The Polish 700 and 800 MHz spectrum auction

The recent 700 and 800 MHz spectrum auction in Poland represented the last major low band spectrum auction in Europe; what can operators and regulators outside of Europe learn from the auction and the wider European experience?

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Insights from the Polish and European 700 and 800 MHz spectrum auction

Introduction

The Polish 700 MHz auction was the last major low-band spectrum auction in Europe following the 2016 EU decision to award the band by 2020

In March 2025, Poland's Office of Electronic Communications (UKE) concluded a landmark spectrum auction, awarding six 2 x 5 MHz blocks in the 700 MHz band and one 2 x 5 MHz block in the 800 MHz band. This event marked one of the final major low-band spectrum awards in Europe, following a decade-long wave of 700 MHz and 800 MHz auctions across the continent. These bands are especially valuable for mobile broadband, offering wide-area coverage and strong signal penetration in urban and rural environments alike. The coordinated release of the 700 MHz band for mobile use was agreed across the EU and EEA, following the 2016 EU decision to make the band available by 2020, primarily to support 5G deployment.

Most European countries have now auctioned spectrum in both the 700 MHz and 800 MHz bands, with notable early movers including Germany (700 MHz in 2015, 800 MHz in 2010), France (700 MHz in 2015, 800 MHz in 2011), and the UK (700 MHz in 2021, 800 MHz in 2013). Poland's delayed 700 MHz auction, originally scheduled for 2020 but postponed multiple times due to political and technical reasons - including cross-border coordination with Ukraine and Belarus - makes it one of the last EU countries to complete this allocation.

As of early 2025, the only major European country that has not yet held a 700 MHz auction is Russia, which is not bound by EU spectrum harmonisation rules. In the EU and EEA, all member states have completed or scheduled their auctions, with the remaining focus now shifting toward 600 MHz (potential future release), mid-band spectrum (C-Band), and mmWave bands. Poland's auction is therefore not only a national milestone but also a key closing chapter in Europe's broader spectrum roadmap. Attention may now shift to future opportunities as well, such as frequencies in the 470-694 MHz band after 2030, possibly as part of a third digital dividend. This band could enable future services, including non-terrestrial networks (NTN), depending on international coordination.

This paper explores the learning from the European experience

In this paper we look at what other operators and regulators outside of the EU can learn from the European experience and the learning for European regulators as they consider spectrum awards in the 600 MHz and 470-694 bands in the future.

The Polish 700 MHz spectrum allocation and outcomes

The following table summarises the outcome of the auction and the results are interesting. Some of the most interesting points are:

- that two operators only secured 2 x 5 MHz each;
- prices for all lots showed very little variation; and
- final aggregate prices were only 3.6% above the reserve price.

Exhibit 1: Polish 700 MHz auction results

Spectrum block	Quantity	Successful bidder	Price (PLN million)
703-708 / 758-763 MHz	2 x 5 MHz	T-Mobile Poland	356
708-713 / 763-768 MHz	2 x 5 MHz	Orange Poland	356
713-718 / 768-773 MHz	2 x 5 MHz	Orange Poland	356
718-723 / 773-778 MHz	2 x 5 MHz	Polkomtel	363
723-728 / 778-783 MHz	2 x 5 MHz	P4	370
728-733 / 783-788 MHz	2 x 5 MHz	P4	356
816-821 / 857-862 MHz	2 x 5 MHz	T-Mobile Poland	425

Source: Regulator website, Policy Tracker

Strategic spectrum acquisition or errors in bidding strategy

An assignment of a single 2 x 5 MHz block is usually associated with a very low or even negative valuation

Coleago has performed spectrum valuations of the 700 MHz band for a wide range of mobile operators and typically a mobile operator requires a minimum of 2 x 10 MHz of spectrum to ensure robust 5G coverage and to justify the investment in network deployment. A 2 x 5 MHz allocation usually has a very low or negative valuation. It is therefore surprising that the auction results include both Polkomtel and T-Mobile each only acquiring a 2 x 5 MHz allocation. This raises the question as to whether the outcome was the result of strategic bidding errors, a deliberate strategy on the part of the two operators or a reappraisal of the potential value of a small allocation.

T-Mobile and Polkomtel may have under-estimated auction demand and got stranded

The UKE opted for a Simultaneous Multi-Round Ascending Auction (SMRA) format and one of the risks of this auction design is “getting stranded” on a single block of spectrum with a negative value whilst attempting to acquire two blocks or more which would have a positive value. Bidders are said to face “exposure risk” and in the closing stages of the auction there is a risk of being stranded as the Standing Highest Bidder on a single block and not being overbid, and then the auction ending with an unfavourable outcome. The auction was concluded within two days and at only a modest premium to the reserve price and so Polkomtel and T-Mobile may have over-estimated the level of demand for the band and were caught out by how quickly the auction ended.

Acquiring a single block may have been designed to create leverage in a post-auction negotiation over swaps and trades

Did Polkomtel and T-Mobile make strategic bidding errors or was this a planned strategy to minimise expenditure in the auction and to generate potential leverage in a post-auction discussion around spectrum trading and swaps, especially in light of the sub-optimal allocations in the 800, 900 and 1800 MHz bands? We would expect to see some post-auction realignment of spectrum across the 700, 800, 900 and 1800 MHz bands.

Operators may have re-appraised the value of a single block, but this may be unlikely

An alternative interpretation of the auction outcome is that operators have begun to reappraise the value of a single, 2 x 5 MHz block. It is possible that if timed with a planned radio equipment refresh coupled with the more mature multi-band radio market, there may be more value in a single block than previously assumed. However, we suspect that the valuation for a 2 x 5 MHz stand-alone block remains challenging.

Most regulators have auctioned the sub 1 GHz bands on the basis of 2 x 5 MHz blocks and so auction design is critical

The auction outcome highlights the potential risk of auctioning small blocks of 2 x 5 MHz which creates the potential for exposure risk and sub-optimal outcomes from a spectral efficiency perspective. An alternative of auctioning 2 x 10 MHz blocks, for example, would have eliminated the risk of getting stranded on a small block with a negative value but may have raised concerns regarding the creation of “artificial scarcity” and potentially high auction prices, given there would have only been three lots in the 700 MHz band and four operators potentially interested in bidding. Larger block sizes may have also raised concerns regarding the risk of an excessive concentration of spectrum in the lower bands but the increasing substitutability of the 700, 800 and 900 MHz bands means that a global post-cap spectrum cap on sub 1-GHz spectrum could potentially have addressed this issue. Across Europe, the 700 MHz band has most commonly been auctioned on the basis of smaller, 2 x 5 MHz blocks which offer maximum flexibility but also risks. Regulators and their auction

advisers should ensure that the auction design minimises exposure risk, the risk of being stranded on a single block of spectrum.

Technical and cross-border interference considerations

Cross-border interference can cause potentially material differences in value between lots within a band

The ongoing use of the 700 / 800 MHz bands by broadcasters in Ukraine and Belarus will present the operators with ongoing interference risks. Poland has pursued bilateral coordination with Ukraine and the issue is expected to be gradually resolved. However, Belarus remains a persistent source of potential disruption. This issue is affecting several other countries in the region including Slovakia, Romania and Moldavia. Not all frequency ranges within the band will be subject to the same levels of interference so it is interesting that there was limited variation in the value of the different lots.

Technical deployment challenges

Passive intermodulation risk (PIM) may also be present for some operators

T-Mobile may face passive intermodulation (PIM) self-interference risks when combining 700 and 800 MHz spectrum. This could affect options to exploit higher order MIMO at low-band unless mitigated through advanced antenna setups or frequency separation strategies and raises further questions as to their acquisition strategy within the 700 MHz band.

Insights for other markets from the wider European experience

Europe provides valuable insights for other markets

The experience of Poland and other European countries in auctioning 700 MHz and 800 MHz spectrum bands offers a valuable set of lessons for mobile operators and regulators in markets where these bands are still to be allocated. Europe's progressive release of low-band spectrum has created a body of regulatory practice, technical understanding and strategic insight that can inform future auctions elsewhere in the world.

Auction timing should reflect market readiness

The release of spectrum should reflect market maturity and industry needs

Western European countries such as Germany (2015), France (2015), and the UK (2021) auctioned 700 MHz earlier and integrated it rapidly into their 4G and 5G spectrum roadmaps. In contrast, several Southeastern European countries postponed their auctions due to concerns over market maturity, regulatory preparedness and international coordination issues. The timing of future awards should reflect how well 700 and 800 MHz devices have diffused amongst the customer base, and it is important to ensure that the spectrum can be auctioned unencumbered by delays in the analogue to digital TV migration process and / or cross-border interference concerns.

Cross-border coordination is essential

Cross-border issues should be resolved prior to the award of spectrum

In Central and Eastern Europe, particularly for countries bordering non-EU states (e.g. Poland with Belarus and Ukraine), bilateral and multilateral spectrum coordination was vital. Operators in these regions faced ongoing interference from analogue TV or delayed digital switchovers in neighbouring states. These challenges delayed Poland’s 700 MHz auction, echoing similar delays in Romania and the Baltics. Potential cross-border interference should be taken into account when designing the award process.

Licence obligations must be balanced with reasonable financial expectations

More creative solutions to deep rural coverage should be considered

Sub 1-GHz spectrum is ideal for providing wide-area mobile broadband coverage and so it is not surprising that rural coverage obligations were attached to the bands in many auctions. Deep rural coverage, however, becomes exponentially more expensive and tends towards a natural monopoly in very sparsely populated areas and so expectations regarding potential auction proceeds must be tempered when challenging obligations are imposed. Creative solutions to meeting the rural coverage challenges

should be considered such as offering discounts for coverage commitments combined with national roaming to take account of poor network economics in sparsely populated regions. Finland has been one of the pioneers in terms of creative auction design in relation to meeting rural coverage goals. The possibility of providing remote coverage through satellite-based, direct-to-device services was not considered significantly in Europe but is something to consider for future awards.

Block size and spectral efficiency

Lot sizes and auction design should ensure final allocations are technically efficient

Spectrum in the 700 and 800 MHz bands were typically auctioned across Europe on the basis of 2 x 5 MHz lots. Whilst the smaller lot sizes allow greater flexibility, it is important to ensure that the auction format reduces exposure risk and that 'winners' avoid being assigned an unprofitable, single 2 x 5 MHz blocks.

Take a holistic approach

Increasing substitutability between low frequency bands offers operators and regulators more flexibility and potentially greater spectral efficiencies

Spectrum in the 700, 800 and 900 MHz bands are increasingly seen as very close substitutes and there are fewer reasons today why operators need holdings in each of the three bands. Regulators should take a holistic approach and look at how best to optimise and assign spectrum across the three bands. Whilst outside of Europe the example of Australia is interesting where Optus now has the entire 2 x 25 MHz of the 900 MHz band, and all operators have spectrum in two rather than in all three low-bands (700 MHz, 850 MHz and 900 MHz). As 600 MHz emerges in markets outside of North America, such as Middle East and some parts of Europe where Digital Terrestrial Television becomes less relevant, we may see 600 MHz as another substitutional band in time.

Reserve prices

A conservative approach to setting reserve prices should be adopted

High spectrum prices have been shown to be correlated with poor outcomes for consumers in terms of network investment, quality of service and pricing. The European experience shows high levels of variation in spectrum prices. Some countries, such as Germany and those in Scandinavia, set modest reserve prices whilst some markets, such as Greece and Romania, imposed high reserve prices resulting in partial auction failure in the case of Romania. Regulators should be conservative when setting reserve prices and set them at reasonable levels, especially when combined with demanding coverage obligations.

Secondary markets offer flexibility

Secondary spectrum trading offers flexibility and ongoing incentives for efficient allocations

Countries like the UK and Netherlands support spectrum trading and leasing. This allows operators to optimise holdings post-auction, especially when initial outcomes are suboptimal. Emerging markets should establish legal frameworks to support trading, particularly in multi-operator or spectrum-constrained markets. The presence of spectrum trading also provides an ongoing incentive for spectrum to move to its most efficient use which would allow regulators to set longer or even indefinite licence terms, such as in the case of the UK.

Technology neutrality

Technology neutrality reflects best practice and should be applied across all markets

Nearly all European regulators have adopted technology-neutral licensing, enabling operators to transition bands from 4G to 5G and eventually 6G. This forward-looking approach should be mirrored in emerging markets to ensure long-term spectrum efficiency.

Summary and conclusions

Europe offers a fascinating set of case-studies and insights for regulators and operators seeking to either successfully award or secure spectrum in the 700 and 800 MHz bands.

- lot sizes and auction design should aim to minimise the exposure risk of being stranded on a single, small block of spectrum;
- auction design should take account of potential cross-border interference and PIM risk and allow operators the ability to express their positional preference within a band;
- the timing of the release of spectrum should be market led;
- alternative approaches to meeting rural coverage targets should be considered;
- increasing substitutability allows for a more holistic approach to assignments for frequencies below 1 GHz;
- reserve prices should be set conservatively;
- spectrum trading offers additional flexibility and ongoing incentives for efficiency; and
- spectrum should be assigned on a technology neutral basis.

How Coleago can help

Coleago has over 20 years of experience in advising both operators and regulators on issues related to spectrum including spectrum management strategies, roadmaps, pricing and award process design and implementation, including auctions. We have supported operators in consultations, spectrum valuation projects and developing and executing spectrum auction bidding strategies.

About the Author and Coleago Consulting Ltd

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