

Temporary COVID-19 spectrum – a missed opportunity for some regulatory innovation?

- ❖ **The Independent Communications Authority of South Africa (ICASA) has assigned spectrum to 17 of the 35 applicants that complied with the provision of their temporary spectrum invitation. The dominant players in the market MTN and Vodacom were granted spectrum in all the available bands, with Telkom, Liquid and Rain being given some additional spectrum to supplement their legacy spectrum in these bands.**
- ❖ **ICASA has also extended the validity of existing radio frequency spectrum licences by three months and has encouraged spectrum sharing by operators following a Ministerial directive to deal with the upsurge in demand for bandwidth during the COVID-19 lockdown.**
- ❖ **The Ministry and the Authority have emphasised that the arrangements are temporary and extraordinary and that the pre-COVID-19 status quo will be reverted to within three months of the end of the national state of disaster or by November 30th the latest.**
- ❖ **The limited provisions set by ICASA for who could apply for spectrum, have allowed the regulator to test what the likely outcomes of the auction later this year might be and will provide much needed relief to spectrum hungry operators who have not been able to access new spectrum for over a decade.**
- ❖ **The opening up of the market to three TV white space operators who were granted secondary spectrum for the first time, demonstrates more progressive thinking about getting cheaper technologies and services into the market.**
- ❖ **Could the directive and regulations for temporary COVID-19 spectrum not be used more experimentally by opening up opportunities for the innovative deployment of complementary technologies and services to meet the diverse needs of the country - particularly to bring the other half of South Africans not online, into the digital economy and to redress the inequality the novel coronavirus pandemic has brought into sharp relief?**

Only 17 out of the 35 applications for temporary spectrum that complied with the narrow provisions of ICASA's application process will be licensed. Dominant players in the mobile market, MTN and Vodacom, received portions of spectrum in every band, with Telkom, Liquid and Rain receiving supplementary spectrum to their legacy assignments in the high demand bands. Cell C did not bid as it has a roaming agreement with MTN. With MTN and Vodacom the only players with pockets deep enough to enter the bidding, this probably does not look very different from the potential outcome of the auction for radio licences in these bands later this year.

The only peculiarity in the temporary spectrum licence process was the licensing of three new companies, the ownership of which has not been disclosed, that received permission to operate in the bands set aside for TV white space – a dynamic, secondary use technology able to operate in the guard bands between those set aside for broadcasting.

The temporary assignment of spectrum follows a directive to ICASA from the Minister of Communications and Digital Technologies in mid-March 2020 to release spectrum to make more of it available to meet the unprecedented demand for bandwidth with the COVID-19 lockdown and to alleviate large-scale digital exclusion in South Africa, in any way, during the country's lockdown.

Table: Temporary spectrum assignment			
Band	Operator	Temporary assignment	Previous spectrum
700/800 MHz	Telkom	40 MHz	
	Vodacom	40 MHz	
	MTN	40 MHz	
2300 MHz	Telkom	20 MHz	60 MHz
	Vodacom	20 MHz	
2600 MHz	Telkom	40 MHz	
	Vodacom	50 MHz	
	MTN	50 MHz	
	Rain	30 MHz	20 MHz
3500 MHz	Telkom	12 MHz	28 MHz
	Vodacom	50 MHz	
	MTN	50 MHz	
	Liquid Telecom	4 MHz	56 MHz

Source: ICASA 2020

" Due to the fact that they simply cannot afford data at current price levels, most people are unable to use the Internet as an "always on" service as it is intended, let alone home-schooling or remote work."

Only about half of all South Africans are online and due to the fact that they simply cannot afford smart devices the 2018 After Access survey tells us. And for large numbers of those who have managed to get online, data at current price levels, is unaffordable for basic communication and information, let alone home-schooling or remote work.

ICASA issued a call for applications for temporary spectrum within a week. It has extended the validity of existing radio frequency spectrum licences by three months and indicated its desire to see greater spectrum sharing by operators. The proviso in the regulations is that this had to be done efficiently and without compromising the quality of communication services or interfering with the functioning of existing broadcasters and operators.

Important conditions accompanying the rights to temporary spectrum are zero rating of all COVID-19 related sites and the creation of virtual classrooms, as determined by the education department.

Permanent high-demand spectrum hearings

These temporary spectrum regulations have somewhat eclipsed the Authority's hearings on the licensing of the International Mobile Telecommunications (IMT), which was planned for April. With the failure to release high demand spectrum for over a decade, the speed with which access to temporary spectrum has been dealt with, is prompting hopes of the impending assignment of high demand spectrum to be fast tracked, as it will be an essential catalyst to the rebuilding of the post COVID-19 economy. On current timelines, the spectrum auction should take place by the end of 2020 at the latest and the licensing of the wholesale open-access network (WOAN) to be concluded in 2021.

If the WOAN has to be operational before the new assigned spectrum is deployed, as has been indicated previously, the delay would severely set back the reconstruction of the economy post COVID-19.

The failure to release high demand spectrum has been cited by operators and analysts, not only as a factor contributing to the high cost of data in the country, as operators deploy 4G services in suboptimal bands, but also as a massive opportunity cost to the country over the last decade, which runs into billions of Rands by various estimations.

Despite welcoming the release of the spectrum, the Ministry, ICASA as well as some commentators emphasise that these arrangements are temporary and extraordinary and that the pre-COVID-19 status quo will be reverted to within three months after the end of the national state of disaster or by November 30th the latest.

Digital dividend bands

In the digital dividend band (700/800 MHz) Telkom, Vodacom and MTN were temporarily assigned 40 MHz each, and in the 2300 MHz band Telkom and Vodacom received 20 MHz each. Telkom already has 60 MHz in this band.

The digital dividend bands are not available for mobile telecommunications currently due to South Africa's failure to migrate broadcasters and operators on 700MHz and 800MHz spectrum, who had not yet been migrated. Despite the process to do so having started in 2000, a staggering 20 years ago, South Africa failed to meet the global cut-off date of 2015 for migration set by the International Telecommunications Union (ITU), the international body responsible for international radio standards and spectrum allocations.

Television white space

The only non-incumbent spectrum offered, possibly because of its ability to function between existing licensees, is technology using this TV white space (TVWS).

ICASA granted authorisation to largely unknown companies, Mthintle Communications, Levin Global and Morai Solutions to use TVWS on approval from the CSIR, which runs the geolocation spectrum database to identify which channels could be used.

This does have the potential to reduce the cost of communications, with the technology being considerably cheaper than GSM technology, a global technology on which the incumbents run their network.

Regulation to enable the use of TVWS spectrum for the rollout of data services was finalised two years ago and its deployment could play a key role in ensuring access for rural areas and marginalised communities. White space devices are required to be type-approved prior to operation; they must meet European Telecommunications Standards Institute (ETSI) certification requirements and support integration of a Geolocation Spectrum Database that controls availability of channels. The costs of deploying such dynamic spectrum technology and the operation of it are lower than later generation GSM technologies, precisely because they are designed to optimise spectrum use through the secondary use of spectrum or spectrum sharing. Although there are many dynamic spectrum technologies, TVWS is the only one that is standardised internationally. It has operated on a test licence in the country in conjunction with CSIR and their Geolocation Spectrum Database.

Potentially other cheaper secondary spectrum use technologies could be deployed at low cost in the largely underutilised spectrum in rural areas through regional licensing, which could have allowed multiple competitors in the market.

But with the narrow terms of those eligible to apply for such a short period, has ICASA not missed the opportunity to use the release of temporary spectrum as a real-life laboratory to see how spectrum might be more innovatively applied to the diverse needs of the country and particularly to bring the half of South Africans who are not online into the digital economy, to redress the inequality that the novel coronavirus has highlighted?

Would this not have been the perfect opportunity to test the potential of alternative licensing arrangements, community networks and lower power micro-networks able to offer niche services that meet unmet needs and complement existing services?

Conclusion and recommendations

The release of the temporary spectrum in advance of the spectrum auction later this year or possibly next, provides us with an opportunity to correct course in order to meet our primary national digital objective of affordable access to the full range of communication services for all.

Greater consideration needs to be given to safeguarding the social value of spectrum as a public good. Some classes of key resources (like spectrum) need demand-side valuation to recognise their utility. Besides infrastructure resources being fundamental to generating greater value, when used as inputs into a wide range of productive processes, outputs of infrastructure industries are generally public and non-market goods that create positive multipliers in both the economy and society (Frischmann 2005, 2012).

In the predominantly mobile markets of Africa, spectrum, the demand side value of spectrum as a classic public good, but impure under regulatory conditions, which make it artificially excludable (licensed) and rivalrous (congestion), needs to be recognised. The current extractive rents being commanded by operators (prices) and governments (licence, auction fees) through commercial supply-side valuation of spectrum, represent a key bottleneck in affordably meeting public demand.

Demand side value can be recognised by expanding the 'spectrum commons'. This can be done by opening up bigger tracts of spectrum for public access such as is currently done on a limited basis in the unlicensed ISM bands intended for research and experimentation.

Wi-Fi operating on the 2.4 GHz and 5 GHz licence-exempt bands, has already demonstrated the power of the commons and its potential as an access technology and a backhaul technology. The nature of Wi-Fi means that there are very low market barriers for both the manufacturing and deployment of this technology. It also serves, now, as a critical off-ramp for traffic on the increasingly overloaded mobile networks.

It has allowed people to build out broadband networks and connect places deemed 'uneconomic' by operators in a manner that was not foreseen by policy makers (See Song 2018). This has resulted in a proliferation of independent non-profit community-led initiatives, as well as commercial wireless internet service providers, able to meet some of the pent up small and micro-scale demand.

This has the potential to provide complementary public services and reduce the cost of services operating on unlicensed spectrum.

With most spectrum largely unused outside the main metropolitan areas, exclusive national licences should to be amended to enable the optimisation of spectrum use to meet the diverse needs within the country.

As operators have had to deal with the absence of spectrum co-ordinated internationally for 4G and the associated higher cost of re-farming their spectrum and operating on suboptimal spectrum, we are already seeing voluntary infrastructure sharing by operators of mostly passive, but also some active, infrastructure. These types of approaches need to be embraced by Government from a critical resources' management perspective.

Encouraging secondary spectrum should enable new dynamic spectrum sharing, which operates at a fraction of the cost of GSM networks using the largely unused spectrum in rural areas. Such an approach could instantly provide low-cost, high-quality bandwidth. But there was more that could have been done to draw in complementary providers, such as community networks, low powered or micro operators or large operators, where currently assigned spectrum is unused.

With 5G spectrum in the 3500 MHz bands now also up for assignment, policymakers need to ensure that 5G technology, which operates well within a spectrum-sharing environment with expectations of traffic offloads to Wi-Fi, is harnessed for public purposes and not just niche commercial applications.

The UK model of licensing 5G local coverage for small areas of 50 square metres to anyone to develop their own local 5G network could have been trialled now and retained after the expiry of the temporary licences. This could be extended to other bands. Local small coverage licences should be permitted wherever spectrum is not being fully utilised and where the entry of a small area licensee would not interfere with an existing licensee. Such licences could be default licenses with minimal regulatory transaction costs and be subject only to the spectrum interference test by ICASA.

Some references that informed the brief for further reading.

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