REVIEW OF THE RETAIL AND WHOLESALE TELECOMMUNICATIONS MARKETS IN BRUNEI (MARKET REVIEW REPORT)

ISSUED BY

THE AUTHORITY FOR INFO-COMMUNICATIONS TECHNOLOGY INDUSTRY OF BRUNEI DARUSSALAM (AITI)

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Introduction

The Authority for Info-communications Technology Industry of Brunei Darussalam (the "Authority / "AITI") has applied four-step market review process as set out in AITI's Market Review Guidelines to identify the retail and wholesale telecommunication markets in Brunei where ex-ante regulation is required. Our analysis assesses the relevant markets given the current sector structure illustrated in Figure 1.

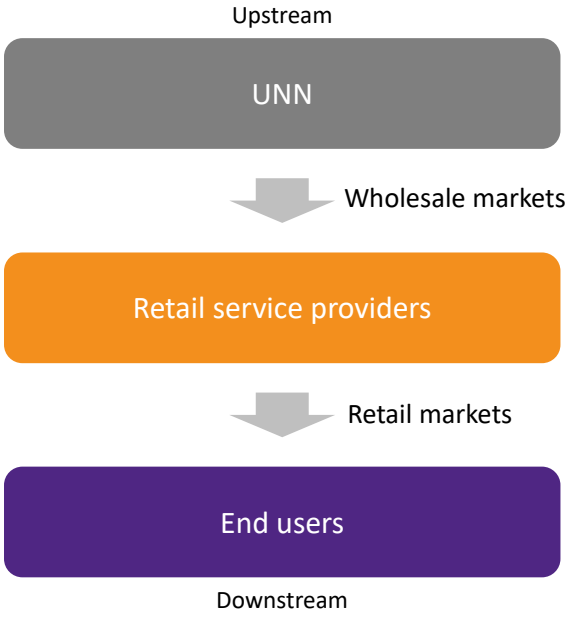

Figure 1: The retail and wholesale markets in Brunei

1 Step 1: Market definition

1.1 Defining the retail markets

1.1.1 Standard competition tests are used, involving the application of a Small but Significant Non-transitory Increase in Price (SSNIP) to define the product and customer scope of each retail market and an examination of geographic variations in the state of competition to define the geographic scope of each market. This process, set out in Annex A, follows the Market Review Guidelines.

1.1.2 As a result of this process, five (5) separate retail markets (RM) have been identified:

1.1.2.1 RM1: Fixed voice telephony services delivered on a stand-alone basis
1.1.2.2 RM2: Fixed broadband services which are aimed primarily at consumers and small businesses
1.1.2.3 RM3: Mobile services for all customers
1.1.2.4 RM4: National high quality transmission services used by large enterprises and government entities. This market includes both point to point transmission services (e.g. leased circuits) and network services such as Internet Protocal Virtual Private Network (IPVPN) and Multiprotocal Label Switching (MPLS) whether there are quality of service guarantees
1.1.2.5 RM5: International high quality transmission services

1.1.3 All five markets are national in scope while RM2, RM4 and RM5 are limited to some extent in terms of customer scope.

1.2 Retail market definition – international comparisons

1.2.1 The Authority previously defined three retail markets for Brunei in 2015. These map onto the five proposed retail markets as follows:

1.2.1.1 Fixed voice telephony services (RM1).
1.2.1.2 Fixed broadband services (RM2, RM4 and RM5 combined).
1.2.1.3 Mobile services (RM3).

1.2.2 The definitions of the five retail markets are consistent with the market definitions in the EU where:

1.2.2.1 a distinction is made between basic quality fixed broadband where quality of service is largely determined on a contended, best efforts, basis, and high-quality transmission services required by large enterprises for many applications. See for example Figure 1.1; and

1.2.2.2 the various mobile services (text, voice, data) are all grouped into a single mobile service market given the economies of scope in the joint provision of these services.

An analysis of the general market conditions and demand side both at retail and wholesale level across the Union suggests that mass-market and business demand differs significantly. To be able to meet the demand of retail business customers for high-quality access and, very often, connect their multiple sites (including cross-border), alternative operators use a number of different wholesale inputs, ranging from leased lines using traditional or alternative interfaces, independently of the underlying infrastructure, to other wholesale access products which fulfil certain quality characteristics[1].

Figure 1.1: High quality vs basic broadband

1.2.3 It is difficult to provide comprehensive benchmarks on how retail markets are defined in other jurisdictions. In Europe the European Commission and national regulators focus their analysis on wholesale markets and on determining which of these markets are susceptible to ex-ante regulation. They do not publish comprehensive lists of retail markets. In the Middle East some regulators do. It is found that the proposed retail markets for Brunei map one-to-one onto the markets identified by the regulator in Oman. See Figure 1.2.

Proposal for Brunei	Retail markets in Oman[2]
RM1: Fixed voice telephony services on a stand-alone basis	Fixed voice telephony services on a stand-alone basis
RM2: Fixed broadband	Fixed broadband
RM3: Mobile services	Mobile services
RM4: National high quality transmission services	National business connectivity services
RM5: International high quality transmission services	International business connectivity services

Figure 1.2: Proposed retail markets for Brunei vs retail markets in Oman

1.3 Defining wholesale markets for Brunei

1.3.1 Under the current sector structure, Unified National Networks (UNN) is the sole supplier of wholesale services in Brunei. These are provided on an end-to-end basis to Retail Service Providers (RSPs) who create retail products by choosing from a menu of several hundred service elements listed in UNN's Service Reference Offer SRO and resell them to end-users. This is a very different situation from that which applies in most jurisdictions - where many wholesale services are supplied on a competitive basis by

[1] COMMISSION RECOMMENDATION of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC o

[2] TRA Oman, June 2021, *Consultation on Market Definition and Dominance (MDD) Report, Position Statement*

Market Players to themselves, to vertically integrated rivals and to resellers. Access seekers might then combine the purchased wholesale service with their own infrastructure to create retail services. Given this important difference, the definition of wholesale markets in other jurisdictions offers little guidance to the appropriate definition of wholesale markets in Brunei. For example, most regulators define wholesale markets for fixed and mobile termination for each operator which offers termination services. No such markets exist in Brunei where UNN is the sole infrastructure provider and there is no interconnection with the infrastructure of other operators.

1.3.2 To define the product scope of current wholesale markets in Brunei, the SSNIP tests is applied to the price of focal wholesale products to assess whether this will generate a profit for UNN. If it does, then it can be assumed the product A is in a separate market from other products offered by UNN. Here it is noted that:

1.3.2.1 there is no opportunity for supply-side substitution following a SSNIP by UNN since UNN is the sole supplier of wholesale products;

1.3.2.2 the opportunity for demand-side substitution by an RSP is determined by how its end-user customers might react to the impact of the wholesale SSNIP;

1.3.2.3 in competitive retail markets, the RSP price for a retail service is determined by UNN's wholesale price plus a markup to recover retail costs;

1.3.2.4 this requires products A and B to be in the same wholesale market and the same retail market for a SSNIP on wholesale product A not to be profitable; and

1.3.2.5 equally it requires products A and B to be in different wholesale markets and different retail markets for a SSNIP on wholesale product A to generate a profit for UNN.

1.3.3 Based on this analysis, the Authority has concluded that the product scope of the wholesale markets in which UNN operates corresponds one-to-one to the retail markets proposed for Brunei and listed in Figure 1.2. It is also noted that competitive conditions in the wholesale market are geographically uniform across Brunei and that the wholesale markets are therefore national in scope.

2 Step 2: Determining whether a market is susceptible to ex-ante regulation

2.1 Determining relevant markets

2.1.1 Step 2 of the market review process requires application of the three criteria test to the retail and wholesale markets identified above to determine which of them is relevant – that is susceptible to ex-ante regulation. There are three criteria:

2.1.1.1 Criterion 1: Are there high and non-transitory barriers to market entry?
2.1.1.2 Criterion 2: Is the market failing to tend towards competition?
2.1.1.3 Criterion 3: Is ex-post competition law insufficient to deal with identified market failures?

2.1.2 A market is not relevant if it fails any one of these three tests and is then not considered further for possible ex-ante regulation. Step 2 is important in ensuring that unnecessary ex-ante regulation is avoided.

2.2 Relevant retail markets requiring ex-ante regulation

2.2.1 Given the current sector structure in Brunei, when the three criteria test is applied to the retail markets listed above, it is found that:

2.2.1.1 No retail market passes Criterion 1 because barriers to entry are low. There are no significant restrictions on market entry by new RSPs and the investment required to enter is low because no significant infrastructure investment is required.
2.2.1.2 All the retail markets therefore fail the three criteria test and are not relevant.

2.3 Relevant wholesale markets requiring ex-ante regulation

2.3.1 The three criteria test for all wholesale markets under the current structure is passed three times over in that:

2.3.1.1 Criterion 1: the barriers to entry are substantial. Brunei is a microstate where the economic case for infrastructure-based competition is especially challenging. In addition, any potential investor is unlikely to try to compete with UNN – given that it is a well-established and government-funded operator which has the corporate objective of minimising its wholesale prices rather than maximising its profits; and
2.3.1.2 Criterion 2: wholesale markets are not tending towards competition; and
2.3.1.3 Criterion 3: competition law is unable to deal with potential market failures because of the complete lack of competition at the wholesale level.

2.3.2 This means that all the wholesale markets in Brunei are relevant given the current sector structure.

3 Step 3: Assessing relevant markets for players with Significant Market Power (SMP)

3.1 The retail markets

3.1.1 There are no relevant retail markets and therefore there is no need to assess any retail markets for players with SMP.

3.2 The wholesale markets

3.2.1 All of the wholesome markets are relevant and UNN is the sole supplier. As such it has SMP in all wholesale markets.

4 Step 4: Developing proposed remedies

4.1 Remedies in the retail markets

4.1.1 There are no relevant retail markets. This means that there is no case for imposing ex-ante remedies on the RSPs under the market review process. However, RSPs will still need to comply with general obligations set out in the Code of Practice for General Duties in the Telecommunications Sector (General Duties Code) and with the competition law restrictions set out in the Code of Practice for Competition in the Telecommunications Sector (Competition Law Code).

4.2 Remedies in the wholesale markets

4.2.1 The following remedies while the current sector structure persists and UNN has SMP in all wholesale markets:

4.2.1.1 a requirement to supply wholesale connectivity services through licensed RSPs only;
4.2.1.2 an obligation to supply wholesale services to RSPs on non-discriminatory terms;
4.2.1.3 an obligation to publish a reference offer, authorised by the Authority, for each of the services it supplies and to use its Service Reference Offer (SRO) as the mechanism for filing tariffs for these services;
4.2.1.4 an obligation to demonstrate that the prices set out in the reference offers are consistent with the wholesale price constraints established by the Authority;
4.2.1.5 an obligation to meet certain quality of service standards in supplying wholesale services to the RSPs;
4.2.1.6 an obligation not to leverage UNN's monopoly power in the supply of wholesale connectivity services when selling value-added services at the retail level; and
4.2.1.7 the development of regulatory conditions which will allow UNN to retire legacy products.

4.2.2 In addition, UNN will still be required to comply with the general obligations as set out in the General Duties Code and competition law restrictions as set out in the Competition Law Code. But it is noted that, whilst the current sector structure remains, it is likely that UNN will be regulated according to the sector specific remedies set out above.

4.2.3 The proposed remedies are described in more detail below.

4.2.4 Selling all connectivity services through licensed RSPs

4.2.4.1 A fundamental design principle of the restructured telecommunication sector is that UNN as a wholesale only network operator sells all its connectivity services via RSPs. Breaking this principle would undermine competition at the retail level by allowing UNN to leverage its market power at the wholesale level into retail connectivity markets. It would also invite the need for additional wholesale regulation on UNN to address possible issues such as margin squeeze and predatory pricing.

4.2.5 Supplying wholesale services on non-discriminatory terms

4.2.5.1 UNN already supplies wholesale services and specifies the services offered and the wholesale prices charged in its SRO. This offer, which is the same for each RSP, ensures non-discrimination in terms of pricing. In addition, there is a need for UNN to demonstrate that it does not discriminate between the RSPs in terms of the operational quality of service (QOS) provided. This means a requirement on UNN:

(a) to produce operational QOS indicators which are specific to each RSP; and
(b) to supply them to the RSPs (for verification) and to the Authority (for monitoring purposes).

4.2.5.2 It is understood that UNN already produces QOS indicators but they are not yet specific to each RSP and will need to be reviewed to ensure they capture and reflect properly the delivery of key services such as provision, service faults, fault repair and service appointments.

4.2.6 Publishing reference offers

4.2.6.1 UNN already provides its SRO as the mechanism for filing tariff for the Authority's approval and this should continue. But it is also proposed that UNN should be required to publish its approved SRO. This will help prospective RSPs decide whether to apply for a SeTi Licence and could provide end users with more information on which to base their decision on choice of RSP.

4.2.7 Demonstrating that the SRO prices are compliant with price controls

4.2.7.1 Four proposals for price controls are made on UNN to ensure that it acts in an economically efficient manner, despite its position as a sole supplier of wholesale services.

4.2.7.2 Proposal 1: For each regulatory period in which the current sector structure applies, require UNN's wholesale prices to be subject to rate of return regulation. Under this proposal:

(a) UNN's overall profits are capped at an agreed level based on its weighted average cost of capital and the size of its regulated asset base. One possible mechanism is outlined in Figure 4.1 below; and
(b) its regulated asset-based is estimated using a building block methodology. See Figure 4.2.

4.2.7.3 Our regulatory benchmarking indicates that this form of regulation is good at preventing monopoly profits while creating the right incentives for efficient investment by UNN and promoting service-based competition. It is the standard approach used when price regulating monopoly utilities and, more recently, fixed access network monopolies in the telecommunications sector.

NPV of ROCE > NPV of UNN revenues less NPV of UNN costs where:

- ROCE = WACC*RAB (regulated asset base)
- UNN revenues = fn (price profile over the regulatory period x demand)
- UNN costs = UNN opex + Depreciation
- NPVs (net present values) are calculated over the regulatory period using WACC as the discount rate
- The RAB is the value of assets used to provide UNN's wholesale services
- The WACC (weighted average cost of capital) is set by DA

Figure 4.1: Capping UNN's overall rate of return

Source: The Authority

Figure 4.2: The building block model for calculating the regulated asset base

4.2.7.4 Proposal 2: Within the rate of return constraint of Proposal 1, further constrain UNN to set prices which are broadly cost-oriented. This then gives the right price signals to the market and leads to efficient use of network resources. It

is not proposed that UNN should be required to demonstrate that every one of its wholesale charges is cost-based – only that each broad service group[3] supplied by UNN earns a return in line with the overall rate of return of Proposal 1. Such an approach gives UNN a reasonable degree of pricing flexibility for individual tariff elements, keeps price regulation relatively simple, and reduces the possibility of regulatory error.

4.2.7.5 Proposal 3: Use UNN's total cost of ownership (TCO) model as the basis for these regulations. Our regulatory benchmarking shows that the TCO model, which forms the basis on which UNN runs its business, is very similar to the rate of return approach of Proposal 1. At the same time:

(a) the TCO model is a good indicator of overall profitability;
(b) it establishes incentives for cost efficiency by setting targets for price reduction to international benchmark levels over a five-year period;
(c) it can be easily modified to provide overall rate of return regulation; and
(d) allocation of assets and operating costs between service groups will be needed to enable cost orientation.

4.2.7.6 Proposal 4: Develop key performance indicators (KPIs) to monitor how prices in each service group are declining over the regulatory period. In particular it is proposed that UNN should provide price indices [4] which show how composite prices for each of the main service groups change over the regulatory period and how these price indices compare with projections made at the start of the regulatory period. Such indicators are a good measure of how well UNN is achieving the corporate objective of lowering wholesale (and hence end-user) prices.

4.2.7.7 It is suggested that each year UNN should demonstrate compliance with Proposals 1 and 2 and provide the KPIs required by Proposal 4.

4.2.8 Meeting QOS standards

4.2.8.1 It is proposed that the Authority should:

(a) define, and agree with Market Players, the operational quality of service standards for UNN's fixed and mobile services. These might include time

[3] Here a 'service group' refers to, for example, all mobile services or all mass market fixed line voice and broadband services.

[4] For example the average of individual prices for each tariff element within a service group weighted by the revenue generated by that element.

for end user switching, initial provisioning[5]; fault rate per access line; fault repair times and service appointments;

(b) task UNN and the RSPs to jointly develop service level agreements (SLAs) for each measure, with the Authority stepping in if the parties cannot agree;

(c) require UNN to publish key performance indicators for each of these standards and consider setting minimum standards if operational quality of service starts to fall or if current operational quality of service is substantially below benchmark levels from other countries;

(d) require UNN to comply with SLAs agreed between it and the RSPs and to make compensation payments automatically to RSPs if SLAs are breached; and

(e) consider imposing penalties on UNN if it breaches any minimum quality of service standards which the Authority decides are necessary.

4.2.9 Preventing UNN from leveraging its monopoly power in the wholesale connectivity markets

4.2.9.1 If it is decided that UNN selling cloud services and other value-added services directly to end-users is in the long-term interests of end users, then it is proposed that the Authority should require UNN to provide separated regulated accounts for its connectivity services business.

4.2.10 Phasing out legacy products

4.2.10.1 In addition to the obligations on UNN set out above, it is proposed that the Authority should establish, through discussion with the Market Players, clear criteria for phasing out legacy products such as copper access network-based products in areas where fibre is fully rolled out. These criteria will need to strike a balance between:

(a) establishing safeguards for end users and RSPs to prevent premature and unilateral action by UNN; and

(b) reducing UNN's overall cost base and ultimately the end-user prices charged for other, non-legacy, products. Implementation of remedies.

4.2.10.2 The proposed remedies developed in Section 4 will be formally communicated in an enforceable form through a Direction to be issued by the Authority.

[5] For example, providing a fixed connection or authorizing a SIM.

Appendix A Defining the retail markets in the telecommunications sector of Brunei

A.1 The product and customers scope of the retail markets

Defining the product and customer scope of retail markets is done by examining focal products within the three retail markets defined by the Authority in its 2015 review. These were:

- the fixed voice telephony market;
- the mobile services market; and
- the fixed broadband market.

An assessment is done to determine whether a SSNIP by a hypothetical monopolist would prove profitable or whether the SSNIP is likely to precipitate demand-side substitution (in which end-users move to other similar products) or supply-side substitution (in which other suppliers are stimulated by the SSNIP to produce the focal product). If it is determined that the SSNIP will generate substitution by other products or suppliers rather than profit, then it is concluded that the focal product is part of a wider market. But if the SSNIP generates profits then it is concluded the focal product is in a separate market.

A.1.1 Defining the fixed voice telephony (FVT) market

The retail FVT services market in Brunei includes the supply of both access and calls. Both elements are required to create a product which an end-user would purchase. A service which delivers calls needs access to end-users to be viable. At the same time, a voice access service without the ability to deliver calls is of no value to an end-user.

The FVT market is separate from the fixed broadband market. The European Commission makes this point in its guidance on the 2014 Recommendation on relevant markets. The distinction is based on the application of a SSNIP test. Fixed voice telephony services clearly do not substitute for fixed broadband. A hypothetical monopolist which offered a fixed broadband service or a FVT service on its own would therefore find a SSNIP profitable.

There is evidence that this distinction is disappearing as end users retain fixed access lines for broadband, and purchase a bundle of fixed broadband and fixed voice telephony in which the focal product is fixed broadband and the FVT service is supplied at little or no extra charge[6]. Given this trend, it is proposed that the retail market for fixed voice telephony should be confined to subscribers who purchase fixed voice telephony on a stand-alone basis.

The FVT market is separate from a market for mobile voice telephony. There are very substantial barriers to mobile operators entering the FVT market. In particular a mobile operator would need to replicate the fixed access network. There is therefore very little prospect of supply-side substitution if a hypothetical monopolist offering FVT were to make a SSNIP. The likelihood of demand-side substitution is greater in that mobile voice telephony calls are a good functional substitute for fixed voice telephony. However, the market for

[6] in 2009 there were 20,000 fixed broadband subscribers but 80,000 fixed line subscribers. By 2020 this had changed to 71,000 fixed broadband subscribers and 104,000 fixed line subscribers

stand-alone fixed voice telephony is declining and is increasingly dominated by end-users who do not want fixed broadband. It is unclear whether demand-side substitution will occur with this group of customers following a SSNIP. It is noted however, there is a general consensus that:

- mobile voice telephony is part of the mobile services market (see below); and
- fixed voice telephony is treated as a separate market from mobile voice telephony

The FVT market includes both residential and business customers. A hypothetical monopolist who offered FVT services to business customers alone would, almost certainly, find a SSNIP unprofitable because of supply-side substitution effects. The SSNIP would prompt suppliers of FVT to residential customers to supply business customers as well - particularly in microstate markets like Brunei where every additional customer contributes a relatively large incremental revenue stream.

It is concluded that it makes sense to restrict the fixed voice telephony market to customers who purchase the service on a stand-alone basis, that this market is separate from mobile voice telephony and is offered to both residential and business customers.

A.1.2 Defining the mobile services markets

This market includes voice, text and data services. Mobile voice, SMS and broadband services are routinely sold as part of the same tariff bundle, which creates some common pricing constraints for end users. The majority of mobile data connections are handset-based, and the majority of handsets only support one SIM. As a result, the subscriber is obliged and incentivised to purchase mobile voice, SMS and data services from the same supplier. New applications running over mobile data (so called 'over-the-top OTT apps) can substitute for traditional mobile voice and SMS services. The growing use of OTT services and common pricing constraints between different types of mobile service therefore imply demand-side substitutability between voice, text and data services. It is also noted that mobile networks are typically deployed to provide a combination of voice, SMS and data services. This implies that there is also supply-side substitutability.

The market includes both business and residential customers. Retail mobile services available to consumers and enterprise customers are generally identical in terms of characteristics. Thus, both types of customers typically have access to an offer containing all the previously identified retail services. Enterprise customers are free to purchase consumer packages, although packages for larger enterprises are priced and possibly bundled differently. At the same time RSPs in Brunei provide their mobile services to both consumers and enterprises.

Enterprise customers may be offered additional services, discounted pricing and serviced through separate distribution channels. Thus, there is limited demand-side substitutability between services for consumers and those for enterprise customers. However, the same network equipment is used to provide retail mobile services to consumers and enterprises. It would therefore be relatively easy for an existing provider of consumer retail mobile services to start offering enterprise retail mobile services (and vice versa). So, there is a substantial

likelihood of supply-side substitution and a SSNIP by a hypothetical monopolist offering service to just one group of customers would prove unprofitable.

The market includes both contract and prepaid customers. Retail mobile services provided under prepaid or contract subscriptions offer identical functionality. Post-paid subscribers can typically migrate to prepay at any time, and some prepaid subscribers can migrate to contract (although migration in this direction is constrained by the fact that some subscribers will not meet the operators' eligibility criteria for contract subscriptions). Thus, there is good substitutability between contract and prepaid subscriptions and some substitutability in the opposite direction. At the same time the RSPs in Brunei offer both prepaid and contract services and can easily provide a different proportion of prepaid or contract services if the market requires it. In other words, supply-side substitution is very likely.

The market spans 2G, 3G and 4G technologies. While 2G, 3G and 4G networks offer different performance characteristics, the nature of the basic services is not fundamentally different, and in most cases, there is automatic handover between the networks (e.g. voice calls and data sessions will switch back and forth between 2G and 3G networks without noticeable interruptions). In this sense, the commercialisation of 2G, 3G and 4G services is a technology evolution, not a distinct relevant market. This leads to the conclusion that 2G, 3G and 4G networks belong to the same relevant market.

There are significant network and licence-related costs involved in an upgrade from 2G to 3G and 4G. However, much of the basic infrastructure (such as towers, cell sites and backhaul) can be re-used. There are also strong incentives for operators to follow their competitors in upgrading. This implies that there is at least some supply-side substitutability between the technologies.

The market is separate from the fixed retail markets. Although mobile services can be used as a substitute for fixed services the reverse is not true: fixed services are not a substitute for mobile services because they lack the intrinsic mobility of mobile. Hence the demand-side substitutability is limited to using mobile services in place of fixed. At the same time SMS is a service that exists on mobile networks only, thus there is no fixed substitutability.

Substitution of mobile broadband for fixed broadband (both wireline and fixed wireless) is possible to some extent. LTE services may be faster than some ADSL broadband lines, and if the challenge of base-station backhaul can be addressed, might be attractively marketed. However, mobile broadband performance is more variable (depending on network loading) and mobile broadband is almost always subject to data caps, whereas most fixed broadband services allow unlimited data usage. Fixed broadband is also typically a household service that is shared, whereas mobile broadband is more of a personal service – although new easily used software and smart phones or mobile dongles make sharing of mobile broadband much easier now.

Fixed residential services are increasingly being bundled with TV services, which may also discourage migration to mobile services. Consequently, in case of a SSNIP in fixed broadband services, there would not necessarily be a rapid migration to mobile broadband services. Similarly, a SSNIP in mobile broadband services would not necessarily cause a rapid migration

to fixed broadband. Thus, fixed and mobile services are not good substitutes from the demand side.

On the supply side, it is not possible for a fixed operator to offer mobile services quickly as it would first need to obtain suitable spectrum and then make significant additional investments. A mobile operator could readily offer fixed-wireless services, although this is likely to require some network adaptions. Supply-side substitutability is therefore only possible from mobile to fixed.

Overall, our analysis indicates that there is a single national retail mobile market in Brunei which is separate from fixed services and which includes voice, messaging and data service offered over 2G, 3G and 4G technologies via both prepay and contract packages to both residential and business customers.

A.1.3 Fixed broadband services

The fixed broadband market is separate from the stand-alone fixed voice telephony market. This distinction is based on the application of a SSNIP test. Fixed voice telephony services clearly do not substitute for fixed broadband. A hypothetical monopolist which offered a fixed broadband service or a fixed voice telephony service on its own would therefore find a SSNIP profitable. This distinction may disappear as end users retain fixed access lines for broadband and purchase a bundle of fixed broadband and fixed voice telephony in which the focal product is fixed broadband and the fixed voice telephony service is supplied at little extra charge. This has led us to define the fixed voice telephony market on a stand-alone basis as set out above.

The fixed broadband market does not include mobile broadband services. This finding, that fixed broadband and mobile broadband are in separate markets, is a common conclusion from market analyses conducted across EU member states. Mobile broadband is limited in its ability to carry large data volumes because the incremental costs of carrying a GB of data in the busy hour is substantially greater for a mobile network than for a fixed network operator. In these circumstances fixed broadband services can meet certain end-user demands which mobile broadband cannot. So, a SSNIP by a hypothetical monopolist in the supply of fixed broadband is unlikely to see any significant demand-side substitution by mobile broadband. Nor would the monopolist face significant supply-side substitution since mobile operators would need to invest in the rollout of fixed access infrastructure – where the barriers to entry are substantial.

This analysis could change in future as mobile operators offer 5G based broadband services which do, at least partially, substitute for fixed broadband for high data volume applications. But the impact of such developments lies outside the time horizon for this market review.

Mobile broadband is part of a bigger mobile services market given the economies of scope in providing mobile data, mobile voice and mobile messaging over a common infrastructure. This finding is consistent with market analysis conducted by a range of telecommunications regulators and national competition authorities. Given the economies of scope, mobile voice, SMS and broadband services are routinely sold as part of the same tariff bundle, which creates some common pricing constraints for end users. The majority of mobile data connections are

handset-based, and the majority of handsets support one SIM only. As a result, the subscriber has strong incentives to purchase mobile voice, SMS and data services from the same supplier.

There are separate markets for fixed broadband services for the mass market (of consumers and small businesses) and for the corporate market where a much higher quality of service is required. The end-user requirements from mass market and the corporate market are quite different. The services for the mass market are highly contended, offer relatively low speeds, are highly asymmetric in upload and download speeds, and have relatively low quality of service when compared with the services for the corporate market. As such a SSNIP for one product set is unlikely to lead to significant substitution by the other and the product sets are in separate markets

This conclusion is consistent with the analysis conducted by the European commission in its 2014 review of relevant markets – a recommendation which has subsequently been implemented by regulators across the EU. In developing its 2014 recommendation the European commission reduced the number of markets susceptible to ex-ante regulation to five – two of which are relevant to fixed broadband:

- Market 3b: wholesale central access provided at a fixed location for mass market products; and
- Market 4: wholesale high-quality access provision at a fixed location.

The end-user markets for national and international high-quality connectivity are separate markets. UNN is the sole supplier of both. This means that there is no opportunity for supply-side substitution under the current sector structure. At the same time, it is clear there can be no demand-side substitution – an international high quality transmission link is no substitute for a national high-quality link or vice versa.

It is concluded that there are three separate fixed broadband markets in Brunei - the mass market (consumers and small businesses) for fixed broadband, the market for national high quality corporate data services and the market for international high quality corporate data services.

A.2 The geographic scope of the retail markets

European Commission guidance specifies that national pricing and provision and, more importantly, uniform competitive conditions across the country are strong evidence of a national market. If these criteria are applied to the retail markets in Brunei under the current sector structure, it is found that:

- UNN supplies the RSPs with wholesale telecommunication services on a national basis;
- the RSPs sell to end users on a national basis; and therefore
- the five retail markets identified above are national in geographic scope.

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