



**Submission in response to the
Australian Competition and Consumer Commission's
consultation paper on
Allocation limits advice for the 26 GHz spectrum
allocation**

27 March 2020

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1 Introduction and summary

Commpute—an industry alliance for competition in digital communications—welcomes the opportunity to provide a submission to the Australian Competition and Consumer Commission’s (**ACCC**) consultation on allocation limits for the forthcoming 26 GHz spectrum allocation.

In this submission we have not sought to address all of the questions and issues raised in the ACCC’s consultation paper.¹ Instead we have concentrated on the implications of the 5G spectrum allocation process for competition in related markets. Specifically, there are three issues that we have focused on from the list of issues on which the ACCC has encouraged comment:

- ‘Q1. Do you have any competition concerns about the allocation of spectrum licences in the 26 GHz band? If so, how do you think these concerns should be addressed?’²
 - In this submission we invite the ACCC to take advantage of a unique opportunity to recommend that 5G spectrum awards should have conditions which either impose or encourage wholesale access conditions favourable to mobile virtual network operator (**MVNO**) competition.
- ‘Q10. What are the relevant downstream markets for the purpose of advice on allocation limits for spectrum licences ...?’³
 - We have identified the downstream markets as the retail mobile services market and the enterprise market(s) involving the provision of specialised services that meet the needs of particular industry verticals.
- ‘Q13. Do you have any views on the state of competition in the relevant markets?’⁴
 - In this submission we have concentrated on the state of competition in the retail mobile service market, particularly as a result of the behaviour of mobile network operators (**MNOs**) in constraining the extent to which MVNOs might compete. The development of competition in the enterprise market will be largely dependent on exploiting the full range of opportunities afforded by 5G technology, and MVNOs have, potentially, a large part to play in developing those opportunities.

We outline a way forward for the ACCC and the sector to use the opportunity to develop processes for allocation of 5G radio spectrum to improve competition in wholesale and retail mobile services markets in Australia.

This submission examines the constraints that currently exist for the development of the MVNO contribution to retail mobile services market competition. It demonstrates that many of those constraints have been imposed by MNOs in terms of limitations on the quality and extent of services that MVNOs may offer, or result from a collective refusal to deal on the

¹ ACCC, *Allocation Limits Advice for the 26 GHz Spectrum Allocation: Consultation Paper*, (February 2020).

² Ibid 4.

³ Ibid 8.

⁴ Ibid 9.

part of the MNOs. The result is that the retail mobile services market is less competitive than it should be, and that this will be exacerbated when 5G services come on stream commercially, because the underperformance will extend to the enterprise market involving industry verticals. The result will be less innovation and development of the industry vertical markets, and, also the deferment of benefits from industry development and competition that should be flowing to consumers generally and to end users in the mobile services market in particular.

We note that the ACCC has previously sought to establish conditions in which a fourth MNO might enter the market and establish its own separate network. The recent Federal Court merger proceeding⁵ tested whether the prospect of a fourth MNO would have been diminished by the proposed merger, resulting in a substantial lessening of competition. The Federal Court received evidence that suggested that the answer to the first issue was ‘yes’ and its decision on the second issue was ‘no’. TPG was widely expected to be a disruptive new entrant to the market. Whether there is any other MNO entrant likely to enter the Australian market is now in some doubt, but may be tested through the 5G auction process. Importantly, however, to have a material impact on competition in the retail mobile services market and in the developing enterprise (industry verticals) market(s), a new MNO entrant will need to have a business plan that disrupts the comfortable oligopoly that currently exists. Part of such a disruption strategy may involve the use of MVNOs to extend impact and reach.

Even without a new entrant MNO, substantial improvements in competitiveness in the retail mobile services market and the developing enterprise (industry verticals) market(s) will flow from appropriate regulation of wholesale mobile access to enable competition from full service MVNOs. One way to facilitate this would be through the declaration of relevant wholesale mobile access services. However, the forthcoming 5G spectrum allocation process creates a more expeditious option to impose appropriate conditions on the way 5G spectrum is to be used by spectrum holders over the coming decades. Many other countries are employing such an approach as part of their own 5G spectrum allocation procedures.

Further, whichever pathway the ACCC takes to achieve greater competitiveness through the 5G spectrum allocation process—whether via a fourth MNO or via increased MVNO opportunities—the route stops first at addressing wholesale access conditions affecting MVNOs (for a successful MVNO may well increase its investment over time to adopt an MNO role in future).⁶

Therefore, this submission proposes the ACCC consider two alternative approaches when preparing its recommendations to the Minister. The first is to impose mandatory access obligations on all competitors who are allocated 5G spectrum through the upcoming award process. The second is to establish an incentives regime under which access to some part of the total spectrum resource subject to award is made available only to competitors who undertake to comply with access conditions that enable the operation of full service, independent MVNOs. Both approaches have merit, but might involve different levels of

⁵ *Vodafone Hutchinson Australia Pty Ltd v Australian Competition and Consumer Commission* [2020] FCA 117 (‘VHA v ACCC’).

⁶ Some market participants saw TPG as pursuing such a ‘ladder of investment’ strategy through its own MVNO business with VHA.

regulatory intervention and administrative ease from the ACCC's perspective. We have no firm preference at this time. We do note however, that if one of the three MNOs is prepared to open up its network to enable full service (thick) MVNO operations then the collective refusal of the MNO oligopolists to deal will be seriously undermined and will likely collapse.

2 Issues arising for the ACCC's consideration

In its Consultation Paper the ACCC lists a series of issues which it invited respondents to consider. With respect, the list of issues seems to be narrow in overall scope and we believe should be expanded to consider how the allocation of spectrum relevant to 5G might be arranged to better facilitate effective competition in an oligopolistic market. The issues numbered 1, 10 and 13 in the ACCC's Consultation Paper partially cover these aspects. More particularly, this submission looks at the unique opportunity that is open to the ACCC and the Government to take advantage of the potential of 5G technology through the award of spectrum licences to dramatically improve the framework and incentives for retail mobile service competition in Australia.

The ACCC has previously sought to preserve the potential for a fourth mobile service provider to enter the Australian market to build and operate a network in competition with the networks currently operated by Telstra, Optus and Vodafone. The ACCC can continue do this by proposing that conditions favouring new entrants be attached to awards of new spectrum rights. It can also keep potential opportunities on foot if it opposes proposed mergers of competitors who might otherwise be inclined to develop new networks.

However, as the recent case in the Federal Court involving a proposed merger of TPG and Vodafone Hutchinson Australia's (**VHA**) network operations demonstrates, the test for declining to approve mergers (substantial lessening of competition in a market) is inherently difficult to meet, particularly if one party denies, as TPG did, any intention to invest in separate network infrastructure in the absence of a merger.⁷ Even if the ACCC had succeeded in the TPG/VHA merger case, there would have been no guarantee that TPG would have proceeded to build its own separate network in Australia, or that such a separate fourth network operation would have been sufficiently disruptive to substantially modify the comfortable oligopolistic market circumstances that currently exist.

Leaving aside the issue of whether or not a fourth mobile network operation is commercially sustainable in the circumstances of the Australian market, facilities-based competition is not the only way to improve competition in the retail mobile services market. This submission proposes two options that the ACCC should consider in forming its recommendations to the Minister about the conditions that should be attached to the award of 5G spectrum. One approach is to attach mandatory wholesale access conditions that will ensure that full service MVNOs can have access to 5G networks without the types of constraints that currently apply to wholesale mobile access. The second approach is to establish an incentive, and to offer MNOs' access to additional 5G spectrum in exchange for acceptance of wholesale access conditions permitting full service (or "thick") MVNO access. Both approaches are considered to be viable alternatives and this submission does not express a preference for one or the other.

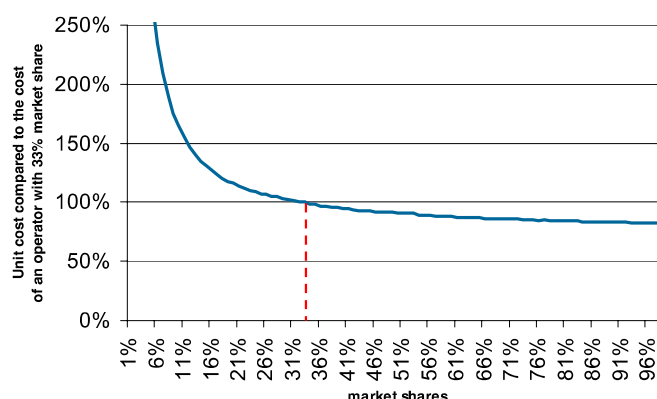
⁷ VHA v ACCC, see note 5 above.

3 The challenge of MNO oligopoly competition

3.1 Mobile network service markets tend to oligopoly

Mobile networks have delivered scale economies, although current technologies indicate that there are reducing returns to scale. Figure 3-1 below⁸ indicates that scale economies peak at around 30% penetration for 2G–3G networks and decline after that. Nevertheless, the diagram provides some indication why there might be a practical commercial limit of 3–4 competitive network operators in most markets.

Figure 3-1: Relation between market share and unit MTR costs according



Source: ERG, *Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates* (2008)

Scale economies are likely even more pronounced with high capacity 5G networks, which require greater network densities (through “in-filling” of networks originally designed for 3G and 4G technologies). Consequently, the ability of a market to commercially sustain a given number of competing and separate mobile networks would be no greater in a 5G environment than at present, and the potential may be that a lesser number might be sustainable.

This tendency towards oligopoly is reinforced by other mobile market characteristics, including:

- the comparative scarcity of suitable spectrum resources;
- the high initial and ongoing levels of capital investment necessary to roll out a mobile network, especially in the absence of regulatory policies that require or encourage infrastructure or network sharing, whether of towers, sites or full roaming capability—in

⁸ Declining or non-linear return to scale in the case of mobile networks can be readily demonstrated by network cost modelling as in the case of the modelled calculations (derived from Romania) which appear in European Regulators Group (ERG), *Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates* (2008), 92, Figure 18.

other words in regulatory environments that have encouraged full facilities-based competition rather than service-based competition;

- high levels of technology change and change in consumer preferences;⁹ and
- reducing annual revenue per customer.¹⁰

3.2 Problems associated with mobile oligopoly competition

The major problem with competition within oligopolies is that they tend towards a level of mutual accommodation, especially in markets in which pricing and other retail market behaviour is transparently obvious, and, as a result, it is difficult to determine if there is effective competition or a degree of effective accommodation. MNO competitors have similar networks and cost structures. They are therefore in a better position than competitors in most markets, and even in other tightly oligopolistic markets, to understand and anticipate each other's market behaviour, including responses to initiatives that might be taken on price or service by each other. The result is that parallelism increases and competition is likely to be far more muted than it would otherwise be.

Lower levels of competitiveness are less likely in a market with four MNOs than with three, or where one of the MNOs has strategies that are likely to be disruptive and to disturb any equilibria that have developed. Presumably the ACCC was hoping that, if it entered the Australian mobile services market as a separate network operator, TPG would have had a suitably disruptive effect. This is certainly the view that the Commerce Commission has taken in relation to the entry of 2degrees as the third network operator in the New Zealand market in 2015.¹¹

3.3 MNOs are reluctant wholesalers

3.3.1 Types of MVNOs

MVNOs may be categorised on a spectrum that ranges from resale to something approaching independent network operation, short of being the holder of a spectrum licence. Within the industry this range is sometimes described as ranging from 'thin' to 'thick', as the functionality of the MVNO increases. Figure 3-2, drawn from the New Zealand Commerce Commission's recent market inquiry, describes very well the way that functionality increases from one MVNO category to another, and the various MVNO operating models that result.

⁹ High levels of environmental change for a market create new entry opportunities, but, in capital intensive markets such as telecommunications, these same conditions serve to increase investor caution. The same caution does not necessarily extend to modest investments associated with service-based competition.

¹⁰ For example, the two largest MNOs have cited reductions in their most recent reports. Telstra in its 2019 Annual Report cites an annual decline in mobile ARPU of 3%, with an expectation that this will continue into the current financial year: *Annual Report, 2019*, p 21. Optus reports in May 2019 that the annual declines in postpaid handset ARPU, pre-paid handset ARPU and mobile broadband ARPU are 3%, 8% and 9%, respectively: <https://www.optus.com.au/content/dam/optus/documents/about-us/media-centre/financial-reports/2019/may/4thqtr-Slides.pdf>, slide 23.

¹¹ New Zealand Commerce Commission, *Mobile Market Study—Findings ('NZCC Market Study')*, (September 2019), especially Finding F10 at p 84.

Figure 3-2: MVNO operating models

	Key Components	Licensed Reseller	Service Provider	Light MVNO	Full MVNO
Enabling infrastructure and network provision	Radio Spectrum				
	Network Switching				
Content and applications	VAS				
	Service Platform				
	SIM Card				
Operations	Billing				
	Pricing Capability				
	Provisioning				
	Customer Care				
Branding, sales and marketing	Devices and Distribution				
	Own Brand				

☐ MVNO does not own
☐ MVNO may or may not own
☐ MVNO owns

Source: Red Dawn Consulting¹²

To date the common conception of MVNOs is as niche operators that have an ability to better serve one or more customer segments and have value to their MNO hosts as a result.¹³ This is the view of Middleton, J in the *Vodafone Hutchison Australia v ACCC*¹⁴ when he noted that ‘MVNOs effectively resell the mobile service of an MNO, and hold the customer relationship’¹⁵ and:

[t]he principal ways in which MVNOs compete with each other and with the MNOs are on price and customer support, but their prices are affected by the economics of their wholesale arrangement with the MNO that supplies to them. The MVNOs provide a different value proposition to the MNOs, in that they usually do not offer the full suite of services provided by an MNO, such as retail stores, handsets and other service add-ons.¹⁶

¹² Source: Red Dawn Consulting, *MVNO Landscape: Global Perspectives and New Zealand Applications*, (February 2019) 11, reproduced in New Zealand Commerce Commission, *Mobile Market Study—Findings* (‘NZCC Market Study’), (September 2019) 75.

¹³ This conception is widely shared. For example, the NZ Commerce Commission study talks in these terms despite recognising that “thicker” MVNO functionality is possible. The Commission said: “MVNOs can offer price competition and some service innovation, product differentiation, and a more flexible set of tariff arrangements which may better meet the needs of specific customer niches. MVNOs often enter to target niche segments of the market that traditional MNOs may not be willing or able to serve.” (NZCC Market Study, above n 12, 72 [4.47]).

¹⁴ *VHA v ACCC*, above n 5, 117.

¹⁵ *Ibid* 170.

¹⁶ *Ibid* 171.

MNOs themselves have recognised that they may need to use MVNOs with different branding to better access certain market segments. These MVNOs need not be arms-length third party operations. As a result, each MNO now operates secondary brands, which add a further level of competition. For example, Telstra's Belong brand entered the retail mobile market in October 2017, Optus has the Virgin Mobile brand (which it has announced it is closing), and Vodafone has the Lebara brand.

3.4 Reasons for reluctance to wholesale

A major problem in mobile service markets in Australia, as well as many other countries over the past decade, is that while there is a degree of competition in the retail mobile services market, there is considerably less at the wholesale level and there is, in effect, a common position taken by MNOs that they are prepared to accept MVNO access, but only on their own terms. MNOs are set up as integrated operators and typically invest in their own networks with a view to offering retail services only; as a consequence they are reluctant wholesalers.

The primary reason is that the financial returns from an integrated wholesale operation are significantly better than from wholesaling (refer Figure 3-3), and enabling access to MVNOs with thick functionality may risk some cannibalisation of the MNOs own retail sales.

Figure 3-3: MVNO operating models and gross margin

MVNO Model	Gross Margin Range
Licensed Reseller	10-20%
Service Provider	20-35%
Light MVNO	35-55%
Full MVNO	45-70%

Source: Red Dawn Consulting¹⁷

The Commission noted that the:

number of key components carried out by the MVNO grows for each progressive model, as does the expected margin discount typically offered by the MNO. This is because the level of investment required by the MVNO increases as it moves from a simple reseller with minimal investment through to a 'full' MVNO, where the MVNO owns and operates core network elements. As a result, the division of components between the MVNO and the host MNO will vary across the operating models, and the level of discount will reflect this division.¹⁸

Further, wholesale services are typically provided as a result of access regulation with regulated returns on the costs of providing the service. But MNOs do not wish to make

¹⁷ NZCC Markey Study, above n 12, 76 [4.63].

¹⁸ Ibid 75 [4.62].

major investments and shoulder a range of business risks in competitive markets in order to receive only a regulated return.

MNOs generally permit limited forms of MVNO access under sufferance. The three most likely circumstances in which MNOs will negotiate MVNO access on commercial terms are:

- to avoid an imminent threat of regulated intervention;¹⁹
- in response to or in anticipation of another MNO breaking ranks by providing MNO access; and
- to address specific market segments that are better addressed through brand differentiation.

MNOs have alternatives to the latter issue, and either instead or as well as permitting access to MVNOs have developed secondary brands of their own.²⁰ It is this strategy of MNO brand diversity through the development of secondary brands that has likely had the greatest impact on the growing market share of MVNOs over the past decade, rather than the competition offered by independent MVNOs that are able to operate at arms-length to their own hosts and other MNOs. Figure 3-4 shows the overall market share movements over that period, but only the ACCC can insist that MNOs provide greater disaggregation of the market share changes among their wholesale MVNO customers.

Figure 3-4: Australian Retail Mobile Market Shares 2010–18

	2010	2011	2012	2013	2014	2015	2016	2017	2018
VHA share (%)	27	24	23	20	18	18	18	18	18
Telstra share (%)	37	40	41	43	45	45	45	43	42
Optus share (%)	30	30	30	28	27	27	27	28	28
MVNO share (%)	6	6	6	8	10	10	10	11	13

Source: ACCC Telecommunications Report 2013–14 and ACCC Communications Market Report 2017–18²¹

¹⁹ Sometimes a threat is sufficient to overcome refusals to deal. In 2005, the French regulator, ARCEP published a draft finding of collective dominance together with proposals for imposition of ex ante obligations (Case FR/2005/0179). Although ARCEP ultimately withdrew this decision in the face of opposition from the European Commission, the publication of the draft nonetheless encouraged the French MNOs to offer more reasonable access terms offered to MVNOs. Alas, the concerns identified in the ARCEP's market analysis persisted and, in 2009, spectrum licence conditions were used to introduce wholesale mobile access obligations.

²⁰ For example, Telstra's Belong brand entered the retail mobile market in October 2017, Optus operates the Virgin Mobile brand (which it has announced it is closing), and Vodafone operates the Lebara brand.

²¹ As quoted in VHA v ACCC, above n 5 [127].

3.5 Keeping MVNOs under control

In practice there are many ways in which MNOs generally keep their hosted MVNOs under control and limit the extent of the competition that they might offer. These variously include:

- arbitrary limits on the wholesale geographic or technology coverage areas relative to the MNO's own downstream retail coverage areas, including exclusion from some publicly funded extensions in network coverage;
- reduced functionality or intentionally degraded service capabilities relative to the MNO's own downstream retail operations, including arbitrary speed limits on data services and higher latency;
- denying access to, and/or refusing to provide a product roadmap for, specific technologies or functionality, such as voice over WiFi, voice over LTE, and eSIM;
- precluding MVNOs from certain markets or use cases, such as IOT.

The characteristics of 5G networks that enable quite different network characteristics within "slices" or part of the network and therefore a level of network differentiation that has never been available before, and it is important that regulatory settings are in place to ensure that this potential will not be denied to the MVNO market by constraints imposed on 5G sharing by MNOs. Early and proactive intervention by the Government is required to safeguard and maximise regulatory outcomes, and 5G allocation rules are an immediate option for doing this.

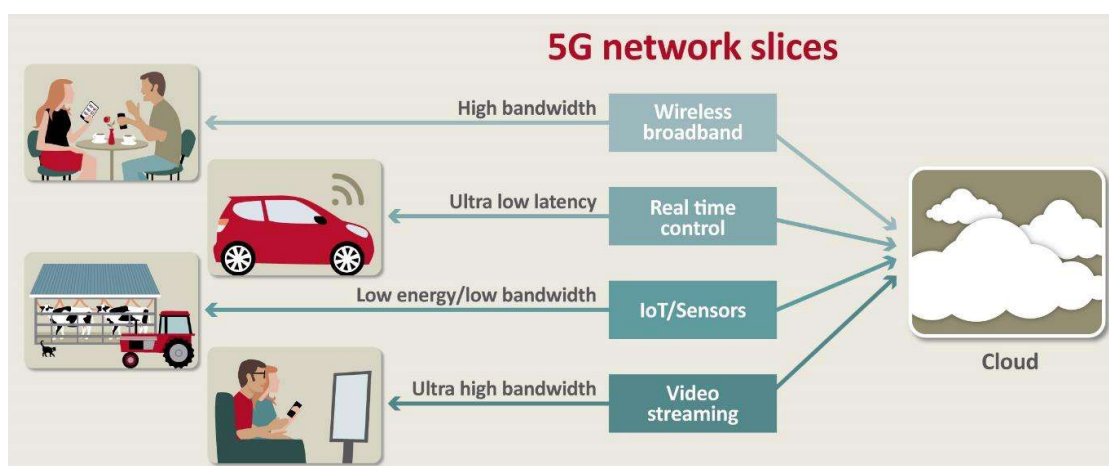
4 Opportunities for increased competition with 5G

4.1 Differentiated network functionality

Network slicing involves the software-definition of different functional characteristics within a single network so that within a “slice” or part of the network quite different services might be offered. In effect, network slicing enables the creation of multiple virtual end-to-end networks to operate from the same physical network. Within 5G the network slicing options are reasonably well developed and a range of possibilities become immediately apparent. Network slicing might be used not only to enable a MNO to differentiate the network environments within its 5G network, but would enable an MVNO to do the same without being constrained by the network choices or strategically imposed restrictions of its host MNO, as now.

Figure 4-1 below, drawn from the recent Commerce Commission study in New Zealand, serves to show the way that network slicing might be put into effect to generate a range of different virtual networks within a single 5G network.

Figure 4-1 Network slicing



Source: NZCC Market Study²²

With network slicing the benefits of 5G can be more widely shared with MVNOs and ultimately with mobile service end users. In fact, the level of effective network service differentiation could potentially exceed that which might have been available via a fourth MNO network without such slicing. Network slicing will enable specialised services for which there is insufficient demand to warrant separate physical network infrastructure to become commercially viable.

²² Mohammed Asif Habibi et al, *Network Slicing in 5G Mobile Communications: Architecture, Profit, Modelling and Challenges*, (Conference Paper, August 2017), as in NZCC Market Study, above n 12, 114 [6.29].

5 Overseas developments

More detailed descriptions of recent developments in selected overseas countries appears at **Appendix A**. For each country the key aspects of the developments and potential relevance for Australia are set out below.

5.1 Canada

The Canadian Radio and Telecommunication Commission (**CRTC**) has already awarded spectrum for 5G services, and a number of operators are trialling initial 5G networks. In January 2020, the CRTC commenced its public hearing into the mobile wireless services generally. The hearing is still on foot and is not expected to be completed until at least May 2020.

In its consultation report, issued on 13 January 2020²³ the CRTC made it clear that it has had the view since it established the regulatory framework in 2015 that ‘MVNO access services to be essential for competition (meaning that denying access to this service would likely result in a substantial lessening or prevention of competition in the downstream retail market).’²⁴ Until now the CRTC saw its role as enacting ‘wholesale regulation that would encourage the development of a mobile wireless service market characterized by a mix of facilities-based competitors and MVNOs, since strong facilities-based competition should naturally result in more opportunities for MVNO competition (for example, through the sale of excess network capacity).’²⁵

The CRTC also notes in the same document that the ‘mix of competitors’ (MNOs and MVNOs) has not developed to the extent previously expected,²⁶ and that there ‘has been virtually no MVNO activity that would provide additional competitive retail options to Canadian consumers’.²⁷

Importantly, as a result of the poor development of MVNO competition the CRTC has, for the current hearing, formed the:

preliminary view that it would be appropriate to mandate that the national wireless carriers provide wholesale MVNO access as an outcome of this proceeding. The Commission considers that, on balance, it is likely that the benefits that a well-developed MVNO market would deliver to Canadians are now more likely to outweigh any negative impacts that a policy of mandated wholesale MVNO access might have on wireless carriers’ network investments, particularly given the extensive investments that have been made in recent years. Further, properly structured rates, terms, and conditions should further mitigate potential negative impacts on future investments.²⁸

²³ CRTC, *Telecom Notice of Consultation CRTC 2019-57: Review of Mobile Wireless Services* (13 January 2020)

²⁴ *Ibid* [34].

²⁵ *Ibid*.

²⁶ *Ibid* [37].

²⁷ *Ibid*.

²⁸ *Ibid* [39].

This is a significant development in the CRTC's thinking, and it may survive the public hearing and review process. Canadian MNOs are on notice.

Amongst the specific questions asked of those wishing to make submissions are questions relating to the conditions that should be attached to mandatory obligations on national wireless carriers (and possibly others) to provide wholesale access, and also a specific question about reservation of spectrum capacity for MVNO access and use:

... should the national wireless carriers be required to make available a certain amount of capacity on their networks for MVNOs to use at commercially negotiated rates? If so, how should the amount of reserve capacity be determined? In this scenario, would it be appropriate to have a default tariffed rate to act as a backstop if negotiations fail?²⁹

Significance for Australia: The CRTC has made a preliminary case for moving from a regulatory framework which allows, even encourages, MVNO access to one in which it is mandatory, and also contemplates the reservation of spectrum capacity, including 5G spectrum, for MVNO use.

5.2 France

In November 2019 the French regulator, ARCEP, proposed terms and conditions for the award for 5G spectrum—in the pioneering 3.4–3.8 GHz band. A two-phase allocation process is scheduled to take place in April 2020. Companies will be able to bid in the second phase for 10 GHz blocs of spectrum subject to conditions which include permitting MVNO access to their entire spectrum allocations. MVNO access will need to be on the same terms as the access permitted to the companies' own downstream retail mobile service operations.

Spectrum is awarded for a 15-year period. ARCEP plans to have two further reviews of the conditions of the award, including the effectiveness of the MVNO access arrangements, during that period.

Significance for Australia: ARCEP has developed an incentive approach whereby access to additional spectrum resources, after the first 50 GHz bloc, will be dependent on accepting wholesale access arrangements that facilitate MVNO development on fair and reasonable conditions. This is seen by ARCEP as preferable to a mandatory wholesale access regime of universal application.

5.3 Germany

The German telecommunications regulator, the Bundesnetzagentur (**BNA**) has identified certain spectrum bands as suitable for the rollout of 5G infrastructure, including 700 MHz, 2 GHz, 3.4–3.8 GHz, 26 GHz and 28 GHz.

In order to encourage new entrants, the BNA has proposed dispensation against certain coverage requirements. New obligations, such as in relation to access and roaming, can only be imposed on MNOs with significant market power (**SMP**) rather than generally, and

²⁹ Ibid, Q 11

neither the BNA nor the competition regulator has determined that any MNO has SMP to date. The German approach has concentrated on facilitating the entry of new MNOs rather than in providing an improved regulatory framework for enhanced MVNO competition.

Significance for Australia: Although the BNA would seek to encourage MVNO development in the German mobile market it is precluded from directly imposing such an obligation. As a result, for the time being, Germany is an example of a jurisdiction in which the pathway towards more competitive and innovative mobile services is via new MNOs entering the market. 5G is seen as an opportunity for that to happen.

5.4 Italy

The Italian regulator, AGCOM, has published its regulation on the award of 5G spectrum.³⁰

AGCOM wishes to use the process to promote the development of 5G services, and in particular, the development of new and innovative applications in certain verticals, such as automotive, manufacturing, and media and entertainment, through exploitation of the specific performance requirements supported by 5G technology.

In areas where the spectrum holder does not have network capability the holder may be required to agree to the use of the frequencies by an access seeker, perhaps through leasing. This is the basis of the “use it or lease it” approach in the regulation.

AGCOM’s approach emphasises the involvement of service providers, MVNOs, as well as participants from other industries, but not to thinner MVNO models such as resale. The regulation actually prevents an access seeker from reselling telecommunications services unless specifically agreed by the MNO spectrum holder.

Significance for Australia: AGCOM has adopted a mandatory approach to wholesale access obligations that favour the development of new and innovative 5G applications, particularly in industry verticals that can be supported within network slicing capabilities of 5G. This approach incidentally supports greater competition in the provision of mobile services, but via “thicker” MVNO operations. Reseller MVNO operations are not particularly encouraged, and are permitted only if the MNO spectrum holder agrees.

5.5 New Zealand

The New Zealand Commerce Commission undertook a comprehensive review of the competitiveness of the mobile services market in New Zealand during 2017–19.³¹ The study was undertaken ‘to gain a better understanding of how the mobile market is currently performing and developing, and to consider how the mobile landscape may evolve in the future’.³² The Commission considered whether the market was competitive and the impact of wholesale access regulation, spectrum allocations and of 5G on competition in future.

³⁰ AGCOM, Resolution n. 231/18/CONS.

³¹ NZCC Market Study, above n 12.

³² Ibid 16.

The Commission concluded that the market was competitive³³ and that particular measures, such as regulating wholesale access need not be considered at this stage. However, in the course of doing so the Commission canvassed many interesting issues of relevance not only to the New Zealand mobile services market, but to mobile services markets more generally, including Australia.

In relation to MVNOs the Commission found that although the MVNO served only around 1% of the retail mobile market, the wholesale market in New Zealand appears to have become more active as a result of 2degrees' entry as a new MNO in 2015 and its approach to offering MVNO access.³⁴ The Commission did not conclude that there was any necessity for regulating MVNO access based on its belief that wholesale markets were becoming more active and that retail markets were competitive.³⁵

The Commission took the view that MVNOs typically are niche players and that their contribution to retail competition was on that basis; for example, that they may be able to offer prices, some service innovation, and tariffs that may better suit niche customer segments.³⁶ This view reflects the marginal position to which MNOs typically seek to constrain MVNOs. The Commission is describing the market reality in New Zealand and elsewhere.³⁷

Significance for Australia: The value of the Commission's study is that it clearly recognises the major impact of 5G and other technological developments on competition in the mobile services sector and, in an economy where the business case for a fourth MNO is weak, recognises that new opportunities might well emerge for improved competitiveness via strengthening and expansion of the MVNOs.

³³ The Commission emphasised that competitiveness had increased since the completion of the national network rollout of the most recent MNO entrant, 2degrees.

³⁴ Finding F10: 'Until recently, wholesale competition between MNOs to host MVNOs has been limited. MVNOs currently serve just over 1% of the retail mobile market, although there is some evidence that increased wholesale activity by 2degrees has prompted a response from Spark and Vodafone in offering MVNO access. New commercial MVNO agreements have been signed during the past 18 months, such as those between Trustpower and Spark, and Kogan Mobile and Vodafone.'

³⁵ NZCC Market Study, above n 12, 69 [4.40].

³⁶ 'MVNO entry can provide consumers with more choice of standalone mobile services as well as bundles that include mobile and other services. MVNOs can offer price competition and some service innovation, product differentiation, and a more flexible set of tariff arrangements which may better meet the needs of specific customer niches. MVNOs often enter to target niche segments of the market that traditional MNOs may not be willing or able to serve.' NZCC Market Study above n 12, 72 [4.47].

³⁷ NZCC Market Study, above n 12, 74 [4.54]: '... MVNOs are dependent on their host network, and this may limit the extent to which they can differentiate their offerings from those of their host MNO, depending on the terms and conditions of access.'

5.6 Portugal

The Portuguese telecommunications regulator, ANACOM, published in February 2020 a draft regulation for comment on the auction process and conditions for the allocation of 5G spectrum.³⁸

The conditions include wholesale access conditions requiring spectrum holders to negotiate wholesale access agreements with MVNOs and other third parties in good faith, with results that enable substantial commercial autonomy to be exercised by the access seekers. Such agreements must allow for both light and full MVNO operation.

Significance for Australia: ANACOM is seeking to encourage new MNO entry and fuller MVNO competition through the 5G spectrum award process. Both of these aims reflect the objectives that are driving the 5G spectrum award process in Australia.

³⁸ ANACOM, *Projeto de Regulamento do Leilão para a Atribuição de Direitos de Utilização de Frequências nas faixas dos 700 MHz, 900 MHz, 1800 MHz, 2,1 GHz, 2,6 GHz e 3,6 GHz: Nota justificativa*, www.anacom.pt/render.jsp?contentId=1508601

6 Wholesale access regulatory options

There are two options for improving mobile market competition through the 5G spectrum award process. Both are viable approaches with good prospects of success and should be considered by the ACCC.

6.1 Mandatory access regime associated with 5G spectrum awards

A mandatory wholesale access regime secured as an integral part of the 5G spectrum award conditions is the first possibility. Under this option all 5G spectrum awards could include obligations on all successful bidders either:

- (a) specified in the auction or other process conditions and which would apply to all relevant spectrum; or
- (b) to be included in access undertakings prepared by the successful bidders and subject to acceptance by the ACCC.

The first of these would require substantial consultation by the ACCC to determine the precise set of conditions that would be optimal and to incorporate them at the outset into spectrum licences that will operate for some 15 years. Although licence conditions can be reviewed during the term of a licence, it is a major intervention in the ongoing business plans of the licensee, in a situation where the incumbent licensee has established certain fair process entitlements. In other words, reflecting the possibilities that have arisen during the life of the licence via the licence amendment process might be best avoided if there is a better way to proceed.

An alternative approach to mandatory access arrangements would be through individual access undertakings. This would enable a range of access undertakings to be considered which may result in some differentiation at the wholesale level and some choice for MVNOs. The minimum requirements would still need to be specified by the ACCC as the basis for its acceptance. The question is whether some diversity between access undertakings offers any competitive advantage compared to the imposition by the ACCC of uniform mandatory licence obligations, and whether it is administratively preferable to negotiate and approve amendments to access undertakings in response to changing market and technological circumstances compared to effecting changes to licence conditions.

Some of the overseas countries considered in previous section of this submission seek to impose broad wholesale access obligations at the outset.

6.2 Incentive regulation via 5G spectrum award conditions

An alternative to the imposition of licence conditions or an obligation to propose an acceptable access undertaking would be to incorporate incentives into the process by reserving some of the available 5G spectrum for bidders who are prepared at the outset to commit to an MVNO access regime in respect of their 5G networks that caters for all potential MVNO categories from reseller to full service (from “thin” to “thick”). This approach would enable all bidders to participate in award contests for certain spectrum but restrict the “reserved” spectrum for those prepared to embrace an access regime.

As a separate matter the spectrum reserved under this scheme might attract a discount, or might simply be available on the same basis as non-reserved 5G spectrum. That is a detail

that would need to be resolved, based on the best package of incentives the ACCC might deem sufficient to ensure success of the scheme. However, it is envisaged that the condition in relation to MVNO access would apply to all of the 5G spectrum of the bidder, not just to the additional reserved spectrum. Indeed, there would be difficulties with any other arrangement in practice.

It would only take one MNO to make a credible bid for the reserved spectrum for the oligopoly line, referred to earlier in this submission, to be breached. It could be seen as providing an incentive for at least one MNO to break ranks. The others would likely follow.

Significantly, either of the two approaches suggested in section 6.1 above—namely, imposition of mandatory access conditions and an approved access undertaking—could be implemented by way of incentive-based model.

7 Conclusions and recommendations

The pathway towards improved competition in the Australian mobile services market that involves maintaining the potential for a fourth MNO by the exercise of the ACCC's powers in relation to mergers appears to be blocked by the recent Federal Court decision. The only realistic way open to facilitate the entry of a fourth MNO is through providing incentives to do so when the opportunity arises, or else wait on entrants to make that decision in their own time when suitable opportunities, such as allocation of new spectrum, arise.

There are such opportunities to create incentives for the entry of a fourth MNO in the forthcoming 5G spectrum award process, and these opportunities are unlikely to arise again for a long time. The award of 5G spectrum is a current requirement with long-term effects that will stretch over the 15-year period of the spectrum licences that are awarded, requiring decisions now about how the award process will be used to facilitate greater mobile services competition in the longer term.

The competitive potential of MVNOs in the mobile market has to date been constrained by a lack of effective access regulation; by a general tendency to see MVNOs as niche players; by emphasis on facilities/network-based competition; by the failure in the wholesale access market; and by a collective (whether collusive or not) refusal of MNOs to deal on certain access constraints. However, this need not be the case in the future.

The technical characteristics of 5G networks, and in particular the possibilities for network slicing, provide a new and unique opportunity to enable MVNOs to participate in the market with less dependence on the network configurations and characteristics of their MNO hosts, and greater opportunities to provide more appreciably differentiated services than with earlier generations of mobile network technology.

Further, the opportunities that arise through 5G are not limited to MVNOs, as traditionally understood, that seek to serve some or all of current mobile market segments. New network service characteristics will attract new MVNO categories that seek to serve the needs of industry verticals and to integrate mobile data services with the processes and transactions of those verticals.

The 5G spectrum award conditions in a number of other countries show a range of initiatives to use the process to improve mobile service market competition, including conditions relating to encouraging or requiring wholesale access, and MVNO support.

Given all this, we believe that the ACCC should:

1. recognise that the most effective, immediately available pathway to improved competitiveness in the mobile services market is via improved conditions for MVNOs and the removal of the constraints that have been imposed, commercially, by MNOs in the absence of relevant regulation;
2. recognise that the 5G spectrum award process offers a new and unique opportunity for the ACCC to intervene and create the conditions for improved MVNO competitiveness;
3. recognise that, given the relatively long licence period that applies to the 5G spectrum awards, the creation of an effective pro-competitive regulatory framework ideally needs to happen now, not part way through the licence period or at some other time;

4. recommend to the Minister that wholesale access conditions should be imposed on 5G spectrum permitting full service MVNO access to all 5G network functionality, including network slicing, in promote greater mobile market competitiveness; and
5. consider and recommend to the Minister one of the following approaches to introduce such wholesale access conditions, namely:
 - (a) the imposition of mandatory access obligations as conditions for the award of any 5G spectrum, or
 - (b) the creation of incentives for MNOs to offer better wholesale access to MVNOs by making available enlarged or reserved 5G spectrum blocs to those bidders who are prepared to provide acceptable access undertakings.

Appendix A – Overseas developments in using spectrum awards to promote mobile competition

A.1 Canada

At the highest levels of Canadian policy making there is a clear commitment to delivering improved consumer welfare and greater competition via enhanced MVNO access. In a letter dated 13 December 2019 the Canadian Prime Minister directed the Minister of Innovation, Science and Industry on these matters as follows:

“... you will ...

- Use all available instruments, including the advancement of the 2019 Telecom Policy Directive, to reduce the average cost of cellular phone bills in Canada by 25 per cent. You will work with telecom companies and expand mobile virtual network operators (MVNO) in the market. If within two years this price target is not achieved, you can expand MVNO qualifying rules and the Canadian Radio-television and Telecommunications Commission mandate on affordable pricing.
- Award spectrum access based on commitments towards consumer choice, affordability and broad access. You will also reserve space for new entrants.”³⁹

The full text of the subsequent public hearing consultative document from the CRTC in relation to MVNO wholesale access is set out below:⁴⁰

Wholesale MVNO access

34. When the wholesale mobile wireless service regulatory framework was established, it was the Commission’s expectation that wholesale regulation, including mandated wholesale roaming access, would encourage competitive entry and generally improve conditions in the downstream retail market. While the Commission found MVNO access service to be essential for competition (meaning that denying access to this service would likely result in a substantial lessening or prevention of competition in the downstream retail market), the Commission’s goal was to enact wholesale regulation that would encourage the development of a mobile wireless service market characterized by a mix of facilities-based competitors and MVNOs, since strong facilities-based competition should naturally result in more opportunities for MVNO competition (for example, through the sale of excess network capacity).
35. In addition, one of the Commission’s concerns, at that time, was the potential for mandated wholesale MVNO access to undermine network investment, particularly with respect to regional competitors’ investments in spectrum and network facilities, and the general expansion of wireless networks, including to rural areas.
36. In this regard, since 2015, there have been positive signs with respect to investment, since facilities-based competitors, both national and regional, have continued to invest in their networks. These investments have resulted in the latest wireless service technologies being made available to the vast majority of Canadians, with LTE technology available to 98.5% of Canadians and LTE-A technology available to 83% of Canadians.
37. However, since that time, it has become increasingly clear that a mix of competitors has not developed to the degree that the Commission had expected in 2015. While facilities-based

³⁹ <https://pm.gc.ca/en/mandate-letters/2019/12/13/minister-innovation-science-and-industry-mandate-letter>

⁴⁰ CRTC, *Telecom Notice of Consultation CRTC 2019-57: Review of Mobile Wireless Services* (13 January 2020)

competitors have continued to expand their operations and reach, and while MVNO activity has increased in the machine-to-machine (M2M)/IoT markets, based on filings to the Commission on MVNO arrangements, there has been virtually no MVNO activity that would provide additional competitive retail options to Canadian consumers.

38. Furthermore, within the last five years, the Commission has twice had to intervene in the mobile wireless service market to address disputes between a carrier and a potential MVNO when the prospective MVNO was unable to successfully negotiate an agreement with a wireless carrier, and instead sought to inappropriately use wholesale roaming as a means to enter the market. While the Commission ultimately determined that the use of wholesale roaming by MVNOs was inconsistent with its wholesale mobile service regulatory framework, these types of situations are, in the Commission's view, symptomatic of a larger problem – namely, that a sustainable retail MVNO market has failed to develop on its own.
39. In light of the above, it is the Commission's preliminary view that it would be appropriate to mandate that the national wireless carriers provide wholesale MVNO access as an outcome of this proceeding. The Commission considers that, on balance, it is likely that the benefits that a well-developed MVNO market would deliver to Canadians are now more likely to outweigh any negative impacts that a policy of mandated wholesale MVNO access might have on wireless carriers' network investments, particularly given the extensive investments that have been made in recent years. Further, properly structured rates, terms, and conditions should further mitigate potential negative impacts on future investments.
40. However, the Commission also continues to support the view that an appropriate mix of facilities-based and service-based competitors can and should exist in the market without specific regulation requiring their presence. In this regard, the Commission considers that while mandated wholesale MVNO access would be an effective means to stimulate the development of a retail MVNO market, as this market matures and MVNOs establish themselves, regulatory intervention should eventually give way to a market-based approach. Accordingly, the Commission's preliminary view is that the national wireless carriers' mandated wholesale MVNO access should be in place for a limited amount of time and be subject to a phase-out period as market forces take hold.
41. In this proceeding, the Commission invites parties to make submissions on its preliminary views. Parties should also, irrespective of their position on the preliminary views, put forward any positions they have with respect to how the Commission should define the parameters of a new mandated wholesale MVNO access service, including with respect to rate-setting policy.

A.2 France

On 21 November 2019, following two public consultations⁴¹, the national regulatory authority, ARCEP, issued a decision⁴² proposing to the responsible Minister terms and conditions for

⁴¹ Public consultation conducted by ARCEP from October 26 to December 19, 2018 relating to the allocation of new frequencies and the public consultation carried out by ARCEP from July 15, 2019 to September 4, 2019 relating to the terms and conditions of allocation of authorizations of use of frequencies in the band 3.4–3.8 GHz in metropolitan France to establish and operate a mobile radio network, both open to the public and the contributions of stakeholders.

⁴² *Décision n° 2019-1386 de l'Autorité de régulation des communications électroniques, des postes et de la distribution de la presse en date du 21 novembre 2019 proposant au ministre chargé des communications électroniques les modalités et les conditions d'attribution d'autorisations d'utilisation de fréquences dans la bande 3,4 -3,8 GHz en France métropolitaine pour établir et exploiter un réseau radioélectrique mobile ouvert au public.* Available at: <https://www.arcep.fr/la-regulation/grands-dossiers-reseaux-mobiles/la-5g/frequences-5g-procedure-dattribution-de-la-bande-34-38-ghz-en-metropole.html>

granting authorisations of frequencies in mainland France necessary to establish and operate a public mobile radio network.

This decision concerns the allocation of frequencies in the band 3.4–3.8 GHz, which has been identified in Europe among the pioneering bands of 5G.⁴³

As part of the plan of allocating frequencies an auction process will likely take place in April this year. The auction is part of a two-phase allocation process. 31 blocks of 10 MHz frequencies are involved and will be allocated in two stages. First, an initial allocation phase will allow a maximum of four candidates to obtain a 50 MHz frequency block, against optional commitments. The reserve price determined by the Government is 350 million euros per 50 MHz block. Then a multi-turn auction will be organized to allocate the frequencies still available. Qualified applicants will thus have the opportunity to acquire additional frequencies, in blocks of 10 MHz. The reserve price determined by the Government is 70 million euros per 10 MHz block.

Four companies have submitted applications for the allocation of frequencies in the 3.4 - 3.8 GHz band in mainland France, namely:

- Bouygues Telecom;
- Free mobile;
- Orange;
- SFR.

The four candidates each requested the allocation of one of the four 50 MHz blocks which will be allocated in return for pledging to the commitments provided for by the procedure. To qualify for the fixed price sale, operators had to accept to meet a number of terms around indoor coverage for businesses, dedicated fixed access services, transparency in the deployment process and MVNO access to 5G.

In April, according to the proposed schedule, during the auctions on 110 MHz, operators will have to bid to obtain additional tranches of 10 MHz each, without however exceeding the ceiling of 100 MHz per operator in the end. In theory, an operator could therefore obtain twice as many frequencies at the end of the allocation as another. Concern has been expressed about the risk of foreclosure of certain market players who would not succeed in obtaining enough frequencies.

In order to encourage innovation by all players in the sector ARCEP defined the commitments that relate to MVNO access to in 5G networks as follows:

'The company⁴⁴ undertakes to offer, on the whole of its mobile network, access to virtual mobile network operators (MVNO), under the following conditions:

- from three months after the issuance of its authorization to use frequencies allocated under this procedure, the company will, as quick as possible, answer to reasonable requests for access;
- at the latest three months after the delivery of its authorization to use frequencies allocated within the framework of this procedure, the company will propose to each of the MVNO applicants already hosted on its network a draft amendment to the existing contract providing for access. It

⁴³ Directive 2018/1972 of the European Parliament and of the Council of 11 December 2018 plans a coordinated allocation between EU member states before December 31, 2020.

⁴⁴ 'The company' here refers to each of the four candidates that requested the allocation of one of the four 50 MHz blocks.

will conduct negotiations in good faith with the MVNO in order to conclude the addendum in a schedule allowing the MVNO to offer the resulting services in a schedule substantially equivalent to that chosen by the company for its own services on the retail market;

- the company will offer hosting conditions which do not restrict competition on the wholesale market for MVNO hosting and the commercial autonomy of MVNOs on the retail market, without objective justification;
- the company will in particular propose an offer based on an architecture known as extended MVNO ("full-MVNO");
- the company will develop its access offer in order to allow MVNOs to benefit from all of the technical developments deployed on its mobile network, under reasonable conditions. In this context, the company will communicate to the MVNOs sufficiently in advance the technical specifications of the said developments in the access offer and will negotiate in good faith in order to allow the MVNOs to launch the resulting services in a schedule substantially equivalent to that used by the company for its own services in the retail market. Among these developments, the access offer will contain a solution allowing the MVNO to supply differentiated services;
- the company will provide access at reasonable economic conditions, having regard in particular to the conditions prevailing on the wholesale and retail markets in which it operates, and compatible with the exercise of effective and fair competition on these markets.

In addition, the company (MNO) will be required to undertake that, in the event that it concludes an agreement for sharing active network elements with one or more operators, it will make its MVNO customers benefit from it under reasonable pricing conditions. With regard to this commitment, ARCEP specifies that:

- MVNO requests may in particular relate to the provision, from the holder's mobile network and associated resources, of a service characterized by performance (throughput, latency, reliability, etc.) or quality of service that would have no equivalent in the services offered by the licensee on the retail market;
- the reasonableness of the request will be assessed in particular with regard to the justification of the requester's needs and the licensee's ability to satisfy it, taking into account in particular the security constraints of its network; and
- the reasonableness of the pricing conditions will be assessed in particular with regard to the services provided by the two parties and their respective contribution in the creation and implementation of the services provided by the MVNO. In this regard, the setting of tariffs should result from negotiations reflecting the respective contributions of the parties to the creation of value. These prices will be revised, if necessary, according to changes in conditions prevailing on the downstream markets concerned.

In France, frequencies will be allocated for 15 years. This period may be extended by 5 years, in the event of an agreement between a telecom operator and ARCEP. Two intermediate meetings are planned in 2023 and 2028 to assess the implementation of the obligations and their needs.

A.3 Germany

With its "Frequenz-Kompass" document of 15 July 2016, the German telecommunications regulator, the Bundesnetzagentur provided an overview of the approach in the area of

spectrum management and identified corresponding fields of regulatory activity for the rollout of digital infrastructures⁴⁵. All interested parties had the opportunity to respond.

Taking into account the responses to the "Frequenz-Kompass", the Bundesnetzagentur launched in December 2016 a public consultation on its document "Points of Orientation for the provision of spectrum for the rollout of digital infrastructures". The Points of Orientation addressed the frequencies suited to and envisaged for the rollout of 5G infrastructures. In particular, the following frequencies were identified for this purpose: 700 MHz (centre gap), 2 GHz (UMTS spectrum), 3400 MHz – 3800 MHz, 26 GHz and 28 GHz. The document also raised the issue whether regulations that benefit service providers/MVNOs and new entrants might be required, in the following terms:

"Consideration must be given, in providing spectrum, to the interests of both the current national mobile operators and those of possible new entrants. Consideration must also be given to the interests of other users requiring frequencies such as small and medium-size enterprises (SMEs) and start-ups."

On 27 June 2017, the Bundesnetzagentur published the document "Key Elements for the rollout of digital infrastructures and identification of demand for nationwide assignments in the 2 GHz and 3.6 GHz bands"⁴⁶. This paper set out, as the basis for consultation, the initial framework procedure for the provision of spectrum. In doing so, the Bundesnetzagentur prompted the start of the process to make key 5G spectrum available. In the document it mentioned again the need to take into account potential new entrants:

'The interests of potential new entrants are also to be taken into account in spectrum provision for the rollout of digital infrastructures. With a view in particular to promoting infrastructure competition the Bundesnetzagentur will take a close look at the necessary regulatory action, keeping an open mind as to the outcome.'

On the basis of the responses to the "Key Elements" paper and the demand for spectrum registered, the Bundesnetzagentur drew up a draft decision of the President's Chamber⁴⁷ on the order for and choice of award proceedings, which it submitted for public consultation.⁴⁸

On 24 September 2018, a consultation draft of a President's Chamber decision (or regulation) on the award conditions and auction rules was published.⁴⁹ As a result of the consultation, the following coverage obligations and associated quality parameters are being set with special coverage obligations for new entrants, and dispensation against the requirements that apply to existing MNOs. In particular, the different obligations applying to

⁴⁵ Communication No 1032/2016, Bundesnetzagentur Official Gazette No 14/2016 of 27 July 2016, page 1714 et seq.

⁴⁶ Communication No 484/2017, Bundesnetzagentur Official Gazette No 13/2017 of 12 July 2017, page 2726 et seq.

⁴⁷ For this purpose, equivalent to the Executive Council in Australia, or Minister in Council in other countries.

⁴⁸ Communication No 35/2018, Bundesnetzagentur Official Gazette No 3/2018 of 7 February 2018, page 329 et seq.

⁴⁹ Communication No 267/2018, Bundesnetzagentur Official Gazette No 19/2018 of 4 October 2018, page 1702 et seq.

new entrants would reduce the market entry barriers. The rollout requirements are also suited to ensuring fair competition:

Mobile Network Operators	New Entrants
Coverage with a transmission rate of at least 100 Mbit/s for at least 98% of households by the end of 2022	Coverage of at least 25% of households by the end of 2023 and coverage of at least 50 % of households by the end of 2025. New market entrants purchasing spectrum in the 3.6 GHz band only must achieve coverage of at least 25% of households by the end of 2025. If a new entrant only purchases spectrum in the 2 GHz band that is available from 2026, the deadline for meeting the obligation will be extended. In this case, the deadline will be 31 December 2028 or 31 December 2030 respectively.
Coverage with a transmission rate of at least 100 Mbit/s and a maximum latency of 10 milliseconds (ms) for all German motorways by the end of 2022	Not required
Coverage with a transmission rate of at least 100 Mbit/s and a maximum latency of 10 ms for all federal roads with connectivity function levels 0 or 1 by the end of 2022	Not required
Coverage with a transmission rate of at least 100 Mbit/s and a maximum latency of 10 ms for all other federal roads by the end of 2024	Not required
Coverage with a transmission rate of at least 50 Mbit/s for all state roads by the end of 2024	Not required
Coverage with a transmission rate of at least 50 Mbit/s for seaports and the inland waterways core network by the end of 2024	Not required
Coverage with a transmission rate of at least 100 Mbit/s for rail routes with more than 2,000 passengers daily by the end of 2022	Not required
Coverage with a transmission rate of at least 50 Mbit/s for all other rail routes by the end of 2024	Not required
Operation of 1,000 "5G base stations" by the end of 2022 Operation of 500 base stations with a transmission rate of at least 100 Mbit/s in not-spots by the end of 2022	New market entrants purchasing 3.6 GHz spectrum must have operational 1,000 "5G base stations".

Roaming and infrastructure sharing were also addressed in the draft decision. Subject to the provisions of telecommunication and antitrust law, the holders of assigned frequencies are to negotiate on the shared use of existing nationwide networks (known as roaming) and on infrastructure sharing whenever a nationwide mobile network operator gives notice of demand for such sharing. Roaming in the decision refers to the process of enabling a mobile network operator to use the mobile networks of other operators for its end users in areas outside its coverage.

With regard to the promotion of competition, national roaming can make it easier for a new entrant to get into the market. Where network operators agree on roaming, this can contribute to the promotion of cost-effective rollout of mobile infrastructure in areas which a single network operator would find economically difficult to develop on its own. The draft decision considers that it is not possible to simply order national or regional roaming in the sense of an access obligation. The imposition of an access obligation according to the law is conditional on the network operator having significant market power. Neither the Bundeskartellamt nor the Bundesnetzagentur has so far found this to be the case in the German mobile market.

However, national roaming for new entrants remains a possibility. In view of the possible appearance on the market of a new entrant following the proceedings for assigning frequencies, the negotiation requirement on national roaming foreseen in the law is a suitable means of promoting efficient and interference-free use of spectrum and the achievement of other regulatory objectives set forth in the law. A requirement for existing mobile network operators to negotiate with new entrants is a means of ensuring fair competition and promoting sustainable competitive markets. As the draft decision sees it, national roaming is a suitable instrument for facilitating entry to the market by new players in areas where spectrum resources are scarce. A new entrant cannot set up a nationwide network in short order but only step by step. However, with a national business model a new entrant will have to be able to offer customers mobile coverage for as much of the country as possible right from the start. A negotiation requirement will lower the hurdles to market entry in the nationwide mobile market. This could increase the variety of mobile providers and promote competition. The authority here also took account of the fact that there are only three mobile networks operators still active nationwide since the merger of Telefonica and E-Plus. The draft decision also intends to clarify that new entrants asking national roaming are undertakings seeking entry to the market as new nationwide mobile network operators on the basis of their own assignments of nationwide spectrum auctioned⁵⁰ in these proceedings.

The German approach has concentrated on facilitating the entry of new MNOs rather than in providing an improved regulatory framework for enhanced MVNO competition.

A.4 Italy

The Italian telecommunications regulator, *Autorità per le Garanzie Nelle Comunicazioni* (AGCOM), completed a public consultation process into the award of 5G spectrum frequencies in April 2018, and published its regulation on the matter following that process.⁵¹

⁵⁰ As a result of the auction four bidders committed to spend a total of €6.6 billion. The auction comprised of 497 rounds of bidding and lead to the entrance of a fourth operator, 1&1 Drillisch, which spent €1.1 billion on two blocks of 5MHz spectrum in the 2GHz band and five blocks of 10MHz in the 3.6GHz band. Deutsche Telekom bid the most, committing a total of €2.2 billion for four blocks in the 2GHz band and nine blocks in the 3.6GHz band. Vodafone spent €1.9. billion on 90MHz in the 3.6GHz band, along with two blocks of 15MHz and two of 5MHz in the 2.1GHz band. Telefonica Deutschland bid €1.4 billion for two blocks in the 2.1GHz range and seven blocks in the 3.6GHz band.

⁵¹ AGCOM, *Resolution n. 231/18/CONS*. See summary of the process and the results in ITU conference proceedings in August 2017: <https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/Events2019/SantoDomingo/5G-Workshop/TallerS4Expositor4.pdf>

The main interest in the process was the award of spectrum in the 5G pioneer bands, (700 MHz, 3.4–3.8 GHz and 24.25–27.5 GHz bands).

AGCOM considers that 5G could be well suited to co-investment models between operators and other players in the market, and, in particular, verticals such as the automotive sector. In AGCOM's view, 5G networks will also impact different vertical markets (manufacturing and industry, automotive, media and entertainment, energy, health and well-being, etc.), enabling them to develop different applications as a result of the specific performance requirements guaranteed by 5G technology.

The AGCOM inquiry treated the automotive sector more in depth due to the fact that specific frequency bands have already been identified, or specific categories of use in the collective bands have been identified, in particular for ITS (Intelligent Transport Systems) and TTT (Transport and Traffic Telematics) applications, confirming a complementarity between typically commercial mobile networks and frequencies for collective use.

AGCOM's regulation (Resolution n 231/18/CONS) imposed three kinds of obligations in the spectrum licence conditions, namely use conditions ("use it or lease it", as described below); coverage obligations for some spectrum bands; and access obligations.

The regulation imposes the following access obligations:

- Operators who acquire spectrum in the 700 MHz band must offer national roaming on their 700, 800 and 900 MHz networks to a new entrant acquiring spectrum in these bands for 30 months in the entire national territory, and for 60 months in areas not covered by the new entrant.
- Each licensee holding at least 80 MHz nationally in the 3.4 – 3.8 GHz band must provide access to other players who are not licensees (that is, to MVNOs, and others). In addition, they must provide access to licensees in the 3,5 GHz band with rights of use covering less than 40% of the national population.

In both cases access is to be provided on the following terms:

- to be based on a commercial agreement with fair and non-discriminatory terms;
- the access agreement to specify the area of interest (that not necessarily includes areas where the holder has coverage obligations or in general intends to cover); and
- if the licensee does not cover the area where a player needs connectivity, the player can deploy the network, upon agreement or by leasing frequencies. This obligation is also aimed at fostering verticals to develop innovative business cases, e.g. by exploiting high performance technologies (such as Massive-MIMO and beamforming) to offer future proof services enabling advanced business scenarios.
- AGCOM is concerned more with the development of 5G services rather than with an increase in competition in the provision of legacy mobile service markets. For that reason, an access seeker cannot resell telecommunications services, except with the agreement of the spectrum licensee.

A.5 New Zealand

The New Zealand Commerce Commission undertook a comprehensive review of the competitiveness of the mobile services market in New Zealand during 2017 -19.⁵² The study was undertaken “to gain a better understanding of how the mobile market is currently performing and developing, and to consider how the mobile landscape may evolve in the future”.⁵³ In the course of the study the Commission considered whether the market was competitive and the impact of wholesale access regulation, spectrum allocations and of 5G on competition in future.

The Commission concluded that the market was competitive⁵⁴ and that particular measures, such as regulating wholesale access need not be considered at this stage. However, in the course of doing so the Commission canvassed many interesting issues of relevance not only to the New Zealand mobile services market, but to mobile services markets more generally, including Australia.

Three vertically integrated national mobile network operators - 2degrees, Vodafone and Spark - provide retail mobile services to New Zealand consumers. In addition, there are currently a small number of mobile service providers that operate solely at the retail level as MVNOs. These retail-only mobile operators include the Vocus brands and the Warehouse, as well as sub-brands like Spark’s Skinny mobile. Kogan Mobile has also recently launched mobile services in New Zealand. The Commission notes that this has changed the competitive landscape compared to the situation a decade before when there were two MNOs and fewer MNVOs.

The Commission did not favour special allocation arrangements to ensure that new spectrum allocations be given to new entrants or third parties.⁵⁵ The context for this view was whether spectrum allocations should be structured to favour a fourth MNO.⁵⁶

In relation to MVNOs the Commission found that although the MVNO served only around 1% of the retail mobile market, the wholesale market in New Zealand appears to have become more active as a result of 2degrees’ entry as an MNO in 2015 and its approach to offering MVNO access.⁵⁷ The Commission did not conclude that there was any necessity for

⁵² NZ Market Study, above note 12.

⁵³ Ibid 16.

⁵⁴ The NZ Commission emphasised that competitiveness had increased since the completion of the national network rollout of the most recent MNO entrant, 2degrees.

⁵⁵ Finding F9: “We do not believe that there is a strong case for including a condition on spectrum rights that requires wholesale access to be offered to third parties.”

⁵⁶ NZCC Market Study, above n 12, 66: ‘Based on our analysis of the performance of the retail mobile market in New Zealand, there does not appear to be a strong case for regulatory intervention to promote a fourth MNO to enter the New Zealand market.’

⁵⁷ Finding F10: ‘Until recently, wholesale competition between MNOs to host MVNOs has been limited. MVNOs currently serve just over 1% of the retail mobile market, although there is some evidence that increased wholesale activity by 2degrees has prompted a response from Spark and Vodafone in offering MVNO access. New commercial MVNO agreements have been signed during the past 18 months, such as those between Trustpower and Spark, and Kogan Mobile and Vodafone.’

regulating MVNO access based on its belief that wholesale markets were becoming more active and that retail markets were competitive.⁵⁸

The Commission took the view that MVNOs typically are niche players and that their contribution to retail competition was on that basis; for example, that they may be able to offer prices, some service innovation, and tariffs that may better suit niche customer segments.⁵⁹ This view reflects the marginal position to which MNOs typically seek to constrain MVNOs. The Commission is describing the market reality in New Zealand and elsewhere.⁶⁰

As already noted, the Commission was disinclined to intervene at all in the MVNO wholesale access market. The Commission further noted that the New Zealand market might not be able to sustain full MVNOs in any case. The future development of MVNO market opportunities was a commercial matter, but one in which spectrum allocation would be important.⁶¹

The Commission recognised some separate technical developments as affecting their prospects for MVNOs in the mobile services market, as follows:

- **5G:** The Commission sees 5G as initially evolutionary, provided on top of existing networks, but, over time, as resulting in the densification of networks with demand resulting in increased in-filling of networks.⁶² Importantly the Commission recognises that 5G will create economic incentives for MNOs to increase usage, and that this may impact MVNO reliance and agreements.⁶³ It is unclear how clearly the Commission recognised, at the same time, that 5G may fundamentally change the nature of the opportunities available to MVNOs and enable them, the regulatory framework permitting, to cease being purely niche players with substantial dependence for their role on their host MNOs.
- **eSIM:** The Commission noted that eSIM technology will enable easy and remote changing of SIM identification details and therefore, if electronic locking is prohibited or limited, will enable MVNOs to more readily change hosts and in the process improve

⁵⁸ NZCC Market Study, above note 12, 69 [4.40].

⁵⁹ “MVNO entry can provide consumers with more choice of standalone mobile services as well as bundles that include mobile and other services. MVNOs can offer price competition and some service innovation, product differentiation, and a more flexible set of tariff arrangements which may better meet the needs of specific customer niches. MVNOs often enter to target niche segments of the market that traditional MNOs may not be willing or able to serve.” NZCC Market Study, above n 5, 72 [4.47].

⁶⁰ Ibid 74 [4.54]: ‘... MVNOs are dependent on their host network, and this may limit the extent to which they can differentiate their offerings from those of their host MNO, depending on the terms and conditions of access.’

⁶¹ Ibid 82 [4.93]: ‘... there is potential for further MVNO entry and expansion, as long as the terms of MVNO access are competitive and the MVNO is able to add value to the retail market. Competition, supported by spectrum allocation, should deliver this.’

⁶² Ibid 118 (Finding 21).

⁶³ Ibid: ‘Investment in 5G may alter the economics of mobile provision and raises the prospect of greater infrastructure sharing, and larger incentives to utilise network capacity through MVNO agreements.’

competitiveness in the wholesale mobile access market.⁶⁴ The eSIM development is not linked with 5G developments, but appears to be running in parallel.

- **Network slicing:** Network slicing is a form of virtual networking architecture which allows network owners to divide up their physical network into multiple virtual end-to-end networks. These virtual networks can have substantially different characteristics to each other, and could be the basis of much greater differentiation between the network service of the host MNO and its MVNOs. The Commission identified network slicing as different from 5G, but the 5G specification incorporates that feature.⁶⁵
- **Infrastructure sharing:** The Commission sees the additional heavy investment associated with various developments, including 5G, as encouraging infrastructure sharing to achieve greater efficiencies.⁶⁶

A.6 Portugal

Following a public consultation, ANACOM, the national regulatory authority of Portugal, determined on 23 December 2019 a number of spectrum allocation measures including:

- designation of the 700 MHz band for terrestrial electronic communications services;
- limitations on usage rights associated with allocations in the 700 MHz, 900 MHz, 1800 MHz, 2.1 GHz, 2.6 GHz and 3.6 GHz bands; and
- specification of the spectrum allocation procedures – namely via auction.

In February 2020, ANACOM issued a draft auction regulation.⁶⁷ The draft auction regulation is presently subject to public consultation. The draft regulation sets out, in particular, the conditions for access to the spectrum that will be made available to the market, the procedural rules of the auction and the conditions that will be associated with the use of the spectrum that is allocated. The following bands are included within the scope of the auction:

- 700 MHz (FDD): 703-733 MHz / 758-788 MHz
- 900 MHz (FDD): 880-885 MHz / 925-930 MHz | 895,1-898,1 MHz / 940,1-943,1 MHz | 914-915 MHz / 959-960 MHz
- 1800 MHz (FDD): 1770-1785 MHz / 1865-1880 MHz
- 2,1 GHz (FDD): 1954,9-1959,9 MHz / 2144,9-2149,9 MHz
- 2,6 GHz (FDD): 2500-2510 MHz / 2620-2630 MHz
- 2,6 GHz (TDD): 2595-2620 MHz
- 3,6 GHz (TDD): 3400-3800 MHz

ANACOM has as one of its key objectives the promotion of greater competition in the electronic communications market, and, in pursuit of that objective has proposed

⁶⁴ Ibid 112 [6.19].

⁶⁵ Ibid 115 [6.31].

⁶⁶ Ibid 115.

⁶⁷ ANACOM, *Projeto de Regulamento do Leilão para a Atribuição de Direitos de Utilização de Frequências nas faixas dos 700 MHz, 900 MHz, 1800 MHz, 2,1 GHz, 2,6 GHz e 3,6 GHz: Nota justificativa*, <https://www.anacom.pt/render.jsp?contentId=1508601>

arrangements to encourage new network operator entrants and the strengthening of service-based competition, including:

- Bidding for new entrants: a spectrum reserve has been proposed for new entrants covering part of the spectrum in the 900 MHz band (880-885 MHz / 925-930 MHz, the entire spectrum available in the band 1800 MHz. In addition, a 25% discount on the final price of the spectrum that is acquired by new entrants is proposed for these frequency bands.
- Spectrum caps: limits are proposed to the acquisition of spectrum, which will apply to any company in the bands particularly suitable for 5G: 2 x 10 MHz, in the 700 MHz band and 100 MHz, in the 3.6 GHz band.
- Usage requirements to prevent spectrum hoarding.
- Network access obligations are proposed for virtual mobile operators (MVNOs) and/or national roaming to companies that acquire significant amounts of spectrum and that already have rights to use frequencies in bands designated for terrestrial electronic communications services.
- Coverage and network development obligations are also proposed with the use of these bands, especially in low density areas. National roaming arrangements are also proposed as means of achieving service improvements in low density regions.

In Article 45⁶⁸ the draft regulation sets in detail the network access obligations, namely:

- the holders of rights of use of frequencies that, at the end of the auction, will hold 2 x 10 MHz in the 700 MHz or at least 50 MHz in the 3.6 GHz band and that at the date of entry into force of the Regulation hold rights of use for frequencies in bands designated for terrestrial electronic communications services, are obliged to allow access to their networks in non-discriminatory conditions, in all these bands;
- the holders of the rights of use must, when requested, negotiate in good faith agreements with third parties, respecting the commercial autonomy of the entities involved, namely regarding the distribution networks and market segments addressed, and allowing conditions of effective competition, namely with regard to the provision of services under appropriate technical conditions and the availability of reasonable remuneration conditions.
- the holders of rights of use referred in paragraph a) must, within the scope of the obligation to access the network to which they are bound, accept the negotiation of:
 - Agreements that allow their networks to be used by third-party virtual mobile operators, in the various options bounded by full MVNO and light MVNO, for the provision of electronic communications services to end users, in the same conditions to those offered to their own customers.
 - National roaming agreements with third parties that, at the date of entry into force of this Regulation, do not have rights of use of frequencies in the bands designated for terrestrial electronic communications services and which, at the end of the auction, will hold, separately or together, up to 2 x 5 MHz in the 700 MHz band, 2 x 5 MHz in

⁶⁸ www.anacom.pt/streaming/projetoRegulamentoLeilao06022020_EN.pdf?contentId=1514562&field=ATTACHED_FILE

the 900 MHz band, 2 x 15 MHz in the 1800 MHz band and 50 MHz in the 3.6 GHz band.

Therefore, the obligation to allow access to the networks provided for in the Article 45 of the draft regulation intentionally benefits entities that do not hold rights to use frequencies in the bands designated for terrestrial electronic communications services. The rights to use frequencies covered by the proposed regulation are granted for a period of 20 years and may be renewed under the terms of the Electronic Communications Law.

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