to the flat, lightweight and updatable architecture. First, the high reliability of 5G network enables trains to better perceive the operating environment and their own operating status, thereby improving the transportation capacity of metro lines. Second, the massive connections of 5G network facilitate the establishment of a visual resource scheduling system for each line of the urban rail transit network. The system is designed to monitor the status of passengers and trains in real time, and improve the efficiency of operation and management. Finally, the large bandwidth of 5G network brings about new customer service platforms, allowing timely and accurate access to services in abundant transportation scenarios in the entire metro travel chain through multiple online and offline channels, and improving the travel experience.”

Cal Changjun  
Deputy General Manager of Guangzhou Metro Group

Partners   





Set-aside carve-out vs policy carve-in?





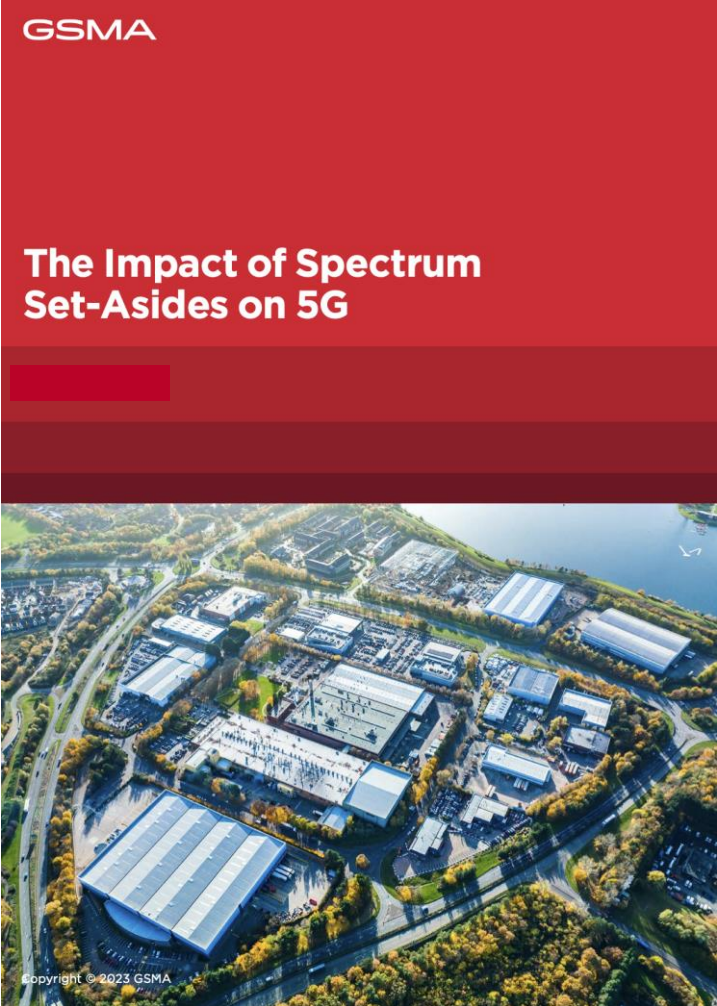
# For the benefit of industry

Mobile allows people-to-machine and machine-to-machine communication on a global scale. By integrating people and IoT, it increases efficiency and drives industrial progress.

# Questions

## The Impact of Set-Asides on 5G

<https://www.gsma.com/spectrum/resources/the-impact-of-spectrum-set-asides-on-5g/>





# The impact of spectrum set-asides for industry users on 5G

LinkedIn Live

21 June 2023

# Background to report



## Industry users

*Want to benefit from mobile ecosystem*

*Want access to core mobile bands*

*Want exclusivity / spectrum sharing*



## Regulators

*How to best enable industry user spectrum access without harming the mobile industry?*



## MNOs

*Growing demands from users*

*Need for more (exclusive) spectrum*

## Aim of the report

- Illustrate approaches to making spectrum available for industry users
- Assess impact on mobile industry from these approaches

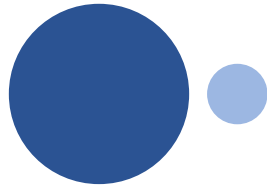


**Based on 5 case study countries**



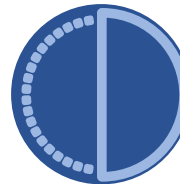
# Approaches to spectrum licensing for industry users

## Spectrum set-aside



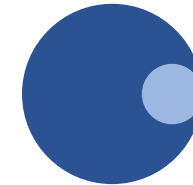
Assigning a range of spectrum to be exclusively licenced to industry users

## Spectrum sharing



Enabling several users to access spectrum simultaneously

## Licence conditions

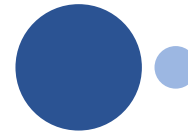


Enabling or requiring public mobile operators to deploy private networks or lease spectrum to industry users

# Germany – Set-aside drives high auction prices

## Licensing approach

- Spectrum set-aside



## Background

- Aim was to create flexibility for new / developing 5G business cases
- 100MHz set aside for industry users ahead of 2019 3.5GHz auction
- Set-aside spectrum awarded on a first-come first-served basis

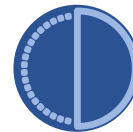
## Impact

- Auction created scarcity for mobile operators → less than 80MHz per bidder available
- Prices increased by about 300% compared to auctions with  $\geq 100$ MHz → cost of EUR3 billion
- Limited take-up of set-aside to date, only 322 campus licences as of Q2 2023

# USA – Sharing model reduces market interest

## Licensing approach

- Spectrum sharing



## Background

- Government study recommended spectrum sharing to unlock further economic value
- Three-tiered CBRS model was introduced to allow shared use in 3550-3700MHz with primary access for military users, second-tier priority licences auctioned, and third-tier unlicensed access free of charge

## Impact

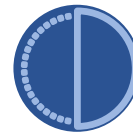
- 91% of licences sold but at 75% discount to next C-Band auction → economic cost of USD15-20 billion
- Uncertainty of spectrum access, interference concerns and power restrictions impair current users
- No evidence of strong take-up by unlicensed users in the CBRS band



# UK – Spectrum sharing creates future uncertainty

## Licensing approach

- Spectrum sharing



## Background

- Ofcom's aim was to enable wireless innovation through local licensing
- Shared access licences offer local access to the 3.8– 4.2 GHz band and other bands
- Local access licences provide temporary access to unused operator-held frequencies in all bands

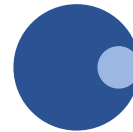
## Impact

- As of Q2 2023, 1672 shared access licences have been assigned to 77 users (60% of licences held by 2 users)
- Most licences are only for (up to) 200MHz – leaving parts of spectrum unused
- Ofcom has retained option to revoke licences in the future

# India – Multi-pronged approach to industry licensing

## Licensing approach

- Licence conditions



## Background

- DoT aims to encourage the roll out of private networks through different approaches
- Currently approved approaches included **network slicing**, development of isolated **on-premise private networks using MNO spectrum** or **spectrum leasing** from MNOs

## Impact

- DoT also considered dedicated set-aside but dismissed it as existing options were deemed sufficient to enable private networks
- Companies interested in private networks are encouraged to participate in market processes to acquire spectrum (similar to 26GHz auction where Adani Group acquired spectrum)

# Finland – Licence conditions stimulating cooperation

## Licensing approach

- Licence conditions and set-aside



## Background

- Finland aims to be a 5G frontrunner through promoting innovative business solutions
- 3.5GHz auction included licence conditions requiring successful bidders to make available access to spectrum for private networks on request (either through MNO solution or spectrum leasing)
- Dedicated set-aside in 2300MHz spectrum and 26GHz

## Impact

- Limited interest in set-aside spectrum
- Quick 5G rollout by Finnish operators
- Initial cooperations at operator-level are evolving (automated port operations, mission-critical networks for waste management, improving safety and operations in mining industry)



# Impact of licensing approaches

	Impact on industry users				Impact on mobile users		
	Geographic access	Certainty of access	Certainty of tenure	Interference management	Efficiency of spectrum use	Spectrum availability	Limited economic cost
Set aside spectrum	✓	✓	✓	?	✗	✗	✗
Spectrum sharing framework	✓	✗	✗	?	?	?	✗
Licence conditions	✓	✓	✓	✓	✓	✓	✓

# Main take-aways from report

---

- **Interest is more driven by spectrum properties than the licensing mechanism**
  - main interest is in access to 3.5GHz band
  - no discernible difference in uptake / spectrum usage from set-asides / spectrum sharing compared to less intrusive mechanisms
- **Set-asides carry risk to economy, as seen by the example of Germany**
  - extra spectrum cost in range of EUR3 billion
  - no operator with access to 100MHz in 3.6GHz
  - limited uptake of set-aside licenses
- **Spectrum sharing complex and fraught with risks**
  - CBRS proved too difficult to implement, even in market with the scale of USA
  - interest in UK shared licences today mainly focused on two licensees (both existing telecoms operators, not industry users)
- **Well-designed licence conditions are least intrusive and stimulate cooperation**
  - builds on common approach to private networks of cooperation between industry users and network operators
  - best of both worlds – mobile operators get access to spectrum where needed whereas industry gains access to widely used bands

# Thank you!

**Marc Eschenburg**

**Partner**

marc.eschenburg@aethaconsulting.com

+44 7557 040032

---

Aetha Consulting Limited  
24 Hills Road  
Cambridge  
CB2 1JP  
United Kingdom  
+44 1223 755575  
[www.aethaconsulting.com](http://www.aethaconsulting.com)

**Confidentiality notice.** *This document and the information contained herein are solely for the use of the GSMA and its members*

**Copyright © 2023.** *The information contained herein is property of Aetha Consulting Limited and is provided on the condition that it will not be reproduced, copied, lent or disclosed, directly or indirectly, nor used for any other purpose other than that for which it was specifically furnished.*