



EUROPEAN COMMISSION
DG Competition

***Case M.9332 - ERICSSON / KATHREIN ANTENNA AND
FILTER ASSETS***

Only the English text is available and authentic.

**REGULATION (EC) No 139/2004
MERGER PROCEDURE**

Article 6(1)(b) NON-OPPOSITION
Date: 20/08/2019

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EUROPEAN COMMISSION

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PUBLIC VERSION

In the published version of this decision, some information has been omitted pursuant to Article 17(2) of Council Regulation (EC) No 139/2004 concerning non-disclosure of business secrets and other confidential information. The omissions are shown thus [...]. Where possible the information omitted has been replaced by ranges of figures or a general description.

To the notifying party

Subject: Case M.9332 - ERICSSON / KATHREIN ANTENNA AND FILTER ASSETS
Commission decision pursuant to Article 6(1)(b) of Council Regulation No 139/2004¹ and Article 57 of the Agreement on the European Economic Area²

Dear Sir or Madam,

- (1) On 15 July 2019, the European Commission received notification of a proposed concentration pursuant to Article 4 and following a referral pursuant to Article 4(5) of the Merger Regulation by which Telefonaktiebolaget LM Ericsson (publ) (“Ericsson” or “Notifying Party”, Sweden) acquires within the meaning of Article 3(1)(b) of the Merger Regulation sole control of parts of Kathrein SE (“Kathrein Group”, Germany) (the “Transaction”) by way of purchase of assets. The Transaction only concerns Kathrein Group’s business in passive antennas and filters as components for mobile network equipment (“Kathrein” or “Target Business”).³ Ericsson and Kathrein Group are collectively referred to as the “Parties”.

¹ OJ L 24, 29.1.2004, p. 1 (the “Merger Regulation”). With effect from 1 December 2009, the Treaty on the Functioning of the European Union (“TFEU”) has introduced certain changes, such as the replacement of “Community” by “Union” and “common market” by “internal market”. The terminology of the TFEU will be used throughout this decision.

² OJ L 1, 3.1.1994, p. 3 (the “EEA Agreement”).

³ Publication in the Official Journal of the European Union No C 245, 22.07.2019, p. 7.

1. THE PARTIES

- (2) Ericsson is a public company headquartered in Stockholm, Sweden. It is a global provider of network equipment and software, as well as services for network and business operations. Ericsson's business is divided into four segments: "Network solutions", "Digital Services", "Managed Services", and "Other".
- (3) Kathrein Group, headquartered in Rosenheim, Germany, is a provider of communication technologies solutions. Kathrein divides its activities in: "Business Solutions in communication technology", "Mobile Communication", "Satellite Reception", "Special Communication", and "Broadcast".

2. THE TRANSACTION

- (4) Under an Umbrella Asset Purchase Agreement entered into on 25 February 2019, Ericsson will acquire Kathrein Group's antenna and filter assets as components in mobile network equipment, belonging to Kathrein Group's wider "Mobile Communication" business segment.⁴ The Transaction will be carried out through the acquisition of various assets (e.g. tangible fixed assets, all inventory, all intangible assets and intangible fixed assets) and the client base representing Kathrein Group's antenna and filter products business. Therefore, the Transaction consists of the acquisition of sole control by Ericsson over part of Kathrein Group within the meaning of Article 3(1)(b) of the Merger Regulation.

3. EU DIMENSION

- (5) The Transaction does not have a Union dimension within the meaning of Article 1(2) or Article 1(3) of the Merger Regulation.
- (6) Nonetheless, the Transaction fulfils the two conditions set out in Article 4(5) of the Merger Regulation since it is a concentration within the meaning of Article 3 of the Merger Regulation and it is capable of being reviewed under the national competition laws of at least three Member States, namely Cyprus, Estonia, Germany, the Netherlands and, potentially, Austria.
- (7) On 19 March 2019, the Notifying Party informed the Commission by means of a reasoned submission that the Transaction should be examined by the Commission pursuant to Article 4(5) of the Merger Regulation. A copy of that submission was transmitted to the Member States on 19 March 2019.
- (8) As none of the Member States competent to review the Transaction expressed its disagreement within 15 working days as regards the request to refer the case to the Commission, the Transaction is deemed to have a Union dimension pursuant to Article 4(5) of the Merger Regulation.

⁴ Kathrein Group's product portfolio of antennas for special purpose deployments, e.g. for in-door use cases in trains and busses and for special communications, is not part of the Transaction. The "Train & Bus" portfolio has already been sold to Huber + Suhner AG and the "Special Communications" portfolio is in the process of being sold to a third party. See Notifying Party's Reply to RFI 9 of 6 August 2019, question 8 and Notifying Party's Reply to RFI 11 of 15 August, question 1.

- (9) Therefore, on 10 April 2019, the Commission informed the Parties and Member States that the Transaction was deemed to have a Union dimension and would have to be notified to the Commission.

4. RELEVANT MARKETS

4.1. Introduction

- (10) Ericsson supplies mobile network equipment, one part of which is Radio Access Network (“RAN”) equipment. RAN equipment establishes a connection between individual mobile devices and the core network through radio connections. Notable components of the RAN equipment are antennas, filters, radio units⁵, baseband⁶, and cabling. Ericsson manufactures baseband and radio units which are the key components of the RAN equipment that it supplies to mobile network operators (“MNOs”).
- (11) Kathrein manufactures antennas and filters and supplies them directly to MNOs or to RAN equipment suppliers, such as Ericsson, which resell them to MNOs as complementary components of the RAN equipment.

4.2. RAN equipment

4.2.1. Product market definition

4.2.1.1. Commission precedents

- (12) In *Nokia/Alcatel-Lucent*⁷, *Ericsson/Nortel Group*⁸, and *Nokia Siemens Networks/Motorola Network Business*⁹, the Commission distinguished between (i) RAN equipment, (ii) Core Network Systems (“CNS”)¹⁰ and (iii) network-related services.
- (13) With regard to RAN equipment, in *Nokia/Alcatel-Lucent*, the Commission examined whether a potential market for RAN equipment could be sub-segmented as follows: (i) by technology standards (2G/3G/4G)¹¹, (ii) between macro-cells¹² and small

⁵ The radio unit contains the analogue to digital conversation logic and functionality, amplifiers etc. The radio unit transforms the digital signals received into analogue and transmits or receives them to/from the antenna via a cable (feeder).

⁶ The baseband (or digital unit) contains the RAN functionality and connects the RAN with the Core/IP network.

⁷ Commission decision of 24 July 2015 in case M.7632 - *Nokia/Alcatel-Lucent*, paragraphs 19-24.

⁸ Commission decision of 2 March 2011 in case M.6095 - *Ericsson/Nortel Group (MSS & Global Services)*, paragraph 27.

⁹ Commission decision of 18 January 2011 in case M.6007 - *Nokia Siemens Networks/Motorola Network Business*, paragraph 10.

¹⁰ Core Network System solutions include the following main elements: (i) wireless packet core equipment, (ii) carrier IP telephony solutions, and (iii) operation and business support software. RAN establishes a connection between the individual mobile devices and the core network through radio connections. See *Nokia/Alcatel-Lucent*, paragraphs 160-196.

¹¹ RAN equipment can be grouped into the standard generations 2G/2.5G (GSM), 3G (WCDMA), 4G (LTE) and 5G (NR).

¹² Individual geographic areas covered with mobile radio equipment are known as "cells" or "macro cells", as the coverage they provide can have a radius range of few tens of kilometres.

cells¹³ and (iii) Single RAN ("SRAN") equipment¹⁴ as a potential separate market segment. Ultimately, the Commission left the precise market definition open.

4.2.1.2. Notifying Party's views

- (14) The Notifying Party refers to the Commission precedents listed at paragraphs (12)-(13).
- (15) With regard to the possible sub-segmentation of the market for RAN equipment by technology standards, the Notifying Party submits that current RAN equipment supports multiple technology standards and further segmentation is not justified.¹⁵ More generally, with regard to technology standards, the Notifying Party explains that the share of 2G and 3G has been steadily declining in the past few years while 4G is increasing and 5G has been slowly emerging since 2018.¹⁶ The Notifying Party explains that, at the present date, 5G has not yet been commercially launched. Nevertheless, the Notifying Party considers that, since 2017 and 2018, 5G mobile network technology is no longer in a pure development phase.¹⁷
- (16) With regard to the possible sub-segmentation between small cells and macro cells, the Notifying Party considers that such distinction is not justified. In the Notifying Party's view, the main difference between macro cell RAN equipment and small cell RAN equipment lies in the output power. While small cell RAN equipment can provide output for a smaller radius (normally between 10 m to 100 m), the radius of macro cell RAN equipment is significantly larger (normally up to 20 km or more). The Notifying Party explains that small cells are generally used if the macro cells' capacity is insufficient and needs to be complemented to deploy a mobile network, for instance during time slots with heavy data traffic. Small cells thus can provide hot spots for users such that users receive a better signal in certain areas.¹⁸
- (17) With regard to the potential separate segment for SRAN equipment, the Notifying Party submits that such segmentation would no longer be relevant, as currently all RAN equipment supports multiple technology standards (see paragraph (15)).¹⁹ Therefore, in the Notifying Party's view, SRAN equipment forms part of the overall market for RAN equipment.
- (18) With regard to new solutions emerging in the industry, such as virtualised RAN solutions²⁰, the Notifying Party submits that there are virtually no (or very few)

¹³ Small cells are technology, deployed mainly in densely populated areas to provide data traffic offloading. Small cells have a radius of between 10 meters to 1 or 2 km. They can be used to provide in-building and outdoor wireless service.

¹⁴ SRAN technology allows mobile operators to run and operate multiple mobile telecommunications standards (2G/3G/4G) on a single network (See Nokia/Alcatel-Lucent, paragraph 16).

¹⁵ Notifying Party's Reply to RFI 11 of 15 August, question 3.

¹⁶ The Notifying Party considers that companies no longer invest in 2G network technology and that 4G will replace 3G in Europe by 2020.

¹⁷ Form CO, paragraph 55.

¹⁸ Form CO, paragraph 140.

¹⁹ Form CO, paragraph 143 Notifying Party's Reply to RFI 11 of 15 August, question 8.

²⁰ According to the Notifying Party, virtualised RAN (vRAN) was formerly referred to as Cloud RAN. Virtualisation involves decoupling software from hardware. The software systems that handle the network user traffic, is moved from hardware on the sites to a cloud. This means that the processing functions are not site hardware dependent anymore. The radio processing intelligence is also moved higher up in the

current commercial deployments in which the full RAN equipment is virtualised. Therefore, according to the Notifying Party virtualised RAN equipment does not have any relevance to assess the Transaction.²¹

- (19) In the Notifying Party's view, the Commission does not have to conclude on the exact product market definition with regard to RAN equipment as the Transaction does not give rise to competitive concerns under any plausible market definition.²²

4.2.1.3. Commission's assessment

- (20) The market investigation provides mixed results as to whether segmenting the RAN equipment market is appropriate.²³
- (21) Several respondents explain that RAN equipment suppliers are generally active across all possible segments. With regard to a possible segmentation by technology standards, respondents explain that the same equipment can be used across different technologies, although several respondents expect 5G technology to require equipment different from legacy technologies. Respondents did not express any firm views as regards as possible segment for SRAN, which the Commission understands may no longer be relevant given that RAN equipment supports multiple technology standards. A number of market participants consider that the segmentation between small cells and macro cells is still relevant.
- (22) As regards virtualised RAN solutions, the results of the market investigation strongly suggest that they belong to the same product market as traditional RAN solutions.²⁴ Respondents explain that while virtualised RAN solutions use very different technologies from traditional RAN solutions, they perform the same functions as traditional RAN solutions. Moreover, respondents confirm that virtualised RAN solutions are a new trend in the market which may gain more relevance in the future.
- (23) Moreover, as explained in more detail in Section 4.3 and 4.4 below, the results of the market investigation indicate that passive antennas, antenna modules and filters should be considered to belong to markets distinct from the market for other RAN equipment components and that the same finding may potentially apply to active antennas. Accordingly, the notion of 'RAN equipment' used in this section and in the remainder of this decision, unless specified otherwise, excludes passive antennas, active antennas, antenna modules (see Section 4.3.1), and filters (see Section 4.4.1).
- (24) With the exception of the segmentation mentioned in the previous paragraph, for the purpose of this decision, the exact product market definition for RAN equipment can be left open, as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible product market definition.

network architecture and provides additional flexibility for scaling the network in order to increase capacity. It reduces the need for expensive proprietary hardware and enables to use cheaper option "off the shelf" hardware.

²¹ Response to RFI 3 of 10 July 2019.

²² Form CO, paragraph 71.

²³ Q1 – Questionnaire to Antenna and Filter Manufacturers ("Q1"), replies to question 21; Q2 – Questionnaire to RAN Equipment Suppliers ("Q2"), replies to question 19; Q3 – Questionnaire to Mobile Network Operators ("Q3"), replies to question 20.

²⁴ Q1, replies to question 22; Q2, replies to question 20; Q3, replies to question 21.

4.2.2. Geographic market definition

4.2.2.1. Commission precedents

(25) In *Nokia/Alcatel-Lucent*,²⁵ the Commission considered that the relevant geographic market for RAN equipment is at least EEA-wide, if not global. The Commission ultimately left the exact geographic market definition open.

4.2.2.2. Notifying Party's views

(26) The Notifying Party submits that the relevant geographic market is at least EEA-wide if not worldwide. In the Notifying Party's view, this is because (i) mobile network equipment is based on international standards, (ii) there are no regulatory barriers, (iii) transportation costs are low, and consequently (iv) suppliers and customers generally supply and source RAN equipment on a worldwide basis.²⁶

4.2.2.3. Commission's assessment

(27) A majority of respondents to the market investigation indicate that they supply and/or procure RAN equipment on a global basis, with the main RAN equipment suppliers based in Europe, USA and Asia.²⁷

(28) In any event, for the purpose of this decision, the exact geographic market definition for the supply of filters can be left open, as the Transaction does not raise serious doubts as to its compatibility with the internal market regardless of whether the market is EEA-wide or global.

4.3. Antennas

(29) Antennas function as a converter between two kinds of electromagnetic waves, cable bounded waves and free space waves. They link the users' equipment and the base transceiver station in the RAN. An antenna covers a specific area which depends on the antenna's capacity.

(30) There are different types of antennas, depending on the number of ports and on whether the antenna is "passive", "active" or hybrid.

(31) The number of ports of an antenna determines the number of signals that can be received and transmitted by the antenna, i.e. the number of frequency bands that can be used. A single-band antenna is a 2-port antenna which supports the usage of one frequency band. Multi-band antennas combine various bands and functions in one antenna (e.g. a 4-port antenna supports two frequency bands, a 6-port antenna supports three frequency bands etc.).²⁸

(32) Passive antennas are connected to other components of the RAN equipment (e.g., radio, baseband) via a high frequency coax cable (a "feeder") which transports the analogue signal. The use of a feeder with passive antennas entails some signal loss

²⁵ Commission decision of 24 July 2015 in case M.7632 - *Nokia/Alcatel-Lucent*, paragraphs 25-35.

²⁶ Form CO, paragraph 100.

²⁷ Q1, replies to questions 25; Q2, replies to questions 24; Q3, replies to question 25.

²⁸ Form CO, paragraph 94.

from the radio unit to the passive antenna due to the characteristics of radio waves and the transmission of analogue signals.²⁹

- (33) Active antennas integrate an antenna module and a radio component in the same physical unit. Antenna modules are a specific kind of passive antenna exclusively designed to be used in an active antenna as they have provisions for mechanical mounting and for an electrical connection of a radio module in order to create an active antenna product.³⁰ In an active antenna, the antenna module and the radio component are thus mechanically and electrically integrated to avoid signal loss. The Notifying Party explains that signal loss is also prevented in active antennas due to the existence of a digital connection between the radio and baseband, irrespective of the distance between them. However, the housing for active antennas is larger and heavier than for passive antennas and therefore its installation is more complex.³¹
- (34) According to the Notifying Party, capacity requirements have changed due to the development from 2G/3G over 4G to 5G mobile networks. While passive antennas will still be used in 5G networks, the Notifying Party expects an increasing demand by MNOs for active antennas in order to increase capacity and improve the performance of 5G networks.³²
- (35) There are two types of active antennas: (i) semi-active antennas and (ii) advanced antenna systems ("AAS"), also called massive multiple-in multiple-out ("massive MIMO" or "mMIMO"). In a semi-active antenna, conventional radio units are built into an antenna housing. In an AAS antenna, the radio unit is physically integrated with the antenna. The Notifying Party explains that this is necessary due to the large number of antenna branches (16 up to hundreds) used to provide the ability to concentrate a narrow radio beam to individual or multiple users and the requirement of their synchronisation. The Notifying Party submits that AAS active antennas still represent a small proportion of sales but their importance is expected to rapidly increase with the evolution of 5G networks.³³
- (36) In addition, there are hybrid antennas that can be described as a mounting solution where the antenna manufacturer has devised a way of mounting an AAS active antenna on top of one of its passive antennas, behind a shroud that has the same profile and looks as the passive antenna.³⁴
- (37) In light of the foregoing, three possible segmentations of the antenna market can be considered: (i) single-band and various types of multi-band antennas (e.g. 4-port, 6-port etc. antennas), (ii) passive antennas and antenna modules for active antennas, and (iii) passive antennas and active antennas. Active antennas (and antenna modules integrated therein) may also be segmented between semi-active antennas and AAS (or mMIMO) antennas.

²⁹ Form CO, paragraph 57.

³⁰ Form CO, paragraph 58.

³¹ Form CO, paragraph 57.

³² Form CO, paragraph 87.

³³ The share of semi-active antennas in the total size of the antenna market at the worldwide level (based on sales) is expected to decline in the coming years (from around [...] in 2019 to [...] in 2022). AAS are expected to account for [...] of the total antenna market in 2022 as compared to [...] in 2019. See Form CO, paragraphs 57 and 79.

³⁴ Form CO, paragraph 311.

4.3.1. Product market definition

4.3.1.1. Notifying Party's views

- (38) In the Notifying Party's view, antennas belong to a separate product market, distinct from other RAN equipment components.³⁵
- (39) As regards the possible distinction between single- and multiband antennas, the Notifying Party explains that, irrespective of the number of ports, passive antennas fulfil the same function and are thus substitutable.³⁶ In the Notifying Party's view, MNOs can achieve the same functionality by using two or more antennas with a low number of ports instead of one antenna with a high number of ports. However, as MNOs require compact antennas, the global trend is clearly towards multiband antennas with an increasing number of bands.³⁷ The Notifying Party considers that there is supply-side substitutability as antenna manufacturers generally offer both single-band and different types of multi-band antennas.³⁸
- (40) The Notifying Party did not express any firm views as to other possible sub-segmentations of the antenna product market.³⁹ However, the Notifying Party considers that technical and commercial differences between antenna modules, passive and active antennas may indicate that they belong to separate product markets.
- (41) First, according to the Notifying Party, an antenna module is specifically designed to be included in a RAN equipment supplier's final product (i.e. the active antenna) and is supplied to one specific RAN equipment supplier only. In contrast, passive antennas are more standardised products designed to fulfil the needs of multiple MNOs.
- (42) Second, in the Notifying Party's view, while passive and active antennas fulfil the same general technical function, they have different use cases. The demand for active antennas is driven by the need for more capacity, such as in densely populated areas or in the context of the roll-out of 5G networks. Moreover, the price level for an active antenna is significantly higher compared to a passive antenna due to the costs of the additional radio component.
- (43) Third, while antenna modules and passive antennas are produced by antenna manufacturers, RAN equipment suppliers are best suited to manufacture active antennas which requires radio capabilities.

³⁵ Form CO, paragraph 93.

³⁶ The distinction between single-band and multi-band antennas is primarily relevant with regard to passive antennas as semi-active antennas currently available on the market generally support a limited number of frequency bands. AAS active antennas with multiple frequency bands are being released by other suppliers during 2019. [product release]. See Notifying Party's Reply to RFI 11 of 15 August 2019, question 3.

³⁷ Notifying Party's Reply to RFI 9 of 6 August 2019, question 2.

³⁸ Form CO, paragraph 94-98.

³⁹ Notifying Party's reply to RFI 7 of 25 July 2019, question 14.

- (44) With regard to hybrid antennas, the Notifying Party submits that these consists of two separate antenna products, the passive antenna and the active antenna, which are mechanically connected.⁴⁰
- (45) The Notifying Party submits that the Commission does not have to conclude on the exact product market definition as the Transaction does not raise any competition concerns under any plausible product market definition.⁴¹

4.3.1.2. Commission's assessment

- (46) The Commission has not previously examined the relevant market for antennas as components for mobile network equipment.⁴²

RAN equipment and passive antennas

- (47) The results of the market investigation suggest that passive antennas, as well as antenna modules, belong to a product market distinct from the market for RAN equipment components.
- (48) First, a majority of the respondents consider that passive antennas are distinct from other components of the RAN equipment and therefore belong to a separate product market.⁴³
- (49) Second, the results of the market investigation confirm that passive antennas have a distinct function in the RAN and are not substitutable with other RAN equipment components. Moreover, MNOs can mix-and-match, purchasing passive antennas on a stand-alone basis, separately from other components of the RAN equipment, or as part of a bundle consisting of a passive antenna and other RAN equipment components (“turnkey solution”).
- (50) Third, from the supply side, respondents indicate that passive antennas and other RAN equipment components are generally manufactured by a different set of suppliers, with the exception of Huawei which produces both passive antennas (as well as antenna modules) and other RAN equipment components.⁴⁴
- (51) Therefore, the Commission concludes that passive antennas and antenna modules belong to a product market distinct from other RAN equipment components.

RAN equipment and active antennas

- (52) With regard to active antennas, several respondents point to the closer integration of antennas and radio units in active antenna systems. In these, antennas are an integral

⁴⁰ Form CO, paragraph 312.

⁴¹ Form CO, paragraph 99.

⁴² Previous Commission decisions do not examine or specify whether antennas are part of the RAN equipment market or constitute a separate product market (see Commission decision of 24 July 2015 in case M.7632 - *Nokia/Alcatel-Lucent*; Commission decision of 22 June 2015 in case M.7563 - *CommScope/TE BNS*; Commission decision of 2 March 2011 in case M.6095 - *Ericsson/Nortel Group (MSS & Global Services)*; Commission decision of 18 January 2011 in case M.6007 - *Nokia Siemens Networks/Motorola Network Business*).

⁴³ Q1, replies to question 3; Q2, replies to question 3; Q3, replies to question 3.

⁴⁴ Q1, replies to question 3.1; Q2, replies to question 3.1; Q3, replies to question 3.1.

part of the RAN equipment and cannot be procured separately from other RAN equipment components.⁴⁵ Therefore, active antennas may not constitute a separate product market distinct from other RAN equipment components.

- (53) The Commission considers that, for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market, irrespective of whether active antennas constitute a separate product market distinct from other RAN equipment components.

Single-band and multi-band passive antennas

- (54) The results of the market investigation indicate that there is no demand-side substitutability between single- and multi-band antennas, although there may be substitutability from the supply side.
- (55) From the demand-side, respondents to the market investigation explain that while the basic function of all antennas is the same, single-band and multi-band antennas are generally used for different purposes and the decision to deploy single- or multi-band antennas is primarily driven by these deployment considerations. Multi-band antennas are designed to support multiple bands of frequencies. They are used to reduce the number of antennas installed on a site given that the same coverage can be achieved with one multi-band antenna as with several single-band antennas. Single-band antennas, on the other hand, are mainly used for special purposes.⁴⁶
- (56) A majority of respondents to the market investigation express the view that multi-band antennas present characteristics (e.g., in terms of functionalities, performance, overall size/weight, price) that cannot be replicated by using single-band antennas, and vice versa.⁴⁷ In particular, in most cases, multi-band antennas cannot be replaced with several single-band antennas due to size, weight or volume restrictions and visual impact limitations.
- (57) Accordingly, demand for single-band and multi-band antennas is not responsive to price changes as confirmed by the results of the market investigation. A majority of respondents, most notably MNOs, responded that they would not switch from procuring multi-band antennas to single-band antennas (or vice versa) in case of a price increase of 5-10%.⁴⁸
- (58) From the supply side, the vast majority of respondents consider that single- and multi-band antennas are fully substitutable.⁴⁹ While it is easier to design and manufacture single-band antennas, (nearly) all antenna manufacturers have developed and offer both types of antennas without any relevant specialisations.
- (59) The Commission considers that, for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market, irrespective of whether the

⁴⁵ Q2, replies to question 3.1; Q3, replies to question 3.1.

⁴⁶ Q1, replies to question 5; Q3, replies to question 5.

⁴⁷ Q1, replies to question 6; Q2, replies to question 5; Q3, replies to question 6.

⁴⁸ Q1, replies to questions 7 and 8; Q2, replies to questions 6 and 7; Q3, replies to question 7 and 8.

⁴⁹ Q1, replies to question 9; Q2, replies to question 8; Q3, replies to question 9.

relevant product market is further segmented between single-band and multi-band antennas.

Passive antennas and antenna modules

- (60) There are mixed views as to whether a segmentation between passive antennas and antenna modules is appropriate.⁵⁰ Overall, the results of the market investigation suggest that passive antennas and antenna modules may be substitutes from the supply side, but there does not appear to be any demand-side substitutability.
- (61) Respondents to the market investigation explain that antenna modules are specifically developed and supplied to RAN equipment suppliers for the production of active antennas and therefore constitute a separate business for antenna manufacturers in the upstream market.⁵¹
- (62) In contrast, antenna manufacturers emphasize the fact that antenna modules are built from the same components as passive antennas. Antenna manufacturers confirm that the main difference lies in the procurement process: passive antennas can be sold on a stand-alone basis to end customers, while antenna modules are produced for original equipment manufacturers, i.e., RAN equipment suppliers, which integrate them directly into the RAN equipment and sell them to end customers.⁵² Importantly, passive antennas are standardised products while antenna modules are customer specific, i.e., manufactured in accordance with customer specifications. Antenna modules for active antennas are developed on the basis of partnership agreements between antenna manufacturers and RAN equipment suppliers.⁵³
- (63) From the supply-side, a majority of respondents indicate that it is common for antenna manufacturers to produce both passive antennas and antenna modules.⁵⁴
- (64) Respondents did not express any views as regards a possible distinction between antenna modules for semi-active and AAS antennas.
- (65) The Commission considers that, for the purpose of the present decision, it can be left open whether there is a separate product market for antenna modules, distinct from passive antennas, and whether such a market would have to be further segmented depending on the type of active antenna for which antenna modules are used, i.e. semi-active and AAS active antennas. The Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

Passive antennas and active antennas

- (66) The results of the market investigation suggest that a segmentation between passive and active antennas is appropriate given the limited degree of demand-side substitutability and the lack of supply-side between passive and active antennas.⁵⁵

⁵⁰ Q1, replies to question 11; Q2, replies to question 9.

⁵¹ Q2, replies to question 9.1.

⁵² Q1, replies to question 11.1.

⁵³ Q1, replies to question 28.2; Q2, replies to question 28.1.

⁵⁴ Q1, replies to question 12; Q2, replies to question 10.

⁵⁵ Q1, replies to question 13; Q2, replies to question 11; Q3, replies to question 11.

- (67) First, from the demand-side, the results of the market investigation confirm that passive and active antennas have the same basic function, i.e., providing coverage for mobile communication services. However, there are important differences between passive and active antennas in terms of their technical and commercial characteristics as well as use cases.
- (68) The results of the market investigation confirm that active antennas have a better performance than passive antennas stemming from lower signal loss and higher capacity. Therefore, they are used in highly densely populated areas while passive antennas are used for standard sites. Active antennas are needed in the context of the 5G network roll out as they support massive MIMO applications much more efficiently and have better beamforming⁵⁶ capabilities.⁵⁷ Respondents to the market investigation also confirm that AAS active antennas are technically more advanced than semi-active antennas and will be more relevant in the long run in the context of the 5G roll-out.⁵⁸
- (69) At the same time, the results of the market investigation also point to some disadvantages that active antennas have in comparison to passive antennas: (i) they are heavier due to integration of the radio unit, (ii) they only support a limited number of frequency bands, (iii) they are less scalable and more maintenance-intensive, and (iv) they contain RAN vendor-proprietary components and interfaces increasing MNOs' dependence on a specific RAN equipment supplier. By contrast, passive antennas are interoperable with RAN equipment of any RAN vendor due to established standardised physical interfaces.⁵⁹
- (70) Second, in respect of price, respondents indicate that active antennas are more expensive than passive antennas but also explain that the choice for active antennas seems to be driven by their improved performance and not by their price.⁶⁰ Accordingly, demand for passive and active antennas is not responsive to price changes, as confirmed by the results of the market investigation. A majority of respondents, most notably MNOs, responded that they would not switch from procuring passive antennas to active antennas (or vice versa) in case of a price increase of 5-10%.⁶¹
- (71) Third, MNOs responding to the market investigation explain that passive and active antennas are complementary and they typically would need to use a mix of active and passive antennas in their networks.⁶² Currently, the share of active antennas installed in mobile networks is very small and according to some respondents, active antennas are only "*used for pilots and still in development*".⁶³ Several MNOs indicate that they already deploy a mix of passive and active antennas. Several

⁵⁶ Beamforming is a technology which can change electronically the direction and shape of an antenna pattern of a directional antenna. Beamforming is the basic technique used by AAS active antennas to increase capacity in a RAN. This is enabled by the higher number of antenna branches in an AAS. See Notifying Party's Reply to RFI 10 of 8 August 2019, question 2.

⁵⁷ Q1, replies to question 14-16; Q2, replies to questions 12-14.

⁵⁸ Q3, replies to question 11.1 and 17.1.

⁵⁹ Q1, replies to question 14-16; Q2, replies to question 12-14; Q3, replies to question 11.1 and 12.1.

⁶⁰ Q1, replies to question 15.1.

⁶¹ Q1, replies to questions 15 and 16; Q2, replies to questions 14 and 15; Q3, replies to questions 14 and 15.

⁶² Q3, replies to question 12.2.

⁶³ Q3, replies to question 12.2.

MNOs explained that AAS active antennas are necessary for the deployment of 5G network, especially to efficiently employ the 3.5GHz band. As a result, the proportion of active antennas in mobile networks is expected to grow significantly.⁶⁴

- (72) Fourth, a majority of respondents to the market investigation do not consider that there is supply-side substitution between passive and active antennas.⁶⁵ Passive antennas are produced by dedicated antenna manufacturers and supplied to MNOs on a standalone basis or as part of a turnkey solution. The only exception is Huawei which has end-to-end in-house capabilities. By contrast, active antennas are manufactured by RAN equipment suppliers and antenna manufacturers only supply the antenna module as they generally lack radio capabilities. MNOs procure active antennas as integrated solutions only from RAN equipment suppliers.⁶⁶
- (73) Respondents did not express any views as regards a possible distinction between different types of active antennas, i.e. semi-active and AAS antennas.
- (74) Therefore, the Commission concludes that passive antennas and active antennas belong to separate product markets.⁶⁷ For the purpose of the present decision, it can be left open whether the market for active antennas has to be further segmented between semi-active and AAS active antennas as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

Conclusion

- (75) In light of the foregoing, for the purpose of this decision, the Commission concludes that passive antennas belong to a separate product market distinct from other RAN equipment components. In addition, the Commission concludes that passive and active antennas belong to separate product markets.
- (76) The question whether passive antennas and antenna modules as well as single-band and multi-band antennas belong to distinct product markets can be left open. Likewise, the question whether the potential product market for active antennas would have to be segmented between semi-active and AAS active antennas and whether antenna modules used for semi-active antennas and AAS antennas belong to distinct product markets can be left open. With respect to these questions, the Commission considers that the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible product market definition.

⁶⁴ Q3, replies to question 12.2.

⁶⁵ Q3, replies to question 15.

⁶⁶ Q3, replies to questions 11.1 and 15.1.

⁶⁷ As regards hybrid antennas, the results of the market investigation confirm that these are merely a combination of a passive and an active antenna. To build a hybrid antenna, RAN equipment suppliers rely on antenna manufacturers to deliver the passive antenna, the antenna module for the active antenna system and finally to mechanically connect the two different antennas. Therefore, hybrid antennas simply consist of two separate antenna products which are mechanically connected. Market participants have not expressed any concerns with regard to the competitive effects of the Transaction in relation to hybrid antennas. As hybrid antennas are a combination of a passive and an active antenna, the Commission does not carry out a separate analysis in this regard. In any event, similar considerations would apply in the context of an assessment of hybrid antennas as those set out in in Section 5.2.3 for passive antennas and Section 5.3.3. for active antennas.

4.3.2. *Geographic market definition*

4.3.2.1. Notifying Party's views

- (77) The Notifying Party refers to the Commission decision in *Nokia/Alcatel Lucent*⁶⁸ according to which the relevant geographic market for RAN equipment is at least EEA-wide, if not global (as discussed in paragraph (25)). The Notifying Party submits that the same market dynamics apply to antennas, which are RAN equipment components.
- (78) The Notifying Party submits that the Commission does not have to conclude on the exact geographic market definition as the Transaction does not raise any competition concerns under any plausible geographic market definition.

4.3.2.2. Commission's assessment

- (79) A majority of respondents to the market investigation indicate that they supply and/or procure (all types of) antennas on a global basis, with the main suppliers being based in Europe, USA and Asia.⁶⁹
- (80) In any event, for the purpose of this decision, the exact geographic market definition for the supply of antennas can be left open, as the Transaction does not raise serious doubts as to its compatibility with the internal market regardless of whether the market is considered to be EEA-wide or global.

4.4. **Filters**

- (81) Filters perform mainly two functions: they amplify the signal from the transceiver for transmission through the antenna, and connect different passive antennas into one common feeder to minimize both signal loss on the feeder as such as well as to minimize the need for individual feeders to be installed in the mast up to the antenna.

4.4.1. *Product market definition*

4.4.1.1. Notifying Party's views

- (82) In the Notifying Party's view, RAN equipment and filters belong to separate product markets.⁷⁰
- (83) According to the Notifying Party, filters are commodity-type products with no significant distinguishing characteristics and no further segmentation of the market for filters is necessary.⁷¹
- (84) The Notifying Party submits that the Commission does not have to conclude on the exact product market definition as the Transaction does not raise any competition concerns under any plausible product market definition.⁷²

⁶⁸ Commission decision of 24 July 2015 in case M.7632 - *Nokia/Alcatel-Lucent*, paragraphs 19-24.

⁶⁹ Q1, replies to questions 23; Q2, replies to questions 21; Q3, replies to questions 22.

⁷⁰ Form CO, paragraph 93.

⁷¹ Form CO, paragraph 204.

⁷² Form CO, paragraph 99.

4.4.1.2. Commission's assessment

- (85) The Commission has not previously examined the relevant market for filters as components for mobile network equipment.⁷³
- (86) The results of the market investigation suggest that filters constitute a separate product market, distinct from other RAN equipment components.⁷⁴ A majority of the respondents consider that filters are distinct from other components of the RAN equipment and therefore belong to a separate product market.⁷⁵
- (87) Moreover, the market investigation confirms that no further sub-segmentation of the possible market for filters is necessary.⁷⁶
- (88) Therefore, the Commission concludes that filters constitute a separate product market distinct from other RAN equipment components.

4.4.2. Geographic market definition

4.4.2.1. Notifying Party's views

- (89) The Notifying Party refers to the Commission decision in *Nokia/Alcatel Lucent*⁷⁷ according to which the relevant geographic market for RAN equipment is at least EEA-wide, if not global (as discussed in paragraph (25)). The Notifying Party submits that the same market dynamics apply to filters, which are RAN equipment components.
- (90) The Notifying Party submits that the Commission does not have to conclude on the exact geographic market definition as the Transaction does not raise any competition concerns under any plausible market definition.

4.4.2.2. Commission's assessment

- (91) A majority of respondents to the market investigation indicate that they supply and/or procure filters on a global basis, with the main suppliers being based in Europe, USA and Asia.⁷⁸
- (92) In any event, for the purpose of this decision, the exact geographic market definition for the supply of filters can be left open, as the Transaction does not raise serious doubts as to its compatibility with the internal market regardless of whether the market is EEA-wide or global.

⁷³ Previous Commission decisions do not examine or specify whether filters are a part of the RAN equipment market or constitute a separate product market (see Commission decision of 24 July 2015 in case M.7632 - Nokia/Alcatel-Lucent; Commission decision of 22 June 2015 in case M.7563 - CommScope/TE BNS; Commission decision of 2 March 2011 in case M.6095 - Ericsson/Nortel Group (MSS & Global Services); Commission decision of 18 January 2011 in case M.6007 - Nokia Siemens Networks/Motorola Network Business).

⁷⁴ Q1, replies to questions 19 and 20; Q2, replies to questions 17 and 18; Q3, replies to questions 18 and 19.

⁷⁵ Q2, replies to question 17; Q3, replies to question 18.

⁷⁶ Q1, replies to questions 19 and 20; Q2, replies to questions 17 and 18; Q3, replies to questions 18 and 19.

⁷⁷ Commission decision of 24 July 2015 in case M.7632 - Nokia/Alcatel-Lucent, paragraphs 19-24.

⁷⁸ Q1, replies to questions 24; Q2, replies to questions 23; Q3, replies to questions 23.

5. COMPETITIVE ASSESSMENT

- (93) Ericsson and Kathrein's activities do not lead to any horizontal overlap. The Transaction creates a number of non-horizontal, i.e. conglomerate and vertical relationships. These relationships are examined in Sections 5.2 and 5.3 below, after a presentation of Ericsson and Kathrein's market shares in Section 5.1.

5.1. Market shares

- (94) According to the Non-Horizontal Merger Guidelines, market shares and concentration levels provide useful first indications of the market structure and of the competitive importance of both the merging parties and their competitors.⁷⁹

5.1.1. Market shares methodology

- (95) With regard to RAN equipment, the Notifying Party provided value-based market share estimates based on information from Dell'Oro Group⁸⁰. According to the Notifying Party, these estimates are based on reported and estimated RAN equipment manufacturers' revenues.⁸¹
- (96) With regard to passive antennas and filters, the Notifying Party estimates the size of the respective markets on the basis of MNOs' purchasing volumes. The Notifying Party thus estimated the market size by using indicators, including capex forecasts by the top MNOs, publications by operators on expansion plans, information on spectrum auctions, analyst data on sold radio units and antenna market forecasts (especially EJM Wireless Report⁸²).
- (97) The Notifying Party estimated market shares by value for passive antennas and filters on the basis of the price paid by MNOs for the respective products. Market share estimates correspond to merchant sales, i.e., exclude internal sales within the different branches of integrated companies which have both antenna and radio manufacturing capabilities.
- (98) Market share estimates presented in Sections 5.1.3. and 5.1.4. below thus take into account all possible sales channels for passive antennas and filters, namely (i) direct sales to MNOs, (ii) sales to RAN equipment suppliers which then resell these antennas/filters, possibly as part of a turnkey solution, and (iii) sales to other sales partners, such as distributors.⁸³
- (99) With regard to antenna modules and active antennas, the Notifying Party submits that there are no publicly available market reports which would allow the estimation

⁷⁹ Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("Non-Horizontal Merger Guidelines"), OJ C 265, 18.10.2008, paragraph 24.

⁸⁰ Form CO, Annexes 6.D.III.1-6.D.III.5, Market data Dell'Oro Group.

⁸¹ Market shares for RAN equipment do not include sales of passive antennas, filters and other on-site equipment which is merely re-sold by RAN equipment suppliers. According to the Notifying Party, even if such sales were to be considered, this would not materially change the reported market shares due to the marginal value of passive antennas and filters as compared to RAN equipment. See Notifying Party's Reply to RFI 7 of 25 July 2019, question 16.

⁸² Form CO, Annex 6.D.II.1, Market data EJM Wireless.

⁸³ Notifying Party's Reply to RFI 7 of 25 July 2019, question 15.

of a detailed set of market shares.⁸⁴ With regard to antenna modules, the Notifying Party provided its best estimates of Kathrein’s market share but was not able to provide its competitors’ market shares. With regard to active antennas, the Notifying Party was not able to provide detailed market share information. However, it confirmed that Ericsson’s and its competitors’ market shares would not be materially different from their shares in the overall RAN equipment market.⁸⁵

5.1.2. RAN equipment

- (100) Ericsson is a supplier of RAN equipment, whereas Kathrein is not active in this market (or in its potential sub-segments).
- (101) Table 1 sets out Ericsson’s and its main competitors’ market shares in the market for the supply of RAN equipment on a worldwide level.

Table 1: Market shares for RAN equipment (Worldwide, 2015-2018)

Worldwide	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Huawei	[20-30]	[30-40]	[30-40]	[30-40]
<i>Ericsson</i>	<i>[20-30]</i>	<i>[20-30]</i>	<i>[20-30]</i>	<i>[20-30]</i>
Nokia	[20-30]	[20-30]	[20-30]	[20-30]
ZTE	[10-20]	[10-20]	[5-10]	[5-10]
Samsung	[0-5]	[0-5]	[0-5]	[5-10]
Others	[0-5]	[0-5]	[0-5]	[0-5]
Total	100	100	100	100

Source: Form CO, Tables 9, 11, 13, 15.

- (102) Table 2 sets out Ericsson’s and its main competitors’ market shares in the market for the supply of RAN equipment in the EEA.

Table 2: Market shares for RAN equipment (EEA, 2015-2018)

EEA	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Huawei	[30-40]	[30-40]	[30-40]	[30-40]
<i>Ericsson</i>	<i>[30-40]</i>	<i>[20-30]</i>	<i>[20-30]</i>	<i>[30-40]</i>
Nokia	[20-30]	[20-30]	[20-30]	[20-30]
ZTE	[5-10]	[5-10]	[5-10]	[5-10]
Samsung	-	-	-	[0-5]
Others	[0-5]	[0-5]	[0-5]	[0-5]
Total	100	100	100	100

Source: Form CO, Tables 10, 12, 14, 16.

- (103) The Notifying Party submits that its market shares in the potential segment for SRAN at the worldwide level and in the EEA are [market position] its market shares in the overall RAN equipment market. The Notifying Party explains that SRAN refers to RAN equipment capable to support multiple technology standards and all of Ericsson's products provide this functionality.⁸⁶

⁸⁴ Form CO, paragraph 78.

⁸⁵ Form CO, paragraph 113.

⁸⁶ Notifying Party's Reply to RFI 11 of 15 August 2019, question 8.

- (104) Table 3 sets out Ericsson’s and its main competitors’ market shares in the markets for the supply of RAN equipment segmented by technology for the year 2018.

Table 3: Market shares for RAN equipment by technology (Worldwide and EEA, 2018)

2018	2G		3G		4G	
	Worldwide (in %)	EEA (in %)	Worldwide (in %)	EEA (in %)	Worldwide (in %)	EEA (in %)
Huawei	[30-40]	[20-30]	[40-50]	[30-40]	[20-30]	[30-40]
Ericsson	[30-40]	[40-50]	[30-40]	[40-50]	[20-30]	[20-30]
Nokia	[10-20]	[20-30]	[10-20]	[10-20]	[20-30]	[20-30]
ZTE	[5-10]	[5-10]	[5-10]	[0-5]	[5-10]	[5-10]
Samsung	-	-	-	-	[5-10]	[0-5]
Others	-	-	[0-5]	[0-5]	[0-5]	[0-5]
Total	100	100	100	100	100	100

Source: Form CO, Tables 15-16.

- (105) It follows that Ericsson’s market share exceeds [30-40]% on the possible market for RAN equipment at the EEA level in 2015 and 2018. If the market for RAN equipment is further segmented by technology standards, Ericsson has a market share exceeding [30-40]% in 2018 with regard to 2G technology ([30-40]% worldwide and [40-50]% in the EEA) and 3G technology ([30-40]% worldwide and [40-50]% in the EEA).
- (106) Regarding 5G technology, Ericsson's market share in the first quarter of 2019 is estimated at [20-30]% in the overall market for RAN equipment at the worldwide level. The market shares of Ericsson's competitors are [30-40]% for Samsung, [20-30]% for Huawei, and [5-10]% for Nokia.⁸⁷ However, the Notifying Party submits that, because 5G technology is still emerging, market share estimates do not yet have any meaningful relevance.
- (107) As demonstrated in Tables 1-3 above, irrespective of the precise segmentation of the market for RAN equipment, in 2018 Ericsson is the second largest RAN equipment supplier worldwide and EEA-wide. Ericsson’s main competitors are Huawei (the market leader) and Nokia. Huawei is an integrated player, with in-house antenna and filter manufacturing capabilities. Nokia partly owns the joint venture Radio Frequency Systems (“RFS”), a small antenna manufacturer. Samsung and ZTE both have a worldwide market share of [5-10]% in 2018 in the overall market for RAN equipment. However, Samsung is significantly smaller at the EEA level ([0-5]%). Smaller competitors (referred to as “others” in the table) are Airspan, Cisco, Fujitsu and NEC.⁸⁸⁻⁸⁹
- (108) Table 4 sets out Ericsson’s and its main competitors’ market shares in the potential markets for the supply of RAN equipment distinguishing between macro and small cells for 2018.

⁸⁷ Notifying Party's Reply to RFI 11 of 15 August, question 7.

⁸⁸ Form CO, paragraph 146.

⁸⁹ The provided market share information does not include virtualised RAN solutions. In the Notifying Party’s view, market share estimates would be [market position] taking into account new players active in virtualised RAN solutions as virtualized RAN solutions have not penetrated the market yet to a remarkable degree. The new entrants Mavenir and AltioStar offer virtualised RAN solutions.

Table 4: Market shares for macro vs. small cells RAN equipment (Worldwide, 2018)⁹⁰

2018	Macro cell (in %)	Small cell (in %)
Huawei	[30-40]	[40-50]
<i>Ericsson</i>	<i>[30-40]</i>	<i>[10-20]</i>
Nokia	[20-30]	[10-20]
ZTE	[5-10]	[10-20]
Samsung	[5-10]	[5-10]
Others	[0-5]	[5-10]
Total	100	100

Source: Form CO, Tables 25-26.

- (109) Table 5 sets out Ericsson's and its main competitors' market shares in the potential market for small cell RAN equipment by technology for 2018.⁹¹

Table 5: Small cell RAN equipment by technology (Worldwide, 2018)

2018	3G (in %)	4G (in %)	5G (in %)
Huawei	[40-50]	[40-50]	-
<i>Ericsson</i>	<i>[20-30]</i>	<i>[10-20]</i>	<i>[30-40]</i>
Nokia	[10-20]	[10-20]	[20-30]
ZTE	[0-5]	[10-20]	-
Samsung	-	[5-10]	[30-40]
Others	[10-20]	[5-10]	-
Total	100	100	100

Source: Form CO, Table 31.

- (110) Ericsson's market share exceeds 30% in the possible segment for macro-cell RAN equipment in 2018.⁹² Regarding small cell RAN equipment, Ericsson's market share is estimated at above 30% in 5G technology in 2018 as demonstrated in Table 5.
- (111) The Notifying Party argues that even if Ericsson's market position is stronger in 5G in comparison with 3G and 4G, the 5G technology is just emerging and therefore the market share estimate does not have any meaningful relevance yet. According to the Notifying Party, based on data available for the first quarter of 2019, Ericsson's market share and that of its competitors are already different compared to 2018, with Samsung representing [30-40]% of the market, Huawei [20-30]% and Ericsson [20-30]%.⁹³

⁹⁰ The Notifying Party is not able to provide market share data for the potential sub-segments for macro cell and small -cell RAN equipment at the EEA level but considers that its market shares would [market position] from its market shares at the worldwide level.

⁹¹ According to the Notifying Party, Dell'Oro Group does not provide market share estimates for macro cell RAN equipment segmented by technology standards. The Notifying Party submits that Ericsson's estimated market shares in the overall market for RAN equipment (Tables 1-3) in fact reflect Ericsson's and its competitors' market position with regard to macro cell RAN equipment. Indeed, macro cell RAN equipment accounts for the major part of the overall RAN equipment market. In 2018, the size of the potential segment for macro cell RAN equipment is EUR [...], while the size of the potential segment for small cell RAN equipment is EUR [...]. See Form CO, paragraph 141, Table 15 and Tables 25-26.

⁹² Ericsson's market share on the possible market for macro cell RAN equipment is [20-30]% in 2017, [20-30]% in 2016 and [20-30]% in 2015.

⁹³ Form CO, paragraph 142. Market share estimates are based on data from Dell'Oro Group.

5.1.3. Passive antennas

- (112) Kathrein is a supplier of passive antennas, whereas Ericsson is not active in this market (or in its potential sub-segments).
- (113) Table 6 sets out Kathrein's and its main competitors' market shares in the market for the supply of passive antennas on a worldwide level for the period 2015-2018.

Table 6: Market shares for passive antennas (Worldwide, 2015-2018)

Worldwide	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Huawei	[10-20]	[20-30]	[20-30]	[20-30]
Commscope	[10-20]	[10-20]	[10-20]	[20-30]
Kathrein	[10-20]	[10-20]	[10-20]	[5-10]
Comba	[5-10]	[10-20]	[5-10]	[5-10]
Tongyu	[5-10]	[5-10]	[5-10]	[5-10]
Mobi	[0-5]	[5-10]	[0-5]	[0-5]
Amphenol	[0-5]	[0-5]	[0-5]	[0-5]
Others	[20-30]	[10-20]	[20-30]	[20-30]
Total	100	100	100	100

Source: Form CO, Table 2-5; Notifying Party's Reply to RFI 10 of 8 August 2019, question 5.

- (114) Table 7 sets out Kathrein's and its main competitors' market shares in the market for the supply of passive antennas in the EEA for the period 2015-2018.

Table 7: Market shares for passive antennas (EEA, 2015-2018)

EEA	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Huawei	[20-30]	[30-40]	[40-50]	[40-50]
Commscope	[10-20]	[10-20]	[10-20]	[10-20]
Kathrein	[40-50]	[20-30]	[10-20]	[10-20]
Comba	[0-5]	[0-5]	[0-5]	[0-5]
Tongyu	[0-5]	[0-5]	[0-5]	[0-5]
Mobi	[0-5]	[0-5]	[0-5]	[0-5]
Amphenol	[5-10]	[5-10]	[5-10]	[0-5]
Others	[0-5]	[10-20]	[10-20]	[5-10]
Total	100	100	100	100

Source: Form CO, Table 2-5; Notifying Party's Reply to RFI 10 of 8 August 2019, question 5.

- (115) In 2018, Kathrein is the third largest supplier of passive antennas both on a worldwide basis and in the EEA with a market share of [5-10]% and [10-20]%, respectively. While Commscope is the largest competitor on a worldwide basis, before Huawei (by a small margin), the latter has a very strong position in the EEA with a market share of [40-50]%, where Commscope represents [10-20]% of the market.
- (116) The passive antenna market is fairly fragmented. The next largest competitors are Comba, Tongyu, Mobi and Amphenol. Comba has a market share of [5-10]% worldwide and [0-5]% in the EEA, while Tongyu has a market share of [5-10]% worldwide and [0-5]% in the EEA. Mobi's and Amphenol's market shares are below 5% both globally and in the EEA.
- (117) In addition, there are several other competitors active in the supply of passive antennas. Jointly, these suppliers represent about [20-30]% of the market on a worldwide basis and almost [10-20]% in the EEA. Such other competitors include

ACE, Aerialcom-Lambda, Alpha, Broad-Radio, Cellmax, CSS Antennas, Filtronic, Galtronix, Gamma, Huber&Suhner, Huisu, Laird, KMW, Matsing, RFS, Rosenberger and other smaller regional vendors.⁹⁴

- (118) Kathrein’s market position has [market position] over the period 2015-2018 while Huawei has been able to expand its market position during the same period. While, in 2015, Kathrein represented [10-20]% of the global market and [40-50]% in the EEA, by 2018, its market share has [market position] on a worldwide basis and is almost [market position] in the EEA.
- (119) Besides Huawei, Kathrein’s other competitors also increased their respective market shares over the period 2015-2018, especially in the EEA: Commscope increased its market share from [10-20]% to [10-20]%, Tongyu from [0-5]% to [0-5]%, Comba from [0-5]% to [0-5]%, Mobi from [0-5]% to [0-5]% and other competitors (considered jointly) from [10-20]% to [10-20]%.
- (120) The Notifying Party was not able to provide market share with respect to the distinction between single-band and multi-band antennas. According to the Notifying Party, the market shares provided for passive antennas reflect Kathrein’s market share in multi-band antennas, while its market shares in single-band antennas, which represent less than [5-10]% of demand for passive antennas, are expected to be significantly lower.⁹⁵

5.1.4. Filters

- (121) Kathrein is a supplier of filters, whereas Ericsson is not active in this market.
- (122) Table 8 sets out Kathrein’s and its main competitors’ market shares in the market for the supply of filters on a worldwide level for the period 2015-2018.

Table 8: Market shares for filters (Worldwide, 2015-2018)

Worldwide	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Huawei	[10-20]	[20-30]	[20-30]	[10-20]
Commscope	[10-20]	[10-20]	[20-30]	[20-30]
Kathrein	[5-10]	[5-10]	[5-10]	[5-10]
Comba	[10-20]	[10-20]	[10-20]	[0-5]
Mobi	[5-10]	[5-10]	[5-10]	[5-10]
Kaelus	[5-10]	[0-5]	[5-10]	[5-10]
Radio Design	-	-	[0-5]	[0-5]
Others	[30-40]	[10-20]	[20-30]	[30-40]

Source: Form CO, Tables 2-5.

- (123) Table 9 sets out Kathrein’s and its main competitors’ market shares in the market for the supply of filters in the EEA for the period 2015-2018.

⁹⁴ Form CO, paragraph 121.

⁹⁵ Notifying Party’s Reply to RFI 9 of 6 August 2019, question 2.

Table 9: Market shares for filters (EEA, 2015-2018)

EEA	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Huawei	[20-30]	[30-40]	[20-30]	[20-30]
Commscope	[10-20]	[10-20]	[10-20]	[10-20]
<i>Kathrein</i>	<i>[20-30]</i>	<i>[30-40]</i>	<i>[20-30]</i>	<i>[10-20]</i>
Comba	[0-5]	[5-10]	[0-5]	[10-20]
Kaelus	[0-5]	[0-5]	[0-5]	[0-5]
Radio Design	-	-	[5-10]	[10-20]
Others	[20-30]	[10-20]	[20-30]	[10-20]

Source: Form CO, Tables 2-5.

- (124) In 2018, Kathrein is the fifth largest supplier of filters on a worldwide basis with a [5-10]% market share and the third largest supplier in the EEA with a [10-20]% market share. While Commscope is the largest competitor on a worldwide basis, Huawei has a strong position in the EEA with a [20-30]% market share. Commscope has a [10-20]% market share in the EEA.
- (125) The filter market is fairly fragmented. The next largest competitors are Mobi ([5-10]% on a worldwide basis), Comba, Kaelus and Radio Design. Comba has a market share of [0-5]% worldwide and [10-20]% in the EEA. Kaelus has a market share of [5-10]% worldwide and [0-5]% in the EEA. While market share information for Radio Design is only available as of 2017, it is the fourth largest filter supplier in the EEA with a [10-20]% market share in 2018.
- (126) In addition, there are several other competitors active in the supply of filters. Jointly, they represent over [30-40]% of the market on a worldwide basis and more than [10-20]% in the EEA.
- (127) Kathrein's market position in filters has [market position] over the period 2015-2018. While, in 2015, Kathrein still had a market share of [5-10]% worldwide and [20-30]% in the EEA, by 2018 Kathrein's 2018 market share in the EEA has almost [market position]. In the same period, Commscope and Radio Design have significantly increased their respective market shares. The same holds for Comba with regard to the EEA, despite its decreasing market share at the worldwide level.

5.1.5. Antenna modules

- (128) Kathrein is a supplier of antenna modules, whereas Ericsson is not active in this potential market (or in its potential sub-segments).
- (129) Table 10 sets out Kathrein's market shares in the markets for the supply of antenna modules on a worldwide level and in the EEA for the period 2015-2018.

Table 10: Kathrein’s market shares for antenna modules (Worldwide and EEA, 2015-2018)

Segment	Geography	2015 (in %)	2016 (in %)	2017 (in %)	2018 (in %)
Overall	Worldwide	[10-20]	[30-40]	[40-50]	[20-30]
	EEA	0	[10-20]	[20-30]	[5-10]
Semi-active antennas	Worldwide	[10-20]	[40-50]	[40-50]	[30-40]
	EEA	0	[10-20]	[20-30]	[5-10]
AAS	Worldwide	-	-	-	[0-5]
	EEA	-	-	-	-

Source: Form CO.

- (130) Kathrein’s market shares in the (potential) market for the overall supply of antenna modules is significantly higher on a worldwide basis than in the EEA. While the Parties were not able to provide competitors’ market shares, Kathrein’s global market share as supplier of antenna modules is estimated at [20-30]% in 2018 (and [5-10]% in the EEA). If antenna modules are further segmented based on the type of active antenna in which they are used, for semi-active antennas, in 2018 Kathrein’s market share is estimated at [30-40]% at the worldwide level and [5-10]% in the EEA. Regarding antenna modules for AAS, in 2018, Kathrein’s market share on a worldwide basis is [0-5]% while it currently does not have any activities in the EEA

5.1.6. Active antennas

- (131) Ericsson is a supplier of active antennas, whereas Kathrein is not active in this market (or in its potential sub-segments).
- (132) According to the Notifying Party’s best estimates, should the active antenna segment be considered separately from RAN equipment, Ericsson’s and its competitors’ market shares would [market position] from their respective shares in the overall RAN equipment segment, both at worldwide and at EEA level.⁹⁶ The same applies should the active antenna segment be further segmented between semi-active and AAS active antennas.⁹⁷
- (133) The Notifying Party considers that its main competitors with regard to active antennas are Huawei, Nokia, ZTE and Samsung.⁹⁸ [competitor information].
- (134) The Notifying Party considers itself as [competitor information].
- (135) The Notifying Party considers that [competitor information]. [competitor information].
- (136) Finally, the Notifying Party considers that ZTE and Samsung also constitute credible active antenna suppliers, with competitive products serving key customers.

⁹⁶ Notifying Party’s Reply to RFI 7 of 25 July 2019, question 12.

⁹⁷ Notifying Party’s Reply to RFI 11 of 15 August 2019, question 2.

⁹⁸ Notifying Party’s Reply to RFI 7 of 25 July 2019, question 12(b).

5.2. Conglomerate assessment

5.2.1. Analytical framework

- (137) According to the Non-Horizontal Merger Guidelines, in most circumstances, conglomerate mergers do not lead to competition problems.⁹⁹
- (138) However, foreclosure effects may arise when the combination of products in related markets may confer on the merged entity the ability and incentive to leverage a strong market position from one market to another closely related market by means of tying or bundling or other exclusionary practices. The Non-Horizontal Merger Guidelines distinguish between bundling, which usually refers to the way products are offered and priced by the merged entity¹⁰⁰ and tying, usually referring to situations where customers that purchase one good (the tying good) are required to also purchase another good from the producer (the tied good).
- (139) Tying and bundling as such are common practices that often have no anticompetitive consequences. Nevertheless, in certain circumstances, these practices may lead to a reduction in actual or potential rivals' ability or incentive to compete. Foreclosure may also take more subtle forms, such as the degradation of the quality of the standalone product.¹⁰¹ This may reduce the competitive pressure on the merged entity allowing it to increase prices.¹⁰²
- (140) In assessing the likelihood of such a scenario, the Commission examines, first, whether the merged firm would have the ability to foreclose its rivals,¹⁰³ second, whether it would have the economic incentive to do so¹⁰⁴ and, third, whether a foreclosure strategy would have a significant detrimental effect on competition, thus causing harm to consumers.¹⁰⁵ In practice, these factors are often examined together as they are closely intertwined.
- (141) In order to be able to foreclose competitors, the merged entity must have a significant degree of market power, which does not necessarily amount to dominance, in one of the markets concerned. The effects of bundling or tying can only be expected to be substantial when at least one of the merging parties' products is viewed by many customers as particularly important and there are few relevant alternatives for that product.¹⁰⁶ Further, for foreclosure to be a potential concern, it must be the case that there is a large common pool of customers, which is more likely to be the case when the products are complementary.¹⁰⁷ Finally, bundling is

⁹⁹ Non-Horizontal Merger Guidelines, paragraph 92.

¹⁰⁰ Within bundling practices, the distinction is also made between pure bundling and mixed bundling. In the case of pure bundling the products are only sold jointly in fixed proportions. With mixed bundling the products are also available separately, but the sum of the stand-alone prices is higher than the bundled price.

¹⁰¹ Non-Horizontal Merger Guidelines, paragraph 33.

¹⁰² Non-Horizontal Merger Guidelines, paragraph 93.

¹⁰³ Non-Horizontal Merger Guidelines, paragraphs 95 to 104.

¹⁰⁴ Non-Horizontal Merger Guidelines, paragraphs 105 to 110.

¹⁰⁵ Non-Horizontal Merger Guidelines, paragraphs 111 to 118.

¹⁰⁶ Non-Horizontal Merger Guidelines, paragraph 99.

¹⁰⁷ Non-Horizontal Merger Guidelines, paragraph 100.

less likely to lead to foreclosure if rival firms are able to deploy effective and timely counter-strategies, such as single-product companies combining their offers.¹⁰⁸

- (142) The incentive to foreclose rivals through bundling or tying depends on the degree to which this strategy is profitable.¹⁰⁹ Bundling and tying may entail losses or foregone revenues for the merged entity.¹¹⁰ However, they may also allow the merged entity to increase profits by gaining market power in the tied goods market, protecting market power in the tying good market, or a combination of the two.¹¹¹
- (143) It is only when a sufficiently large fraction of market output is affected by foreclosure resulting from the concentration that the concentration may significantly impede effective competition. If there remain effective single-product players in either market, competition is unlikely to deteriorate following a conglomerate concentration.¹¹² The effect on competition needs to be assessed in light of countervailing factors such as the presence of countervailing buyer power or the likelihood that entry would maintain effective competition in the upstream or downstream markets.¹¹³

5.2.2. *Affected markets*

- (144) The Transaction may have a significant impact within the meaning of Section 6.4 of the Form CO in relation to the supply of RAN equipment and the supply of both passive antennas (Section 5.2.3) and filters (Section 5.2.4), the latter products being required by MNOs in addition to RAN equipment in order to deploy mobile networks.¹¹⁴

5.2.3. *Passive antennas and RAN equipment*

- (145) Kathrein's passive antennas are complementary to the RAN equipment supplied by Ericsson, these products consisting in different components necessary to build mobile networks. The Transaction thus creates a conglomerate relationship between the activities of Ericsson and Kathrein.
- (146) Passive antennas are procured by MNOs either (i) directly from antenna manufacturers, or (ii) indirectly, via a bundle sold by RAN equipment suppliers consisting of passive antennas and other RAN equipment components. This bundle constitutes what is designated in the industry as a "turnkey solution".

¹⁰⁸ Non-Horizontal Merger Guidelines, paragraph 103.

¹⁰⁹ Non-Horizontal Merger Guidelines, paragraph 105.

¹¹⁰ Non-Horizontal Merger Guidelines, paragraph 106.

¹¹¹ Non-Horizontal Merger Guidelines, paragraph 108.

¹¹² Non-Horizontal Merger Guidelines, paragraph 113.

¹¹³ Non-Horizontal Merger Guidelines, paragraph 114.

¹¹⁴ In the Form CO, the Notifying Party also provides an analysis on why the relationship between the markets for the supply of passive antennas and RAN equipment does not lead to anticompetitive vertical effects (see Form CO, paragraphs 165 to 178). The Commission notes that passive antennas and other RAN equipment components are complementary products and are not vertically related, in the sense that they are not situated at different levels of the supply chain. Therefore, the Commission does not carry out a separate analysis of potential vertical effects arising from the Transaction in this regard. In any event, similar considerations would apply in the context of an assessment of vertical effects as those set out in Sections 5.2.3 and 5.2.4 below.

- (147) The Commission examined whether the Transaction could give rise to conglomerate non-coordinated effects consisting of the potential foreclosure of suppliers of passive antennas that compete with Kathrein, and/or the potential foreclosure of suppliers of RAN equipment that compete with Ericsson as a result of the implementation of a conglomerate strategy by the merged entity.
- (148) A possible practice that could potentially lead to conglomerate effects is mixed bundling.¹¹⁵ Post-Transaction, the merged entity could attempt to reduce its competitors' ability to compete by offering its bundled sales of passive antennas and RAN equipment to MNOs at a price lower than the sum of the standalone prices for these products.¹¹⁶ In doing so, or even independently thereof, the merged entity may reduce its passive antenna sales to competing non-integrated RAN equipment suppliers. Such practices could potentially lead to the anticompetitive marginalization of rivals selling standalone components (i.e., non-integrated competitors) and to consumer harm, if the bundled offer was not replicable and the bundling strategy diverted sufficient demand from non-integrated rivals so as to make them unable to compete effectively.

5.2.3.1. Notifying Party's view

- (149) The Notifying Party considers that conglomerate effects are unlikely for the following reasons.
- (150) First, the Notifying Party submits that the merged entity would not have the technical ability to increase its bundled sales. According to the Notifying Party, the choice between purchasing passive antennas on a standalone basis from antenna suppliers or as part of a (bundled) turnkey solution is made by MNOs, which specify in their tenders whether they prefer being offered bundles (generally for commercial reasons) or standalone components. Suppliers thus offer their products in a bundled or standalone manner depending on the specific requirements set out by MNO customers. MNOs thus have a strong countervailing buyer power and are unlikely to be influenced in their procurement decision in this regard.¹¹⁷
- (151) Second, the Notifying Party points out that neither Ericsson nor the Target Business have a significant competitive position in any plausible relevant market. In 2018, Kathrein's estimated market shares for passive antennas are below 20% on any plausible market segment (down from over [40-50]% in the EEA in 2015) and Ericsson's estimated market share in RAN equipment is about [30-40]% both on a worldwide basis and in the EEA. Ericsson's market share is only higher, albeit below [40-50]%, for 2G and 3G technology. According to the Notifying Party, neither Ericsson's RAN equipment nor Kathrein's passive antennas are viewed as

¹¹⁵ Other possible practices, which could potentially have anticompetitive effects, are pure bundling or tying as well as a degradation of interoperability. However, these practices are not plausible in the context of passive antennas, as explained in the assessment in paragraphs (181) and (171) respectively. Therefore, Section 5.2.3. mainly focusses on mixed bundling.

¹¹⁶ Pre-Transaction, while Ericsson offers bundles of passive antennas and RAN equipment, [terms and conditions].

¹¹⁷ Form CO, paragraph 184 and 199.

particularly important and several credible alternative suppliers with a comparable product offering will remain on the market.¹¹⁸

- (152) Third, the Notifying Party explains that competing RAN equipment suppliers and antenna manufacturers will continue to effectively compete with the merged entity even in the event that it sold passive antennas as a bundle together with RAN equipment. RAN equipment suppliers will be able to replicate turnkey solutions offered by the merged entity: (i) Huawei and Nokia already have in-house passive antenna capabilities and (ii) other RAN equipment suppliers, such as Samsung and ZTE, already source passive antennas from third parties in order to offer turnkey solutions.¹¹⁹ According to the Notifying Party, there will remain a sufficient number of alternative antenna suppliers after the Transaction. Standalone antenna suppliers will thus continue to sell passive antennas to competing RAN equipment suppliers and directly to MNOs and will therefore continue to have a large enough pool of customers.¹²⁰
- (153) Fourth, the Notifying Party submits that MNOs can easily switch suppliers of RAN equipment and passive antennas and multi-source from various manufacturers.¹²¹
- (154) The Notifying Party submits that the merged entity will in any case not have the incentive to push for an increase in its bundled sales or to tie its sales of RAN equipment and passive antennas. It submits that passive antennas have a low value compared to other RAN equipment components, in particular the baseband and the radio. Therefore, a bundling strategy risking losing MNO customers would not be profitable.¹²²
- (155) Overall, the Notifying Party submits that the Transaction will not result in any significant reduction of sales by competitors that offer products on a stand-alone basis. In the first place, MNOs will continue to determine their own procurement strategy. In the Notifying Party's view, MNOs could not be forced by a bundling strategy to purchase a turnkey solution that they would not believe optimal for their needs. In the second place, passive antenna manufacturers will continue to supply both MNOs and RAN equipment suppliers which will enable the latter to also offer turnkey solution to MNOs.¹²³

5.2.3.2. Commission's assessment

- (156) The Commission considers that the merged entity will not have the ability and incentive to foreclose non-integrated competitors by bundling its sales of passive antennas and other RAN equipment components. Even if the merged entity engaged in a strategy to foreclose rivals through bundling or tying, such strategy would not have a significant detrimental effect on competition.

¹¹⁸ Form CO, paragraphs 193 to 194.

¹¹⁹ Form CO, paragraph 185 to 189.

¹²⁰ Form CO, paragraph 190.

¹²¹ Form CO, paragraph 192.

¹²² Form CO, paragraphs 195 to 197.

¹²³ Form CO, paragraph 198 to 200.

As regards ability

- (157) First, the Commission considers that the merged entity does not have a sufficient degree of market power to leverage its position in the supply of passive antennas or in the supply of RAN equipment to foreclose non-integrated competitors active in these markets.
- (158) With regard to RAN equipment, the market shares presented in Section 5.1.2. do not suggest that Ericsson has significant market power. In an overall market for the supply of RAN equipment, Ericsson's market share is about [30-40]% both on a worldwide level and at EEA level in 2018. If the market for RAN equipment is further segmented by technology standards, Ericsson's market share is about [40-50]% in 2018 in 2G and 3G technology both on a worldwide level and in the EEA. Its market share for the more recent 4G technology remains below 30%. If the market for RAN equipment is further segmented between macro and small cells, Ericsson's market share is [30-40]% in the possible segment for macro-cell RAN equipment in 2018 and [30-40]% in the possible segment for small cells for 5G technology in 2018; however, more recently its market share decreased to [20-30]% in the latter segment. For all other segments and years, Ericsson's market share remains below 30%. In addition, Ericsson's market position has remained stable over the period 2015 to 2018.
- (159) Irrespective of the precise segmentation of the market for RAN equipment, in 2018 Ericsson is the [market position] RAN equipment supplier (except for legacy technologies 2G and 3G in the EEA, [market position]). Ericsson's main competitors are Huawei (the market leader) and Nokia. Samsung and ZTE are also significant competitors. Ericsson also faces smaller competitors, namely Airspan, Cisco, Fujitsu and NEC.
- (160) The results of the market investigation confirm that Ericsson is unlikely to have a significant degree of market power. The majority of antenna manufacturers, RAN equipment suppliers and MNOs that responded to the market investigation consider that Ericsson's RAN equipment product portfolio is comparable to the products of other RAN equipment suppliers in terms of quality, performance and price.¹²⁴ This result supports the notion that Ericsson faces significant competitors that present credible alternatives to MNOs.
- (161) With regard to passive antennas, similarly, market shares presented in Section 5.1.3. do not suggest that Kathrein has market power.¹²⁵ In 2018, Kathrein is the [market position] supplier of passive antennas both on a worldwide basis and in the EEA with a market share of [5-10]% and [10-20]%, respectively. Notably, Kathrein's market position has [market position] over the period 2015 to 2018, as explained in Section 5.1.3. Kathrein thus faces significant competitive constraints from suppliers with material market shares like Commscope, Huawei or Comba.
- (162) The results of the market investigation confirm that Kathrein is not a particularly important competitor in the supply of passive antennas and that there are several

¹²⁴ Q1, replies to question 31; Q2, replies to question 31; Q3, replies to question 29.

¹²⁵ As explained in paragraphs (245) to (249), Kathrein does also not have significant market power with regard to antenna modules. Therefore, Kathrein would equally not have significant market power in a potential broader market encompassing passive antennas and antenna modules.

credible alternative suppliers. The majority of antenna manufacturers, RAN equipment suppliers and MNOs that responded to the market investigation consider that Kathrein's passive antenna offering is comparable with the products of other antenna manufacturers in terms of quality, performance and price.¹²⁶

- (163) MNOs confirm that they procure passive antennas from several different suppliers. Besides Kathrein, MNOs generally list Huawei, Commscope, Comba and Amphenol as their top passive antenna suppliers.¹²⁷ According to the Notifying Party, Comba was able to improve the quality of its products significantly in the past few years, [supplier information].¹²⁸ Other antenna manufacturers frequently mentioned by market participants as credible alternatives are CellMax, Mobi, RFS, Rosenberger, Tongyu and Wi-com.¹²⁹ One MNO summarizes the supply situation as follows: "*There are more than 10 main passive antenna manufacturers, and an uncertain number of small manufacturers over the world.*"¹³⁰
- (164) In the course of the market investigation, only one MNO submitted a different view and considered that Kathrein offers unique products in terms of quality, price and innovation.¹³¹¹³² This respondent indicated that, even if Huawei's passive antennas are comparable to Kathrein's products, however, Huawei is not an independent antenna supplier.
- (165) However, this view is at odds with Kathrein's current market position and [market position] over the past few years. Moreover, these comments are inconsistent with the majority view expressed by other MNOs and respondents to the market investigation. With respect to Huawei, although the company appears to predominately sell passive antennas to MNOs (on a standalone basis or as part of turnkey solutions), the Commission notes that Huawei also generated sales to RAN equipment suppliers, albeit in more limited volumes. [business relationship].¹³³
- (166) Respondents to the market investigation also explain why, in their view, Kathrein has [market position] market shares over the last few years. According to several respondents, the quality of Kathrein's product is on par with that of the other main suppliers, but its prices are generally higher, making Kathrein less competitive.¹³⁴ [internal documents]. On a quarterly basis, Kathrein receives written feedback from Ericsson on its performance as a supplier. In a 2018 report, Ericsson thus described Kathrein's commercial position as "[supplier information]".¹³⁵

¹²⁶ Q1, replies to question 30; Q2, replies to question 30; Q3, replies to question 28.

¹²⁷ Q3, replies to question 26.1.

¹²⁸ Form CO, paragraph 123.

¹²⁹ Q2, replies to question 25.1.

¹³⁰ Q3, reply of Telefónica to question 36.1.

¹³¹ Q3, reply of Deutsche Telekom to question 28.1.

¹³² Notably, this MNO also underlined Kathrein's unique offer for indoor solutions and industrial applications (e.g. for trains and tunnels). However, as explained by the Notifying Party, Kathrein Group's product portfolio of antennas for special purpose deployments is not part of the Transaction. See paragraph (4); Notifying Party's Reply to RFI 9 of 6 August 2019, question 8.

¹³³ Notifying Party's Reply to RFI 7 of 25 July 2019, question 1 and Notifying Party's Reply to RFI 9 of 6 August 2019, question 3; Notifying Party's Reply to RFI 11 of 15 August, question 1.

¹³⁴ Q2, replies to question 30.1 and 37.1.

¹³⁵ Notifying Party's Reply to RFI 9 of 6 August 2019, question 5.

- (167) Second, the Commission notes that the merged entity is unlikely to be able to significantly increase its (bundled) sales of passive antennas and RAN equipment post-Transaction in light of MNOs' demand patterns.
- (168) In the first place, the results of the market investigation confirm that MNOs procure passive antennas both directly from antenna manufacturers and from RAN equipment suppliers. Based on the responses to the market investigation, the proportion of passive antennas purchased on a standalone basis is estimated to be at least 50% market-wide, however with significant variation across MNOs.¹³⁶
- (169) According to MNOs, the advantages of purchasing turnkey solutions are: (i) bundle discounts, (ii) one-stop-shopping and reduced coordination efforts from an operational perspective, and (iii) RAN equipment suppliers taking the responsibility for the installation and integration of the passive antenna into the RAN equipment and ensuring the compatibility and interoperability of all components used across the mobile network. However, MNOs also indicate that purchasing turnkey solutions entails several disadvantages, namely: (i) higher and/or hidden costs (e.g. service fees), (ii) less freedom and control in the selection of the best components and their network integration, and (iii) increased dependency on a single RAN equipment supplier.¹³⁷ Overall, it appears that the more price-sensitive MNOs tend to negotiate with antenna manufacturers directly when procuring passive antennas on a standalone basis.¹³⁸ For other MNOs, the main reason for procuring passive antennas on a standalone basis is to keep a better control of the design and deployment of their mobile networks, including by testing and integrating passive antennas themselves.¹³⁹
- (170) The results indicate that MNOs assess the costs and benefits of both options, i.e. to opt for a standalone or turnkey solution, on a case-by-case basis.¹⁴⁰ An MNO explains that it is pro-actively increasing its share of standalone passive antenna purchases after an integrated RAN equipment supplier had increased its share of bundled sales by granting vouchers for passive antennas.¹⁴¹ This MNO thus developed a counter-strategy in order to effectively avoid being dependent on an integrated supplier.
- (171) The results of the market investigation also confirm that mixing-and-matching passive antennas and RAN equipment from different vendors presents no interoperability issues to MNOs. This is because the integration of passive antennas in RAN equipment is governed by established, market-wide interoperability standards (i.e., the 3rd Generation Partnership Project ("3GPP") standard).¹⁴²⁻¹⁴³ The

¹³⁶ Q3, replies to question 27.

¹³⁷ Q2, replies to question 32; Q3, replies to question 30.

¹³⁸ Minutes of the call of 29 May 2019 with Comba, paragraph 5.

¹³⁹ Minutes of the call of 5 June 2019 with Commscope, paragraph 9.

¹⁴⁰ Q3, replies to question 30.

¹⁴¹ Q3, reply of Deutsche Telekom to question 27.1.

¹⁴² Q3, replies to question 30.2.

¹⁴³ Given the existence of established, market-wide interoperability standards governing the integration of passive antennas and other RAN equipment components, the Commission notes that the merged entity would not be able to degrade interoperability, for instance, by selectively improving the interoperability between Ericsson and Kathrein products, while degrading the interoperability of the merged entity's products with third party products. The Commission has not received any indication from market players

combination of passive antennas and RAN equipment takes place by connecting the antenna with a standardized connector via a high frequency coax cable, which transports the analogue signal to the passive antenna. In each case, the standards for the control and monitoring interface between a base station and a variety of tower-top equipment are observed.¹⁴⁴

- (172) Accordingly, although MNOs recognize that any infrastructure exchange causes some switching costs, for instance in terms of the testing of new components, switching between different passive antenna suppliers is technically and commercially possible.¹⁴⁵ MNOs confirm that switching between suppliers is easy as passive antennas are commoditised products that are interoperable with any RAN vendor's equipment.¹⁴⁶
- (173) In the second place, MNOs that responded to the market investigation confirm that they multi-source passive antennas and generally work with more than two different suppliers at the same time.¹⁴⁷
- (174) Besides the advantage of being less dependent on a single supplier, multi-sourcing is required as antenna specifications differ across mobile network sites. Therefore, even an integrated RAN equipment supplier would be unlikely to hold an antenna portfolio covering all types of passive antennas and would need to procure certain types from third-party suppliers.¹⁴⁸ Thus, an antenna manufacturer explained in the course of the market investigation that it continues to sell passive antennas to integrated RAN equipment suppliers, such as Nokia or Huawei.¹⁴⁹
- (175) In the third place, while respondents to the market investigation consider that the merged entity may have the technical ability to respond to a RFQ for a standalone RAN equipment solution with a bundled offer (to the extent that such an offer would be permissible under the relevant tender rules), there are mixed views as to whether the merged entity would be successful in increasing its bundled sales after the Transaction.¹⁵⁰ MNOs indicate that they will remain in control of their procurement strategy. For instance, one MNO explains that, when selecting passive antennas and RAN equipment, *"it considers all relevant factors such as quality/performance, price and maintaining a balance between different vendors on the market"*.¹⁵¹
- (176) In contrast to MNOs, most antenna manufacturers and RAN equipment suppliers believe that the merged entity will be able to increase its bundled sales and divert demand away from standalone suppliers.¹⁵² However, only few respondents believe

that such a strategy would be likely; rather, market players unanimously confirm the relevance of the existing interoperability standards with regard to passive antennas.

¹⁴⁴ Form CO, paragraph 27.1.

¹⁴⁵ Q3, replies to question 31.

¹⁴⁶ Q3, replies to question 31.1.

¹⁴⁷ Q2, replies to question 26.1 and 36.1.

¹⁴⁸ Minutes of the call of 29 May 2019 with Comba, paragraph 5.

¹⁴⁹ Minutes of the call of 29 May 2019 with Comba, paragraph 4.

¹⁵⁰ Q1, replies to question 35; Q2, replies to question 35; Q3, replies to question 32.

¹⁵¹ Q3, reply of Deutsche Telekom to question 32.1.

¹⁵² Q1, replies to question 37; Q2, replies to question 37.

that such an increase would have a negative impact on competition and make it more difficult for stand-alone players to compete.¹⁵³

- (177) Third, the Commission notes that non-integrated competitors have effective and timely counter-strategies available in order to be able to effectively compete with the merged entity in the event of a potential foreclosure strategy by the merged entity.
- (178) The majority of antenna manufacturers, RAN equipment suppliers and MNOs that responded to the market investigation consider that standalone antenna manufacturers and RAN equipment suppliers will have the ability to replicate turnkey solutions offered by the merged entity.¹⁵⁴ Several antenna manufacturers explain that standalone competitors already team up, for instance against the integrated player Huawei, and that RAN equipment suppliers can purchase passive antennas from several sources for their turnkey solutions.¹⁵⁵ Overall, the results indicate that the partnership model is how the majority of RAN equipment suppliers currently operates. All RAN equipment suppliers seem to collaborate with antenna manufacturers and offer bundles or could enter into such partnerships.¹⁵⁶
- (179) Only a few respondents are concerned that while the Parties' competitors may have the technical ability to replicate the merged entity's turnkey solution through partnerships, non-integrated players would not be as competitive as the merged entity. In particular, they submit that non-integrated players will not be able to replicate the merged entity's bundle discount. Moreover, they are concerned that standalone antenna manufacturers may become less competitive due to the reduced demand post-Transaction.¹⁵⁷ However, these concerns are not consistent with the fact that non-integrated players are already competing effectively with integrated players pre-Transaction.
- (180) Moreover, MNOs consider that post-Transaction there will remain a sufficient number of alternative antenna manufacturers and RAN equipment suppliers such that MNOs can continue purchasing these components on a standalone basis, even if the merged entity were to tie its passive antenna and RAN equipment sales.¹⁵⁸ With regard to RAN equipment suppliers, the results of the market investigation confirm that the Transaction would leave the number of suppliers unaffected and that customers currently purchasing RAN equipment on a standalone basis expect to be able to do so post-Transaction.¹⁵⁹

As regards incentives

- (181) In light of the foregoing, the merged entity is unlikely to have an incentive to engage in a pure bundling or tying strategy. As explained in paragraph (168), a significant share of MNOs is not interested in buying turnkey solutions, but instead prefers to buy passive antennas and RAN equipment on a standalone basis. If the merged entity were to pursue a pure bundling or tying strategy, it would risk losing the sales from

¹⁵³ Q1, replies to question 37.1 and 38.1; Q2, replies to question 37.1.

¹⁵⁴ Q1, replies to question 40; Q2, replies to question 40; Q3, replies to question 35.

¹⁵⁵ Q1, replies to question 40.1.

¹⁵⁶ Q2, replies to question 40.1; Q3, replies to questions 32.1 and 32.2.

¹⁵⁷ Q1, replies to question 40.1.; Q2, replies to question 40.1; Q3, replies to question 35.1.

¹⁵⁸ Q3, replies to question 36 and 37.

¹⁵⁹ Q3, replies to question 37.1.

customers who prefer to mix-and-match and purchase only passive antennas or only RAN equipment from the merged entity together with the standalone product of another supplier. A share of these customers may decide to cease purchasing these products from the merged entity.

- (182) In this context, it is also relevant to mention that the value of passive antennas is significantly lower than the value of the other RAN equipment components.¹⁶⁰ The Notifying Party estimates that passive antennas represent around [5-10]% of the RAN equipment value.¹⁶¹ Respondents to the market investigation unanimously confirm that passive antennas represent only a small portion of the overall value of the RAN equipment, even in case of a complex multi-band antenna. Therefore, it is very unlikely that Ericsson would be willing to forego sales of RAN equipment in order to gain market shares on the market for the supply of passive antennas where turnover and profits are more modest. Vice versa, it is very unlikely that Ericsson would be able to convince MNO customers to buy a bundle consisting of passive antennas and RAN equipment, if such customers were looking to buy passive antennas on a standalone basis.
- (183) It also appears unlikely that the merged entity will have the incentive to foreclose rivals through a mixed bundling strategy and/or through the reduction of passive antenna sales to non-integrated competitors.
- (184) First, the majority of antenna manufacturers and RAN equipment suppliers that responded to the market investigation considers that the merged entity will have an incentive to increase its bundled sales.¹⁶² Respondents indicate that Ericsson will have the option of either selling passive antennas and RAN equipment at market rates, thus gaining the antenna margin as part of the company's profit, or offering a bundle at a reduced price to increase its sales and gain market share. Nevertheless, MNOs cast doubt that the merged entity will have an incentive to expand bundled sales by pointing to the fact that Ericsson already has an agreement with Kathrein to distribute antennas and could already today offer commercial advantages to customers purchasing a turnkey solution as opposed to purchasing components in a standalone form.¹⁶³
- (185) Second, in its assessment of the likely incentives of the merged firm, the Commission may take into account factors such as, inter alia, the type of strategies adopted on the market in the past or the content of internal documents.¹⁶⁴
- (186) With respect to past strategies adopted on the market, respondents to the market investigation indicate that Huawei, which is already integrated, employs a mixed bundling strategy offering bundles at a reduced price.¹⁶⁵ Therefore, a number of respondents are concerned that, assuming that the merged entity would increase bundled sales to MNOs as a result of the Transaction, it may at the same time have an incentive to decrease its passive antenna sales to competing RAN equipment

¹⁶⁰ Q1, replies to question 36.2; Q2, replies to question 36.2.

¹⁶¹ Form CO, paragraph 173.

¹⁶² Q1, replies to question 36; Q2, replies to question 36.

¹⁶³ Q3, replies to question 33.1.

¹⁶⁴ Non-Horizontal Merger Guidelines, paragraph 109.

¹⁶⁵ Q1, replies to question 37.1; Q2, replies to question 38.1; Q3, replies to question 33.1.

suppliers (for commercial or technical reasons, such as capacity constraints). This would be in line with Huawei's strategy to only have limited passive antenna sales to competing RAN equipment suppliers.¹⁶⁶

(187) [reference to internal documents on post-Transaction business strategy]¹⁶⁷

(188) It follows that, on balance, the merged entity is unlikely to have the incentive to foreclose rivals through bundling, tying or other exclusionary strategies.

As regards effects

(189) Even if the merged entity engaged in a mixed bundling strategy or other exclusionary strategy, for all the reasons set out in paragraphs (157)-(180), such strategy would be unlikely to result in a significant reduction of sales prospects by standalone rivals in the market leading to a reduction in rivals' ability or incentive to compete.

(190) The implementation of a mixed bundling strategy may potentially lead to (i) a reduction of Ericsson's procurement of passive antennas from third parties and (ii) a reduction of Kathrein's passive antenna sales to third parties.

(191) With regard to the first effect, the Commission notes that, before the Transaction, Ericsson's position as customer for other standalone antenna manufacturers is limited. According to the results of the market investigation, Ericsson represents less than 10% of most antenna manufacturers' sales of passive antennas. Ericsson represents between 10% and 30% of passive antenna sales of only two antenna manufacturers.¹⁶⁸ Moreover, several passive antenna suppliers indicate that they would be able to start selling or increase their sales to customers other than Ericsson.¹⁶⁹

(192) In any event, as explained in paragraph (174), an integrated RAN equipment supplier is likely to continue to procure passive antennas from a range of different suppliers. [business strategy].¹⁷⁰ [business strategy]. According to Ericsson, this is due to the need to fulfil specific requests from customers who prefer to multi-source and procure passive antennas from a number of different suppliers. [business strategy].¹⁷¹ [business strategy].¹⁷²

(193) With regard to the second effect, the Commission notes that Kathrein's position as supplier to standalone RAN equipment manufacturers is fairly limited pre-Transaction. According to the results of the market investigation, Kathrein represents less than 10% of other RAN equipment suppliers' passive antenna purchases (in order for them to offer turnkey solutions to MNOs).¹⁷³ Moreover, several RAN equipment suppliers indicate that they would be able to start sourcing or increase

¹⁶⁶ Notifying Party's reply to RFI 9 of 6 August 2019, question 3.

¹⁶⁷ [internal documents].

¹⁶⁸ Q1, replies to question 27.

¹⁶⁹ Q1, replies to question 27.2.

¹⁷⁰ Notifying Party's reply to RFI 9 of 6 August 2019, question 7.

¹⁷¹ Form CO, paragraph 123.

¹⁷² Notifying Party's reply to RFI 9 of 6 August 2019, question 7.

¹⁷³ Q2, replies to question 37; Q3, replies to question 34.1.

their purchases from antenna manufacturers other than Kathrein.¹⁷⁴ Consequently, even in the unlikely scenario that Ericsson would reduce its sales of passive antennas to competing RAN equipment suppliers, this would not affect their ability to source passive antennas and, thus, they would continue to compete effectively as suppliers of both stand-alone and turnkey solutions to MNOs.

- (194) Moreover, for the reasons set out in paragraphs (167) to (176), the Commission does not expect that the Transaction will divert significant demand from standalone products to bundled sales. In any case, the Parties' non-integrated competitors are able to replicate the merged entity's bundled offer as there remains a sufficient number of standalone players in both markets.

5.2.3.3. Conclusion

- (195) In light of the above considerations and based on the results of the market investigation, the Commission considers that the Transaction does not raise serious doubts as to its compatibility with respect to the relationship between the market for the supply of passive antennas and the market for the supply of RAN equipment.

5.2.4. *Filters and RAN equipment*

- (196) Kathrein's filters are complementary to the RAN equipment supplied by Ericsson, all these products consisting in components necessary to build mobile networks. The Transaction thus creates a conglomerate relationship between Ericsson and Kathrein.
- (197) Like passive antennas, filters are procured by MNOs either (i) directly from filter manufacturers, or (ii) indirectly, via a bundle sold by RAN equipment suppliers consisting of filters and other RAN equipment components as part of a turnkey solution.
- (198) The Commission examined whether the Transaction could give rise to conglomerate effects consisting of the potential foreclosure of suppliers of filters that compete with Kathrein, and/or the foreclosure of suppliers of RAN equipment that compete with Ericsson.

5.2.4.1. Notifying Party's view

- (199) The Notifying Party considers that conglomerate effects are unlikely for the following reasons.
- (200) First, the Notifying Party submits that the merged entity would not have the technical ability to increase its bundled sales because, as described in relation to passive antennas, suppliers offer their products in a bundled or standalone manner depending on the specific requirements set out by their MNO customers. MNOs thus have a strong countervailing buyer power and are unlikely to be influenced in their procurement decision in this regard.¹⁷⁵
- (201) Second, the Notifying Party points out that neither Ericsson nor the Target Business have a significant competitive position in any conceivable relevant market. In 2018,

¹⁷⁴ Q1, replies to question 27.2.

¹⁷⁵ Form CO, paragraph 209.

Kathrein's estimated market share for filters remains below 20% (down from over [30-40]% in the EEA in 2016) and Ericsson's estimated market share in RAN equipment is about [30-40]% both on a worldwide basis and in the EEA.

- (202) Third, the Notifying Party explains that other RAN equipment suppliers and filter manufacturers will continue to effectively compete with the merged entity even in the event that it sold filters as a bundle together with RAN equipment. As for passive antennas, RAN equipment suppliers will be able to replicate turnkey solutions offered by the merged entity, either relying on in-house filters capacities or procuring filters from alternative suppliers.¹⁷⁶ Standalone filter manufacturers will thus continue to sell filters to competing RAN equipment suppliers and to MNOs directly and will therefore continue to have a large enough pool of customers.
- (203) Fourth, the Notifying Party submits that MNOs can easily switch suppliers of RAN equipment and filters and multi-source from various manufacturers.¹⁷⁷
- (204) The Notifying Party submits that the merged entity will in any case not have the incentive to push for an increase in its bundled sales or to tie its sales of RAN equipment and filters. It submits that filters have a low value compared to other RAN equipment components. Therefore, a bundling strategy risking losing MNO customers would not be profitable.¹⁷⁸

5.2.4.2. Commission's assessment

- (205) The Commission considers that the merged entity will not have the ability to foreclose non-integrated competitors by bundling its sales of filters and other RAN equipment components. Even if the merged entity engaged in a strategy to foreclose rivals through bundling or tying, such strategy would not have a significant detrimental effect on competition.

As regards ability

- (206) First, the Commission considers that the merged entity does not have a sufficient degree of market power to leverage its position in the supply of filters or in the supply of RAN equipment to foreclose non-integrated competitors active in these markets.
- (207) With regard to RAN equipment, the Commission refers to paragraphs (157)-(160) above which set out why Ericsson is unlikely to have a significant degree of market power.
- (208) With regard to filters, market shares presented in Section 5.1.4. do not suggest that Kathrein has market power. In 2018, Kathrein is the fifth largest supplier of filters on a worldwide basis with a [5-10]% market share and the third largest supplier in the EEA with a [10-20]% market share. Notably, as explained in detail in Section 5.1.4, Kathrein's market position has [market position] over the period 2015 to 2018. Kathrein thus faces significant competition from the main market players, namely Commscope, Huawei, Comba, Mobi, Kaelus and Radio Design.

¹⁷⁶ Form CO, paragraph 210.

¹⁷⁷ Form CO, paragraph 211.

¹⁷⁸ Form CO, paragraph 214.

- (209) The results of the market investigation confirm that Kathrein is not a particularly important competitor in the supply of filters and that there are many credible alternative suppliers. A majority of filter manufacturers, RAN equipment suppliers and MNOs that responded to the market investigation consider that Kathrein’s filter offering is comparable with the products of other filter manufacturers in terms of quality, performance and price.¹⁷⁹
- (210) MNOs confirm that they rely on several different filter suppliers. Besides Kathrein, MNOs generally list Huawei, Commscope and Radio Design as their top suppliers of filters.¹⁸⁰ MNOs do not identify any relevant differences across filter manufacturers. A respondent thus explains that “*most suppliers have a broad range of filters in their portfolios, i.e. there are no types of filters produced by Kathrein which are not also offered by competitors*”.¹⁸¹ One filter manufacturer explains that the filter market is characterized by a high level of customization; however, this is not consistent with the majority view of other respondents to the market investigation.¹⁸²
- (211) Second, the Commission notes that the merged entity is unlikely to be able to significantly increase its (bundled) sales of filters and RAN equipment post-Transaction in light of MNOs’ demand patterns, as set out for passive antennas in paragraphs (167)-(174). Compared to passive antennas, the results of the market investigation suggest that MNOs are even less likely to purchase bundles consisting of filters and other RAN equipment components because filters are generally procured separately and represent a limited portion of the cost of the RAN equipment.¹⁸³ A respondent thus explained that “[*t]he filter market has a huge diversity and usually is not involved in the RAN process. Cost is residual comparing with the RAN.*”¹⁸⁴ Therefore, the filter and RAN equipment markets seem to be less closely related than the passive antenna and RAN equipment markets.
- (212) Third, the Commission notes that non-integrated competitors have effective and timely counter-strategies available in order to be able to effectively compete with the merged entity in the event of a potential foreclosure strategy by the merged entity. A majority of respondents consider that standalone filter manufacturers will have the ability to compete with the merged entity, even in the event that it sold filters as a bundle together with RAN equipment.¹⁸⁵ As explained in detail for passive antennas in paragraphs (177)-(180), standalone competitors can and do to some extent collaborate already pre-Transaction in order to offer bundled products and compete against integrated players.

As regards incentives

- (213) In light of the foregoing, the merged entity is unlikely to have an incentive to engage in a pure bundling or tying strategy. If the merged entity were to pursue a pure bundling or tying strategy, it would risk losing the sales from customers who prefer

¹⁷⁹ Q1, replies to question 43; Q2, replies to question 43; Q3, replies to question 38.

¹⁸⁰ Q3, replies to question 26.1.

¹⁸¹ Q3, reply of Vodafone to question 38.1.

¹⁸² Q1, reply of Commscope to question 45.1.

¹⁸³ Q3, replies to questions 39, 40.

¹⁸⁴ Q3, reply of Telefonica to question 40.1.

¹⁸⁵ Q1, replies to question 45; Q2, replies to question 45; Q3, replies to question 40.

to mix-and-match filters and RAN equipment from different suppliers. A share of these customers may decide to no longer purchase from the merged entity at all.

- (214) In this context, it is also relevant to mention that the value of filters is significantly lower than the value of the other RAN equipment components. The Notifying Party estimates that filters represent around [0-5]% of the RAN equipment value.¹⁸⁶ Therefore, it is very unlikely that Ericsson would be willing to forego RAN equipment sales in order to gain market shares in filters where turnover and profits are more modest. Vice versa, it is very unlikely that Ericsson would be able to convince MNO customers to buy a bundle consisting of filters and RAN equipment, if such customers were looking to buy filters on a standalone basis.
- (215) With respect to mixed bundling, several market participants indicate that, in their view, the merged entity will pursue a similar bundling strategy as for passive antennas and/or combine its bundling strategy by offering bundles consisting of passive antennas, filters and other RAN equipment components.¹⁸⁷
- (216) As noted in paragraphs (181)-(188) with regard to passive antennas, it appears unlikely that the merged entity will have the incentive to foreclose rivals through a mixed bundling strategy and/or through the reduction of filter sales to non-integrated competitors. [reference to internal documents on post-Transaction business strategy].
- (217) It follows that, on balance, the merged entity is unlikely to have the incentive to foreclose rivals through bundling or tying or other exclusionary practices.

As regards effects

- (218) Even if the merged entity engaged in a mixed bundling strategy, for all the reasons set out in paragraphs (206)-(212), the Commission notes that such strategy is unlikely to result in a significant reduction of sales prospects by standalone rivals in the market leading to a reduction in rivals' ability or incentive to compete.

5.2.4.3. Conclusion

- (219) In light of the above considerations and based on the results of the market investigation, the Commission considers that the Transaction does not raise serious doubts as to its compatibility with respect to the relationship between the market for the supply of filters and the market for the supply of RAN equipment.

5.3. Vertical assessment

5.3.1. Analytical framework

- (220) According to the Non-Horizontal Merger Guidelines, a vertical merger may significantly impede effective competition as a result of non-coordinated effects if such merger gives rise to foreclosure.
- (221) The Non-Horizontal Merger Guidelines distinguish between two forms of foreclosure. Input foreclosure occurs where the merger is likely to raise the costs of

¹⁸⁶ Form CO, paragraph 173.

¹⁸⁷ Q1, replies to question 44.1.

downstream competitors by restricting their access to an important input. Customer foreclosure occurs where the merger is likely to foreclose upstream competitors by restricting their access to a sufficient customer base.

- (222) In assessing the likelihood of an anticompetitive foreclosure scenario, the Commission examines, first, whether the merged entity would have, post-merger, the ability to substantially foreclose access to inputs or customers, second, whether it would have the incentive to do so, and third, whether a foreclosure strategy would have a significant detrimental effect on competition.¹⁸⁸
- (223) As regards ability to foreclose, under the Non-Horizontal Merger Guidelines, input foreclosure may lead to competition problems if the upstream input is important for the downstream product.¹⁸⁹ For input foreclosure to be a concern, a vertically integrated merged entity must have a significant degree of market power in the upstream market. It is only in those circumstances that the merged entity can be expected to have significant influence on the conditions of competition in the upstream market and thus, possibly, on prices and supply conditions in the downstream market.¹⁹⁰
- (224) With respect to incentives to foreclose, paragraph 40 of the Non-Horizontal Merger Guidelines states that the incentive of the merged entity to foreclose depends on the degree to which foreclosure would be profitable. The vertically integrated firm will take into account how its supplies of inputs to competitors downstream will affect not only the profits of its upstream division, but also of its downstream division. Essentially, the merged entity faces a trade-off between the profit lost in the upstream market due to a reduction of input sales to (actual or potential) rivals and the profit gain, in the short or longer term, from expanding sales downstream or, as the case may be, being able to raise prices to consumers.¹⁹¹ Additionally, paragraph 42 of the Non-Horizontal Merger Guidelines indicates that “[t]he incentive for the integrated firm to raise rivals’ costs further depends on the extent to which downstream demand is likely to be diverted away from foreclosed rivals and the share of that diverted demand that the downstream division of the integrated firm can capture”.
- (225) As regards the effects of input foreclosure, the Non-Horizontal Merger Guidelines explain that such conduct raises competition concerns when it leads to increased prices on the downstream market. First, anticompetitive foreclosure may occur when a vertical merger allows the merging parties to increase the costs of downstream rivals in the market thereby leading to an upward pressure on their sales prices. Second, effective competition may be significantly impeded by raising barriers to entry to potential competitors.¹⁹² The Non-Horizontal Merger Guidelines further state that if there remain sufficient credible downstream competitors whose costs are not likely to be raised, for example because they are themselves vertically integrated or they are capable of switching to adequate alternative inputs, competition from

¹⁸⁸ Non-Horizontal Merger Guidelines, paragraph 32.

¹⁸⁹ Non-Horizontal Merger Guidelines, paragraph 34.

¹⁹⁰ Non-Horizontal Merger Guidelines, paragraph 35.

¹⁹¹ Non-Horizontal Merger Guidelines, paragraph 40.

¹⁹² Non-Horizontal Merger Guidelines, paragraphs 47-49.

those firms may constitute a sufficient constraint on the merged entity and therefore prevent output prices from rising above pre-merger levels.¹⁹³

- (226) For customer foreclosure to be a concern, a vertical merger must involve a company which is an important customer with a significant degree of market power in the downstream market. If, on the contrary, there is a sufficiently large customer base, at present or in the future, that is likely to turn to independent suppliers, the Commission is unlikely to raise competition concerns on that ground.¹⁹⁴

5.3.2. *Affected markets*

- (227) The Transaction gives rise to a vertical relationship insofar as Kathrein supplies antenna modules, which are used as an input by RAN equipment suppliers such as Ericsson to manufacture active antennas. In light of the market shares set out in Sections 5.1.5 and 5.1.6 above, the Transaction gives rise to a number of vertically affected markets, namely the upstream market for antenna modules (and potential sub-markets for antenna modules used for semi-active and AAS antennas) and the downstream market for active antennas (and potential sub-markets for semi-active and AAS antennas).¹⁹⁵

5.3.3. *Antenna modules and active antennas*

5.3.3.1. Introduction

Technical characteristics of active antennas

- (228) The development of an active antenna requires the mechanical and electrical integration of an antenna module and a radio unit (which is a RAN equipment component) in the same physical housing.¹⁹⁶
- (229) The Notifying Party explains that antenna modules are customer-specific products based on specification requirements¹⁹⁷ defined by the RAN equipment supplier. RAN equipment suppliers select antenna modules to be integrated in their active antennas via calls for tenders.¹⁹⁸ Once the antenna module manufacturer has been selected for a specific project, it closely collaborates with the RAN equipment supplier in the development of the active antenna.¹⁹⁹ The Notifying Party thus

¹⁹³ Non-Horizontal Merger Guidelines, paragraph 50.

¹⁹⁴ Non-Horizontal Merger Guidelines, para 61.

¹⁹⁵ In the Form CO, the Notifying Party also provides an analysis on why the relationship between the markets for the supply of antenna modules and active antennas does not lead to anticompetitive conglomerate effects (see Notifying Party's Reply to RFI7 of 25 July 2019, question 18). The Commission notes that such an analysis does not appear relevant in the assessment of the Transaction, as antenna modules constitute an input for the development of active antennas rather than a complementary product which can be purchased also on a standalone basis by the end customers. Therefore, the Commission does not address any potential conglomerate effects arising from the Transaction in this regard.

¹⁹⁶ Form CO, paragraph 57.

¹⁹⁷ The RAN equipment supplier conceptually designs the complete active antenna product resulting in a specification of the antenna module. This specification includes the electrical and radiating properties and performance as well as mechanical mounting interface. Form CO, paragraph 131.

¹⁹⁸ Form CO, paragraph 119.

¹⁹⁹ The Notifying Party explains that after the award has been concluded, a phase is entered in which the RAN equipment supplier and the selected antenna module manufacturers adjust or finalize the complete

explains that the development of active antennas requires RAN capabilities and therefore standalone antenna manufacturers cannot produce active antennas.²⁰⁰

- (230) There are no standard interfaces for the integration of the radio and the antenna module into an active antenna, i.e., each active antenna has a specifically designed antenna module and interface to the radio module. MNOs thus cannot procure the integral components of an active antenna separately and instead purchase integrated active antennas from RAN equipment suppliers.²⁰¹
- (231) The Commission notes that, as explained in paragraphs (69) and (171), passive antennas are interoperable with the RAN equipment of any RAN vendor due to established standardised physical interfaces. In contrast, the interface between active antennas and other RAN equipment components in a mobile network is vendor-specific and proprietary.²⁰² Therefore, MNOs must purchase active antennas and other RAN equipment components from the same RAN equipment supplier.
- (232) The O-RAN Alliance²⁰³, which was founded by several industry players in 2018, serves as a forum for discussing an open interface for RAN solutions.²⁰⁴ Ericsson is a member of the O-RAN Alliance, while Kathrein is not. Open interfaces, if widely adopted in the industry, would allow MNOs to procure active antennas and other RAN equipment components from different vendors and increase the interoperability of all components in the mobile network.²⁰⁵ However, the Commission notes that specifications for fully open baseband interfaces are not mature as no products have been brought to market at this point in time. Therefore, any future potential impact of the O-RAN Alliance on competition in the active antenna market cannot be taken into account to assess the Transaction's effects and will not be further discussed in this decision.

Ericsson's and Kathrein's activities

- (233) Ericsson produces semi-active and AAS antennas. In the period 2016-2018, Ericsson has sourced antenna modules for its active antenna offerings from [supplier information] and Kathrein. For active antennas under development and not yet

product design together. During this process the purchaser's and the supplier's know-how is combined to reach the best possible result from the view of all parties involved. See Form CO, paragraphs 131 and 297.

²⁰⁰ Form CO, paragraph 305.

²⁰¹ Form CO, paragraph 280.

²⁰² The Notifying Party explains that the interface between the baseband and the radio is currently to a very large extent an interface based on the Common Public Radio Interface ("CPRI") standard. This is a baseband interface which is only standardised up to a general point, on top of which, each RAN equipment manufacturer has added its specific dialect of the interface to support certain features of its own radios and baseband software. See Form CO, paragraph 54.

²⁰³ The O-RAN Alliance was founded in August 2018 by a number of industry players (AT&T, China Mobile, Deutsche Telekom, NTT, and Orange). O-RAN is an initiative aiming to develop an open interface for RAN equipment and a wide ecosystem based on ensuring interoperability of RAN equipment components (radio and baseband) from different RAN equipment suppliers.

²⁰⁴ Based on the Notifying Party's submission, for active antennas, such an open interface concerns the connection between the radio and the baseband interface and not the connection between the antenna module and the radio within the active antenna, which in any event is defined by the RAN equipment supplier and will remain vendor specific and proprietary. See Form CO, paragraph 143

²⁰⁵ Minutes of call with Telefonica of 11 June 2019, paragraph 6.

released, Ericsson also procured antenna modules from [supplier information]. [supplier information].²⁰⁶

- (234) Currently, Kathrein [business relationship] for the development and supply of semi-active antennas. Kathrein's business relationship with Ericsson regarding semi-active antennas is long-standing, having started in 2012. It concerns semi-active antennas called AIR products. The Target Business also started delivering antenna modules for AAS active antennas [business relationship].²⁰⁷
- (235) The Notifying Party explains that Kathrein [tender information]. [tender information].²⁰⁸
- (236) The Commission examined whether the Transaction could give rise to a possible risk of input foreclosure for the supply of antenna modules, as a result of exclusive supplies of Kathrein's antenna modules to Ericsson, to the detriment of other RAN equipment suppliers. In addition, the Commission assessed the risk of a possible customer foreclosure for Kathrein's competitors should the merged entity stop acquiring antenna modules from other antenna manufacturers and exclusively rely on the antenna modules provided by Kathrein.

5.3.3.2. Notifying Party's view

- (237) According to the Notifying Party, the Transaction is not likely to lead to input or customer foreclosure with regard to active antennas for the reasons set out at paragraphs (238)-(243) below.
- (238) First, with regard to possible input foreclosure, the Notifying Party submits that Kathrein does not have any market power in the possible segment for antenna modules. Kathrein's market share is higher only in a potential segment for antenna modules for semi-active antennas, around [30-40]% at worldwide level (and [5-10]% in the EEA). However, regarding antenna modules for AAS, which will gain in importance in the future, Kathrein's market share is around [0-5]% at the worldwide level, and Kathrein currently does not have any activities in the EEA. The Notifying Party explains that semi-active antennas are considered as a "bridge technology"²⁰⁹ which is rapidly declining.²¹⁰ In addition, antenna modules are produced and

²⁰⁶ [tender information]. See Notifying Party's Reply to RFI 7 of 25 July 2019, question 7.

²⁰⁷ Form CO, paragraph 62.

²⁰⁸ The Notifying Party submits that [tender information]. See Notifying Party's Reply to RFI 7, question 3.

²⁰⁹ The Notifying Party explains that semi-active antennas allow for a faster deployment than passive antennas and therewith performance improvements for MNOs. As the passive and active components are already adjusted to each other, the installation process on site is faster. Regarding performance, the benefit is that the high level of integration of passive and active components in the same physical unit allows for shorter signal paths compared to passive antennas on masts with a long cable connecting them to the base station. According to the Notifying Party, AAS encompass the same advantages mentioned above (i.e. faster deployment and better performance in comparison to passive antennas) and in addition are a further development of the semi-active antenna. The Notifying Party expects that replacement of semi-active antennas by AAS will increase in the future. See Notifying Party's Reply to RFI 7, questions 11 and 12.

²¹⁰ The share of semi-active antennas in the total size of the antenna market at the worldwide level (based on sales) is expected to decline in the coming years (from around [...] in 2019 to [...] in 2022). AAS are expected to account for [...] of the total antenna market in 2022 as compared to [...] in 2019. See Form CO, paragraph 79.

supplied via bidding procedures which ensure fierce competition between antenna module suppliers.²¹¹

- (239) Second, in the Notifying Party's view, RAN equipment suppliers are not dependent on Kathrein's antenna modules for their active antenna offerings. Currently Kathrein does not deliver antenna modules for active antennas to any customer other than Ericsson. The Notifying Party argues that, as antenna modules are (i) based on specification requirement determined by RAN equipment manufacturers and (ii) sourced on the basis of bidding procedures, other antenna suppliers will be able to produce such products for Ericsson's competitors. Post-Transaction, there will be various suppliers from which Ericsson's competitors can source antenna modules, e.g., Huawei, Commscope, Comba, Tongyu, Mobi, RFS, Rosenberger and Amphenol as well as numerous smaller and regional active and specialised antenna suppliers.
- (240) Third, the Notifying Party submits that the merged entity will not have the incentive to foreclose access to antenna modules. In the Notifying Party's view, antenna modules and active antennas represent a minimal value of the total costs for RAN equipment. For antenna modules, RAN equipment manufacturers send RFQs to numerous suppliers and will be able to continue to rely on many alternative suppliers after the Transaction. According to the Notifying Party, this is all the more true as no other RAN equipment manufacturer is currently procuring antenna modules from the Target Business.²¹²
- (241) Fourth, with regard to possible customer foreclosure, the Notifying Party argues that Ericsson's market position as a customer of antenna modules is modest. In the Notifying Party's view, suppliers of antenna modules will have a sufficiently large customer base available after the Transaction. It can be expected that antenna manufacturers' sales of antenna modules with various RAN equipment manufacturers will further increase as demand for active antennas and antenna modules, respectively, will increase in the coming years with the roll-out of 5G networks.²¹³
- (242) Fifth, the Notifying party submits that Ericsson will not have an incentive to stop sourcing antenna modules from third parties (such as [supplier information]). The Notifying Party submits that Ericsson will continue to source antenna modules from [supplier information].²¹⁴ [business strategy].
- (243) Finally, according to the Notifying Party, as Ericsson's competitors do not currently source antenna modules from Kathrein, the Transaction will not have any effect on the possible market for active antennas. Furthermore, the Notifying Party argues that the main RAN equipment manufacturers will be able to replicate the merged entity's active antenna offering post-Transaction by relying at least partly on in-house

²¹¹ Notifying Party's Reply to RFI 7 of 25 July 2019, question 18.

²¹² Notifying Party's Reply to RFI 7 of 25 July 2019, question 18.

²¹³ Notifying Party's Reply to RFI 7 of 25 July 2019, question 18.

²¹⁴ Form CO, paragraph 166.

antenna modules capabilities (Huawei, Nokia) or on third party antenna module suppliers (Samsung, ZTE).²¹⁵

5.3.3.3. Commission's assessment

(244) The Commission considers that the merged entity will not have the ability and incentive to foreclose non-integrated competitors by engaging in input or customer foreclosure. Furthermore, even if the merged entity would engage in input or customer foreclosure (*quod non*), such strategy would not have a significant detrimental effect on competition.

(A) Input foreclosure

As regards ability

(245) First, the merged entity will not have a significant degree of market power in the upstream market for the supply of antenna modules. As set out in Table 10, in 2018, Kathrein's market share in the potential market for the supply of antenna modules is limited (especially at EEA level) and has been [market position] compared to 2017. Kathrein's market share is currently higher than 30% only in the potential market for antenna modules used in semi-active antennas at the worldwide level ([30-40]%) but is not as such indicative of market power, in particular taking into account the factors considered below.²¹⁶

(246) Second, RAN equipment suppliers are not dependent on Kathrein's antenna modules for developing active antennas.

(247) The results of the market investigation confirm that Kathrein's antenna modules are, on balance, comparable to those of other suppliers in terms of quality and performance.²¹⁷ Some respondents point out that the price of Kathrein's antenna modules is higher than other suppliers, making it difficult for Kathrein to be competitive.

(248) [business relation]. Based on the Notifying Party's submission, Kathrein [tender information].²¹⁸

(249) Furthermore, with regard to antenna modules for AAS antennas, over the period 2016-2018, Kathrein [tender information].^{219:220} Ericsson's internal documents indicate that [supplier information].²²¹

(250) Third, the Commission notes that the merged entity would not have the ability to foreclose rival RAN equipment suppliers through input foreclosure by degrading the

²¹⁵ The Notifying Party refers to an example of a successful partnership between Nokia and CommScope for the development of active antennas. See Form CO, paragraph 188.

²¹⁶ As explained in paragraph (161), Kathrein does also not have significant market power with regard to passive antennas. Therefore, Kathrein would equally not have significant market power in a potential broader market encompassing passive antennas and antenna modules.

²¹⁷ Q3, replies to questions 41 and 41.1; Q1, replies to question 46; Q2, replies to question 46.

²¹⁸ Notifying Party's Reply to RFI 7, question 6.

²¹⁹ Notifying Party's Reply to RFI 7, question 3.

²²⁰ [business relationship]. [market information on a third party supplier]. See Q2, replies to question 27.1.

²²¹ Notifying Party's Reply to RFI 9, question 5, Annex 1 and Annex 2.

terms and conditions by which it will supply antenna modules to RAN equipment suppliers.

- (251) The market investigation results indicate that RAN equipment suppliers are not dependant on Kathrein’s antenna modules for their active antennas and that there will remain a sufficient number of alternative suppliers of antenna modules after the Transaction.²²² For example, an antenna module manufacturer expressed the view that “*there is and will continue to be competition between antenna module providers and that the real negotiating power will lie with the RAN vendors that are active antenna suppliers*” such that the merged entity will not have the ability to degrade terms and conditions for the supply of antenna modules.²²³
- (252) [business relationship]. Therefore, the Transaction is unlikely to affect any possible ability of the merged entity to foreclose competitors by degrading terms and conditions by which it will supply antenna modules to them. As a result, the Transaction is unlikely to bring about material merger-specific changes in the upstream market for the supply of antenna modules that would affect downstream competitors.
- (253) Fourth, non-integrated competitors have effective and timely counter-strategies available in order to be able to effectively compete with the merged entity in the event of an input foreclosure strategy by the merged entity.
- (254) Antenna modules are customer-specific products, which are developed on the basis of specifications defined by RAN equipment suppliers. Furthermore, antenna modules are manufactured and supplied on the basis of calls for tenders and collaboration between antenna module manufacturers and active antenna suppliers.
- (255) There will remain a sufficient number of credible alternative antenna module suppliers after the Transaction to allow non-integrated RAN equipment suppliers to manufacture and supply active antennas, as confirmed by the market investigation results.²²⁴ Such antenna manufacturers include, e.g. Commscope, Comba, Tongyu, Mobi, RFS, Rosenberger, Amphenol and other smaller antenna manufacturers. The vast majority of respondents to the market investigation confirmed that post-Transaction there will be “*enough competition*” and that globally there are “*many alternative vendors*”.²²⁵
- (256) The results of the market investigation thus show that market players which are not vertically integrated will have the ability to effectively compete with the merged entity post-Transaction.²²⁶ Respondents to the market investigation point out that various active antennas are already produced through partnerships between vendors of RAN equipment and antenna module manufacturers.²²⁷ Standalone antenna module manufacturers and RAN equipment suppliers will thus have the ability to replicate the merged entity’s active antenna offering by entering into partnerships.

²²² Q1, replies to question 55; Q3, replies to question 44.1.

²²³ Q1, reply of Commscope to question 51.1.

²²⁴ Q1, replies to question 55; Q2, replies to question 55; Q3, replies to question 47.

²²⁵ Q1, replies to questions 51.1; Q2, replies to question 55.1.

²²⁶ Q1, replies to question 57; Q2, replies to question 57; Q3, replies to question 48.

²²⁷ Q3, replies to question 48.

As regards incentives

- (257) The Commission considers that, on balance, the merged entity is unlikely to have an incentive to engage in an input foreclosure strategy.
- (258) The value of antenna modules is significantly lower than the value of active antennas.²²⁸ As the Notifying Party explains, the value of antenna modules in semi-active antennas is around [30-40]% of its total value, and [0-5]% in AAS active antennas.²²⁹ Furthermore, a number of antenna manufacturers that responded to the market investigation consider that the merged entity may have the incentive to stop supplying antenna modules to competing active antenna manufacturers.²³⁰
- (259) [business relationship]. Therefore, there are no indications that, by engaging in an input foreclosure strategy, the merged entity would divert any demand away from rivals in the downstream market for active antennas, although it would likely forego any potential sales of antenna modules to third parties. This factor therefore limits any possible incentive the merged entity might have to engage in foreclosure in relation antenna modules.
- (260) Similarly, the merged entity is unlikely to have an incentive to engage in input foreclosure by degrading the terms and conditions for the supply of antenna modules. [market position]. By degrading terms and conditions for the supply of antenna modules, the merged entity would risk further losing potential sales of antenna modules without any conceivable gain in the downstream market for active antennas.
- (261) [reference to internal documents on post-Transaction business strategy].²³¹
- (262) It follows that, on balance, the merged entity is unlikely to have the incentive to seek to foreclose rivals by engaging in an input foreclosure strategy.

As regards effects

- (263) Even if the merged entity pursued an input foreclosure strategy, for the reasons set out in paragraphs (245)-(262), such a strategy is unlikely to result in a reduction in rivals' ability or incentive to compete with the merged entity and lead to increased prices in the downstream market for active antennas.
- (264) First, Kathrein's role in the potential market for antenna modules is limited. [business relation]. [market position].²³²
- (265) Second, for the reasons set out in paragraphs (253)-(256) above, post-Transaction, there will remain a sufficient number of credible alternative antenna module suppliers such that non-integrated players will be able to enter into partnerships and replicate the merged entity's active antenna offering. Therefore, post-Transaction

²²⁸ Q2, replies to question 50.2.

²²⁹ Form CO, paragraph 78.

²³⁰ Q1, replies to questions 49 and 49.1; Q2, replies to questions 50 and 50.1.

²³¹ [internal documents].

²³² Notifying Party's Reply to RFI 7 of 25 July 2019, question 3.

RAN equipment suppliers will be able to continue to effectively compete with the merged entity in the downstream market for active antennas.

Conclusion

(266) In light of the above considerations and based on the results of the market investigation, the Commission considers the Transaction does not give rise to serious doubts as to its compatibility with the internal market as a result of any input foreclosure strategy by the merged entity with regard to antenna modules.

(B) Customer foreclosure

As regards ability

(267) First, the merged entity will not have a significant degree of market power in the downstream market for the manufacturing and supply of active antennas. As set out at paragraph (132), irrespective of the precise market definition, Ericsson's market share in the potential market for active antennas [market position] from its market share in the market for RAN equipment, where Ericsson does not have a significant degree of market power (see paragraphs (157)-(160) above).

(268) In addition, the market investigation confirms that Ericsson's active antenna portfolio is comparable to those of other active antenna suppliers in terms of quality, performance, price and other characteristics.²³³ Moreover, the results of the market investigation strongly suggest that the market for active antennas, in particular AAS, is nascent and in the early stages of its development.²³⁴

(269) Second, the Commission considers that Ericsson does not constitute an important route to market for antenna module manufacturers. None of the antenna suppliers that responded to the market investigation sold any antenna modules to Ericsson in the past 3 years (Ericsson only purchased antenna modules from Kathrein and [supplier information], see paragraph (233)).

(270) A majority of antenna manufacturers indicated that they supply antenna modules and cooperate with other RAN equipment suppliers for the development of active antennas.²³⁵ RAN equipment suppliers that responded to the market investigation confirm that they source antenna modules and cooperate with several antenna manufacturers for the development of active antennas.²³⁶

(271) Third, the merged entity is unlikely to have the ability to exclusively rely on in-house production to source its internal requirements of antenna modules, to the exclusion of other antenna module suppliers.

(272) Several respondents to the market investigation confirm that active antenna designs and requirements vary widely among vendors and different vendors have unique selling points such as cost, performance, compactness, modularity, beam steering

²³³ Q1, replies to question 47; Q2, replies to questions 47 and 47.1; Q3, replies to questions 42 and 42.1.

²³⁴ Q2, replies to question 47.2.

²³⁵ Q1, replies to questions 29 and 29.1.

²³⁶ Q2, replies to question 27.1

capability etc.²³⁷ On that basis, the merged entity will be unlikely to be able to meet all requirements by solely relying on its in-house antenna module capacity.²³⁸

- (273) Furthermore, Ericsson plans to purchase antenna modules from a number of third party suppliers such as [supplier information].²³⁹ The Commission notes that, [business strategy], Ericsson will most likely need to continue sourcing different antenna modules from several suppliers. The Commission thus considers that the merged entity will most likely not have the ability to stop sourcing antenna modules from alternative antenna manufacturers post-Transaction.
- (274) Fourth, the Commission notes that non-integrated competitors have effective and timely counter-strategies available in order to compete with the merged entity in the event of a customer foreclosure strategy.
- (275) The majority of antenna manufacturers and RAN equipment suppliers that responded to the market investigation indicate that Ericsson's competitors in the downstream market for active antennas that will continue to procure antenna modules for their active antenna offerings include Nokia, Samsung, ZTE, and new entrants such as Mavenir and AltioStar.²⁴⁰ Therefore, there will remain sufficient demand for antenna modules from alternative RAN equipment suppliers after the Transaction.

As regards incentives

- (276) The Commission considers that, on balance, the merged entity is unlikely to have an incentive to engage in a customer foreclosure strategy.
- (277) First, it would not appear profitable for the merged entity to exclusively rely on Kathrein's antenna modules due to potentially higher costs associated with reduced purchases from alternative antenna module suppliers. The quality of Kathrein's antenna modules is on par with that of other suppliers, but its prices are higher, as confirmed by the market investigation (see paragraph (247)). [reference to internal documents on post-Transaction business strategy].²⁴¹ Some respondents to the market investigation also point out that given the high price of Kathrein's antenna modules, the merged entity will most likely deploy alternative solutions such as sub-contracting to third party antenna module manufacturers.²⁴²
- (278) Second, due to product differentiation, Ericsson is likely to continue sourcing antenna modules from third parties in order to develop and expand its active antenna portfolio. Antenna modules are customer-specific products, whereby the development of each antenna module requires a team of developers for a period of 9-12 months.²⁴³ As the market for AAS antennas is projected to grow, [business strategy].²⁴⁴ [business strategy].

²³⁷ Q1, replies to questions 48 and 48.1; Q2, replies to questions 48 and 48.1.

²³⁸ Q2, replies to question 48.1 and 49.1.

²³⁹ Notifying Party's Reply to RFI 7 of 25 July 2019, Annex 2.

²⁴⁰ Q1, replies to questions 56 and 56.1; Q2, replies to question 56.

²⁴¹ [internal documents]

²⁴² Q1, replies to question 49.1; Q2, replies to question 49.1.

²⁴³ Form CO, paragraph 307.

²⁴⁴ [internal documents].

As regards effects

- (279) The Commission considers that even if the merged entity attempted to engage in a customer foreclosure strategy, the Transaction would not adversely affect upstream rivals' ability to compete in such a way as to lead to detrimental effects on competition in the downstream market for the supply of active antennas.²⁴⁵
- (280) The Commission notes that, as explained in paragraph (132) above, Ericsson's position in the downstream market for active antennas is relatively limited. Before the Transaction, Ericsson sources antenna modules primarily from Kathrein and [supplier information] and accounted for less than 10% of antenna module suppliers' sales (other than Kathrein) in the last 3 years.
- (281) Moreover, for the reasons set out in paragraphs (133) and (275), post-Transaction antenna module suppliers will be able to sell their product to a number of alternative active antenna manufacturers such as Nokia, Samsung, ZTE, Mavenir and Altiosar. Therefore, the Commission considers that any potential customer foreclosure strategy of the merged entity will not deprive antenna module suppliers in the upstream market of access to a sufficient customer base in the downstream market for active antennas and will thus not reduce their ability to compete in the foreseeable future. As a result, the Transaction would also not lead to detrimental effects in the downstream market for active antennas.

Conclusion

- (282) In light of the above considerations and the results of the market investigation, the Commission considers that the Transaction does not raise serious doubts as to its compatibility with the internal market in relation to a possible customer foreclosure strategy by the merged entity with regard to active antennas.

6. CONCLUSION

- (283) For the above reasons, the European Commission has decided not to oppose the notified operation and to declare it compatible with the internal market and with the EEA Agreement. This decision is adopted in application of Article 6(1)(b) of the Merger Regulation and Article 57 of the EEA Agreement.

For the Commission

(Signed)
Margrethe VESTAGER
Member of the Commission

²⁴⁵ Non-Horizontal Merger Guidelines, paragraph 72.