STAKEHOLDERS CONSULTATION ON:

Draft Regulatory Framework for Active Mobile Network Sharing Agreements

16th June 2022

Legal Disclaimer

This Consultation is not a binding legal document and also does not contain legal, commercial, financial, technical or other advice. The Telecommunications Regulatory Authority is not bound by it, nor does it necessarily set out the Authority’s final or definitive position on particular matters.
# Table of Contents

1 Public Consultation cover document 4
   1.1 Introduction 4
   1.2 Context to this consultation 5
   1.3 Overview of the draft regulatory framework 9
   1.4 Status of the regulatory framework 11
   1.5 The consultation process 11
      1.5.1 Comments on this consultation document 12
      1.5.2 Overview of the matters for consultation 13
      1.5.3 List of Consultation questions 14

2 Draft Regulatory Framework for reviewing active mobile network sharing agreements in oman 15
   2.1 Introduction 15
   2.2 Legislative background 15
   2.3 Objectives of this regulatory framework 19
   2.4 General obligations on all Applicants 19
   2.5 Overview of the review/approval process 20
   2.6 Information requirements in the formal application 23
   2.7 Determining the expected impact of the proposed sharing agreement 27
   2.8 Key principles the TRA will expect to consider as part of the approval process 31
   2.9 Considerations for specific forms of active mobile sharing 38
   2.10 Dispute resolution 41

Annex A - Analysis of common forms of mobile sharing 43

Annex B - Case studies 52
1 PUBLIC CONSULTATION COVER DOCUMENT

1.1 INTRODUCTION

Mobile network operators (MNOs) provide connectivity and communication services over deployed network infrastructure including electronic/active (antennas, radio network controllers, servers, core network functionalities, spectrum, etc.) and non-electronic/passive (sites, towers, power systems) elements. Two or more MNOs can decide to share different elements of their networks and operate them jointly.

Network sharing can, therefore, be ‘active’ or ‘passive’. The sharing of non-electronic infrastructure, such as towers, poles, ducts, or dark fibres is referred to as passive network sharing. On the other hand, when MNOs also share active infrastructure elements, such as antennae and radio network controllers, this is referred to as active network sharing.

Active network sharing agreements (NSAs\(^1\)) may or may not include the sharing of spectrum resources and the core networks of the MNOs. Therefore, active network sharing can be further split into three main types:\(^2\)

- Multi-Operator Radio Access Network (MORAN) sharing, which involves the sharing of all radio access network (RAN) equipment but where the MNOs concerned maintain their independent spectrum resources;
- Multi-Operator Core Network (MOCN) sharing, which involves the sharing of all RAN equipment, as well as the sharing of spectrum resources; and
- Core network sharing where MNOs share, along with their RAN equipment and spectrum resources, their core transmission networks and other systems, including the switching centre, billing platform and value added services.

NSAs between MNOs can benefit those MNOs by leading to cost savings and network improvements relative to a counterfactual of no, or only more limited forms, of network sharing. However, in some circumstances and again relative to a counterfactual, such agreements could also lead to a potential lessening of competition, to the ultimate detriment of consumers.

The Telecommunications Regulatory Authority (the “TRA”) is responsible for the protection of consumers’ interests and the promotion of competition in the telecommunications sector. In line with its powers, the TRA has determined the need to prepare a regulatory framework setting out how it

\(^1\) Note that within this document any references to “NSAs” refer to active mobile network sharing agreements.

\(^2\) An MNO can also engage in national roaming on another MNO’s network. National roaming does not, however, require network elements to be shared. This is because, under national roaming, traffic from one MNO is carried and routed on another MNO’s network. As a result, national roaming may not be strictly classified as network sharing. Furthermore, national roaming is a regulated Access and Interconnection (A&I) service. This means that the incumbent MNOs in the Omani telecommunications sector must offer this service on approved terms and conditions as set out in their Reference Access and Interconnection Offers (RAIOs). Consequently, it is not considered within the scope of this framework.
intends to assess the net benefits of any proposed NSAs between MNOs, taking into account the potential impacts of such agreements on competition and consumer welfare in the telecommunications sector, as well as general public interest. As discussed in more detail in Section 2.3 below, the framework sets out the consultation process, the information requirements for Applicants, and the key principles the TRA intends to adopt to assess proposals. The regulatory framework will complement TRA’s existing regulatory toolkit on passive infrastructure sharing, in-building coverage and general ex-ante regulatory remedies imposed on dominant licensees, as well as the obligations on licensees imposed within their operating licences, frequency authorisations and elsewhere.

The TRA notes that, in line with international precedent and given the strong focus of this regulatory framework on the competitive effects of NSAs, this framework may be complemented by any sector-specific merger and acquisition guidelines or regulation that the TRA may develop in future, whereby those guidelines or regulations consider also agreements involving one or more licensee.

The draft regulatory framework is set out as an Annex to the public Consultation document. The TRA now invites stakeholders and interested parties to comment on this by responding to this consultation. The final regulatory framework will be published as a result of this consultation process.

This document also contains two further annexes that provide further information on NSAs:

- Annex A provides an overview of the most common forms of network sharing, and the key risks and benefits that may arise under each form; and
- Annex B presents five case studies on the regulatory approach adopted by international regulators when assessing the potential competitive effects of NSAs.

The remainder of this document provides a brief overview of the context to this consultation, the draft regulatory framework, and then provides information to relevant stakeholders on the consultation process.

1.2 CONTEXT TO THIS CONSULTATION

As discussed further in Section 2.2.1 below, the TRA believes that global trends, coupled with developments in the Omani telecommunications sector, are likely to present increased incentives for MNOs to engage in active NSAs going forward.

The TRA already has in place a regulatory framework to assess passive network sharing agreements. However, there is currently a gap in the TRA’s regulatory toolkit around how to assess active mobile network sharing agreements. The TRA is, therefore, seeking to close that gap through the publication of this framework.
1.2.1 INCREASING TRENDS TO ACTIVE MOBILE NETWORK SHARING

Network sharing between mobile operators has become a common practice in an increasing number of telecommunications market around the world.

The sharing of passive infrastructure (such as physical sites, towers, poles, ducts, dark fibre, power systems, etc.) gives rise to large savings for the concerned MNOs on capital expenditure and operating costs. This is because passive sharing allows MNOs to consolidate existing sites, share site rental costs, and share the costs of deploying new sites and passive infrastructure. In these forms of network sharing, all involved MNOs continue to self-supply and operate their own active network equipment.

However, in some cases MNOs are now also increasingly looking to share active network equipment, with the number of NSAs steadily growing over the last decade.\(^3\) The key motivation behind this trend has been the introduction and widespread rollout of 4G technologies, since entering an active network sharing agreement at this time allowed MNOs to significantly reduce their capital expenditure, compared to a counterfactual no or passive sharing only. Additionally, the sharing of active network infrastructure may also provide MNOs with additional capacity in congested areas, with reduced need for investment.

A similar trend is expected with the advent of 5G and the subsequent rollout of 5G networks. Indeed, compared to 4G, the rollout of 5G may demand higher investment in an MNO’s radio access network (RAN) and transmission network, due to the greater capacity and technological sophistication of 5G radio network equipment. Additionally, 5G network services will operate at higher frequencies than previous technologies, including 4G, implying a change in the configuration of mobile networks and a move towards smaller sites. As a result, the deployment of 5G networks will require significant capital investments.\(^4\)

Further, sharing of network and infrastructure may help MNOs expand their coverage into previously unserved geographies. This is because, in the absence of network sharing, individual MNOs would have to incur significant costs to expand their coverage to remote regions that are generally sparsely populated. These higher marginal costs of serving additional customers\(^5\) imply a lower return on investment, and could therefore disincentives MNOs from expanding coverage into such regions. On the other hand, joint deployment of network infrastructure in remote regions can reduce the capital and operating costs incurred by a single MNO to acquire new subscribers, since the deployment costs

\(^3\) https://www.adlittle.com/en/network-sharing-5g-era

\(^4\) 5G deployments to date have been based on a “non-standalone” (NSA) architecture which requires 4G (radio and core network) to anchor connections and uses 5G (radio) to add data connection capacity. This introduces tight coupling between the existing 4G radio network and the new 5G radio network. An NSA architecture requires, therefore, that both 4G and 5G radio are actively shared to enable active sharing of 5G radio. With the longer term move towards “standalone” (SA) architecture there may be more flexibility to make separate sharing decisions.

\(^5\) These are the effective retail costs incurred by MNOs to serve one additional customer on to their network. Since one site would serve fewer customers in sparsely populated remote regions, as compared to densely populated urban regions, the effective subscriber acquisition costs are higher in the former.

Telecommunications Regulatory Authority – Sultanate of Oman
would be shared. All other things the same, this would suggest an increased incentive for MNOs to expand network coverage.

Along with the increasing global trends towards active network sharing, the recent entry of a third mobile network operator into the Omani telecommunications market is likely to further contribute to the prospect of NSAs in Oman. This is because entering a sharing agreement could potentially present a significant cost saving opportunity for a new entrant and give rise to further benefits, such as a significant reduction to the time it takes for them to have a fully operational network.

1.2.2 COMMON FORMS OF NETWORK SHARING

In practice, network sharing agreements take many forms in practice. They are generally classified on the basis of the elements of the network infrastructure shared between MNOs. Depending on their needs, MNOs can choose to limit their sharing to non-electronic (passive) infrastructure only, such as sites and masts, or they can choose to also share their ‘active’ assets within their radio access, transmission, and/or core networks. This large range of possible forms of network sharing implies varying levels of integration. As such, different forms of sharing can give rise to significantly different regulatory risks. The common forms of active and passive sharing are discussed in Section 2.1 above.

Network sharing can also be classified on the basis of the ownership and operational models used to govern arrangements, and how those are divided geographically between the sharing parties. The most common forms of ownership models are:

- **Joint ventures** where the sharing MNOs form a joint venture to own and operate the shared network. Shared infrastructure may be owned and operated by the joint venture, or by the parent companies with a split arrangement; and

- **Multi-lateral service provisioning** where multiple sharing MNOs provide their network infrastructure to be shared. In practice, this could be undertaken through a geographic split of network ownership and operation, where MNOs are responsible for operating the shared assets in different parts of the joint coverage area.

Some less common ownership models are:

- **Unilateral service provisioning** where only one of the sharing MNOs provides its infrastructure to be shared; and

- **Third party providers** where a third party service provider, not necessarily affiliated with the MNOs, leases infrastructure for them to use. These third parties can be external companies such as tower operators.

More information on the different forms of network sharing, and the likely risks and benefits therein, is contained in Annex A to this document.
1.2.3 COMMON BENEFITS OF ACTIVE MOBILE NETWORK SHARING AGREEMENTS

In addition to providing significant cost savings to MNOs, the sharing of active network assets may also give rise to potential benefits for the telecommunications market by generating network efficiencies and enhancing the service quality to end-user. These common benefits can make NSAs desirable. Without prejudice to its assessment of any specific proposals, the TRA believes that possible benefits from active network sharing commonly include:

- **Faster network roll-out and greater coverage**: Active network sharing can facilitate faster roll-out than under no or passive network sharing only, since MNOs can pool and co-ordinate their resources, avoiding duplication of infrastructure. This can allow MNOs to achieve greater network coverage, through lowering the unit costs of deployment in geographic areas that might have been too costly to cover individually, given the potential incremental revenues that a single MNO could earn from such coverage. Therefore, NSAs can potentially increase the availability of mobile services to a larger number of end-users in otherwise unserved geographic areas.

- **The roll-out of newer, faster technologies**: As discussed above, the roll-out of new mobile technology incurs significant investment costs, which can be greatly reduced if MNOs co-ordinate on their roll-out by sharing active network and infrastructure elements. This would facilitate a quicker roll-out of new technologies than under no or passive network sharing only, which could bring forward improvements in reliability, access, and speeds. In turn, this could lead to a host of benefits for the telecommunications sector, as well as the wider Omani economy.

- **Better quality and capacity**: If NSAs include the sharing of spectrum resources, MNOs could pool their spectrum to offer higher capacity on their network, potentially allowing them to offer higher quality services (faster speeds, for example). This in turn could allow an optimisation of scarce resources (such as mobile spectrum).

As a result, the sharing of active (and passive) network elements between MNOs can accrue significant benefits to both the sharing MNOs and end-users.

1.2.4 THE NEED TO REVIEW PROPOSED MOBILE NETWORK SHARING AGREEMENTS

Despite the various benefits discussed above, the sharing of network elements, and the subsequent co-ordination between MNOs, can give rise to serious risks to competition. It is possible, therefore, that the benefits arising from the NSA are overshadowed by the costs to consumers arising from such a distortion to, or lessening of, competition.

- The degree of integration between sharing MNOs can increase their incentives and ability to share commercially sensitive information with each other (such as forward-looking investment plans), and subsequently, their ability to tacitly collude and set prices in a non-competitive manner.

- Further, network sharing agreements between MNOs that exclude other MNOs in the market could give rise to significant competitive asymmetries and effectively provide a competitive advantage to those MNOs that form part of the agreement compared to any excluded from it.
This, in turn, may adversely impact the ability for the excluded MNO to actively compete against the other MNOs.

- Note that in certain cases, the TRA may also consider the potential impact of a network sharing agreement between two or more MNOs on the ability of providers of fixed broadband services to also compete effectively with those MNOs in a broader broadband market. In particular, the TRA notes that Fixed Wireless Access (FWA) services can offer a direct competitive constraint to fixed broadband services, which is likely to get stronger with the advent of 5G. As a result, if an MNO that provides FWA broadband services enters into a network sharing agreement, it may be afforded a competitive advantage over another fixed broadband provider. The TRA will therefore assess this likely impact and consider this in determining the appropriate way forward.

The potential for NSAs to have both positive and negative effects on the market means it is important for the TRA to prepare a formal regulatory framework, which would allow it to assess any proposals to identify the scope of the risks and benefits, and come to a decision based on the expected net benefits of any proposed NSA.

1.3 OVERVIEW OF THE DRAFT REGULATORY FRAMEWORK

This Consultation Document and the draft regulatory framework sets out the TRA’s preliminary views on how it will assess any proposed NSAs and the process for such assessment.

The draft regulatory framework covers the following topics:

- The approval process for assessing proposed active mobile network sharing agreements;
- The information that Applicant MNOs will be required to provide to the TRA; and
- The key principles the TRA will adopt when assessing the competitive risks and benefits of the proposed agreement, in the public interest.

1.3.1 THE APPROVAL PROCESS

The process for the assessment of any proposed NSA will follow the process as outlined below:

1. **Notification**: MNOs that wish to engage in NSAs must formally notify the TRA by submitting a formal application.

2. **Regulatory assessment of expected benefits and risks**: Upon notification, the TRA will conduct an assessment of the potential benefits and the risks to competition and consumers.

---

6 This is because the quality and speed on service under 5G FWA broadband will be more comparable to those experienced under fixed broadband, offered at similar prices.
more generally that could arise as a result of the proposed arrangement. As part of this, the TRA may issue information requests to the MNOs.

3. Preliminary decision: Based on the regulatory assessment, the TRA would expect to publish a preliminary decision on the proposed agreement (including any potential remedies or amendments required to the agreement to address any concerns that the TRA has identified).

4. Invitation to comment: After publishing its preliminary decision, the TRA will invite the Applicants, as well as other relevant stakeholders, including market competitors, to comment on the TRA’s preliminary views and submit evidence-based arguments as to why they agree or disagree with the TRA’s preliminary decision.

5. Proposed remedies: As part of the preliminary decision, the Applicants may be required to offer, or may choose to offer, to the TRA, commitments to address any identified concerns.

6. Final decision: On the basis of wider stakeholder comments and any commitments made by the Applicants, the TRA would expect to publish its final decision to clear the proposed sharing arrangement (either unconditionally, or subject to remedies), or to block the sharing arrangement.

1.3.2 INFORMATION REQUIREMENTS

As part of the notification process, MNOs must submit a formal application to the TRA. This application, along with the regulatory framework, will form the basis of the TRA’s regulatory assessment. The TRA can only assess the proposal on what it has received and will not judge favourably any incomplete or unfounded applications.

The formal application must, at the minimum, include:

- general information about the Applicants;
- the scope of the proposed active network sharing arrangement (geographical and type);
- the rationale behind/benefits to the Applicants of the proposed arrangement; and
- an assessment of the likely risks identified by the parties to the telecommunications sector from the proposed NSA and how the Applicants propose to address or mitigate those risks.

1.3.3 KEY PRINCIPLES ADOPTED BY THE TRA TO ASSESS ACTIVE NETWORK SHARING AGREEMENTS

To assess any proposed NSA, the TRA will, in each case, follow a set of key principles to identify the potential risks and benefits of approving the particular NSA. The TRA will consider the relevant evidence available and decide the weight to place on that evidence in its decision-making, in light of the specific circumstances surrounding the proposed agreement and the proposed terms of that agreement.
These principles will cover, amongst others, the likely impact of the proposed NSA on:

- direct competition between the Applicants;
- the competitiveness of third parties (including excluded MNOs or other broadband providers and access seekers); and
- Outcomes in the Omani telecommunications sector, and wider economy, including the impact on telecommunications service users in the Sultanate.

If the TRA concludes that a proposed agreement leads to significant negative outcomes in the telecommunications market that cannot be mitigated by the parties, or poses a risk to national security, the TRA holds the unequivocal right to block the proposed agreement.

Additionally, in NSAs that involve the sharing of spectrum resources, the TRA will also consider the impact on the distribution of mobile spectrum holdings across all licensed operators. This is because MNOs in such agreements could potentially pool their spectrum holdings to have disproportionately higher spectrum holdings than their competitors, possibly leading to significant competitive asymmetries.

1.4 STATUS OF THE REGULATORY FRAMEWORK

This Consultation Document and the draft regulatory framework does not necessarily represent the final view of the TRA on any of the matters consulted upon herein. The TRA is open to receive and consider respondents’ reasoned views and documented comments on all of these matters.

As a result of this consultation process, the TRA’s views may or may not vary in relation to some or any matters covered in the Consultation Document and the draft regulatory framework. Nevertheless, the respondents are advised that the assumption they should entertain for practical purposes is that, absent any further comment, the TRA is likely to confirm the preliminary view expressed in the Consultation Document. If respondents have a different view of the matter then they should consider submitting that view together with reasons and, if relevant, evidence in support.

1.5 THE CONSULTATION PROCESS

The TRA is pleased to invite licensees, stakeholders, and other interested parties to respond to this consultation by providing their comments and views on the draft regulatory framework set out in the Annex to this document.

This public consultation process is as follows.

- **Stakeholder workshop:** During the consultation phase, the TRA will host a workshop for all interested parties. During the workshop, the TRA will briefly present the key parts of the proposed framework, followed by an opportunity for attendees to ask questions.
**Consultation responses**: Public telecommunications licensees and other stakeholders and members of the public may make submissions in writing in relation to the questions set out in the Consultation. These should reach the TRA no later than **3.00 PM on 21st July 2022**. All submissions will be published on the TRA’s website following the receipt.

Following the completion of the above, the TRA shall consider all the comments received and then publish a Position Statement and final regulatory framework.

**1.5.1 COMMENTS ON THIS CONSULTATION DOCUMENT**

This Public Consultation Document will be available on the TRA’s website at: [http://www.tra.gov.om](http://www.tra.gov.om)

Respondents who wish to express opinions on this Public Consultation Document are invited to submit their comments in writing to the TRA.

Any comments provided in response to this Public Consultation Document should be provided in hard and soft copy (both in PDF and Word format) to the following addresses:

a) E-mail to: public.consultation@tra.gov.om

b) Delivery (hard and soft copy) by hand or by courier to:
   
   Telecommunications Regulatory Authority
   
   TRA Premises at Seeb Airport Heights
   
   P.O. Box 3555, P.C. 111,
   
   Muscat, Sultanate of Oman.

The TRA welcomes all comments on the Consultation. The TRA encourages respondents to support all comments with relevant argument and if relevant, data, analysis, benchmarking studies and information based on the national situation or on the experience of other countries. Indeed, it may give greater weight to comments supported by such evidence. In providing comments, respondents should indicate the question number to which their comments relate. The TRA has prepared specific questions for respondents to address if they wish. It would be helpful to the TRA if respondents answered those specific questions of interest to them, but submissions may take any form that the respondent chooses. The TRA is under no obligation to adopt the comments of any respondent.

In case any respondent wishes to keep any part of their response as confidential, they should indicate that clearly and provide a redacted version for publication. In absence of a redacted version, no submission, or part thereof, will be considered as confidential.

The TRA is under no obligation to adopt the comments of any respondent.
1.5.2 OVERVIEW OF THE MATTERS FOR CONSULTATION

This document invites stakeholders to comment on the TRA’s draft regulatory framework to assess proposed NSAs. In particular, stakeholders are invited to:

1. Respond to the TRA’s assessment of the risks and concerns that can arise through such agreements.

2. Put forward any further possible benefits or anti-competitive risks arising from such agreements that have not been considered by the TRA in this draft framework.

3. Discuss any important technical considerations of network and infrastructure sharing that have not been addressed, but could affect the TRA’s assessment of such an agreement.

4. Comment on the approval process and the roles of the TRA and the Applicant MNOs in approving any proposed agreements.
1.5.3 LIST OF CONSULTATION QUESTIONS

Below is the list of consultation questions which the industry is requested to respond to. In providing comments, respondents should clearly indicate the question number to which their responses relate.

**Question 1**

Does the industry agree with the TRA’s preliminary view on the risks and benefits of network sharing agreements? If not, please set out, supported by evidence, what additional considerations the TRA ought to cover.

**Question 2**

Does the industry agree with the TRA’s proposed approach to assessing network sharing agreements, including the review and approval process? If not, please set out, supported by evidence, what additional considerations the TRA ought to cover.

**Question 3**

Please comment, including supporting evidence, on the types of remedies covered in the draft regulatory framework. Please set out, supported by evidence, whether you agree with the TRA’s proposed approaches to address any potential concerns identified.

**Question 4**

Does the industry agree that the proposed review and approval process for the assessment of network sharing agreements is clear and transparent? Does the industry agree with the proposed roles of the TRA and industry Applicants in the process?

**Question 5**

Does the industry consider it appropriate to have a separate regulatory framework for assessing network sharing agreements (complemented with merger and acquisition regulation/guidelines)? Or is the industry of the opinion that comprehensive guidelines governing mergers and acquisition would suffice for the TRA to assess a range of agreements including network sharing agreements?
2 DRAFT REGULATORY FRAMEWORK FOR REVIEWING ACTIVE MOBILE NETWORK SHARING AGREEMENTS IN OMAN

2.1 INTRODUCTION

The Telecommunications Regulatory Authority (the “TRA”) was established pursuant to the Telecommunications Regulatory Act (the “Act”) issued by the Royal Decree No. 30/2002 to regulate the telecommunications sector of the Sultanate.

This document constitutes the TRA’s regulatory framework for the assessment of active mobile network sharing agreements in Oman. The framework states how the TRA expects to assess whether any active network sharing agreements (NSAs) proposed by Omani licensees is in the public interest, based on the potential risks and benefits of the agreements in the relevant market(s).

The framework also provides an overview of the process the TRA is likely to follow when reviewing such agreements, as well as the roles of the TRA and the Applicants within this process.

Note that this regulatory framework will be complimented with the specific guidelines for assessing mergers, acquisitions and agreements (“M&A”) in the telecommunications sector by the TRA in future.

2.2 LEGISLATIVE BACKGROUND

The TRA has granted Class 1 licences (“Licence”) to three telecommunications companies (“Licensees”) in Oman to install and operate a Public Telecommunications System and provide Public Cellular Mobile Services, in accordance with the provisions of the Telecommunications Regulatory Act (“The Act”).

The TRA is also in charge of assigning and managing spectrum relevant to the provision of telecoms services. Spectrum rights are assigned to all three MNOs based on spectrum authorisations. These set the terms and conditions for the use of the assigned spectrum during the licence period, including sharing or leasing thereof. TRA Decision No. 116/2019 (“Spectrum Policy”) regulates the licensing of stations and radio equipment operation, and frequency assignment, pursuant to the Act.

**Article 1 of Decision 116/2019** states that ‘The Authority may assign or reassign the frequencies or frequency ranges to the Applicant of Radio License according to the National Frequency Bands Allocation Plan. The frequencies to be assigned by the Authority shall be restricted in a way approved by the Authority. No change of the frequencies or their technical specifications shall be made without the written approval of the Authority.”

The TRA is responsible for the protection of consumers’ interest and the promotion of competition within the sector. The competition rules of the Sultanate of Oman in the telecommunications sector comprise Articles 40 and 41 of the Act, Article 79 the Executive Regulations, Article 26 of the Licences

---

7 Note that within this document any references to “NSAs” refer to active mobile network sharing agreements.

8 Available on TRA’s website: https://www.tra.gov.om/En/GeneratedPage.jsp?menu=75
and the Decision on Anti-competitive Behaviour in the Sultanate of Oman. Given this and the potential impact of NSAs on competition and market outcomes, it is important that the TRA reviews all proposed agreements before they come into effect.

**Article 40 of the Act** states that ‘the Licensee shall not perform any conduct, take an action or omit to take an action that could prevent or restrict competition in relation to any commercial activity connected to telecommunications […]. The conduct, the action or the omission therefrom, shall be considered as preventing or restricting competition [including] making changes in market structure that are conducive to preventing or restricting competition, in particular, mergers in the telecommunications sector.’

**Article 41 of the Act** states that ‘The Authority shall have the function of deciding whether the conduct, action or omission therefrom, is conducive to preventing or restricting competition, through the application of the provisions of Article 40 of this Act, subject to the provisions of regulations and decisions issued for the purpose of introducing competition in the telecommunications sector, and the general principles included in the license. Before issuing a decision in this regard, the Authority shall undertake to carry out the investigations it deems necessary, and to request any information or data from the licensee, or to summon any person to express his point of view on the subject.’

**Article 79 of the Executive Regulations** builds on Articles 40 and 41 of the Act, by providing that ‘concerted conduct between two or more licensees in a direct or indirect manner, with the object of preventing or restricting competition in the market, shall be deemed an agreement with others to bring about any of the following matters in the telecommunications market:

a) The fixing of tariffs or other conditions of service.

b) The pre-selection of the successful party for a contract or a work opportunity.

c) The dividing-up of shares as between licensees.

d) Any other agreement which the Authority considers such as to prevent or restrict competition.”

**Article 26 of each of the Licenses issued to Class 1 Operators** also prohibits certain types of undue discrimination and other anti-competitive practices. In particular,

‘The Licensee shall not (whether in respect of the rates or other terms and conditions applied or otherwise) show undue preference to, or exercise undue discrimination against, particular persons or persons of any class or description as respects the provision of the Licensed Services. The Licensee may be deemed to have shown such undue discrimination if it unfairly favours to a material extent a business carried on by it in relation to the provision of the Licensed Services so as to place at a significant competitive disadvantage persons competing with that business. The Licensee shall not engage in any other anti-competitive practices and, in particular, shall not:

a) abuse any dominant position in any Telecommunications Service market;
b) enter into agreements with any other Licensed Operator or Service Provider which have as their purpose or effect the fixing of prices, allocation of customers or specific service markets or other improper restraint on competition; or

c) Use information provided by other Licensed Operators or Service Providers for anti-competitive purposes.

d) Any question relating to whether any act done or course of conduct is contrary to this Condition shall be determined by the Regulatory Authority.”

The TRA considers that the regulation of merger, acquisition, and agreements involving one or more licensee is indispensable to ensuring a market structure that is conducive to competition. It is the TRA’s policy to intervene in M&A activities if there is a potential adverse effect on competition. In such circumstances, the TRA will either require remedies to address any competitive concerns, or prevent the merger or acquisition from going ahead, where remedies cannot be devised or are considered unsatisfactory or inadequate.9

Articles 1 and 2 of Decision No. 70/2013 (“Ex-post regulations”) establish the agreements and practices that are regarded as anti-competitive.

**Article 1** of the Ex-post regulations states that ‘Without prejudice to the provisions of the Telecommunications Regulatory Act and its Executive Regulation, the following agreements and practices shall be regarded as anti-competitive:

a) Agreements which directly or indirectly fix purchase or selling prices or any other trading conditions (otherwise known as ‘price fixing’, and includes the practice known as ‘resale price maintenance’);

b) Agreements which limit or control competition in markets, technical development or investment (otherwise known as collusion or collusive agreements);

c) Agreements which divide or allocate markets or sources of supply (otherwise known as ‘market fixing’ or ‘orderly marketing’);

d) Agreements which require a customer to accept more services than it wishes to take (otherwise known as full-line forcing agreements) including agreements that run for unduly long periods;

e) Agreements which apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing one or more of them at a competitive disadvantage (otherwise known as discriminatory practices’); and

---

f) Agreements which make the conclusion of contracts subject to acceptance of a condition or an obligation which has no connection with the subject of such contracts (otherwise known as ‘second line forcing’ and/or ‘third line forcing’).

g) Practices which constitute an abuse of a dominant position;

h) Any other practices, agreements or omissions to act that may prevent or restrict competition in the market.

Article 2 of the Ex-post regulations states that ‘The Authority may, at its own discretion, or based on a request from the concerned party, exempt any agreement or practice from the provisions of agreements and anti-competitive practices stipulated in Article (1) of these Regulations, or in the Executive Regulation of the Telecommunications Regulatory Act if the Authority considers that such agreements and practices:

a) Will make a positive contribution to markets that will outweigh its anticompetitive effects.

b) Are of minor importance to be subject to the provisions of Article (1) of these Regulations or the other decisions issued by the Authority.

Further, the Guidelines on anti-competitive behaviour10 (“Guidelines”) issued under the Ex-post regulations, set out how these rules will apply in practice.

(a) Section 6 of the guidelines sets out the different types of anti-competitive agreements prohibited by Article 40 of the Act, as well as the situations where the TRA is likely to conclude that the pro-competitive effects of a arrangement outweigh the restriction on competition.

(b) Section 7 of the guidelines sets out the TRA’s approach to investigating mergers between parties, and the factors it will consider when assessing the impact on competition.

Pursuant to its responsibilities, the TRA has determined the need to establish a regulatory framework to assess active network sharing agreements between MNOs.

Article 16 of the Spectrum Policy sets out the requirement for licensees who wish to offer access and or share (parts of) their networks with other licensees, to have to seek pre-approval from TRA of such agreements. In particular:

Article 16 of the Spectrum Policy states that ‘The Licensee is not allowed to relinquish, lease or dispose of the radio equipment to another party by any way except after the latter has obtained a radio license

to use such stations or radio equipment, and after the Licensee has obtained a prior written approval of the Authority for such disposal.’

Further, Article 17 of the Spectrum Policy states that ‘The Licensee shall Use the radio frequencies assigned to him for their intended purposes, and shall not dispose of them or dispose of his licensed Radiocommunications equipment to any other party by waiver, lease, utilization or otherwise except after obtaining a prior written consent from the Authority.’

The TRA also issued its ‘Site Sharing Guidelines’ to govern the sharing of passive infrastructure including masts, towers, and rooftops. Those Guidelines are not affected by this publication.

2.3 OBJECTIVES OF THIS REGULATORY FRAMEWORK

This framework sets out how the TRA will assess any proposed NSAs in the telecommunications sector. This includes an overview of the approval process, as well as the steps that the TRA expects to adopt to assess the expected net impact of, and any potential adverse effects from, a proposed agreement. As part of this, this framework identifies the key principles that the TRA would expect to consider when carrying out its assessment of any specific sharing proposal, and elaborates how the TRA expects to come to a decision on whether it will approve a proposed NSA or not.

In doing so, the framework seeks to guide licensees on their role in the overall process and aspects of sharing agreements that TRA may, in certain situations, consider problematic due to, for example, their expected adverse impact on competition.

Pursuant to its duties, the TRA aims to apply this framework to protect the public interest and preserve competition in the Omani telecommunications market, while also not disproportionately restricting initiatives taken by market participants, that could benefit them, as well as the wider market.

2.4 GENERAL OBLIGATIONS ON ALL APPLICANTS

Applicants are obliged to submit any proposed NSA to the TRA for review and approval before such agreement can be enacted. The Applicants must submit their Application consistent with principles set out in this framework. The TRA holds the final authority over the approval of any proposed agreements and has the right to block any agreement it deems to not be in the public interest. For the avoidance of doubt, any proposed amendments to existing NSAs, including proposals to dissolve agreements, must also be submitted to the TRA for its prior approval, before such amendments or dissolution can take effect.

The terms of the Class 1 Licence under which all MNOs in Oman operate require the licensees to install and operate a Public Telecommunications System to provide Public Cellular Mobile Services in accordance with the provisions of the Act, the decisions issued in implementation thereof and the Terms and Conditions set out in the Licence.

All MNOs must continue to meet all the obligations set out in their Licences, including in respect of, but not limited to legal, quality of service, and national security obligations. Such obligations would not be removed in the event that two or more MNOs propose to enter into an active network sharing agreement.

For the avoidance of doubt, it is the responsibility of the sharing parties, within their application to the TRA, to demonstrate their continued compliance with these obligations and to make the case for the sharing agreement.

### 2.5 OVERVIEW OF THE REVIEW/APPROVAL PROCESS

This section sets out the overall approach that the Authority will expect to follow when assessing the potential effects of proposed NSAs (including amendments to existing NSAs). It also sets out the main steps, and actions required by key players as part of the review process. Any timings set out below are indicative only, with the TRA retaining the right to pause the review process at any time, for example, if, but not limited to, the Applicants fail to submit, on time, the requested information.

The TRA expects that the review process will follow a six stage process, as summarised in the Figure below. Each process stage is discussed briefly below.
1. **Notification**: MNOs that wish to engage in NSAs must notify the TRA by submitting a formal application (“Application”) to the TRA. This Application must, at the minimum, include:

   i. general information about the Applicants;
   
   ii. the scope of the proposed active network sharing arrangement (geographical, and type (including High level design/low level design);
   
   iii. the rationale behind/benefits to the Applicants of the proposed arrangement;
   
   iv. a brief assessment of the likely risks identified by the parties to the telecommunications market; and
   
   v. a copy of the full, draft NSA.

The information that Applicants shall be expected to include in their applications is set out in Section 3.6 below.

The TRA can only assess the proposal on what it has received and will not judge favourably any incomplete Applications. Upon receipt of the application, the TRA will assess whether a submitted Application is complete or not and inform the Applicants on the outcome of the
completeness check, and whether the TRA will commence with its regulatory assessment of the proposed NSA. Any incomplete Applications will be deemed not to have been submitted and will be rejected by the TRA by default.

2. **Regulatory assessment of expected benefits and risks:** Once the completeness of the Application is confirmed, the TRA will conduct an assessment of the potential benefits and the risks to competition and consumers more generally that could arise as a result of the proposed arrangement. This assessment will be based on the principles laid out in Section 3.7 of this framework, as well as on the submissions by the Applicants. To facilitate this assessment, the TRA may seek further information and clarification from the Applicants. MNOs are required to respond to any information request from the TRA within the timeline stated in the specific request for information.12

3. **Preliminary decision:** Based on the regulatory assessment, the TRA would expect to publish a preliminary decision on the proposed agreement within six weeks of receiving comprehensive and complete responses to all information requests issued by the TRA during Stage 2 above.13 In this, the TRA would expect to adopt one of three preliminary positions:

   i. The proposed agreement will be cleared without objections;

   ii. The proposed agreement will be cleared subject to certain remedies and commitments by the Applicants to address any identified concerns;

   iii. The proposed agreement will be blocked due to potentially adverse effects on competition or consumers more generally.

4. **Invitation to comment:** After publishing its preliminary decision, the TRA will invite the Applicants, as well as other relevant stakeholders, including market competitors, to comment on the TRA’s preliminary views and to submit evidence-based arguments as to why they agree or disagree with the TRA’s preliminary decision. Unless stated otherwise, this process will follow the TRA’s standard consultation process and associated timelines. The TRA may then publish these responses, subject to confidentiality considerations, giving the Applicants an opportunity to provide responses to the industry comments.

5. **Proposed remedies:** The Applicants may be required to offer, or may choose to offer, to the TRA, commitments to address any identified concerns. This would be the case if:

   i. In its preliminary decision, the TRA identifies potential concerns with the proposed agreement but recognises the scope for certain remedies to address those concerns; or

   ii. The Applicants proactively choose to make commitments.

---

12 Receiving partial or not well documented responses to any clarification questions will unduly delay the TRA’s regulatory assessment and the publication preliminary decision.

13 As stated above, the TRA retains the right to “stop the clock” at any time during the review process. This may be required if, for example, the responses to its information requests are delayed, incomplete, not well evidenced and/or not addressing the TRA’s information needs.
6. **Final decision**: On the basis of wider stakeholder comments and any commitments made by the Applicants, the TRA would expect to publish its final decision to clear the proposed sharing arrangement (either unconditionally, or subject to remedies), or to block the sharing arrangement. The TRA expects to issue its final decision within six weeks of receiving all comments on its preliminary decision.

### 2.6 INFORMATION REQUIREMENTS IN THE FORMAL APPLICATION

As part of the notification process (i.e., Stage 1 within the overall review process set out in Section 3.5 above), MNOs must submit an Application to the TRA. This Application, along with the regulatory framework, will form the basis of the TRA’s regulatory assessment. The TRA can only assess the proposal on what it has received and will not judge favourably any incomplete Applications.

The Application must cover, at a minimum:

1. **General information about the Applicants**: This shall include the name and contact details of:

   a. An individual within each of the sharing parties
   
   b. Any authorised representatives of the sharing parties
   
   c. if not already provided in response to (a) and (b), the person(s) submitting the Application
   
   d. The person or persons to whom the TRA should address any correspondence.

**GUIDANCE NOTE TO ITEM 1**

Applicants can authorise a representative, for example, a firm of solicitors, to complete the Application on their behalf and to act for them in further correspondence with the TRA.

If an authorised representative ceases to act for notifying parties, the TRA must be advised of this immediately.

Applicants must give the name and address of a person who is authorised to accept all correspondence and accept service or take receipt on behalf of Applicants. This may be a person within the company or the Applicants’ authorised representative.

‘Contact details’ include full name, telephone number, Oman address and email address where the TRA can make contact between 7.30am and 3.00pm on working days. If any such details change, Applicants should notify the TRA immediately in writing.
2. **The details of the proposed sharing arrangement:** The Applicants shall describe the arrangements by which they will engage in the sharing arrangement, including:
   a. The parties to the sharing arrangement.
   b. The type of sharing arrangement
   c. The key terms of the arrangement
   d. The timing of key process steps
   e. The ownership and operational structure post-sharing, including whether the parties propose to establish a Joint Venture company to own and operate the shared assets.

   The parties must submit a copy of the full network sharing agreement, as part of their application.

**GUIDANCE NOTE TO ITEM 2**

**NOTE TO 2.A** – When describing the sharing parties, Applicants need to provide their full legal names and explain how this entity fits within a wider group structure if relevant, specifying the ultimate ownership. Applicants should identify any legal or natural person which, directly or indirectly, owns, controls, or has material influence over (together, referred to hereafter as ‘controls’) any one of the sharing parties.

**NOTE TO 2.B** – When describing the type of sharing arrangement, Applicants need to indicate which elements of the network infrastructure will be shared, including whether it covers Radio Access Network (RAN) components, spectrum resources, core networks, and backhaul. The Applicants must also provide information on the extent of passive infrastructure that would be shared under the proposed NSA, if any.

Applicants need also to provide information on the geographic scope of the agreement, including whether it covers the entire Sultanate of Oman or whether it is focused on certain geographic regions.

**NOTE TO 2.c** – The description of the key terms of the sharing arrangement should include, but should not necessarily be limited to, any factors upon which completion of the sharing arrangement is conditional, together with the status of these factors.

**NOTE TO 2.D** – On timing, Applicants need to specify the expected time scale for the planned exchange of contracts and signing of the sharing agreement. Also, Applicants need to specify the expected time scale for the sharing arrangement to be operationalised.

**NOTE TO 2.e** – Applicants need to provide a diagram of the proposed ownership and operational structure. Where appropriate, details of the ownership structure should include the identity and shareholdings, pre- and post-sharing, of any persons holding 10% or more of the voting rights, issued share capital or other securities in any established Joint Ventures.

Applicants need to include a description of any other links between the sharing parties (either formal or informal). This should also include (but should not necessarily be limited to) any associated persons.\(^4\)

\(^4\) An associated person refers to any person who is not an owner, partner or director of the Applicants but performs services on behalf of the Applicants.
3. **Other sharing arrangements:** Applicants should provide brief details of any other sharing arrangements (including passive sharing) in which either of the sharing parties is currently part of, and describe the impact on these arrangements of the proposed NSA.

4. **The strategic and economic rationale for the sharing arrangement:** Applicants should describe the strategic motivation for entering into the proposed sharing arrangement. This must include:
   
   a. The extent of expected CAPEX and OPEX savings as a result of the NSA.
   
   b. The expected impact of the NSA on meeting coverage obligations and improving service quality.

Where possible, the Applicants must also identify to what extent these savings and service improvements can translate to efficiencies and benefits for customers in the relevant market(s).

To support this assessment, the Applicants must provide any documents prepared internally, or by external consultants, that discuss such expected efficiencies or relevant customer benefits.

**GUIDANCE NOTE TO ITEM 4**

The parties’ description of potential efficiencies and customer benefits should include (but not necessarily be limited to) the following:

a) a detailed explanation of how the NSA would generate such efficiencies and customer benefits

b) if reasonably practicable, a quantification of any such efficiencies and customer benefits, specifying the timeframe in which they are likely to be achieved

c) an explanation of the extent to which the benefits generated by the NSA are likely to be passed on to customers in the relevant market(s)

d) an explanation of the reasons why such efficiencies and customer benefits could not be achieved in the absence of the proposed NSA (or by engaging in lesser forms of sharing arrangements), and

e) Any documents prepared internally or by external consultants discussing the expected efficiencies.

5. **An assessment of the competition risks and proposed mitigation strategies:** Applicants should provide a description of the kinds of competition risks that the proposed sharing arrangement could potentially give rise to. These must include the risks identified in this framework, as well as other risks that the Applicants believe to be relevant and potentially substantial.

For each of the competition risks identified, the Applicants must either:

i) Provide potential remedies to mitigate the impact of this risk; or

ii) Briefly describe why they believe that the proposed NSA is unlikely to give rise to the risk.
6. **Details of the approach the Applicants propose to take to regulate the sharing of commercially sensitive information:** This should include any internal process/protocol that will be put in place to restrict the flow of commercially sensitive information within different departments of the Applicants. In particular, the plan must provide insight on how the following processes will be managed under the sharing agreement:

   a. Operations  
   b. Performance reporting  
   c. Capacity forecasting  
   d. Technology strategy and roadmaps  
   e. Shared network investment decisions

If the proposed NSA includes the establishment of a Joint Venture, the Applicants must provide their approach to avoid the sharing of commercially sensitive information between the Joint Venture and the sharing MNOs (i.e., Applicants).

7. **Resilience plan:** Applicants should provide a detailed Network Resilience Plan for the shared network and a Disaster Recovery Plan, or updates thereof.

**GUIDANCE NOTE TO QUESTION 7**

The Network Resilience Plan (“NRP”) must outline the steps taken by the Applicants to ensure sufficient resilience in their joint network to minimise the impact on consumers of any network failure or a natural disaster.

The Disaster Recovery Plan (“DRP”) must outline the procedure the Applicants will put in place for resuming service on the shared network in the aftermath of a network failure, or a natural disaster.

The NRP and the DRP must be developed (or updated) and submitted in conjunction with each other, and holistically outline the provisions for the shared network to respond to network blackouts and brown-outs in a way that minimises the service impact on customers, and the financial impact on the economy.

8. **Forward looking investment and roll-out plans:** The Applicants must individually submit their forward-looking investment and roll-out plans to allow the TRA to assess their individual incentives in the presence and absence of the proposed NSA.

   **Approach to identifying and mitigating security risks:** The Applicants must provide a detailed plan to tackle any potential concerns that may arise as a result of the proposed NSA in meeting Article (44) requirements. Note that even if Applicants believe that the proposed NSA is unlikely to give rise to security concerns, the Application must still address the same and explain why they are unlikely to be affected.
9. **Continued compliance with regulatory and license obligations:** The Applicants must demonstrate that they will continue to comply with the regulatory and legal obligations as set out in their Licenses and other TRA regulations.

10. **An ‘Exit plan’ setting out a plan in the event that the Applicants wish to dissolve the agreement:** The Applicants must provide a high-level overview of the ‘Exit plan’ that will be followed if they wish to dissolve the proposed NSA in the future. This plan must indicate, broadly, the steps that will be taken to transition from the provision of services over the shared network to provision of the services over separate networks, in a way that prevents service disruption and any possible harm to consumers.

## 2.7 DETERMINING THE EXPECTED IMPACT OF THE PROPOSED SHARING AGREEMENT

The TRA’s decision to clear or block a proposed NSA will depend on its assessment of the net impact of the NSA on the relevant market(s). To undertake this assessment and identify the potential risks to competition and benefits to customers, the TRA will be guided by the following process:

1. **Defining the relevant market(s):** The TRA will identify the product and geographic market(s) that are likely to be affected as a result of the proposed NSA. The TRA’s economic assessment will then be based on the expected outcomes in these identified market(s). This is explored further in Section 3.7.1 below.

2. **Establishing the counterfactual:** The TRA will adopt a counterfactual analysis to undertake its assessment. Under this framework, the TRA will identify the potential competitive outcomes in the market as a result of the proposed NSA (‘the factual scenario’) compared to a world without the proposed NSA (‘the counterfactual scenario’). The counterfactual scenario will be determined by the TRA on a case-by-case basis, depending on the state of the market at the time of the proposal, and the terms of the NSA.\(^\text{15}\) This is discussed further in Section 3.7.2 below.

3. **Identifying the potential risks to competition:** The TRA will follow a set of key principles to identify the potential risks of approving a proposed active network sharing agreement. These principles will cover:
   
   a. The likely impact of the proposed NSA on direct competition between the Applicants;
   
   b. The likely impact of the proposed NSA on the competitiveness of third parties (including excluded MNOs and access seekers); and
   
   c. The likely impact on outcomes in the Omani telecommunications sector. If the TRA concludes that a proposed agreement leads to significant negative outcomes in the

\(^{15}\) The types and scope of the potential risks and benefits identified by the TRA will depend on the TRA’s assessment of the appropriate counterfactual for the proposed agreement.
telecommunications market, or poses a risk to national security, the TRA holds the unequivocal right to block the agreement.

Where the TRA identifies potential risks to competition, it may require the sharing MNOs to offer some commitments and remedies to assuage these concerns. The framework sets out some potential remedies by way of example. However, these examples are not exhaustive, and the TRA will adopt a more targeted approach to identifying potential remedies. This is explored further in Section 3.8 below.

4. **Identifying the potential efficiencies and customer benefits**: The TRA’s assessment will also consider the potential benefits that could arise from the proposed agreement, relative to the counterfactual. These potential benefits would ultimately be expected to accrue to the end-users in the relevant downstream market(s) and underpin the TRA’s view that active network sharing arrangements that do not lead to a substantial lessening of competition should be cleared. This is discussed further in Section 3.8.3 below.

   The key sources of benefits would be expected to include:
   a. Improved network coverage
   b. Quicker roll-out of new technologies
   c. Lower prices for end-users
   d. Better service quality

Further to the general, potential benefits and risks associated with most common types of active mobile network sharing agreements, the TRA has identified further considerations that it would expect to take into account when assessing specific forms of active mobile sharing. The specific forms of network sharing are discussed in Section 3.9 below. These include:
   a. Sharing mobile spectrum
   b. Joint ownership and operation of shared assets through a joint venture
   c. Core network sharing

5. **Assessing the net impact of the proposed NSA**: The TRA will employ qualitative and, where relevant, quantitative techniques to determine whether the proposed NSA is likely to give rise to a net benefit, based on the assessment above. Where the TRA identifies the risk of anti-competitive or other negative effects, it may require the sharing MNOs to propose remedies and commitments to assuage its concerns. If the remedies do not sufficiently address the TRA’s concerns, the TRA may block the proposed NSA.

   The TRA’s approach to determine the net impact of proposed sharing agreements is explored in more detail below.
2.7.1 MARKET DEFINITION

As the first step to assess the potential competitive impacts of a proposed agreement, the TRA will define the relevant product and geographic market(s) affected by the agreement. The relevant market refers to the set of products and geographies that are likely to be affected as a result of the proposed sharing arrangement. The definition of the relevant market(s) will allow the TRA to focus its assessment on those products and regions that are likely to benefit or suffer the competitive consequences of the proposed active network sharing, relative to the status quo.

The TRA will define the particular markets on a case-by-case basis. However, given the overall nature of NSAs, it would expect that these would include the following, possibly with some further degrees of segmentation:

- **The retail market for mobile services**: Since MNOs compete in the retail market to offer mobile services to end-customers, any benefits or adverse outcomes are likely to impact the quality of service (including prices) experienced by the users.

- **The wholesale market for mobile services**: MNOs also operate in the wholesale market where they can provide access and interconnection services to other operators (such as MVNOs). The lessening of competition between the sharing MNOs, or reduced competitive pressures from MNOs excluded from the sharing arrangement, could impact the quality of services experienced by access seekers.

- **The market for access to passive network infrastructure**: Since the sharing of active network elements will also involve the sharing of passive infrastructure (such as sites and masts), greater levels of integration between passive infrastructure owners can increase the level of concentration in this market. This may increase the Applicants’ ability and incentive to foreclose operators that seek access to their sites and masts, to place their own antennas and provide competing services.

The TRA would expect the relevant geographic market(s) to likely cover the entire Sultanate of Oman, in line with the coverage obligations and nationally uniform pricing, which suggests there are similar competitive conditions throughout the country. However, where the proposed network sharing agreement has a regional dimension, the TRA will assess, on a case-by-case basis, the relevant geographic market. For example, if MNOs propose to share their networks in rural areas only, where coverage and service levels may differ from other parts of the country, the TRA may adopt a sub-national market definition.

---

16 Mobile Virtual Network Operators (MVNOs)
2.7.2 COUNTERFACTUAL ANALYSIS

To identify the potential risks and benefits that could arise as a result of the proposed active network sharing agreement, the TRA will compare the state of the market with the proposed agreement (‘factual scenario’), to the state of the market without the agreement (‘counterfactual scenario’). This counterfactual analysis considers the incremental benefits and risks in the factual scenario over the counterfactual scenario, in the relevant market(s) identified by the TRA.

In the TRA’s assessment, the factual scenario would represent a situation where the proposed active network sharing agreement is cleared without any objections or remedies. Under this scenario, the TRA would estimate the potential impact of the shared network infrastructure on the MNOs’ incentives and competitive pressures in the relevant market(s), as well as the potential cost savings, and subsequent improvements in network quality, coverage, and the roll-out of new technologies.

On the other hand, the counterfactual will represent the expected direction of travel in the market in the absence of the proposed agreement. The counterfactual may be a ‘business-as-usual’ scenario where the proposed arrangement is blocked, and the market continues to function as it did prior to the proposal. On the other hand, it may consider alternative agreements that may arise if the proposed NSA was to be blocked. Under this scenario, the improvements of network quality, expansion of coverage, and the roll-out of new technologies would be considered on a case-by-case basis.

Therefore the TRA will assess the incremental risks and benefits that the proposed agreement is likely to give rise to, and whether, on balance, the benefits outweigh the risks. The TRA would expect that this assessment could include both qualitative and quantitative methods and tests.

- **Qualitative methods** could include the TRA’s assessment of how the market is likely to evolve and how the sharing MNOs are likely to alter their behaviour under the two scenarios, along with customer and stakeholder surveys. For example, surveys could allow the TRA to collate a wider range of views on the future of the telecommunications market in Oman and on the importance of different competitive elements that may be influenced as a result of the sharing arrangement.

- **Quantitative methods** may include an assessment of the parties’ market shares in the different relevant market(s), in order to identify the likely market power held by the sharing MNOs. The TRA may also, if required, conduct quantitative assessments to estimate the degree of direct competition between the sharing MNOs and how these may be affected by the proposed arrangement.

In its assessment, the TRA may employ market share thresholds to identify the likely competitive risk resulting from the proposed NSA. Depending on the nature of the TRA’s concerns, these could be based on the share of total customers or revenues in the retail or wholesale markets for mobile services, or the share of total spectrum holdings, among others. If the combined market share of the sharing MNOs does not breach the pre-defined
threshold, the TRA may presume that the proposed NSA is unlikely to be harmful to competition. Such an NSA may then warrant a less in-depth assessment by TRA.

**Market share threshold to warrant detailed investigation by the TRA**

In particular, if the combined market share of the Applicants is **LESS THAN 30%**, the TRA will not undertake a detailed assessment of the proposed agreement, since it would presume that such an agreement is unlikely to lead to any dominance and hence anti-competitive outcomes in the relevant markets.

Critically, however, the methods adopted by the TRA will differ on a case-by-case basis. Furthermore, they will only be applied if the TRA believes them to provide useful insights and if the available data so allows such analysis.

### 2.8 KEY PRINCIPLES THE TRA WILL EXPECT TO CONSIDER AS PART OF THE APPROVAL PROCESS

Based on the information provided by the Applicants, the TRA will, for each proposed NSA, follow a set of key principles to identify the potential risks and benefits of approving a proposed active network sharing agreement. The TRA will consider the relevant evidence available and decide the weight to place on that evidence in its decision-making, in light of the specific circumstances surrounding the proposed agreement and the proposed terms of that agreement.

These principles will cover:

- The likely impact of the proposed NSA on direct competition between the Applicants;
- The likely impact of the proposed NSA on the competitiveness of third parties (including excluded MNOs and access seekers);
- The likely impact on outcomes in the Omani telecommunications sector.

Additionally, in NSAs that involve the sharing of spectrum resources (MOCN or core network sharing), the TRA will also consider the impact of the proposed sharing agreement on the distribution of mobile spectrum. This is because MNOs in such agreements could potentially pool their spectrum holdings to have disproportionately higher spectrum holdings than their competitors, leading to significant asymmetries and a potentially detrimental impact on competition. This is covered in Section 3.9 below.

Each of these principles is considered in detail below.

---

In so doing, and given the case-specific nature of these assessments, the TRA would not expect to make any precise predictions about the future, such as whether any particular innovations will take place or whether a new entrant will enter the market.
2.8.1 THE IMPACT ON DIRECT COMPETITION BETWEEN THE APPLICANTS

The first principle considers the likely impact of the proposed network sharing agreement on the level of competitive pressure exerted by the sharing MNOs on each other in the factual scenario, compared to the counterfactual scenario. The TRA considers this is likely to be relevant because the increased level of integration and co-ordination between the parties could serve to dampen the competitive constraints they impose on each other and increase the ability of the parties to engage in anti-competitive behaviour.

The TRA has identified three key aspects that could impact this level of competition, namely, the risk and level of information sharing between the parties, the incentives of the parties to tacitly collude and the degree of technical convergence.

INFORMATION SHARING

To effectively plan and roll-out shared networks, the MNOs must share some level of operational information. This includes technical information that is necessary to allow the correct technical deployment and operation of the shared network, as well as target capacity specifications for the joint network.

However, this can give rise to competitive concerns through the potential for the parties to share commercially sensitive information that can adversely affect the degree of competition between them and thus distort or weaken the competition in the relevant downstream markets.

Such information could include, but is not limited to:

- Operation of the RAN shared equipment, which could give insight into the operator’s core network performance;
- Performance reporting, which could provide insight on market performance;
- Forward-looking plans that include projections of customer numbers or marketing strategies;
- A technology roadmap that includes future strategies to adopt and deploy new technologies; and
- Network investment decisions that could provide insight into planned unilateral investments by individual MNOs.

Therefore, sharing MNOs must have in place, and provide details on it to the TRA as part of their application, a robust information management process/protocol to avoid the sharing of commercially sensitive information.

The TRA would then expect, as part of its review of any NSA application, to assess critically the potential for the proposed NSA to result in undue sharing of commercially sensitive information and any resulting risks to downstream competition.
To this end, as outlined in Section 3.6 above, the TRA will require the sharing MNOs, as part of the formal Application, to provide a detailed plan on how they aim to manage information sharing between the sharing parties.

Where the TRA identifies such risks, it may require the sharing MNOs to put in place or enhance existing safeguards in the proposed protocol.

This may, for example, be in the form of clear physical and operational separations between the technical/network planning departments and the sales/customer facing departments of each MNO. This separation would allow the normal flow of information but would aim to restrict the flow of certain confidential information that needs to be shared between the technical teams to operationalise the shared network, but must not influence the MNOs’ commercial and sales strategies. The TRA may also require the MNOs to commit to keeping such information confidential, where relevant and not shared beyond an agreed “confidentiality ring”.

The TRA may also place limits on what information can be exchanged between the sharing parties. For instance, the sharing of forecasting information will be required to only cover what is needed for network planning purposes of the shared network. As such, any subscriber forecasts or future marketing plans will be considered to be commercially sensitive information which must not be exchanged between the sharing parties.

If the Applicants do not include provisions for the safe handling of sensitive commercial data or if the TRA is dissatisfied with the steps outlined in the proposal, the TRA holds the right to reject the proposal and block the proposed NSA.

In cases where the parties propose to operate the shared assets by way of a joint venture, the TRA may require the parties to demonstrate how the joint venture aims to manage the sharing of confidential information. This may include the establishment of a ‘clean team’ to regulate the type of information shared between the parties.

**TACIT COLLUSION**

Tacit collusion refers to a situation where multiple companies within a market align, without explicit agreement, their behaviour, independently of other suppliers and consumers, in order to achieve a more profitable outcome for themselves. This occurs when competitors become aware of the interdependence of their actions. Consequently they independently determine that the payoff they could achieve from following a certain strategy will benefit all colluding parties.

As discussed above, sharing MNOs need to engage in some level of information sharing to deploy and operate their shared network. The greater levels of knowledge about each other’s forward-looking strategies that such information sharing will lead to, can reduce the barriers to tacit collusion and increase the ability of the sharing MNOs to weaken the competitive pressure they place on each other.

Therefore, in its assessment, the TRA would expect to assess, qualitatively, the potential for the proposed sharing arrangement to reduce informational barriers between the sharing MNOs relative
to the counterfactual, and subsequently, the risk of tacit collusion between the parties increasing. Such an assessment will be likely to be based on the following factors:

- **Market shares**: Tacit collusion is easier to maintain in markets with a small number of large players since it requires more limited co-ordination between the parties. The TRA would, therefore, expect to assess the potential impact of the proposed sharing agreement on the number and size of effective players in the relevant market(s), based on estimated market shares. In particular, the TRA would expect to assess whether, based on the degree of information sharing outlined in the proposal and the combined market share of the sharing parties, the incentives to tacitly collude are higher under the factual, compared to the counterfactual.

- **Operational knowledge of other MNOs’ costs**: The TRA would also expect to assess the likely impact of the proposed sharing agreement on the degree of cost symmetries between the sharing parties, compared to the counterfactual. Symmetry and similar cost structures could increase the likelihood of there being some potential for tacit collusion by the sharing parties.

- **Type and degree of information sharing**: The TRA will also expect to consider, based on the proposal, the degree of information sharing that the parties would expect to engage in and whether this would include information on roll-out strategies, bidding strategies in any future spectrum awards, and commercial information. The TRA would then assess the risks of the degree and type of information shared on the incentives and abilities of the parties to tacitly collude.

**On the basis of these three criteria, the TRA can qualitatively assess the incremental risks of the sharing parties engaging in tacit collusion under the proposed active sharing agreement, relative to the counterfactual, and the extent to which that could lead to anti-competitive outcomes in the market in the form of higher prices and/or lower quality of service to end-users.**

**CONVERGENCE IN THE QUALITY OF SERVICE**

The TRA also believes that the sharing of active mobile network infrastructure between MNOs could erode the competitive differentiation between them due to potential convergence in their service parameters. MNOs compete, in the retail and wholesale markets, on the basis of a number of parameters including network coverage, technologies offered, and the quality of voice and broadband services.

Absent sharing and to gain a larger share of the market, MNOs could potentially invest and innovate to improve their services and offer better quality or coverage than competing MNOs. However, given that a number of these parameters are determined in the RAN of the MNO, sharing RAN elements across MNOs could undermine these incentives to invest, since MNOs would have access to the same parameters as their competitor(s). In particular, if entering into a sharing arrangement would allow MNOs to attain equivalent service levels to other sharing members, or if other members are able to ‘free ride’ on the investments of the MNO, there could be reduced incentives for them to invest in improving service quality.
Given this risk, the TRA would expect to qualitatively assess the extent to which service parameters that are vital to the direct competition between sharing MNOs are likely to converge. Subsequently, the TRA will assess whether the MNOs’ incentives to invest in and innovate their individual networks are likely to fall significantly as a result of the sharing agreement, compared to the counterfactual.

The TRA would expect to partly base this assessment on the internal forward-looking roll-out and investment plans of the sharing MNOs. Through this exercise, the TRA would aim to identify whether there exist strong incentives for the MNOs to individually invest in their network and service, and whether these incentives would weaken as a result of the sharing agreement.

The TRA will also consider the extent of the existing external competitive constraints in the market (i.e., constraints imposed on the sharing MNOs by other competitors). If competitors impose sufficient constraints, the sharing MNOs may still have sufficiently strong incentives to invest in their networks, despite the potential equalisation of service parameters.

2.8.2 THE IMPACT ON THE COMPETITIVENESS OF THIRD PARTIES

The sharing of active network elements between two or more MNOs could affect the competitiveness of other operators, differentiating between:

- MNOs excluded from the NSA;
- Fixed broadband service providers; and
- Access seekers in the wholesale market for mobile services in Oman.

EXCLUDED MOBILE NETWORK OPERATORS

The sharing of active network assets can allow MNOs to reap significant benefits in the form of better service quality, improved coverage (which could help them meet coverage obligations), new technology offers, as well as significant savings in their CAPEX and OPEX. These benefits can afford a significant competitive advantage to MNOs that engage in such sharing arrangements, potentially at the expense of MNOs that are excluded from these arrangements.

For example, the reduced costs could allow MNOs in sharing arrangements to significantly out-invest their competitors and provide much better service. This is particularly relevant with the dawn of 5G deployment in Oman, since any MNOs that are excluded from potential network sharing agreements could be expected to face much larger costs in deploying or upgrading to a 5G network. As a result, the sharing MNOs may be able to enter the 5G market much quicker and establish and sustain a significant competitive advantage over their competitor(s).

The TRA will, therefore, assess whether the ability of excluded MNOs to effectively compete is significantly compromised as a result of exclusive sharing arrangements. For example, this could be
the case if excluded MNOs no longer offer a sufficiently strong and credible competitive constraint on the sharing MNOs, relative to a market without the proposed sharing arrangement.

If the TRA concludes that the proposed arrangement sufficiently weakens the competitive constraint offered by excluded MNOs, it may require the sharing MNOs to divest part of their joint network infrastructure to the MNO(s) in the question, to allow them to reap part of the cost and service quality benefits of the proposed sharing agreement.

PROVIDERS OF FIXED BROADBAND SERVICES

The sharing of mobile network infrastructure between two or more MNOs may also affect their ability to compete with fixed service providers. In particular, the TRA notes that Fixed Wireless Access (FWA) services can offer a direct competitive constraint to fixed broadband services, which is likely to get stronger under 5G FWA technology. As a result, if an MNO that provides FWA broadband services enters into a network sharing agreement, it may be afforded a competitive advantage over another fixed broadband provider.

The TRA will, therefore, assess whether the proposed NSA substantially may lead to one or more of the sharing MNOs that provide FWA broadband services to gain dominant position (and thus act anti-competitively) in the markets for fixed broadband services.

ACCESS SEEKERS IN THE WHOLESALE MARKET

In the wholesale market for mobile services, MNOs offer access to other operators, who use the MNO’s network to provide mobile services in the retail market. Operators that do not own any network infrastructure but provide retail services entirely on another operator’s network are known as Mobile Virtual Network Operators (MVNOs).

MNOs compete in the wholesale market to provide mobile access and origination services to MVNOs, who then in turn compete with the MNOs in the retail downstream markets. This competition at the wholesale level may limit the incentive of individual MNOs to foreclose access to MVNOs. However, if two or more MNOs enter into a network sharing agreement, they potentially have a heightened ability to tacitly collude, which may give rise to stronger incentives to jointly foreclose access to MVNOs. This is because MVNOs serve as a potential competitive constraint to MNOs in the retail downstream market. However, if, as a result of input foreclosure, MVNOs are unable to access a network, they will be forced to exit the market, which in turn, would weaken competition in the retail market to the benefit of the sharing MNOs.

---

18 This is because the quality and speed available under 5G FWA broadband services will be more comparable to those experienced on fixed broadband services.

19 Note that operators that have their own network (MNOs) can also be access seekers on other MNOs' networks if they do not have network coverage in parts of the jurisdiction covered by the access-providing MNO. This is known as national roaming.
Given this risk, the TRA will assess whether the increased integration between MNOs engaging in network sharing arrangements could alter their incentives to provide access to access seekers in the wholesale market for mobile services, with a view to foreclosing and subsequently, driving them out of the retail market.

In considering the risk of foreclosure, the TRA will take into account any ex ante obligations that may apply to the relevant MNOs at the time.

If the TRA identifies such a risk, it may require the sharing MNOs to continue honouring any access agreements they had with access seekers, prior to the sharing arrangement, on unchanged terms, or introduce new offers to access seekers, that allows them to maintain their competitiveness.

2.8.3 THE IMPACT ON OUTCOMES IN THE OMANI TELECOMMUNICATIONS SECTOR

NETWORK RESILIENCE

The TRA is also cognisant that any active mobile network sharing arrangements which result in there being fewer independent mobile networks could result in greater vulnerability in infrastructure and mobile coverage. This decreased redundancy could adversely impact network resilience, especially in times of emergencies or natural disasters.

In particular, if the proposed active mobile sharing agreement implies that there would only be one shared network infrastructure in significant parts of the Sultanate (compared to there being multiple, independent networks in the counterfactual), a power failure or a natural disaster may pose a greater risk of network blackouts, in the factual relative to the counterfactual scenario. This risk is accentuated when all MNOs operating in a given geographic region share their networks and there is no alternative infrastructure.

Therefore, the TRA will assess whether the proposed active network sharing agreement is such that it significantly reduces network resilience and poses a high risk of network black-outs.

The TRA considers the risk of major black-outs occurring to be particularly high under centralised core networks. In other words, more sharing of core network assets may increase risk of large scale network failures. On the other hand, greater sharing of transmission networks may increase the risks of localised outages, while representing a lower risk of large-scale blackouts. The TRA would take this consideration into account in its assessment.

To address this potential concern, the TRA would expect to require MNOs to design the shared network in a way that ensures sufficient resilience and demonstrate this to the TRA as part of the application. This could be achieved by adding redundancy to fully shared networks or by requiring the sharing MNOs to offer access to their unused, duplicated sites to third party operators on reasonable terms to maintain non-integrated network options.
POTENTIAL BENEFITS TO THE TELECOMMUNICATIONS SECTOR

In addition to the potential risks identified above, the TRA also considers there to be a range of potential benefits that could arise from NSAs. These potential benefits would ultimately be expected to accrue to the end-users in the market and underpin the TRA’s view that active network sharing arrangements that do not lead to a substantial lessening of competition should be cleared.

The key benefits identified by the TRA are as follows:

- **Improved network coverage:** By sharing network infrastructure, MNOs can potentially optimise the distribution of their masts and antennas. This could allow them to disinvest in duplicated network assets and redeploy their assets in previously unserved regions and increase their combined geographic coverage. This, in turn, could allow them to extend their service coverage to remote, rural areas and meet coverage obligations in a more cost-efficient manner. Further, any incremental cost savings from active network sharing may enable investment in expanding coverage levels in remote geographic areas.

- **Quicker roll-out of new technologies:** The cost savings generated by network sharing could allow MNOs to invest in the roll-out of new technology at a larger and faster scale. This is particularly relevant with the dawn of 5G technology.

- **Lower prices for end-users:** The cost savings generated by network sharing may potentially be passed on, in part, to end-users in the form of lower retail prices than might be the case in the counterfactual.

- **Better service quality:** Any cost savings generated by network sharing may be passed on, in part, to end-users by enabling service (quality) enhancing investments by the sharing parties. Sharing arrangements that involve the sharing of mobile spectrum can also directly result in better service quality by improving network capacity and speeds.

In its assessment, the TRA would expect to qualitatively identify the potential for the proposed sharing agreement to give rise to the benefits identified above or any other benefits that may be identified by the Applicants in their Application. In particular, the TRA would expect to assess the scale of these benefits arising from the network sharing agreement, as compared to the counterfactual, and identify whether these efficiency benefits accrue to the end-users and are directly related to the proposed network sharing.

The TRA will then contrast the estimated scale of these benefits with the potential risks identified above, to ascertain whether the proposed arrangement is likely to give rise to a net benefit to the Omani telecommunications market.

2.9 CONSIDERATIONS FOR SPECIFIC FORMS OF ACTIVE MOBILE SHARING

Further to the general, potential benefits and competitive risks associated with most common types of active mobile network sharing agreements discussed above, the TRA has identified further considerations that it would expect to take into account when assessing specific forms of active mobile sharing.
2.9.1 SHARING MOBILE SPECTRUM

Multi-Operator Core Network (MOCN) sharing involves the sharing of active network infrastructure, as well as the MNOs’ spectrum resources. In assessing potential MOCN arrangements, the TRA would expect to follow the same considerations highlighted above. However, given the additional dimension of sharing spectrum, which is a scarce national resource and essential input to providing mobile services, the TRA will take into account a number of additional considerations, in any assessment of such a proposed NSA.

The TRA recognises that if existing MNOs were to enter into a network sharing agreement which involves spectrum sharing, they could potentially pool their holdings and be able to offer much higher quality and capacity services as compared to their competitors who are excluded from the sharing arrangement. Whilst this may offer some short term benefits to consumers, it could also lead to significant competitive asymmetries and give rise to unfavourable outcomes in the market.

**Given this risk, the TRA will assess the likelihood of any spectrum sharing arrangements leading to highly concentrated spectrum holdings in the hands of a subset of competitors in the market, such that it gives rise to large competitive imbalances.** This may consider overall spectrum holdings, or spectrum holdings in individual bands or groups of bands, as appropriate. To address this potential concern, the TRA may, for example, require the relevant MNOs to potentially return some of their spectrum rights, so that the TRA may more efficiently and equitably distribute mobile spectrum among all MNOs.

Second, spectrum is a key source of competitive differentiation between MNOs in the wholesale and retail mobile service markets, and the sharing of spectrum between MNOs may therefore reduce significantly the competitive differentiation between them. As such, **the TRA will assess the degree of competitive differentiation between the Applicants, and the extent to which this may be eroded due to spectrum sharing.** For example, if the sharing MNOs have other sources of competitive differentiation, such as backhaul capacity, international connectivity, and retail customer service, the equalisation of their spectrum holdings is less likely to reduce the level of competition between them, compared to a situation where the sharing MNOs rely primarily on their spectrum holdings to differentiate themselves.

**Finally, in proposed NSAs that include the sharing of spectrum resources, the TRA will, in addition to the concerns highlighted above, consider the impact of the proposed agreement on future spectrum awards.** For example, it is possible that spectrum sharing could lead, all else the same, to a potential fall in the overall future demand for spectrum. Since MNOs would not require as much spectrum under a sharing agreement, as they would when operating individually, it is possible that this could lead to excess supply of mobile spectrum in future spectrum assignments. Such a situation would represent an inefficient use of national resources. If the TRA believes that MNOs entering into a spectrum sharing agreement could deflate the demand for mobile spectrum to such an extent that
there will exist excess supply, it may consider possible spectrum related remedies before approving the proposed NSA.

On the other hand, the TRA also notes further potential benefits that may arise as a result of spectrum sharing. In particular, spectrum sharing can allow MNOs to expand their geographic coverage, particularly to rural regions, in a cost-effective manner. This is because, for rural coverage, networks use low frequency spectrum. Since the amount of this spectrum is limited, sharing spectrum can allow a larger number of MNOs to offer services in remote, rural regions, with deeper levels of competition than may be the case under alternative models (such as where one MNO relies on national roaming on another MNO’s network).

The TRA also notes that when developing and implementing spectrum sharing agreements, the relevant MNOs need to ensure and be able to demonstrate to the TRA that the sharing is undertaken in a manner consistent with their licence obligations. In particular, the TRA notes that, as long as spectrum sharing entails the sharing of RAN equipment, the pooling of spectrum across multiple licensees is consistent with Article 16 of Decision No. 116/2019.\(^\text{20}\) Even if MNOs engage in the sharing of their spectrum holdings, individual licensees will continue to be held responsible for the spectrum they hold – i.e., any regulatory or legal liability will remain with each licensee. The Applicants must demonstrate, as part of the Application, that they will continue to comply with their legal and regulatory obligations, as set out in their License and other TRA documentation.

2.9.2 JOINT OWNERSHIP AND OPERATION OF SHARED ASSETS THROUGH A JOINT VENTURE

Network sharing agreements where the MNOs establish a new Joint Venture (JV) to own and operate the shared assets may be subject to further assessments by the TRA. These assessments will focus on the terms of the agreement between the sharing MNOs and the JV, including the settlement model to financially transact with the JV.

As part of its assessment, the TRA will review the details of any proposed JV agreement to ensure that it does not alter the incentives of the parties in a way that it may lead to a substantial lessening of competition. In particular, the TRA will assess whether the proposed management structure of the JV adequately implements information sharing protocols, in a transparent manner.

If the TRA identifies such a risk, it may require the parties to amend the proposed terms of their JV.

Further, the TRA notes that when developing and implementing JV based sharing agreements, the relevant MNOs need to ensure and be able to demonstrate to the TRA that the sharing is undertaken in a manner consistent with their licence obligations to install and operate networks. In particular, the arrangement must be structured in a manner wherein even if the joint network is operated by the JV

\(^{20}\) In particular, Article 16 provides for the TRA to approve the Licensee to relinquish, lease or dispose of the radio equipment to another party. However, if MNOs share spectrum in a way that does not include the sharing of RAN equipment, then Article 16 of the Spectrum Policy no longer applies.
(i.e. not the licensees), the regulatory liability stays with each of the sharing MNOs. This will ensure that the sharing MNOs will be responsible to continue to meet their licence, legal and regulatory obligations, as well as customer handling duties, while effectively only ‘outsourcing’ the operation of their network to the JV).

2.9.3 CORE NETWORK SHARING

MNOs can also choose to share, in addition to the active and passive network elements and spectrum resources, their individual core and transmission networks. The core network is a central part of the overall mobile network. It exists between the RAN and external networks and performs switching functions for all mobile services.

The sharing of core network infrastructure between MNOs represents a much more integrated sharing arrangement than active sharing and therefore suggests a greater convergence in individual MNOs’ service offerings and subsequently, reduced downstream competitive differentiation.

The TRA will expect to assess the potential scope of technical convergence under core network sharing, and its potential impact on competition.

The core network is also responsible for critical functions within the mobile network such as subscriber profile information, location services, and service authentication. Legal intercept also takes place in operators’ core networks. The sharing of these networks could, therefore give rise to potential concerns of aspects related to article (44).

Given this risk, the TRA will carefully consider the potential security risks that may arise as a result of core network sharing. As mentioned above, MNOs will be required to continue to comply with their individual service obligations as described in their License.

2.10 DISPUTE RESOLUTION

As mentioned in Section 3.4, Applicants require prior approval from the TRA to amend any aspect of the NSA, or to dissolve the agreement.

If the sharing MNOs do seek to dissolve their sharing agreement, they must approach the TRA with a clear and comprehensive ‘exit plan’ that demonstrates how they will transition from the provision of their services over the shared network, to the provision of their services over disparate networks, in a way that does not lead to service disruptions and any possible harm to their customers.

To assuage the TRA’s concerns about such disputes in the future, the Applicants must provide, as part of their proposal to enter into an NSA, a brief overview of this exit plan. This must highlight, broadly, the steps the MNOs will take to prevent any adverse impact on consumers in the event that the NSA was dissolved.
In all matters of dispute between the sharing MNOs (whether related to a proposed dissolution or not) the TRA will apply the principles set out in Article 51 Repeated (2) of the Act, as well the Dispute Resolution Procedure (Decision No 44/2010) including amendments.

Article 51 Repeated (2) of the Act states that “If a dispute arises between the licensees in the interpretation of the provisions of this Act, its implementation or the interpretation of the terms of their mutual agreement or its implementation, this dispute shall be brought before the Authority which may ask any of its parties to submit documents and data it deems required to settle the dispute. The Authority’s decision issued regarding the dispute shall be considered final and binding to the parties.”
ANNEX A - ANALYSIS OF COMMON FORMS OF MOBILE SHARING

This annex provides an overview of the most common types of network sharing arrangements, identified across a number of dimensions. This annex also lists some of the key risks and benefits that the different forms of sharing can give rise to, and as such, need to be accounted for when undertaking a regulatory assessment of them.

Note that this annex provides a high-level overview only and focuses on the most common forms of network sharing. As such, it does not offer an exhaustive list of network sharing options available.

In particular, this annex does not serve as a menu of options available to MNOs who wish to enter into a network sharing agreement. The TRA would expect the MNOs to identify the form of network sharing that would suit their needs best, and subsequently present the key benefits and risks that may arise from such an Agreement as part of their formal Application, for the TRA’s consideration.

Network sharing arrangements can primarily be classified on the basis of four dimensions:

1. The network assets shared;
2. Deployment and operational arrangements;
3. Ownership of shared assets; and
4. Geographic division of the shared network.

It is important to note that network sharing arrangements often overlap across these four dimensions, since each dimension looks at these agreements from a different angle. Therefore, the classifications in this annex do not represent an exhaustive set of all combinations of network sharing agreements. Rather, it provides an insight into the key characteristics of different types of sharing agreements. Each of these dimensions is explored in further detail below.

A.1 - THE NETWORK ASSETS SHARED

The most prevalent dimension to classify different forms of network sharing agreements is based on the elements of the network infrastructure shared between MNOs. Depending on their needs, MNOs can choose to limit their sharing to non-electronic (passive) infrastructure only, such as sites and masts, or they can choose to share all their assets, including their radio access, transmission, and core networks, essentially operating as a single network entity. This large range of possible forms of network sharing implies varying levels of integration. As such, different forms of sharing can give rise to significantly different regulatory risks.

Therefore, it is important to differentiate the different types of sharing arrangements based on the extent of sharing, and individually identify potential risks. A high-level overview is provided in the Figure below.
A.1.1 - PASSIVE SHARING

Passive sharing refers to the sharing of non-electronic elements of the network infrastructure, and could include the cell sites, masts, power systems, and the physical site space itself. Crucially, none of the electronic, or ‘active’, network elements are shared between operators, who continue to operate independently. Passive sharing can be further classified into site sharing, mast sharing, and antenna sharing:

- Under **site sharing**, two or more operators share physical site space, but may maintain separate masts/towers, antennas and other active elements. However, they may choose to share support equipment, including shelters, power supply, etc. This kind of sharing is commonly implemented and is generally undertaken in dense urban regions, where availability of suitable space is restricted.

- Under **mast or structure sharing**, in addition to sharing the physical site space, operators also share masts/towers

- Under **antenna sharing**, in addition to the above, operators also share passive antennas and where appropriate, common equipment associated with antennas, such as combiners and feeder cables. This allows operators to further reduce duplication of physical assets, while maintaining separate active infrastructures.
A.1.2 - ACTIVE SHARING

Under active sharing, operators share electronic network infrastructure, such as the radio access network (RAN) which includes active antennas and radio network units, in addition to sharing passive infrastructure. Depending on whether active network sharing arrangements include the sharing of spectrum resources or the core networks, it can be classified into three broad types: MORAN sharing, MOCN sharing and core network sharing.

- **MORAN sharing.** Multi-Operator Radio Access Network (MORAN) refers to a sharing arrangement where operators share all their RAN assets (apart from radio carriers) and passive infrastructure elements, but maintain separate spectrum resources. This is the more commonly implemented form of active network sharing, since the resultant integration between sharing MNOs is limited. In other words, since customer experience with regards to coverage and service quality is largely determined by MNOs' spectrum holdings, it is not significantly impacted by MORAN sharing arrangements.

- **MOCN sharing.** Multi-Operator Core Network (MOCN) refers to a sharing arrangement where operators share their spectrum holdings, in addition to their RAN assets, and passive infrastructure elements. Under such an arrangement, only the operators' core network and transmission network remain separate. Since customer experience is largely determined by spectrum holdings, MOCN can lead to a more efficient use of spectrum and possibly higher quality of service, provided resource sharing rules are in place to share capacity between MNOs. However, the sharing of spectrum may also need to be considered carefully by regulatory authorities, given the scarce nature of spectrum and its importance for providing mobile services.

- **Core network sharing.** Finally, operators can also choose to share their core networks, in addition to other active and passive network elements (including spectrum) to essentially operate as a single network entity with little to no differentiation in service offerings. Such agreements are very rare in practice, since they require a large degree of operational co-ordination and may give rise to more serious competitive concerns than other forms of network sharing.

**BOX 1: SHARING BACKHAUL/TRANSMISSION**

In addition to the decision to share active or passive network elements identified above, MNOs can also separately choose to share their backhaul (transmission networks). Sharing backhaul can give rise to significant savings in operating costs and is therefore often implemented alongside active sharing arrangements.

---

21 GWCN (Gateway Core Network) is a similar solution where part of the core network is shared (i.e. the MME for 4G). This enables additional cost savings compared to MOCN, but may reduce the level of differentiation between MNOs.
In general, a single microwave link can be used for multi operator sharing. Operators share a single physical radio frequency (RF) channel. VLANs are used to separate the operators traffic transported over the single physical RF link by creating logical flows. The Quality of Service (QoS) setting for each VLAN is used to inform the microwave equipment how to treat each VLAN/flow in case of link degradation that could lead to bandwidth decrease.

MW links typically use 28/56/112 MHz channel over particular regulator managed fixed link frequency, or an operator allocated spectrum, or unlicenced spectrum. Millimetre wave (mmW) at higher frequency is also an option, but this is mainly for very short distances where high channel spectrum is available.

A microwave link will be designed to provide a target capacity for a given availability (e.g. 99.99% availability) subject to path conditions and antenna types. Usually, the microwave link capacity is dimensioned 20%-30% more than the required capacity based on engineering rules.

An example for a multi-operator sharing a single microwave link with 3G/4G traffic requirements is shown below where 3G is common to both operators using the same RAN equipment, but 4G is using separate RAN for each operator.

Traffic is encapsulated in VLANs of specific size and QoS marked at the IDU/Ethernet switch (QoS settings are derived either by the RAN QCI at the RAN site (upstream) or the DSCP marking provided by the CSG (downstream) in line with the e2e QOS policy and traffic priorities). These VLANs are...
transported via the single microwave link that is VLAN/QoS 'aware'. Traffic will be dropped based on the QoS priority settings in case the microwave link is degraded and capacity gets restricted. This is achieved by the QoS/VLANs mechanism over the RF section using ACM (adaptive coding modulation) that can intelligently drop traffic based on QoS and RF condition.

In the upstream direction the traffic for each operator is passed from the IDU/Ethernet switch to the IP CSG (Cell Site Gateway). This gateway is connected mainly via a fibre link to an IP WAN (Wide Area Network) that transports the traffic to the operators' Core sites.

**KEY BENEFITS AND RISKS**

There are four key characteristics of network sharing agreements that vary depending on the extent of network infrastructure shared. The extent of the risks and benefits that may arise from a proposed network sharing agreement will depend crucially on the form of network sharing, as well as on factors such as the current state of the market and position of the sharing parties. These characteristics are highlighted in the table below.

### TABLE 2  THE KEY BENEFITS AND RISKS OF THE GENERAL FORMS OF NETWORK SHARING

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>Passive sharing</th>
<th>Active sharing</th>
<th>Core network sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost savings</td>
<td>Passive infrastructure sharing gives rise to large OPEX savings for MNOs due to the reduction in site lease costs as a result of the consolidation of existing sites, and large CAPEX savings due to the reduction in site build costs to deploy new sites. The TRA would expect some of these savings to be passed on to end-users in the form of lower retail prices, higher quality services, or extended service coverage.</td>
<td>Further sharing beyond passive infrastructure provides further scope for incremental CAPEX and OPEX savings. However, if the arrangement includes the sharing of backhaul transmission, there is significant potential for further CAPEX and OPEX savings. The TRA would expect some of these savings to be passed on to end-users in the form of lower retail prices, higher quality services, or extended service coverage.</td>
<td></td>
</tr>
<tr>
<td>Network quality</td>
<td>Since MNOs maintain completely independent RANs, passive sharing only has a limited impact on network quality.</td>
<td>Depending on the form of active sharing, such arrangements can give rise to significant improvements in network quality including better</td>
<td></td>
</tr>
</tbody>
</table>
CHARACTERISTIC

<table>
<thead>
<tr>
<th>Passive sharing</th>
<th>Active sharing</th>
<th>Core network sharing</th>
</tr>
</thead>
</table>

speeds, wider coverage, and quicker deployment of new technologies. This is because the increased sharing of active network components can allow MNOs to benefit from each other’s network investments and technologies, allowing them to offer a more diverse service offering.

### Co-ordination

- Passive infrastructure upgrades to accommodate new equipment
- Commercial negotiations with land owner(s)
- Tower replacements
- Site operations

However, the degree of co-ordination is more limited compared to active sharing.

Active sharing requires more detailed, and regular, co-ordination between sharing parties since certain operational decisions may have to be made jointly. This suggests a greater risk to the sharing parties (through on-going interdependency) as well as to the market (through the risk of information sharing and tacit collusion), potentially harming end-users or competitors.

### Operational differentiation and regulatory concerns

Since MNOs retain control of their active equipment and spectrum, they maintain their ability to differentiate their service quality and offerings, and hence their competitiveness. However, MNOs sharing 100% of their sites will have similar coverage performance, removing one element of service differentiation.

Once MNOs have shared passive infrastructure, the differentiators of service quality include:

- unilateral additional site deployments
- spectrum holdings (under MORAN only)
- technology deployed
- Capacity deployed

To the extent that MNOs can converge on these factors through active sharing, there may be a reduced ability to differentiate services.

*Source: Frontier Economics*
This suggests a general trade-off between cost savings to MNOs from sharing more parts of their networks (from passive to active to core network) and their ability and incentives to engage in infrastructure-based competition. In particular, moving to more integrated forms of sharing potentially implies greater scope for savings, but can simultaneously restrict the degree of strategic differentiation between the sharing MNOs.

Sharing of assets requires that deployment and operations of those shared assets is done jointly. For reasons of cost efficiency, MNOs may also choose to extend this shared deployment and operations arrangement to non-shared assets. This introduces a greater dependency between the MNOs which introduces additional risk of restricting the degree of strategic differentiation between the sharing MNOs. This is discussed further in Section A.2 below.

A.2 - DEPLOYMENT AND OPERATIONAL ARRANGEMENTS

Another dimension across which network sharing agreements can be classified is the degree of shared deployment and operations adopted by the MNOs. Joint deployment and operations is necessary for shared assets (either by one or the MNOs or through a JV). Further efficiencies can be gained by extending the deployment and operations sharing to non-shared assets. For example, the MNOs may have unilateral deployment programmes that they may choose to jointly deploy and non-shared assets that they may choose to jointly operate. Such extended sharing of deployment and operations can deliver efficiencies in both time and cost by, for example, enabling better deployment coordination, and achieving greater volume discounts from suppliers of the deployment and operations services.

Joint deployment and operation of both shared and non-shared infrastructure requires more and ongoing co-ordination between the MNOs, increasing risks to them, as well as to competition in the market (through the risk of tacit collusion).

A.3 - OWNERSHIP OF SHARED ASSETS

The third dimension to classify network sharing agreements is the ownership model employed by the MNOs to manage the shared infrastructure. Since different ownership models can give rise to potentially different incentives for the sharing parties, this is an important consideration when assessing network sharing agreements. Figure 4 below provides an overview of the most common types of ownership models.

Note that MNOs engaging in an agreement which leads to changes in ownership of network assets will need to ensure that the terms and conditions of the licences are not breached.22

---

22 For instance, where the MNO(s), rather than the joint venture, are the parties licensed to deploy a mobile telecommunications network.
A.3.1 - JOINT VENTURE

Under this model, MNOs in the agreement form a joint venture (JV) to own and operate the shared network. Shared infrastructure may be owned and operated by the JV, or by the parent companies with a split arrangement.

Traditionally, this is the most common ownership model employed by MNOs sharing their infrastructure.

A.3.2 - MULTILATERAL SERVICE PROVISIONING

Under this model, two or more of the participating MNOs provide their infrastructure to be shared. In practice, this could be undertaken through a geographic split of network ownership and operation, where MNOs are responsible for operating the shared assets in different parts of the joint coverage area.

This is also a commonly adopted ownership model, for example, by O2 and T-Mobile in Czechia (as explored further in Annex B).

A.3.3 - UNILATERAL SERVICE PROVISIONING

This model is similar to multilateral service provisioning, except that the ownership of infrastructure remains separate (each MNO owns its own network), and only one of the participating MNOs provides its infrastructure to be shared. This is most applicable when one of the MNOs in the sharing agreement owns most of the assets.

However, if the agreement leaves no alternative MNOs in the market (along with an absence of the ability to self-supply), this model could concentrate network assets into the hands of the MNO that...
holds the shared infrastructure and give rise to competitive concerns. This is because, in such a situation, this agreement could effectively create a monopoly and completely remove network-based competition from the market. In such circumstances, ex ante regulation of access to that network may be required, due to the risks of the provider otherwise engaging in anti-competitive behaviour.

A.3.4 - THIRD PARTY PROVIDER

The final ownership model is where a third party service provider, not necessarily affiliated with the MNOs, leases infrastructure for them to use. These third parties can be external companies such as tower operators. Under this model, the control of the site shifts from the MNOs to the neutral host.

In practice, one or more MNOs can also sell their network assets to an independent provider (e.g. Tower Company). As that provider is commonly not active downstream (i.e. vertically integrated), there is then no risk of distorting downstream competition through discrimination or refusal to supply.

A.4 - GEOGRAPHIC DIVISION OF THE SHARED NETWORK

The fourth dimension concerns the geographic implementation of network sharing, particularly with regards to the different incentives in urban and rural regions. In particular:

- **Urban areas:** Congestion and lack of physical space in urban areas generally represents high costs of site acquisition and lease. Sharing of passive network elements can help reduce capital and operating costs significantly, while allowing the greater number of operators to help ease capacity constraints on congested urban sites. However, the required capacity per site may exceed the site’s ability to support it due to size, weight, or emission limits, which may require unilateral site deployment.

- **Rural areas:** Rural areas are generally more remote and less densely populated. This effectively increases the cost per customer of deploying new sites in rural areas, and reduces the return on investment. Sharing infrastructure can reduce this cost burden, while allowing MNOs to meet their rural coverage operations. Sharing in rural areas is generally seen as a cost efficient solution to extend coverage since there is a greater focus on coverage than on service quality. This could be because, for example, a basic coverage layer network is sufficient, given the low levels of traffic, to meet required quality of service levels.
ANNEX B - CASE STUDIES

This annex considers five active mobile sharing arrangements between mobile operators in Europe and South America. Specifically, it focuses on the assessment undertaken by the relevant national regulatory or competition authority to identify any potential lessening of competition, or harm to consumers, in the market for mobile services that could arise as a result of these arrangements.

The purpose of this international review is to highlight how such assessments have been approached by other regulatory /competition authorities and to identify some key themes and common concerns that have arisen as a result. Note that in its assessment process, the TRA is not obliged to follow the practices and approaches adopted by the regulatory/competition authorities in these case studies. These cases serve merely as examples of how different authorities have assessed the potential impacts of NSAs, and the factors that they have accounted for, in their assessment, given the particular characteristics of the affected markets and the proposed agreements. The assessment process that will be followed by the TRA to assess proposed NSAs is set out in the regulatory framework in Section 3.

The five case studies explored in this annex cover the following network sharing agreements:

- **Denmark**: Telenor and TeliaSonera
- **Belgium**: Proximus and Orange
- **Czech Republic**: O2 and T-Mobile
- **Colombia**: Telefonica and Tigo
- **Ireland**: Eircom and O2

Table 3 below provides a brief overview of the five network sharing agreements.
<table>
<thead>
<tr>
<th>CASE STUDY</th>
<th>TYPE OF NSA</th>
<th>YEAR</th>
<th>EXCLUSIVITY</th>
<th>NETWORKS ASSETS COVERED</th>
<th>TECHNOLOGIES COVERED</th>
<th>OWNERSHIP MODEL</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Denmark</strong></td>
<td>MOCN</td>
<td>2012</td>
<td>The NSA excluded 1 of the 3 MNOs in the wholesale market</td>
<td>40%-60% The MNOs share their Radio Access Network (RAN) infrastructure covering both physical resources (masts and antennas), as well as all spectrum resources. However, the core and transmission networks remained independent</td>
<td>2G (for voice), 3G (for voice and data), as well as 4G (LTE).</td>
<td>The assets were owned and operated by a joint venture, Newco</td>
<td>Cleared subject to commitments by the sharing MNOs</td>
</tr>
<tr>
<td><strong>Belgium</strong></td>
<td>MORAN</td>
<td>2019-present</td>
<td>The NSA excluded 1 of the 3 MNOs in the wholesale and retail markets</td>
<td>50%-70% All three MNOs already shared parts of their passive infrastructure, including towers and sites. This agreement also included active equipment on their</td>
<td>2G, 3G, and 4G</td>
<td>The assets were owned and operated by a 50/50 joint venture MWingz</td>
<td>NSA suspended to carry out further review</td>
</tr>
<tr>
<td>CASE STUDY</td>
<td>TYPE OF NSA</td>
<td>YEAR</td>
<td>EXCLUSIVITY</td>
<td>JOINT MARKET SHARE OF SHARING PARTIES</td>
<td>NETWORKS ASSETS COVERED</td>
<td>TECHNOLOGIES COVERED</td>
<td>OWNERSHIP MODEL</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------</td>
<td>-------</td>
<td>-------------</td>
<td>----------------------------------------</td>
<td>-------------------------</td>
<td>----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RAN. However, the operators maintained separate spectrum, core network and transmission network.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>MORAN</td>
<td>2011- present</td>
<td>The NSA excluded 1 of the 3 MNOs in the wholesale and retail markets</td>
<td>~75%</td>
<td>The two MNOs shared their RAN equipment, but maintained separate spectrum, as well as core and transmission networks</td>
<td>2G and 3G originally, which was expanded to also include 4G</td>
<td>Operations were split geographically, with O2 operating the shared network in the eastern part of the country, and T-Mobile in the western.</td>
</tr>
<tr>
<td>Colombia</td>
<td>MORAN</td>
<td>2013</td>
<td>The NSA covered 2 of the 5 MNOs</td>
<td>&lt;40%</td>
<td>The two MNOs shared their active network infrastructure, while maintaining independent spectrum resources, and core and transmission networks</td>
<td>4G</td>
<td>The assets were operated by a joint venture, Netco 4G</td>
</tr>
<tr>
<td>CASE STUDY</td>
<td>TYPE OF NSA</td>
<td>YEAR</td>
<td>EXCLUSIVITY</td>
<td>NETWORKS ASSETS COVERED</td>
<td>TECHNOLOGIES COVERED</td>
<td>OWNERSHIP MODEL</td>
<td>OUTCOME</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>------</td>
<td>-------------</td>
<td>-------------------------</td>
<td>----------------------</td>
<td>-----------------</td>
<td>---------</td>
</tr>
<tr>
<td>Ireland</td>
<td>MORAN</td>
<td>2014</td>
<td>The NSA covered 2 of the 4 MNOs</td>
<td>The two MNOs shared site equipment, power supplies, and towers and transmission equipment</td>
<td>The assets were owned and operated individually</td>
<td>The NSA was considered to be a necessary commitment to clear the proposed merger between 2 MNOs</td>
<td></td>
</tr>
</tbody>
</table>
KEY THEMES ARISING FROM REGULATORY ASSESSMENTS OF ACTIVE MOBILE NETWORK SHARING AGREEMENTS

The TRA has identified some common themes across the regulatory assessments undertaken in the five case studies. These include common concerns arising from network sharing arrangements and potential remedies for the same. Although the extent and severity of the concerns depend on the market context, as well as the specifics of the proposed arrangement, these common concerns provide a useful overview of the types of competitive issues that the TRA will consider when conducting its assessments. These are summarised below.

THE ASSESSMENT PROCESS

- **The impact on competition:** Across the five case studies, the assessment has primarily concerned the potential impact of the sharing agreement on competition in the relevant markets. By considering factors such as the risk of tacit collusion and information sharing between the relevant parties, as well as the impacts on the competitiveness of MNOs excluded from the agreement, the regulatory/competition authorities have sought, where necessary, to put in place commitments and remedies to ensure that the agreement does not restrict competition, and ultimately lead to unfavourable outcomes for end-users. This has been reflected in the framework, with the primary focus on the impact of any potential sharing agreements on the competitiveness of the various parties in the mobile sector, as well as on the general level of competition in the market.

- **Complexity of the process:** Across the different assessments considered, a common characteristic is the general level of complexity involved in assessing such an agreement. This complexity has often resulted in these assessments taking several years to come to a conclusion. This is because there are a number of market-specific and agreement-specific factors that must be taken into account when considering the risks and benefits. For example, the specific settlement model used between two Danish MNOs entering into a sharing agreement was deemed to potentially be problematic and the regulator required a specific commitment to assuage its concerns. This suggests the need for a case-by-case assessment of network sharing agreements.

- **Recognition of potential benefits of such agreements:** Regulatory/competition authorities identify the potential benefits that can accrue to the market through network sharing agreements, typically identifying improved coverage, the rollout of new technologies, and significant cost savings for operators as such potential benefits. Therefore, if regulatory/competition authorities identify potential competitive concerns, they generally exhibit a preference for imposing remedies or commitments to address those concerns, as opposed to blocking the proposal outright. This suggests a desire to prevent any adverse competitive effects as a result of the proposed agreements, while ensuring that the potential benefits are not foregone.

KEY INSIGHTS FROM THE ASSESSMENTS

- **Information sharing between MNOs increasing the risks of tacit collusion:** Network sharing agreements inevitably require the sharing MNOs to exchange information and discuss forward-looking plans. Across their assessments, regulatory/competition authorities have identified the risk posed by this increased integration on the MNOs’ incentives and ability to tacitly collude. This is particularly problematic if the sharing agreement involves a joint venture, since it can act like an open forum for MNOs to obtain knowledge on each other’s prices and customers, making it easier to co-ordinate to the detriment of competition in the market. Sharing MNOs must therefore commit to restricting the type of information shared as part of their agreement. If the agreement
involves the creation of a joint venture, the risk of information sharing must also be limited by regulating the appointment of the members on the Board of the joint venture.

- **Restriction of direct competition between the sharing MNOs:** Another concern raised by regulatory/competition authorities is the impact of the agreement on the direct competition between the sharing MNOs. Active sharing, and to a greater extent, spectrum sharing, can lead to an equalization in the service quality of the MNOs (on the basis of coverage, technology, and speeds). As a result, this can severely reduce the competitive differentiation between the MNOs and subsequently, give rise to competitive concerns. The potential impact of the restriction of direct competition between the sharing MNOs can vary depending on the type of sharing, as well as the extent of competitive pressures imposed by the remaining competitors in the market. Divestment of shared assets to maintain geographic competition may be a possible remedy, but this must be assessed on a case-by-case basis.

- **Increased concentration of spectrum resources:** Active sharing agreements that also share spectrum resources have given rise to concerns regarding the distribution of spectrum among the MNOs in the market. In particular, regulatory/competition authorities have identified the scope for the sharing MNOs to hold a disproportionately larger amount of (combined) spectrum, as compared to their direct competitors, which would give them a distinct competitive advantage by allowing them to offer greater capacity at higher speeds. This risk can be addressed in the design of any future spectrum awards to minimise the asymmetry in the spectrum holdings between MNOs.

- **Alteration of commercial incentives due to the adopted financial model:** Proposed sharing arrangements involving the formation of a JV have also raised concerns regarding the settlement model adopted by the sharing MNOs. For example, a settlement model wherein the sharing MNOs face no fixed costs, due to settling with the JV on a usage basis, would reduce incentives to unilaterally increase their customer base and benefit from economies of scale. Therefore, regulatory/competition authorities have closely assessed the way the JV interacts with the sharing MNOs and required commitments if they identify a risk of altered incentives. Depending on the type of settlement model adopted by the sharing MNOs, the TRA will closely review the terms of the arrangement with the JV. If the TRA identifies the risk of the terms altering the MNOs’ incentives, the MNOs will be required to amend the terms.

Each of these agreements is explored in further detail below.
B.1 - DENMARK: RAN SHARING AGREEMENT BETWEEN TELENOR AND TELIASONERA

B.1.1 - CONTEXT AND SCOPE OF THE AGREEMENT

In 2012, two of the four mobile network operators (MNOs) in Denmark, Telenor and Telia, put forward a proposal to the Danish Competition and Consumer Authority (DCCA) to share their Radio Access Network (RAN) infrastructure covering both, physical resources (masts and antennas), as well as all their spectrum resources. The proposed sharing agreement would extend throughout Denmark and would cover all technologies including 2G (for voice), 3G (for voice and data), as well as LTE. However, the parties’ core networks and transmission links would remain separate, and they would continue to be independent providers of mobile telephony and mobile broadband services in the wholesale and retail markets, maintaining separate marketing and administration responsibilities.

The objective of this sharing arrangement was to restructure the parties’ individual RAN networks and create an optimal access network to fulfil their coverage obligations at the lowest cost. The parties argued this would allow them to extend their coverage to previously unserved geographies, while allowing an earlier and more extensive rollout of LTE technologies. Further, the parties believed, that by sharing their RAN and spectrum, they would be able to better compete with the market leader’s (TDC) mobile network with regards to both, coverage and technology.

The two MNOs proposed to implement this sharing agreement via a joint venture, Newco, which would allow them to jointly own, control, and develop the shared RAN infrastructure.

At the time, Telenor and Telia were the second and third largest MNOs in Denmark, with a combined retail market share of around 50% of total connections. The remaining two MNOs (TDC and Hi3G) were not part of this RAN sharing arrangement. Further, at the time, Hi3G did not have its own RAN but was roaming on TDC’s network. As such, the wholesale market for mobile telephony and broadband was a three player market. There were concerns that the proposed sharing agreement could lead to cost and informational asymmetries between Telenor and Telia on one hand, and TDC on the other.

B.1.2 - THE COMPETITIVE ASSESSMENT OF THE PROPOSED AGREEMENT

B.1.2.1 - THE RELEVANT AUTHORITY AND THE ASSESSMENT FRAMEWORK

The potential competitive effects of the proposed agreement were assessed by the Danish Competition and Consumer Authority (DCCA). When considering the relevant framework to apply to assess the agreement, the DCCA concluded that it did not constitute a merger and as such was not covered by the rules of the Danish Competition Act on merger control. This is because, under the proposed arrangement, Newco would only be responsible for operating the joint assets, while the two MNOs would continue as independent entities with regards to their operations and commercial strategies. Since Newco was not an independent joint venture with independent decision-making competence, over and above that required for the operation of the network for the use of the parties, the arrangement was not considered to be strong enough to warrant a merger control assessment.

As a result, the DCCA assessed the potential competitive impacts of the sharing arrangement in accordance with the legislation for assessing horizontal agreements in the Competition Act, as well as the European Commission guidelines. In particular, section 6 of the Danish Competition Act prohibits agreements that directly, or indirectly, restrict
competition. However, section 8 of the Act allows for certain agreements to be exempt from such prohibition, if they can be shown to improve efficiencies, and lead to better outcomes for consumers, so long as they do not impose unnecessary restrictions to achieve these objectives. As such, a key question within DCCA’s assessment was whether section 8 would apply to this particular sharing agreement.

Under its assessment framework, the DCCA first defines the relevant markets which are likely to be affected by the proposed sharing agreement, and subsequently assesses the likely positive and negative impacts of the agreement on each of the identified markets.

**B.1.2.2 - THE MARKET DEFINITION**

In line with the assessment framework, the DCCA identified four relevant product markets/product layers where the agreement could give rise to anti-competitive outcomes:

- **The market for access to passive network infrastructure:** To provide wholesale and retail mobile services, MNOs use a combination of self-owned, as well as access to third-party owned, masts and antennas. Under the proposed agreement, the masts and antennas owned by the two MNOs would be aggregated and the decisions regarding site access/colocation and colocation on their antennas to access seekers would be left to Newco.

- **The market for spectrum resources:** Since the proposed agreement included spectrum sharing, the DCCA saw a need to assess the impact on current and future spectrum holdings. In particular, the DCCA was concerned about spectrum caps being imposed on individual bidders in future auctions, since Telia and Telenor would be bidding for spectrum jointly.

- **The wholesale market for mobile services:** Since capacity generated in the RAN is an essential input to a mobile operator’s retail and wholesale service offerings, the market for mobile telephony and mobile broadband was considered to be a relevant market.

- **The retail market for mobile services:** As above

The geographic scope of each of these product markets was defined as the entire territory of Denmark, given Telenor and Telia’s national coverage levels at the time.

**B.1.2.3 - COMPETITIVE CONCERNS RAISED**

Having defined the relevant markets to consider, the DCCA identified five potential anti-competitive concerns as a result of the proposed sharing agreement that it explored in further detail. These were:

1. Lessening of competition for access to passive mobile infrastructure
2. Increased concentration of mobile spectrum resources
3. Lessening of the direct competition between the two parties due to coverage and technology being removed as potential competitive differentiators
4. The risk of tacit collusion in the wholesale and retail markets for mobile services
5. Increased information exchange between the two parties increasing the risk of tacit collusion
Each of these concerns are explored in detail below.

**LESSENING OF COMPETITION FOR ACCESS TO PASSIVE MOBILE INFRASTRUCTURE**

The proposed sharing agreement would make some of the masts and antennas owned by the two sharing MNOs redundant, as they looked to integrate their infrastructure to avoid duplication. Given this, the DCCA was concerned that dismantling these masts would have adverse impacts on other operators that were collocating their antennas at these sites, reducing their geographic service coverage. This in turn may hamper their ability to continue to compete effectively in the relevant downstream markets.

The DCCA therefore required the parties to guarantee that they would sell or rent these masts to another network operator, with masts only been decommissioned if no other operator was interested in taking them over. Further, the parties submitted an undertaking that the sale or rental price for these masts would bet set in a reasonable and non-discriminatory manner.

**INCREASED CONCENTRATION OF SPECTRUM RESOURCES**

A second potential concern highlighted by the DCCA was the impact of the sharing arrangement between Telia and Telenor on the market for spectrum allocation.

Prior to the sharing arrangement, the total spectrum jointly held by Telenor and Telia was significantly larger than the individual spectrum holdings of 3 and TDC. As such, Telenor and Telia pooling their spectrum holdings could have a significant impact on their ability to offer greater speeds and capacities than their competitors, giving them a competitive advantage. Additionally, following the sharing arrangement, Telia and Telenor would have combined spectrum resources in higher frequency bands which would allow them to offer services with LTE-advanced technology at maximum speeds.

Under the proposed agreement, Newco would be in charge of bidding at future spectrum auctions and would be the holder of future licenses. However, despite this, the DCCA expressed a concern that the parties may bid for spectrum separately and then pool spectrum under Newco, which could offer them significantly more spectrum than their competitors and therefore, a material competitive advantage in the long run.

As such, the DCCA required the two operators to submit an undertaking to not bid or acquire spectrum licenses for mobile and data services individually, but only through Newco. Further, the DCCA also suggested that Newco be treated as a single operator in future auctions and be subject to any spectrum cap (rather than both MNOs being separately subject to that spectrum cap).

---

23 In 2012, the Danish telecommunications authority announced that in the upcoming spectrum auction, a bidder could acquire no more than 2*20 MHz. This implied that, if the sharing agreement went ahead, Newco would be subject to this cap, as opposed to Telia and Telenor separately being able to acquire 2*20 MHz and pooling them together.
LESSENING OF DIRECT COMPETITION BETWEEN THE TWO PARTIES

The proposed sharing arrangement would increase the alignment between the parties’ service offerings, particularly the level of coverage and technology offered, which the DCCA was concerned could lower the level of strategic differentiation between the two players, and subsequently weaken downstream competition. The DCCA considered three types of service characteristics:

- **Coverage:** The differential coverage between operators serves as an important differentiator in the quality of service, as identified by a market survey undertaken by the DCCA. Since geographic coverage levels are entirely driven by the RAN, the DCCA concluded that the proposed sharing agreement would result in identical coverage levels of both parties, eliminating this as a potential differentiating factor when competing downstream.

- **Technology:** The DCCA identified that, despite the risk that the proposed agreement could lead to an equalisation in the technology offer of the two MNOs, reducing the strategic differentiation between the two, there was a natural convergence in the technology offers in the counterfactual scenario (i.e. in the absence of the agreement). Therefore, the DCCA concluded that the agreement did not give rise to any incremental concerns under the counterfactual.

- **Quality, capacity, and speed:** Whilst these dimensions are also important differentiators of retail mobile service offerings, the DCCA did not consider the NSA to adversely impact them. This is because these characteristics are partly defined by the operator’s core and transmission networks, which would continue to be maintained independently.

THE RISK OF TACIT COLLUSION IN THE WHOLESALE AND RETAIL MARKETS FOR MOBILE SERVICES

The DCCA was concerned that Telenor and Telia, as a result of their close collaboration, could collectively raise prices and eliminate price competition, to the detriment of customers (such as MVNOs) and end-users. In the wholesale market, this could have a knock-on impact on the retail downstream markets by limiting the ability of MVNOs to compete to such an extent that they have to exit the retail market, diluting downstream competition and harming end-users.

To assess the impact of the network sharing agreement on the risk of tacit collusion, the DCCA assessed whether restricting competition in the retail market by raising wholesale prices to MVNOs would be more profitable than continuing to operate in the wholesale market in a non-coordinated manner.

To do so, the Authority followed the European Commission’s guidelines to undertake a counterfactual analysis to assess the risk of tacit co-ordination under a sharing agreement (the ‘factual’) as compared to the risk under no agreement (‘the counterfactual’). As per the guidelines, the Authority assessed this risk against five conditions:

---

Market share and concentration: Since tacit collusion is easier to maintain in markets with fewer players, the market shares of individual companies is an important element to consider when assessing the risk of tacit co-collusion. The wholesale market was characterised by only three MNOs\textsuperscript{25}, with Telenor and Telia representing 60-80\% of the market. Therefore, the DCCA concluded that the risk for tacit collusion was already high under the counterfactual. However, the proposed agreement was expected to further exacerbate this risk, since even though the number of MNOs would remain unchanged, two of the three MNOs would have greater incentives to collude.

Special market conditions: The DCCA also assessed other market factors that could act as a catalyst or a barrier to tacit collusion, and whether the proposed agreement would have a material impact on them. These were:

- **Barriers to entry:** The DCCA concluded that the proposed agreement was unlikely to have an effect on barriers to entry into the market (and hence the scope for entry-based competition) which were perceived to be high in the wholesale level, but low at the retail level;

- **Operational knowledge of other companies costs:** As per the DCCA, the proposed sharing agreement would likely lead to cost symmetries as Telenor and Telia would share a larger proportion of common costs, thus making tacit collusion easier.

- **Customer mobility:** The DCCA concluded that proposed agreement would have no effect on the level of customer mobility in the wholesale and retail markets.

- **Economies of scale:** The DCCA also concluded that since the sharing arrangement did not include the core and transmission networks, the parties would continue to benefit from independent economies of scale. This would continue to provide a strong incentive to attract larger numbers of customers to spread out the fixed costs as widely as possible, weakening the incentives to collude.

- **The degree of uniformity of cost structures:** Since the sharing arrangement between Telenor and Telia would unify the share of costs related to the production of RAN capacity, there would be a greater degree of common costs between the two parties. Despite the majority of these common costs being fixed (and therefore, having a limited impact on prices), the DCCA was concerned that an increase in the already large degree of cost symmetry between the two MNOs, could lead to a greater risk of tacit collusion.

- **The settlement model between the parties and the joint venture:** The way the operators choose to settle with the JV was also considered to be an important factor. The DCCA required the settlement model with Newco to reflect the underlying cost structure of the RAN. In particular, the DCCA required the fixed costs to be shared equally between the parties, to maintain economies of scale and hence the individual incentives of the MNOs to compete for additional customers.

- **Information exchange:** The DCCA concluded that since the agreement would allow the parties to exchange commercial and strategic information, it would likely increase the risk for tacit collusion compared to the status quo of no sharing.

Overall, the DCCA concluded that the risk of tacit collusion existed in the market even under the counterfactual scenario. However, this risk could be increased under the factual due to the increased degree of cost symmetry and

\textsuperscript{25} Even though 3 had its own network infrastructure, it had more limited coverage and product offerings to wholesale customers. As such, MVNOs did not consider 3’s network to be a viable alternative. As such, wholesale customers sought access to the networks owned by Telenor, Telia, and TDC.
the level of information sharing between the parties. Additionally, the choice of settlement model could reduce incentives to compete for customers.

**INCREASED INFORMATION EXCHANGE BETWEEN THE TWO PARTIES**

The DCCA also raised concerns about the potential for sharing commercially sensitive information on prices, costs, and customers between Telenor and Telia, through Newco’s invoicing.

As such, the DCCA required the parties to submit undertakings regarding the information contained within Newco’s invoices to the parties, as well as commitments restricting what information may be exchanged between Newco employees.

**B.1.2.4 - THE BENEFITS OF THE PROPOSED SHARING AGREEMENT**

Having identified the primary competitive concerns as a result of the proposed sharing agreement between Telenor and Telia, the DCCA also assessed the potential benefits and efficiency gains that it could give rise to, and whether these benefits would be subsequently shared with the end-users. Subsequently, the DCCA established whether the potential benefits arising from the agreement would be large enough to offset the anti-competitive effects it had identified or whether the benefits could be achieved through other means. This, in turn would guide the DCCA’s decision on whether the proposed agreement should be exempt from prohibition under section 6 of the Danish Competition Act.

The key benefits identified by the DCCA are summarised in Table 4 below.

**TABLE 4  KEY BENEFITS OF THE PROPOSED NETWORK SHARING AGREEMENT**

<table>
<thead>
<tr>
<th>BENEFIT</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A better network</td>
<td>- Optimised distribution of masts and antennas making geographic coverage more fine-grained, increasing coverage in rural areas</td>
</tr>
<tr>
<td></td>
<td>- Diversified product offering with Telenor able to access the increased speeds resulting from Telia’s investments in LTE technology, and Telia benefitting from more robust 2G coverage, by using Telenor’s expansive 2G network.</td>
</tr>
<tr>
<td>Cost savings</td>
<td>- Significant savings in site build and lease costs primarily as a result of fewer masts and antennas require to operate one RAN</td>
</tr>
<tr>
<td></td>
<td>- Scope for further savings from Telenor not having to invest in its LTE network from scratch.</td>
</tr>
<tr>
<td>Increased competitive pressure on TDC</td>
<td>- Creation of a better RAN could provide stiffer competition to the retail market leader, TDC, with regards to network coverage.</td>
</tr>
</tbody>
</table>

*Source: DCCA (2012). Review of network sharing agreement between Telenor and Teliasonera*
Based on a qualitative assessment of the potential extent of the three benefits identified above, the DCCA concluded that any anti-competitive effects likely to result from the reduction in competition between the parties would be offset by efficiency gains in the form of the creation of a mobile network with better coverage and technology offerings. Further, the DCCA considered that these benefits would be passed on to end-users in the form of better coverage and new technologies, as well as increased investment in the network by Telia and Telenor.

Further, the DCCA concluded that the efficiency gains achieved by the proposed agreement could not be replicated in the absence of network sharing, or by adopting a different model of sharing. In particular:

- **Passive sharing or MORAN sharing** (i.e. maintaining separate spectrum resources) alone would not allow Telenor and Telia to benefit from using each other’s technological capabilities, since the technologies supported by a network depend, in part, on the capability of network infrastructure and the spectrum bands used.
- **A single operator (such as Telenor or Telia individually)**, with no network sharing, would not be able to achieve these efficiency gains without incurring significant costs, since a single operator would have to invest in new sites and antenna positions to achieve the same increases in coverage and network quality.

### B.1.3 - PROPOSED REMEDIES AND THE FINAL DECISION

As explored above, the DCCA identified a number of potential anti-competitive concerns that could arise as a result of the proposed agreement. In order to address these concerns, the two MNOs made five commitments to the DCCA. These were:

- To address the **concerns on the increased risk of tacit collusion at the wholesale level**, the MNOs agreed to accommodate all third party requests for access to wholesale mobile services on “market conditions”, unless this is technically unfeasible.
- To address the **concerns on the settlement method between the parties and the JV**, the parties committed to adopting a tariff arrangement that reflected the underlying cost structure of the RAN, where all parties bear fixed costs equally.
- To address the **concerns on the potential concentration of spectrum resources**, the parties committed to buying frequency licences jointly through Newco.
- To address the **concerns on the potential reduction in competitors’ coverage due to the closing down of masts and antenna positions**, the parties committed to selling or letting antenna sites to other operators on reasonable and non-discriminatory terms. These sites would only be closed down if there were no interested parties.
- To address **concerns on the potential sharing of commercially sensitive information**, the parties committed to adopt a set of restrictions regarding what information could be shared between the JV and the parties, as well as restrictions on the appointment of the members on the board of the JV.

Based on these five commitments, coupled with the DCCA’s conclusion that any anti-competitive effects as a result of the sharing agreement were likely to be offset by the efficiency gains, the DCCA concluded that the agreement qualified under section 8 of the Danish Competition Act and there were no grounds for action on the proposed sharing agreement in accordance with section 6 of the Danish Competition Act.

Therefore, the sharing agreement was cleared to proceed.
B.2 - BELGIUM – MORAN SHARING AGREEMENT BETWEEN PROXIMUS AND ORANGE

B.2.1 - CONTEXT AND SCOPE OF THE AGREEMENT

Proximus and Orange are the largest MNOs in Belgium and entered the market in 1994 and 1996 respectively. In 1999, the third MNO, Telenet entered the Belgian mobile market, but despite having national coverage, it was unable, for many years, to gain significant market share from Proximus and Orange.

In 2019, Proximus and Orange, announced an agreement to share their RANs to enable a faster and broader roll-out of 5G in Belgium, improving coverage and meeting increasing demand for high quality and better indoor coverage. This agreement would not only cover 5G rollout but also support the sharing of existing 2G, 3G, and 4G RAN networks, allowing a large number of sites to be shut down and placed more efficiently along the grid. The shared infrastructure would be planned, built, and operated by a 50/50 joint venture, MWingz.

Regulatory obligations implied that all three MNOs already shared parts of their passive infrastructure, including their towers and sites. The proposed sharing agreement, therefore, aimed to extend the level of sharing between Proximus and Orange to also include active equipment on their RAN. However, the operators would maintain their separate spectrum assignments, as well as separate core and transmission networks. As such, the operators would continue to offer their services on the retail and wholesale markets separately, as well as each retaining ownership of their equipment and remaining free to invest unilaterally.

Telenet also entered, unsuccessfully, conversations to form part of the sharing arrangement. As a result, Telenet appealed to the Belgian Competition Authority (BCA) that the agreement could give rise to anti-competitive outcomes, particularly with regards to an upcoming spectrum auction. As such, Telenet submitted an undertaking to the BCA to suspend this proposed agreement till after the auction.

Responding to Telenet’s formal complaint, the BCA undertook a prima facie assessment of the proposed network sharing agreement and came to the conclusion that there was sufficient scope for the agreement to give rise to anti-competitive outcomes, and subsequently decided to suspend it for two months, during which period the Belgian telecommunications authority, the BIPT (The Belgian Institute for Postal services and Telecommunications) would carry out an in-depth review of the terms of the agreement.

This case study focuses on the BCA’s initial prima facie assessment prompted by Telenet’s submission.

B.2.2 - THE COMPETITIVE ASSESSMENT OF THE PROPOSED AGREEMENT

B.2.2.1 - THE RELEVANT AUTHORITY AND THE ASSESSMENT FRAMEWORK

In Belgium, any activities that potentially restrict competition are investigated, in the first instance, by the BCA. To carry out its legal powers, the BCA comprises an Investigation Service (the Investigation and Prosecution Service) and a decision-making body (Competition College). This particular assessment of the sharing agreement was carried out by the Competition College (CC) of the BCA.

It is important to note that the CC only carried out a prima facie investigation to assess whether there was a need for a more in-depth consideration of the proposed agreement. As such, this investigation only considered whether the
potential anti-competitive concerns raised in Telenet’s submission were reasonable. If it concluded that they did, this would trigger a more detailed assessment by BIPT.

As a first step, the CC had to determine, by assessing whether or not the joint venture was a full functioning merger, the relevant framework to assess this agreement. In doing so, the CC concluded that this was not the case, as the proposed joint venture would not independently offer its own services in the retail and wholesale markets. As a result, the proposed arrangement was not assessed under the rules on merger control. Instead, the agreement was assessed under the rules on the exchange of commercially sensitive information and forms of cooperation between competitors, in light of Articles 101 and 102 of the TFEU (the Treaty on the Functioning of the European Union)\(^{26}\).

As part of its assessment, the CC first identified the relevant markets that were likely to be affected by the agreement, after which it assessed key anti-competitive concerns in these markets from the proposed JV.

**B.2.2.2 - THE MARKET DEFINITION**

In line with the framework, the CC identified four relevant markets, all of which were national in scope. These were:

- the market for retail business mobile services,
- the market for non-business mobile services\(^{27}\),
- the market for wholesale access to mobile networks;
- the market(s) for acquiring mobile spectrum/bandwidth.

Having defined the relevant markets, the CC undertook its assessment of the potential anti-competitive effects of the proposed agreement. This review places greater weight on the assessments and conclusions of the CC itself, as opposed to the concerns raised by Telenet in its submission.

**B.2.2.3 - COMPETITIVE CONCERNS RAISED**

In its assessment, the CC focussed on two main areas. These were:

- The impact of the agreement on competition in the retail and wholesale mobile markets;
- The impact of the agreement on future spectrum auctions.

**IMPACT ON COMPETITION IN THE RETAIL AND WHOLESALE MOBILE MARKETS**

Assessing the three dimensions below, the CC considered it reasonable to assume that the proposed sharing agreement could lead to a lessening of competition in the retail and wholesale mobile markets. As such, it concluded that a more in-depth analysis of these potential concerns was warranted. In particular:

- The proposed network sharing agreement equalised the network coverage and capacity between Proximus and Orange, which could subsequently limit competition in the retail and wholesale mobile markets in Belgium.

---

\(^{26}\) Articles 101 and 102 of the Treaty on the Functioning of the European Union (TFEU) prohibit agreements and concerted practices which may affect trade and prevent or restrict competition.

\(^{27}\) Note that the CC identified the retail markets for business and non-business mobile telephony separately because 5G services would primarily be offered to business customers to begin with.
Additionally, given the limited competitive pressure exerted by Telenet, there could be reduced incentives to innovate and invest in new technologies, particularly in the business retail market. The CC concluded that the restriction of direct competition between the two MNOs was a reasonable concern. This conclusion was echoed by the BIPT (the Belgian telecommunications authority) who believed that a further assessment was necessary to assess the practical implications of the proposed agreement.

- Secondly, the CC considered that the sharing of commercially sensitive information between Proximus and Orange could make it easier for the two to co-ordinate on strategic decision making to the extent that the joint objectives of the JV would supersede individual incentives between the two MNOs to compete. Despite Proximus and Orange taking steps to handle such information exchange (for example, by setting up a clean team in the JV that would restrict the type of information shared between the parties), the CC concluded that it could not be certain that the proposed arrangement would not dampen the incentives for mutual competition.

- Finally, an increase in the degree of common costs between Proximus and Orange, as a result of joint production, could potentially lower informational barriers between the two, and make it easier to tacitly co-ordinate. However, the CC concluded that since the costs faced by each operator would depend heavily on their spectrum assignments, there was insufficient evidence to suspect that potential cost alignment could increase the potential for co-ordination.

**IMPACT ON FUTURE SPECTRUM AUCTION**

The CC also assessed the potential impacts of the sharing agreement on future spectrum auctions, based on whether the agreement would lead to a heightened risk of co-ordination of bidding behaviour during the auctions.

The key concern was that the discussions and implementation of the sharing agreement between Orange and Proximus requires information exchanges and mutual interaction that – even in the absence of explicit coordination – could potentially allow them to gain insights and make deductions about their future bidding behaviour during a spectrum auction. This may create an information asymmetry between the participants in the auction.

However, the CC concluded that it was not obvious that the parties’ bidding decisions would be led by anything else than their own strategy, given that the proposed agreement did not concern spectrum sharing and that the parties would remain competitors in the Belgian mobile market.

The CC also noted that even if the two sharing parties co-ordinated their bidding behaviour, they would have an interest in bidding less aggressively to reduce the cost spectrum. As such, this would reduce spectrum related revenues for the government, but would, in practice, benefit Telenet as it would increase its chances to win greater quantities of spectrum.

As such, the CC found insufficient evidence to conclude that the sharing agreement would lead to an alignment in the bidding behaviour between Proximus and Orange in an upcoming spectrum auction.

**B.2.2.4 - PROPOSED REMEDIES AND THE FINAL DECISION**

Based on the CC’s *prima facie* conclusions that the proposed agreement could potentially lead to adverse impacts on competition, the BCA moved to undertake a more in-depth assessment of the proposed agreement. However, due to
the potentially long assessment period, the BIPT proposed to suspend the agreement for two months during which, it would review its proposed terms.

As far as we are aware, neither the BCA, nor the BIPT investigations are concluded and as such, it is unclear whether there have been any further concerns raised.

B.3 - CZECH REPUBLIC: ACTIVE NETWORK SHARING BETWEEN O2 AND T-MOBILE

B.3.1 - CONTEXT AND SCOPE OF THE AGREEMENT

O2 and T-Mobile are the two largest network operators in the Czech mobile market, jointly accounting for approximately 75% of all subscribers. There is also a third MNO active (Vodafone). O2’s mobile infrastructure and wholesale business is operated by CETIN, a network infrastructure company28.

In 2011, T-Mobile, O2, and CETIN entered into an active network sharing arrangement wherein they shared their RAN equipment, but maintained separate spectrum assignments, as well as core and transmission networks. At the time, the operators shared all available technologies (i.e. 2G and 3G). Around 2014, the network sharing agreement broadened in scope to also share 4G LTE networks. The agreement covered the entire Czech territory with the exception of Prague and Brno, thus amounting to around 85% of the population, with O2 responsible for operating the shared network in the eastern part of the country, and T-Mobile operating the shared network in the Western part.

However, in 2016, the European Commission (EC) identified potential anti-competitive concerns with regards to the sharing of 4G technology in this agreement, and subsequently opened formal investigations to assess whether the sharing agreement led to a restriction of competition.

The EC’s final verdict on this case is still outstanding. However, it still provides a valuable insight into an assessment of the key potential concerns arising from a network sharing arrangement, and the types of remedies that could potentially be put in place to assuage those concerns.

B.3.2 - THE COMPETITIVE ASSESSMENT OF THE PROPOSED AGREEMENT

B.3.2.1 - THE RELEVANT AUTHORITY AND THE ASSESSMENT FRAMEWORK

In 2016, the EC launched a formal investigation to assess the potential anti-competitive concerns arising due to the network sharing agreement. In particular, the EC investigated whether the cooperation between O2, CETIN, and T-Mobile risked slowing down quality improvements in existing infrastructure, and delaying or hindering the deployment of new technologies, such as 4G/LTE and future technologies, and new services based on them, in particular in densely populated areas.

28 O2 and CETIN are owned by the same corporate group, PPF
The EC assessed the agreement under Article 101 of the TFEU (Treaty for the Functioning of the European Union) and Article 53 of the EEA Agreement, which prohibit agreements and concerted practices which may affect trade and prevent or restrict competition.

**B.3.2.2 - COMPETITIVE CONCERNS RAISED**

Based on its assessment, the EC issued a Statement of Objections (SO) in 2019, wherein it came to a preliminary view that the sharing agreement restricted competition, in breach of EU antitrust rules.

The EC assessed a number of specific circumstances in this case, with particular emphasis on the fact that the Czech mobile communications market was highly concentrated, with O2 and T-Mobile jointly accounting for 75% of the market. Subsequently, it concluded that, instead of leading to greater efficiencies and higher service quality, the network sharing agreement was likely to restrict direct competition between the two MNOs to the extent that it would reduce their incentives to improve their networks and services to the benefit of users. In turn, this was expected to hinder the roll-out or the development of new technologies, and lead to poor outcomes for consumers.

**B.3.3 - PROPOSED REMEDIES AND THE FINAL DECISION**

To address the competitive concerns raised by the EC, in 2021, T-Mobile, O2/CETIN, as well as the respective parent companies, Deutsche Telekom and PPF, offered commitments with regards to their network sharing arrangements. These commitments were:

- to modernise the mobile network, through the deployment of multi-standard RAN equipment in certain radio frequency layers, which would allow the parties to increase their overall LTE capacity and support faster roll-out of 5G services for Czech consumers;
- to set and review the financial conditions for unilateral network deployments, in order to ensure that the pricing arrangements between the two MNOs reflect the underlying costs of any investments or services provided by the operator responsible for the shared network in that part of the country;
- to improve the contractual provisions within the agreement to streamline the governance structure and limit information exchange to only that which is absolutely necessary for the operation of the shared network;
- to implement measures to ensure that CETIN effectively prevents information spill-over between T-Mobile and O2.

The EC subsequently invited interested parties to submit their views on the proposed commitment, after which the EC would take a final view as to whether the commitments sufficiently addressed the competition concerns.
B.4 - COLOMBIA: ACTIVE NETWORK SHARING AGREEMENT BETWEEN TELEFONICA AND TIGO

B.4.1 - CONTEXT AND SCOPE OF THE AGREEMENT

In 2013, two of the five\textsuperscript{29} Colombian MNOs, Telefonica and Tigo, entered into a network sharing agreement to share their active network infrastructure, while maintaining independent spectrum resources. The primary aim of this agreement was to facilitate the rapid deployment of the new 4G-LTE technology, over as wide a coverage area as possible, while minimising the associated infrastructure (CAPEX) and operating (OPEX) costs. The shared assets would be operated by a joint venture known as Netco 4G.

B.4.2 - THE COMPETITIVE ASSESSMENT OF THE PROPOSED ARRANGEMENT

B.4.2.1 - THE RELEVANT AUTHORITY AND THE ASSESSMENT FRAMEWORK

Ex ante regulation in Colombia is undertaken by the competition authority, the Superintendency of Industry and Commerce (SIC). However, before the SIC could carry out a regulatory assessment, it was important to ascertain whether the proposed agreement qualified for ex ante review. This was considered by the Colombian Ministry of Commerce, Industry, and Tourism (MICT).

The MICT first aimed to determine whether the agreement constituted a merger or a collaboration agreement. This is because under Colombian law\textsuperscript{30}, proposed mergers are subject to ex ante assessment and regulation whereas business collaboration agreements are analysed ex post, in case the relevant authorities had concerns that the agreement was restricting competition.

In order to determine whether the proposed arrangement was a merger or a collaboration agreement, the MICT assessed three criteria. Based on this it concluded the arrangement was a collaboration agreement as opposed to a merger. Each criteria is discussed below.

WHETHER THE ARRANGEMENT IS PERMANENT AND RESULTS IN THE ELIMINATION OF A COMPETITOR FROM THE MARKET

An agreement is considered to be a merger if it results in the permanent elimination of a competitor from the market, since such an agreement could potentially lead to long term competitive consequences which must be assessed before the agreement is finalised.

In this case, the MICT concluded that since the primary purpose of the proposed arrangement was to jointly deploy 4G services, while the parties maintained independent marketing and strategic operations, the agreement would not result in the elimination of a competitor, nor in the reduction of competition. As such, the MICT believed this arrangement to be a business collaboration, as opposed to a merger.

\textsuperscript{29} Despite the presence of five MNOs in Colombia, only three (Claro, Telefonica, and Tigo) have more than 5% market share each

\textsuperscript{30} Article 9 of Law 1340 of 2009
WHETHER THE ARRANGEMENT LEADS TO UNIFICATION IN A LINE OF BUSINESS OR A MARKET

The MICT also assessed whether the agreement would lead to the creation of a business that would itself, have an independent presence in the market and could provide services to third parties, independently of the sharing parties. The creation of such a business would likely affect market dynamics, and would require an ex ante investigation.

In this case, the MICT concluded that the joint venture created by the arrangement, Netco 4G, would only have the powers to operate the shared infrastructure and networks, and would not be able to provide services to third parties. Since Telefonica and Tigo would maintain independent marketing and strategic operations, the MICT concluded that the arrangement would not result in the unification of a line of business, or a market. As such, the arrangement was again considered to be a collaboration agreement, as opposed to a merger, on this basis.

WHETHER THE BUSINESS RESULTING FROM THE TRANSACTION WOULD HAVE ‘FULL FUNCTION’ IN THE MARKET

Finally, the MICT considered whether the entity resulting from the arrangement, Netco 4G, would have full functions in the relevant market, i.e., the provision of mobile telephony and broadband services. However, given that the only function of Netco 4G was to operate the shared infrastructure, without any extension into other activities undertaken by the sharing parties, the MICT again concluded that the proposed arrangement was a business collaboration.

B.4.2.2 - PROPOSED REMEDIES AND THE FINAL DECISION

As the MICT concluded that the proposed arrangement should be considered a “business collaboration”, it was not subject to any ex ante approval.

However, this does not mean that the proposed agreement falls outside the remit of competition law. If, going forward, the arrangement is found to have led to anti-competitive conduct, or in any way restricted competition, the SIC can undertake an ex post investigation and impose the relevant sanctions.
B.5 - THE REPUBLIC OF IRELAND: NETWORK SHARING ARRANGEMENT BETWEEN EIRCOM AND O2

B.5.1 - CONTEXT AND SCOPE OF AGREEMENT

Prior to 2014, all four Irish MNOs were party to one of two network sharing arrangements, with one agreement in place between Eircom and Telefonica (or ‘O2’), and one in place between Vodafone and Hutchison (or ‘Three’).

In 2014, the European Commission (EC) investigated a proposed merger between Three and O2. As part of its assessment, the EC identified the potentially reduced incentives for O2 to continue its existing network sharing agreement with Eircom, since its merger with Three would provide it with similar benefits with respect to coverage and cost savings. As such it would have much less to gain from the sharing agreement.

However, the EC also identified potential benefits stemming from this agreement and concluded that a breakdown of the sharing agreement as a result of the merger would be an undesirable outcome.

As such, the EC required O2 to continue its arrangement with Eircom as a necessary remedy for the proposed merger to be cleared. This case study explores the EC’s motivations to preserve the network sharing agreement and the potential benefits it could give rise to.

B.5.1 - THE COMPETITIVE ASSESSMENT OF THE PROPOSED ARRANGEMENT

B.5.1.1 - THE RELEVANT AUTHORITY AND THE ASSESSMENT FRAMEWORK

The assessment of the potential effects of the network sharing arrangement between Eircom and O2 was undertaken by the EC, as part of its wider assessment of the proposed merger between Three and O2. Since the EC was primarily assessing the merger, it adopted the European merger control framework to carry out the investigation.

As part of its assessment of the likely effects of the merger on the parties’ incentives, the EC concluded that the merged entity was likely to frustrate, or terminate, the network sharing arrangement between Eircom and O2. This was because, according to the EC, the merged entity would have much less to gain from the network sharing agreement than O2 had before the merger.

B.5.1.2 - THE BENEFITS OF THE SHARING AGREEMENT

As part of its assessment, the EC identified three key benefits from the network sharing agreement between Eircom and O2. These are summarised in Table 5 below.
## TABLE 5  KEY BENEFITS OF THE SHARING ARRANGEMENT BETWEEN EIRCOM AND O2

<table>
<thead>
<tr>
<th>BENEFIT</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved competitive pressure exerted by Eircom</td>
<td>The significant cost savings and increased coverage for Eircom would make it a stronger competitor in the market, exerting greater constraints on the merged entity.</td>
</tr>
<tr>
<td>Significant OPEX savings for the sharing parties</td>
<td>The level of integration between Eircom’s and O2’s network would have given rise to significant cost savings, due to the removal of duplication of network assets.</td>
</tr>
<tr>
<td>Extensive rollout of LTE network</td>
<td>Eircom and O2 could jointly deploy an extensive LTE network that would provide high-speed and better quality services to end-users.</td>
</tr>
</tbody>
</table>


### B.5.1.3 - PROPOSED REMEDIES AND THE FINAL DECISION

To ensure that the benefits identified above would not be foregone as a result of the merger between Three and O2, the EC required the merged entity to amend the existing network sharing agreement between Eircom and O2 to ensure that the agreement stayed in place and to offer improved terms to Eircom. This commitment would, according to the EC, enhance Eircom’s ability and incentives to compete in the Irish mobile market.

As a result, Eircom and Three agreed to share site equipment, power supplies, and towers and transmission equipment throughout Ireland. Eircom and Three noted that the network sharing deal does not cover the transfer of spectrum or other assets, and that they will continue to compete with each other in the open market.