

# Market mechanisms that are applied to licensed mobile spectrum in the UK could be improved

January 2023

Mark Colville and Chris Nickerson

Analysys Mason has undertaken a study to review the three market mechanisms that are currently applied to licensed mobile spectrum in the UK. Our study examined the benefits of, and issues with, these market mechanisms and concluded that changes – particularly to pricing – would be beneficial.

## Context

2022 marked the 20th anniversary of a report commissioned by the UK government entitled *Review of radio spectrum management*, led by Professor Martin Cave ('the Cave report'). The Cave report played a key role in shaping the market mechanisms that the government and Ofcom have defined for managing access to licensed mobile spectrum in the UK, namely:

- **auctions:** the assignment of spectrum licences through an auction process
- **pricing:** the levying of annual licence fees (ALFs)
- **trading:** the ability for spectrum licences to be traded (and potentially leased).

Since the Cave report was published, the mobile sector in the UK has evolved significantly and we expect it to continue to change in terms of the technologies that will be used, the demand for services and the structure of the market.

These changes raise the question of whether the market mechanisms also need to evolve. Our study reviewed the effectiveness of the three mechanisms over the last two decades, and their appropriateness to the present – and future – environment for spectrum management.

We considered the application of market mechanisms for their stated purpose of promoting the efficient use of spectrum,<sup>1</sup> and positive outcomes for users of mobile services. Whether by design or not, some of the market mechanisms may also have a wider impact (for example, they could generate income for the government, which can in principle be used for wider social benefits, such as building hospitals or raising pay for public sector workers). However, such considerations were beyond the scope of our study.

The study, for techUK on behalf of the UK Spectrum Policy Forum (SPF), underwent a rigorous peer review process by a panel that included three former Ofcom Directors. It was carried out by Analysys Mason, together with Professor Martin Cave.

---

<sup>1</sup> This refers to both economic and technical efficiency, as well as spectrum utilisation. Economic efficiency (by which we mean "allocative efficiency") is maximised when spectrum is allocated to users that generate the greatest economic value from it. Technical efficiency refers to spectral efficiency (that is, bits per second per hertz). Spectrum utilisation refers to how widely the spectrum is used in a geographical sense, and how frequently.

## Findings: trading and auctions work well overall, but ALFs are not needed to promote efficiency

A high-level summary table of our conclusions is shown in Figure 1.

**Figure 1: Key conclusions**

Question	Trading	Auctions	Pricing (ALFs)	
Does the basic philosophy articulated in the Cave report still support the use of a market mechanism of this form?	Yes	Yes	No	
Is the market mechanism approach and current implementation of that approach optimal in terms of both promoting spectrum efficiency and avoiding undue problems/risks?	No	No	No	
Are there possible alternative options that might lead to better outcomes, in relation to ...	... the market mechanism approach?	No	No	Yes
	... the way the market mechanism approach is currently implemented?	Yes	Yes	Yes

Source: Analysys Mason

In summary, we concluded that both auctions and trading work well overall, and should continue to form an important part of the management of mobile spectrum in the UK. However, in both cases, some changes could be beneficial.

- For **trading**, we recommend the introduction of market-led leasing and potentially a more automated system involving less friction and lower transaction costs (that is, if more localised use of higher frequencies leads to increased volumes of trades at lower value).
- For **auctions**, consideration should be given on a case-by-case basis to whether alternative options (for example, administrative assignment, dynamic spectrum access (DSA) or hybrid approaches) are more appropriate. For higher frequencies, or where there is expected to be some form of shared use in the future, such options might increase spectrum utilisation.

The most significant issue we identified with the current market mechanisms relates to **pricing**. Given the ability to trade, ALFs levied on licensed mobile spectrum are not required in order to promote efficiency, since mobile network operators (MNOs) already face the opportunity cost of their spectrum (that is, because they could sell it, it represents capital tied up in their business). While there might be other reasons why ALFs are beneficial, these do not form part of their stated purpose and therefore fall outside the scope of our study. As such, we recommended that two possible alternatives to ALFs should be considered.

## Alternatives to ALFs

### Option 1: remove ALFs

This option would not result in any loss:

- (relative to the current situation) in terms of spectrum efficiency, and potentially offers gains if barriers to trading are reduced
- in terms of spectrum utilisation, and potentially offers gains if there is an increase in network investment
- of consumer benefits in terms of increased retail prices, and potentially offer gains if retail prices were to fall.

### **Option 2: adopt a ‘non-cash’ (or hybrid) approach (for example by replacing ALFs with coverage/investment commitments)**

While ALFs are not required to promote efficient use of spectrum, the scope of our study also includes the application of market mechanisms to achieve positive outcomes for users of mobile services. Levying the amount that MNOs would have been required to pay in ALFs (~GBP360 million in 2022) in the form of coverage or other investment commitments, which improve the quality of mobile services could help to achieve such positive outcomes. For example, requiring MNOs to invest in extending mid-band (for example, 3.5GHz) 5G coverage into rural areas, improving network quality along transport routes, or increasing the power resilience of their networks.

This option effectively replaces the wider social benefits that are achieved through government spending of the current cash ALFs with benefits targeted at mobile users specifically (noting that wider social benefits are beyond the scope of our study). Implementation challenges would need to be carefully explored, but this option would:

- offer benefits in terms of driving improvements to digital infrastructure
- offer benefits to consumers through enhanced network quality, with a possibility of some downward pressure on retail prices
- potentially offer benefits to the MNOs (if there was incremental revenue)
- not result in any loss (relative to the current situation) in terms of spectrum efficiency.

For more information about our spectrum management services, please contact [Mark Colville](#) or [Chris Nickerson](#).