



OFFICE FOR COMMUNICATION  
PRINCIPALITY OF LIECHTENSTEIN

## **Market Analysis**

# **Lifting of existing regulatory measures concerning wholesale central broadband access provided at fixed location for mass market products**

**Analysis of the market for fixed internet broadband connections at retail level with regard to the regulation of the wholesale market M3b in accordance with the EFTA Surveillance Authority's recommendation of 11 May 2016 on relevant product and service markets in the electronic communications sector**

**Final Version**

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# 1 Management Summary

In this market analysis, the Office of Communications (hereinafter referred to as the "AK" or regulatory authority) examines whether the existing regulatory measures on the access market for centrally provided broadband connections at fixed locations can be repealed.

This market was included as market no. 5 in the Annex to the 2008 Market Recommendation<sup>1</sup> (hereinafter "2008 Market Recommendation") of the EFTA Surveillance Authority ("ESA"), with the following name and explanation:

*"Broadband access for large customers. This market comprises non-physical or virtual network access, including "bitstream access" at fixed locations. This market is similar to the physical access covered by market 4 above according to, as broadband access can be provided at the wholesale level via physical access in conjunction with other elements".*

ESA assumed in the 2008 Market Recommendation that this market has high and non-transitory barriers to entry as a result of high sunk costs, limited development of alternative access networks and a limited degree of local loop unbundling.

In the last market analysis<sup>2</sup>, the AK determined that there was no effective competition on the market for broadband access for large customers and that Telecom Liechtenstein AG (hereinafter "Telecom Liechtenstein" or "TLI") alone had considerable market power, so that corresponding ex ante obligations were imposed on<sup>3</sup> in 2009. Among other things, TLI was obliged to grant broadband access at wholesale level, in particular bitstream access, to any other provider upon reasonable request on the basis of an approved standard offer, and to charge cost-based fees.

By regulating access to local loops<sup>4</sup> and other network infrastructure of Liechtensteinische Kraftwerke ("LKW"), competition at the downstream wholesale and end customer levels was ensured nationwide, so that the access problem at bitstream or resale connection level no longer exists. TLI is currently still subject to the obligation to take measures from 2009.

Market analyses must be reviewed periodically in accordance with Art. 21 Para. 2 of the Act of 17 March 2006 on Electronic Communications (Communications Act; KomG); LGBI. No. 91/2006 ("KomG").<sup>5</sup>

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<sup>1</sup> available at [https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=uriserv%3AOJ.C\\_2009.156.01.0018.01.ENG](https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=uriserv%3AOJ.C_2009.156.01.0018.01.ENG)

<sup>2</sup> available at [https://www.llv.li/files/ak/pdf-llv-ak-analysis\\_broadband\\_market\\_m5\\_en.pdf](https://www.llv.li/files/ak/pdf-llv-ak-analysis_broadband_market_m5_en.pdf)

<sup>3</sup> available at [https://www.llv.li/files/ak/pdf-llv-ak-verfuegung\\_m5\\_tli\\_physischer\\_breitbandmarkt\\_signiert\\_20091216.pdf](https://www.llv.li/files/ak/pdf-llv-ak-verfuegung_m5_tli_physischer_breitbandmarkt_signiert_20091216.pdf)

<sup>4</sup> in 2009 analysis of market M4 of ESA Market Recommendation 2008, available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/archive/physical-access-to-network-infrastructure-2009-2023>;

in 2023 replaced by the analysis of market M3a of ESA Market Recommendation 2016, available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-subscriber-connection>

<sup>5</sup> available at <https://www.gesetze.li/konso/2006091000>

According to the explanations in the Commission Staff Working Document of 9 October 2014 on the European Commission's "Market Recommendation 2014"<sup>6</sup> and the corresponding ESA Market Recommendation of 5 November 2016<sup>7</sup> (hereinafter "Market Recommendation 2016"), which is currently applicable to Liechtenstein, the national regulatory authorities ("NRAs") should assume that Market 3b of the Market Recommendation 2016 corresponds to Market No. 5 of the Market Recommendation 2008. Market 3b is referred to in the 2016 Market Recommendation as the wholesale market "Centrally provided access to local loops for wholesale bulk products at fixed locations".

The defined market in this analysis includes centrally provided access to broadband connections at fixed locations, which is the relevant upstream input for Internet broadband connections on the mass market, among other things. The broadband connection is defined in a technology-neutral manner. The market covers the entire territory of Liechtenstein.

This market analysis, which is carried out in accordance with the planning of the new 2019+ market analysis round<sup>8</sup>, takes into account current market developments as well as the changes to European regulatory requirements that have occurred since then.

Based on the market analysis, the AK found that there is effective competition in the end customer market for broadband connections in the fixed network, which is largely independent of wholesale services for broadband access. For the remaining small number of wholesale-dependent internet broadband connections and their providers, there are also unregulated wholesale offers from two providers on the market.

Effective competition in the end customer market manifests itself in several market entries in recent years, in a high number of providers in terms of market size, all of which are active throughout the country, in declining market shares of TLI and a clear competitive orientation with regard to broadband performance and prices. In the forecast, the market will remain competition-orientated in the AK's assessment.

Competition is based on regulated access to network infrastructure, i.e. on the wholesale level that is furthest upstream of the end customer market for Internet broadband connections. This access is available nationwide for every end-user connection. The three-criteria test for the wholesale market analysed here is therefore not met and therefore the requirements for the continuation of special regulation are not met.

**The obligations imposed on Telecom Liechtenstein regarding broadband access for wholesale customers should therefore be lifted by order without a transitional period and no new obligations should be imposed.**

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<sup>6</sup> Commission Recommendation of 9 October 2014 on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (Text with EEA relevance) (2014/710/EU), available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014H0710>

<sup>7</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3AE2016C0093>

<sup>8</sup> available at <https://www.llv.li/files/ak/marktanalyse-2019-plus-v20.pdf>

## Public consultation

The AK conducted a public consultation on the market analysis from 26 March to 15 April 2024<sup>9</sup>. The consultation period of 20 days was set in compliance with the legal requirement<sup>10</sup> of at least 14 days, with a comparable duration to other lifting orders<sup>11</sup>, but comparatively shorter than consultation periods that the AK normally sets for market analyses that oblige operators to take regulatory measures. In view of the no longer market-relevant obligations which are lifted with the market analysis in question, and in view of the imminent entry into force of the revised Communications Act to adopt the Code, which would entail considerable revision work for the market analysis in question if the proceedings have not yet been completed when it enters into force, the AK set a short consultation period, which, however, was deemed sufficient and problem-free at the AK's discretion.

The AK received statements from the two providers Telecom Liechtenstein and Liechtensteinische Kraftwerke, which did not contain any objections, points of criticism or demands. The providers comment the lifting of the regulatory measures as justified and do not see any future restrictions on competition orientation as a result of the lifting.

The statements did not necessitate any changes to the market analysis document.

To ensure transparency, the AK published the comments received on April 26, 2024 as well as an evaluation document in which the comments are discussed by the AK. The registered providers were in turn informed of this through public information sent directly to them.

## Notification to ESA, EEA consultation

Following notification of the market analysis and the planned lifting of the measures to the ESA and the EEA regulatory authorities on April 26, 2024, the deadline for the EEA consultation expired on May 27, 2024. In a letter dated May 23, 2024, the ESA submitted its comments, in which it did not comment further on the lifting of the measures. The ESA published the corresponding comments document under Case No. 92106 dated May 23, 2024 on its "eCom registry" website. No feedback was received from the regulatory authorities of the EEA states.

The AK will carry out the final steps of the market analysis proceeding in accordance with the planning in Figure 1.

	2024	
	May	June
Deliver lifting order to TLI		
Notify Final Measures Adopted to ESA		

Figure 1: Planning the conclusion of the process [Source: AK]

<sup>9</sup> The consultation document, statements and the consultation evaluation are available at <https://www.llv.li/en/national-administration/office-for-communications/consultations/completed-consultations/market-analysis-of-wholesale-central-access-for-the-mass-market-products>

<sup>10</sup> Art. 24 para. 2 of the Ordinance of 3 April 2007 on the Tasks and Competences of the Regulatory Authority in the Field of Electronic Communications (RKV)

<sup>11</sup> 2022 Market analysis lifting measures for access to the public telephone network at fixed locations ESA2008-M1: 22 days; 2021 Market analysis lifting measures relating to call origination for voice calls ESA2008-M2: 15 days

### About the structure of the document

Chapter 2 introduces the principles and legal aspects of market analysis.

The current state of regulation and the dependencies of the retail market for Internet broadband connections on the wholesale markets are described in chapter 3 described.

Developments in recent years on the retail market for Internet broadband connections and on the upstream broadband access market are described in chapter 4 presented.

In chapter 5 the relevant market is defined and its competitive state is analysed in chapter 6 with regard to the three-criteria test.

As the competition problems of the old market analysis no longer exist and the three-criteria test is not met, Chapter 6.3 deals with lifting the existing obligations of special regulation.

## **2 Principles and legal aspects of market analysis**

The basis for special regulation and market analysis can be found in particular in Art. 20 et seq. of the KomG in conjunction with Art. 32 et seq. Art. 32 ff. of the Ordinance of 3 April 2007 on Electronic Communications Networks and Services (VKND); LGBl. NR. 67/2007 ("VKND"). They define how the regulatory authority defines markets, how these are to be regularly analysed ex officio and how the regulatory authority is to take special regulatory measures in order to eliminate or reduce the negative consequences of a lack of competition.

Pursuant to Art. 21 para. 2 KomG, the AK must regularly examine whether there is effective competition on the electronic communications markets in Liechtenstein. If there is no effective competition, i.e. if one or more providers have significant market power, the AK must take the necessary special regulatory measures (Art. 23 ff. KomG) to eliminate or minimise the competition problems identified. This procedure is called a market analysis. The overall process of special regulation and market analysis is divided into the following stages according to Figure 2.

Overall process of special regulation	1	Collecting and analysing the necessary market and company data	
	Market analysis in the broader sense	2	Definition of the relevant markets in the national context in terms of product and geography
		3	Identification of (possible) companies with market power
		4	Identification of current and potential competition problems
		5	Identification and design of special regulation measures to be imposed
	6	Consultation of interested national parties, in particular the companies concerned, on the planned measures	
	7	Notification of the market analysis and the planned measures for assessment by the EFTA Surveillance Authority and the regulatory authorities in the EEA	
	8	Imposition of the necessary measures by means of an order	
	9	Monitoring the implementation of and compliance with the measures imposed	

Figure 2: Overview of the overall process of special regulation [Source: AK]

In the market analysis, the regulatory authority defines the relevant product and geographic communications markets in the so-called market definition in accordance with Art. 21 Para. 1 KomG (Level 2 in Figure 2).

The regulatory authority then examines the competitive situation in the defined markets. The existence of significant market power - which corresponds to a dominant position in general EEA competition law - is to be determined in particular on the basis of the criteria set out in Art. 31 para. 1 VKND (level 3 in Figure 2).

If the regulatory authority identifies one or more providers with market power in a defined market, it identifies existing and potential competition problems (level 4). Following national and international consultation, the regulatory authority then determines and imposes the necessary and proportionate measures for special regulation in accordance with Art. 23 KomG in conjunction with Art. 34 ff. Art. 34 ff. VKND, which are suitable for eliminating or minimising the competition problems prevailing on the affected market (levels 5 - 8).

In the market analysis, the AK relies on the Liechtenstein legal bases with which the relevant EEA directives are implemented nationally. Art. 20 Para. 1 KomG and Art. 6 Para. 2 of the Ordinance of 3 April 2007 on the Tasks and Powers of the Regulatory Authority in the Electronic Communications Sector (RKV), LGBl. 2007 No. 68, ("RKV") stipulate that in special regulation, the AK observes the decisions of the ESA pursuant to Art. 7 Para. 4 of Directive 2002/21/EC on a common regulatory framework for electronic communications networks and

services<sup>12</sup> (hereinafter "Framework Directive") and takes its relevant recommendations and guidelines into account as far as possible. These are in particular the 2016 Market Recommendation<sup>13</sup>, the ESA Recommendation of 2 December 2009 on notifications, deadlines and consultations pursuant to Art. 7 of the Framework Directive<sup>14</sup> (hereinafter "Notification Recommendation") and the EFTA Surveillance Authority's Guidelines of 16 November 2022 on market analysis and identification of significant market <sup>15</sup> (hereinafter "ESA Guidelines"). The guidelines, recommendations, directives and other documents relevant to this market analysis are listed in Annex 3 are summarised in Appendix 3.

## 2.1 Guidelines for analysing the market and determining significant market power

The ESA guidelines summarise the regulatory approach to market analysis (see Chap. 2.2) and address the definition of the relevant market (see Chap. 2.3) and the assessment of significant market power<sup>16</sup> (see Chap. 2.7). The guidelines describe the principles that NRAs should apply when analysing markets that are eligible for ex ante regulation and when assessing significant market power. The ESA Guidelines reflect the latest evolving case law of the Court of Justice of the European Union, economic thinking and rapidly evolving markets. The ESA Guidelines are in line with the guidelines issued by the European Commission on 7 May 2018<sup>17</sup>.

## 2.2 Regulatory approach for market analysis

In the following, the AK summarises the regulatory approach from the ESA guidelines, in particular points 13 - 23, which are the most up-to-date and comprehensive in terms of how market analyses are carried out. Corresponding points can also be found in the recitals of the 2016 Market Recommendation.

When conducting the market analysis, the NRAs assess the relevant market in a forward-looking and structural manner over the relevant period. The relevant period (the next review period) is the time between the end of the current review and the end of the next market

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<sup>12</sup> Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services, <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32002L0021>

<sup>13</sup> EFTA Surveillance Authority Decision No 93/16/COL of 11 May 2016. EFTA Surveillance Authority Recommendation on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation under the act referred to at point 5cl of Annex XI to the EEA Agreement (Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services), as amended by Protocol 1 to the EEA Agreement and by the sectoral adaptations to Annex XI to that Agreement [2017/608], available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3AE2016C0093>

<sup>14</sup> available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:E2011C1013\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:E2011C1013(01))

<sup>15</sup> available at <https://www.eftasurv.int/cms/sites/default/files/documents/gopro/ESA%20New%20Guidelines%20on%20market%20analysis%20and%20SMP%20assessment.pdf>

<sup>16</sup> Topic "Regulatory approach to market analysis" in section 1.3, "Definition of the market" in section 2, "Assessment of significant market power" in section 3 of the ESA guidelines

<sup>17</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018XC0507%2801%29>



review, during which the NRAs have to assess certain market characteristics and market developments.

The starting point for determining the wholesale markets that are eligible for ex ante regulation should always be the analysis of the corresponding retail markets. NRAs must determine whether the underlying retail markets are potentially competitive in the absence of wholesale regulation based on a finding of sole or joint significant market power and thus whether the absence of effective competition is a permanent phenomenon.

To this end, NRAs should take into account existing market conditions and market developments that are expected or foreseeable over the next review period in the absence of regulation on the basis of significant market power. This approach is referred to as the "modified greenfield approach"<sup>18</sup>. In addition, the effects of other types of (sector-specific) regulation as well as decisions or provisions applicable to the relevant retail markets and associated wholesale markets in the relevant period must also be taken into account in the analysis.

If the underlying retail markets are found to be potentially competitive under the modified "greenfield approach" - i.e. without wholesale regulation - NRAs should conclude that regulation at the wholesale level is no longer necessary. If this is not the case, the wholesale markets upstream of the retail market should be analysed.

In their analysis, NRAs should use past data and current data where relevant to developments in this market in the next review period. In this respect, it should be emphasised that evidence of past practice does not automatically imply that this practice is likely to continue in the next review period. Nevertheless, past practice is relevant if the characteristics of the market have not changed significantly or are unlikely to change significantly in the next review period.

Accordingly, NRAs should take into account both static and dynamic considerations when analysing the market in order to address the market failures identified at the retail level and impose appropriate obligations at the wholesale level to, inter alia, promote competition and contribute to the development of the internal market. These obligations should be based on the regulatory principles set out in Article 8 of Directive 2002/21/EC, i.e. promoting regulatory predictability, efficient investment, innovation and infrastructure competition.

The analysis should be based on a functional analysis of the links between the relevant wholesale markets and the underlying retail markets and other relevant markets, where NRAs consider this appropriate. In its previous decision-making practice, the Commission has pointed out that the conditions on the retail markets can provide NRAs with information on the structure of the wholesale markets, but do not in themselves indicate the existence of significant market power at the wholesale level. As the Commission has already stated in several decisions pursuant to Article 7 of Directive 2002/21/EC, it is not necessary to prove that one or more undertakings have significant market power at the retail level, either individually or jointly, in order to conclude that they have significant market power on the relevant wholesale market. In line with Recital 23 of the 2016 Market Recommendation, ex

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<sup>18</sup> See Commission Staff Working Document of 27 April 2018, SWD(2018) 124 final, Commission Staff Working Document accompanying the document Communication from the Commission Guidelines on market analysis and the assessment of significant market power, available at [https://ec.europa.eu/transparency/documents-register/detail?ref=SWD\(2018\)124&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2018)124&lang=en)

ante regulation at the wholesale level should be sufficient to address competition problems on the relevant downstream markets.

When defining the market and analysing market power in a given relevant wholesale market in terms of whether it is effectively characterised by competition, direct and indirect competitive pressure should be taken into account, irrespective of whether the competitive pressure comes from electronic communications networks, electronic communications services or other types of services or applications that are comparable from an end-user perspective.

According to recital 27 of the Framework Directive, no inappropriate ex ante regulatory obligations should be imposed on emerging markets where the market leader is likely to have a significant de facto market share. Premature ex ante regulation could have a disproportionate impact on competitive conditions in an emerging market. At the same time, however, foreclosure of such newly emerging markets by the leading company should be prevented.

## 2.3 Market definition

When defining the market, the regulatory authority determines the relevant product and geographic communications markets (market definition) in accordance with competition law and Art. 15 Par. 3 of the Framework Directive and taking the 2016 Market Recommendation into account as far as possible (Art. 21 Par. 1 KomG).

Art. 15 of the Framework Directive refers in para. 2 to the EC Guidelines on market analysis and the assessment of significant market power, which provide further details on the market definition (see also Chap. 2.1 above).

In the following, this chapter mainly refers to the ESA guidelines<sup>19</sup>, to the chapter "Market Definition" and in particular page 14 of the Commission Staff Working Document of 27 April 2018 on the EC guidelines<sup>20</sup> and to Chapter 2.1 of the Commission Staff Working Document of 9 October 2014 on the Commission Recommendation on relevant product and service markets<sup>21</sup> of 2014.

Market definition is the prerequisite for assessing whether a particular market is characterised by effective competition or should be subject to ex ante regulation. The market definition sets the boundaries in terms of products/services and geographic scope within which the competitive dynamics are to be analysed in order to systematically determine the direct and indirect competitive pressure to which the companies in the market in question are exposed.

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<sup>19</sup> ESA guidelines number 26-30, 37, 39, 46, 48, 51

<sup>20</sup> Commission Staff Working Document of 27 April 2018, SWD(2018) 124 final, on the EC Guidelines on market analysis and the assessment of significant market power (2018/C 159/01), available at [https://ec.europa.eu/transparency/documents-register/detail?ref=SWD\(2018\)124&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2018)124&lang=en)

<sup>21</sup> Commission Staff Working Document of 9 October 2014, SWD(2014) 298, Explanatory Note Accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, available at <https://www.pts.se/globalassets/startpage/dokument/legala-dokument/eu-regler/explanatorynote-201410091.pdf>

As ex ante regulation is aimed at the absence of effective competition, which is expected to exist over a certain period of time, markets must be defined with foresight.

Two key competitive forces must be taken into account when defining the market: i) substitutability on the demand side and ii) supply-side flexibility.

Demand-side substitutability is a factor used to determine the extent to which customers are willing to substitute the product or service in question with other products or services, while supply-side substitutability provides an indication of whether suppliers other than those of the product or service in question would switch their production or offer the relevant products or services immediately or in the short term without incurring significant additional costs. For network industries - such as electronic communications - supply-side substitutability is of particular importance because the same network can be used to provide different services. The difference between potential competition and supply-side substitutability is that the latter is characterised by an immediate reaction to a price increase, whereas potential entrants may need more time to bring their offer to the market. Supply-side substitution does not imply significant additional costs, whereas potential market entry can cause significant sunk costs and is therefore not considered in the market definition.

The starting point for market definition activities is the definition of end customer markets over a certain time horizon, taking into account demand and supply-side substitutability from the end consumer's perspective.

The corresponding wholesale markets are then defined, taking into account the demand- and supply-side substitutability of products from the perspective of an operator wishing to compete in the supply of end users.

NRAs should start by identifying and analysing the wholesale market that is furthest upstream of the retail market where the competition problems have been identified.

It should be noted that this may be a market consisting of or comprising more general cross-market wholesale products such as passive infrastructure access (e.g. duct access) or passive access measures. Only then, if measures in the most upstream market alone are not sufficient to solve the competition problem in the retail market, can NRAs move on to define and analyse wholesale markets further downstream in the supply chain, again using a modified greenfield approach if regulation is in place at the time of the assessment.

Whether demand-side substitutability or supply-side switching flexibility exists can be determined using the "*SSNIP*" test<sup>22</sup>. In this test, the NRA should ask itself what would happen if a small but significant and persistent price increase were to occur for a particular product or service and the prices of all other products or services remained constant ("relative price increase"). While whether a relative price increase is significant will depend on each individual case, NRAs should assume that customer (consumer and business) reactions to a small but sustained price increase are likely to be in the range of 5% to 10%. The reaction of customers will indicate whether substitutable products exist and, if so, how the relevant product market should be defined.

As a starting point, the NRA should first identify an electronic communications product or service that is offered in a particular geographic area and could be considered for the

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<sup>22</sup> "small but significant non-transitory increase in price", also known as the hypothetical monopolist test

imposition of obligations. Subsequently, the NRA may include additional products or areas, depending on whether these products or areas exert competitive pressure that affects the price of the initially analysed product or service. The NRA should apply this test up to the point at which it can demonstrate that a relative price increase would be profitable within the defined geographic and product markets, i.e. the point at which there would no longer be a critical loss of revenue from switching to other readily available substitutes or to providers in other geographic areas.

However, the ability of customers to replace a product with an alternative because of a small but significant and persistent relative price increase may be affected by, among other things, significant switching costs. Customers who have invested in certain technology or made other necessary investments in order to obtain a service or use a product may not be willing to incur the additional costs of switching to a service or product that is actually interchangeable, or may find the switching costs prohibitively high. In addition, customers may be tied to the previous provider by long-term contracts. In a situation where customers incur significant costs to replace product A with product B, these two products may therefore not be in the same relevant market.

Once the relevant product market has been defined, the next step is to determine its geographic scope. Only when the geographic scope of the product or service market is known can an NRA properly assess the competitive conditions in this market.

According to established case law, the relevant geographic market comprises an area in which the companies are involved in supply and demand for the relevant products or services and the competitive conditions are sufficiently homogeneous and can be distinguished from neighbouring areas in which significantly different competitive conditions exist.

In the electronic communications sector, the relevant geographic market has so far been determined on the basis of two main criteria: a) the area covered by a network and b) the existing legal and other administrative instruments.

With regard to relevant markets of the market recommendation, the NRA's task in practice will generally be to determine the geographical scope (geographical definition) of the relevant markets.

## **2.4 Competitive conditions on retail markets and ex ante regulation of wholesale markets**

This chapter largely refers to the contents of the 2016 Market Recommendation and the Commission Staff Working Document of 2018<sup>23</sup> on ex ante regulation, which ultimately serves to ensure sustainable effective competition on retail markets in the interests of end users.

The starting point for the analysis is the retail markets. If there is no effective competition on the retail markets without wholesale regulation, an analysis of the wholesale markets is required. However, if an NRA concludes that there is sustainable competition on the defined

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<sup>23</sup> Recitals 7 - 26 of the 2016 Market Recommendation and chapters "Regulatory principles" and "Relationship between relevant retail and wholesale markets" of the Commission Staff Working Document of 27 April 2018, SWD(2018) 124 final, on the EC Guidelines on market analysis and the assessment of significant market power (2018/C 159/01), available at [https://ec.europa.eu/transparency/documents-register/detail?ref=SWD\(2018\)124&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2018)124&lang=en)

retail market without regulation at the wholesale level, it should also conclude that ex ante regulation at the wholesale level is no longer necessary. In such a case, the relevant wholesale market in question should be examined with a view to lifting ex ante regulation.

NRA's do not need to identify significant market power at the retail level in order to justify a further definition of related wholesale markets. It is sufficient to identify a competition problem at the retail level if there is no regulation at the wholesale level.

Prior commitments are only imposed on markets where there is not yet effective competition. The analysis of the actual competitive situation should also include a clarification of whether the market is potentially competitive and thus whether the absence of effective competition is a permanent phenomenon.

When determining the wholesale markets that are eligible for ex ante regulation, the starting point is the analysis of the corresponding retail markets. This analysis of the retail markets is carried out with foresight, taking into account demand-side and, where applicable, supply-side substitutability over a certain period of time.

It should be analysed whether there is effective competition in the retail markets in the absence of regulation based on a finding of significant market power in the forecast period. In addition, the effects of other regulations applicable to the relevant retail and related wholesale markets throughout the period in question should be taken into account in the analysis.

As part of the analysis, taking into account probable or foreseeable market developments, it should be determined whether the market in the forecast is competition-orientated, i.e. whether the lack of competition will be permanent.

If, in the absence of ex ante regulation, there is no effective competition on the retail market in question, the relevant wholesale market that is eligible for ex ante regulation under Article 16 of the Framework Directive should be analysed. When defining the market and analysing market power on a particular relevant wholesale market to determine whether it is effectively characterised by competition, direct and indirect competitive pressure should be taken into account.

Where wholesale markets are vertically interconnected in the value chain, the wholesale market at the top of the upstream value chain in relation to the retail market in question should be assessed first. An NRA should examine the markets that are downstream in relation to a regulated upstream input, step by step up to the retail market, to determine whether they would be effectively competitive if upstream regulation were in place.

## **2.5 Market recommendation: Markets eligible for ex ante regulation**

In its annex, the 2016 Market Recommendation specifies electronic communications markets that may have characteristics that justify ex ante regulation, as they fulfil the three-criteria

test. This means that the NRA should assume that the three criteria are met in these markets<sup>24</sup>. Before the NRA defines markets that deviate from the 2016 Market Recommendation, it must ensure that they fulfil the three-criteria test (Art. 21 para. 1 let. a-c KomG). If one of the three criteria is not met, this indicates that the market should not be defined as a market eligible for ex ante regulation<sup>25</sup>. It is assumed that by regulating the relevant wholesale markets contained in the 2016 Market Recommendation, a lack of effective competition at the wholesale level, which in turn is the cause of identified market failures on the retail markets, can be remedied<sup>26</sup>. However, if an NRA concludes that there is sustainable competition on the defined retail market without regulation at the wholesale level, it should also conclude that ex ante regulation at the wholesale level is no longer necessary<sup>27</sup>.

If, as part of the market analysis in accordance with Art. 32 para. 3 VCND, the NRA determines that the conditions for special regulation in accordance with Art. 22 of the Act are not met with regard to a relevant market and that special regulation measures still exist for companies on this market, these must be lifted subject to a transitional period of no more than six months.

## 2.6 Three-criteria test

In accordance with the 2016 Market Recommendation, Art. 21 para. 1 let. a-c KomG sets out the three criteria that must be met cumulatively in order for a market to be subject to ex ante regulation. The following explanations use recitals 16-21 of the 2016 Market Recommendation.

### **First criterion: There are significant and persistent barriers to access.**

The first criterion is to assess whether there are significant and persistent barriers to entry. However, given the dynamic nature and functioning of the electronic communications markets, when preparing a forward-looking analysis to determine the relevant markets for ex ante regulation, it should be taken into account that barriers to entry may be removed in a relevant period of time.

Two types of barriers to entry are relevant: structural barriers to entry and legal or regulatory barriers to entry. Structural barriers to entry result from the initial cost or demand situation, which leads to an imbalance between incumbents and new entrants, thus hindering or preventing their access to the market. Significant structural barriers exist, for example, if the market is characterised by absolute cost advantages, significant volume and/or size-related advantages, capacity bottlenecks and high sunk costs in the past. A corresponding structural barrier may also exist if the provision of a service requires a network component that cannot be replicated technically or only at high cost, making the service unprofitable for competitors.

Legal and regulatory barriers to entry result from legislative, administrative or other measures that have a direct impact on the conditions of entry and/or the position of operators on the relevant market. An example of legal or regulatory barriers to entry that impede or prevent

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<sup>24</sup> Recitals 16 and 24 of the 2016 Market Recommendation

<sup>25</sup> Recital 22 of the 2016 Market Recommendation

<sup>26</sup> Recital 23 of the 2016 Market Recommendation

<sup>27</sup> Recital 24 of the 2016 Market Recommendation

access to the market is a limited number of companies that have access to frequencies for the provision of basic services.

Barriers to entry can become less relevant in innovative markets characterised by constant technological progress. Here, competitive pressure often arises from upcoming innovations from potential competitors that are not yet present on the market. When deciding whether barriers to entry are likely to continue to exist without regulation, it is necessary to examine whether market entries are frequent and successful in the sector and whether sufficiently rapid and sustained market entries can limit market power or are likely to do so in the future. The significance of barriers to entry depends, among other things, on the minimum efficient scale of output required for an efficient activity and the sunk costs.

**Second criterion: The market structure does not tend towards effective competition.**

The second criterion is used to analyse whether a market structure tends towards effective competition within a certain period of time. When applying this criterion, the state of infrastructure competition and other competition behind the barriers to entry must be examined.

A trend towards effective competition based on the second criterion means that the market will either reach the status of a market with effective competition within the review period without ex ante regulation or will reach this status after this period if there is evidence of a positive dynamic for this period. Market dynamics can arise, for example, as a result of technological developments or the convergence of products and markets, which can lead to operators active in different product markets exerting competitive pressure on each other. This can also be the case in markets with a limited but sufficient number of companies with different cost structures that are confronted with price elastic demand. Furthermore, there may be excess capacity in a market that would normally allow competing firms to increase their production very quickly in response to a price increase. In such markets, market shares may change over time and/or prices may fall.

The most important indicators to be taken into account when examining the first and second criteria are comparable to those used in the context of a forward-looking market analysis to determine the existence of significant market power. These are, in particular, barriers to entry in the absence of regulation (including the extent of sunk costs), market structure, market performance and market dynamics, including market shares and trends, market prices and market price developments, as well as the size and coverage of competing networks or infrastructures.

**Third criterion: Competition law measures alone are not sufficient to adequately counteract the identified market failure.**

The third criterion is fulfilled if the market failure in question cannot be adequately counteracted by competition law means alone.

The third criterion serves to assess the appropriateness of the remedies that can be imposed under competition law to address an identified persistent market failure, in particular in view of the fact that ex ante obligations can effectively prevent infringements of competition law. Competition law interventions are unlikely to be sufficient if, for example, extensive requirements need to be met as part of a measure to remedy a persistent market failure or if frequent and/or rapid interventions are necessary. Prior regulation should therefore be seen

as an appropriate supplement to competition law if competition law measures alone would not be sufficient to adequately remedy a persistent market failure that has been identified.

## 2.7 Market power

According to the definitions in Art. 3 para. 1 no. 3 KomG, an "undertaking with significant market power" is

*"a company which, either alone or jointly with others, enjoys a position equivalent to control, i.e. a position of economic strength that enables it to behave to a significant extent independently of competitors, customers and ultimately consumers".*

From an economic perspective, significant market power refers to the power of a company to permanently raise prices significantly above the competitive level (i.e. the efficient costs of providing the service) without having to suffer significant losses in sales.

The existence of economic market power is analysed in the market analysis, whereby the criteria of Art. 31 VKND are taken into account in particular according to their relevance for the market under scrutiny. Further details on the assessment of significant market power can be found in Chapter 3 of the ESA Guidelines. In the following, the AK lists the main contents of the ESA guidelines from points 54-63.

When assessing the market power of a company, it is important to consider the market shares of the company and its competitors as well as the competitive pressure exerted by potential competitors in the medium term. Market shares can give NRAs an initial indication of the market structure and the relative importance of the companies operating in the market. However, market shares must be interpreted taking into account the respective market conditions and, in particular, the dynamics of the market and the extent of product differentiation.

According to the established case law of the Court of Justice of the EU, a particularly high market share held by a company over a certain period of time (over 50 %) is -in itself evidence of the existence of a dominant position-, except in exceptional circumstances. Experience has shown that the higher the market share and the longer it is held, the more likely it is to be an important initial indication of the existence of significant market power.

However, even companies with high market shares cannot act largely independently of customers who have sufficient bargaining power. Moreover, the fact that a company with a strong position in the market is gradually losing market share may well indicate increasing competition in that market, but does not preclude a finding of significant market power. Market shares that fluctuate significantly over time may be an indication of a lack of market power in the relevant market. The fact that an entrant is able to rapidly increase its market share may also indicate that the market in question is more competitive and that barriers to entry can be overcome in a reasonable timeframe.

If the market share is high but remains below the 50% threshold, NRAs should base their assessment of SMP on other important structural market characteristics. They should then carry out a detailed structural assessment of the economic characteristics of the market concerned before drawing conclusions on the existence of significant market power.



The determination of significant market power depends on how easy it is to enter the market. In the electronic communications sector, barriers to entry are often high due to technical constraints such as spectrum scarcity, which may limit the amount of spectrum available, or because entry into the relevant market requires extensive infrastructure investment and capacity planning over long periods of time for reasons of profitability.

However, high barriers to entry can become less important in markets characterised by continuous technological innovation, as new technology in particular enables market entrants to offer qualitatively different services with which they can challenge the operator with considerable market power. In the electronic communications markets, competitive pressure can also come from upcoming innovations from potential competitors who are not yet present on the market.

NRAs should therefore take into account the likelihood that undertakings not currently active in the relevant product market will be able to enter the market in the medium term. Companies that, in the event of a price increase, would be able to switch or expand their range of products or services in order to enter the relevant market should be treated by NRAs as potential entrants, even if they are not yet producing the product or providing the service in question at the time of the investigation.

Market entries are more likely if potential market entrants are already present in neighbouring markets or provide services that are relevant for the provision of the relevant retail services or competition for these services. In determining whether market entry is likely and viable, the key factor is whether the minimum volume required for cost-effective operation can be achieved.

NRAs should also carefully consider economies of scale and scope, network effects, the importance of access to scarce resources and the sunk costs associated with network expansion.

Based on the determination of powerful suppliers and the identification of the relevant competition problems in the analysed markets, the necessary special regulatory measures that are suitable for eliminating or reducing the competition problems identified must then be determined.

## **2.8 Market consultation**

If the AK intends to take special regulatory measures that are likely to have a significant impact on the market in question, it shall notify interested parties in accordance with Art. 24 para. 1 of the KomG and give them the opportunity to comment on the content of the measures within a reasonable period of time. For this purpose, the AK must conduct a public consultation in accordance with Art. 46 KomG in conjunction with Art. 24 para. 1 let. a RKV.

In accordance with Art. 46 para. 2 KomG, the AK also publishes important information such as the lifting of special regulatory measures via public consultations.

The consultation procedure pursuant to Art. 24 para. 1 KomG in conjunction with Art. 46 para. 1 KomG is a non-litigious administrative procedure of its own. Art. 46 para. 1 KomG for the purpose of analysing the market is a non-contentious administrative procedure of its own.

It serves to review the competitive situation and promote transparency through the early and public discussion of the market analysis prepared by the AK<sup>28</sup>.

The consultation participants have a (pure) right to be heard. According to Art. 47 Para. 1 KomG, "participation in a public consultation does not give rise to any further legal claims".

The AK publishes the consultation document, the evaluation of the comments and the comments themselves, insofar as they are not subject to a confidentiality obligation, on its website<sup>29</sup>. The consultation procedure is concluded with the publication of the final version of the market analysis in accordance with Art. 41 para. 1 let. b KomG<sup>30</sup>.

## 2.9 Notification procedure ESA

In order to ensure that any special regulatory measures planned at national level that are likely to have an impact on trade between EEA member states do not adversely affect the internal market or the objectives pursued by the European legal framework, the AK must notify the ESA and the other EEA NRAs of the draft measures in accordance with Art. 24 para. 2 KomG in conjunction with Art. 27 para. 1 TCA (or Art. 7 para. 3 Framework Directive) in the notification procedure. Art. 27 para. 1 RKV (or Art. 7 para. 3 of the framework directive) in the notification procedure. This EEA-wide consultation serves to create transparency and consolidate the internal market. Further details are set out in the notification recommendation<sup>31</sup>.

The notification procedure should include the special regulatory measures proposed by the NRA to remedy the identified market failure, as well as the justification for the measures. If the draft measure relates to a market that proves to be competitive and for which special regulatory measures already exist, the notification should also contain the proposals for lifting these obligations.

The draft measures notified by the AK should be accompanied by the documents required by the ESA to fulfil its tasks. For the draft measures notified using the short notification form, the ESA does not generally require any additional documents in order to fulfil its tasks.

Draft measures for markets listed in the current Market Recommendation 2016 for which a lack of competition has been identified in the course of a prior market review and regulatory measures have been imposed should be submitted to the Authority using the standard notification form in accordance with Annex I of the Notification Recommendation.

In an initial phase, the ESA has one month<sup>32</sup> to assess the submitted analysis and the planned measures. If the authority expresses justified doubts about the compatibility of the submitted measures with applicable EEA law, it may extend the deadline for further investigation of the

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<sup>28</sup> A distinction must be made between the market consultation procedure and the subsequent, contentious special regulation procedure pursuant to Art. 23 para. 1 KomG, in which the AK imposes specific individual "obligations with an order (special regulation measures)" on a company with market power.

<sup>29</sup> available at <https://www.llv.li/en/national-administration/office-for-communications/consultations/current-consultations/market-analysis-centralised-broadband-access-for-mass-market>

<sup>30</sup> available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/centralised-broadband-access-for-the-mass-market>

<sup>31</sup> in particular recitals 2, 11 and points 1 (b), 4, 5, 8, 13, 20-22

<sup>32</sup> in accordance with Article 7(3) of Directive 2002/21/EC (Framework Directive), available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0021&from=GA>

facts by two months. If there are no such doubts, the AC may adopt the national measures submitted. If, however, the ESA concludes within the extended period that the market definition or the determination of significant market power violates applicable EEA law, it may prohibit the AC from implementing the planned measure.

With regard to the design of the specific measures of the special regulation *per se*, i.e. the obligations imposed on the providers, the ESA only has the authority to comment, but not to prohibit. If the ESA comments on a draft measure submitted, the AK must take the comments into account as far as possible.

All relevant documents and published information relating to the notification of special regulatory measures by the AK can be viewed in the ESA's electronic register<sup>33</sup>. All public documents relating to the national consultations can be viewed on the AK website<sup>34</sup>.

## 2.10 Time horizon

Article 21 Para. 2 KomG stipulates that the competitive situation in the defined markets must be regularly reviewed by the regulatory authority, taking into account the ESA guidelines as far as possible, without the time horizon of a market analysis being specifically defined. The time horizon for market analyses is set at three years in Art. 16 Para. 6 of the Framework Directive. The successor Directive (EU) 2018/1972 of 11 December 2018 on the European Electronic Communications Code ("Code")<sup>35</sup>, which will apply in the EU from 21 December 2020, provides for an extended time horizon of five years in Art. 67 para. 5 let. a, which can be extended by one year, and justifies the extended deadline compared to the Framework Directive with greater stability and improved regulatory predictability.

Due to the market analysis of the network infrastructure, which was only renewed in October 2023 and is the authoritative basis for competition on the downstream broadband markets and regulates access to the passive network infrastructure with a time horizon of 5 years, the AK envisages a time horizon of the same length for the market analysis in question. According to the AK's considerations, the agreed time horizon of 5 years is also preferable to a shorter duration in terms of greater stability and regulatory predictability, whereby the AK will continue to keep the market under observation and provide for regulatory intervention, such as a new market analysis, in the event of serious changes in the competitive situation.

## 2.11 Changing guideline basis - Code

With regard to the repeal measures of the special regulation, the AK notes that the Code will enter into force shortly, but that the repeal measures of the market analysis in question will still be decreed under the KomG on the basis of the 2002 directive package, and thus the repeal will extend into the near future under the revised legal framework of the Code.

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<sup>33</sup> available at <https://www.eftasurv.int/internal-market/notifications-and-applications/ecom-notifications/ecom-documents?country=LI>

<sup>34</sup> available at <https://www.llv.li/en/national-administration/office-for-communications/consultations>

<sup>35</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018L1972>

It is concluded that, from a forward-looking perspective, the repeal measures are also justified under the future legal framework of the Code, in particular in view of the fact that the regulation of network infrastructure relevant to the competitive state of the market in question will also continue under the Code.

## 2.12 Competence

In accordance with Art. 56 KomG in conjunction with Art. Art. 3 RKV, the AK, as the competent regulatory authority, is responsible for the fulfilment of all regulatory tasks in the field of electronic communications. These tasks include, in particular, the promotion and monitoring of effective competition in accordance with Art. 56 Para. 1 let. a KomG as well as ordering and lifting of special regulatory measures in accordance with Art. 56 Para. 1 let. h KomG.

## 2.13 Competition authority

There is no national competition law in Liechtenstein apart from the competition rules applicable under the EEA Agreement. There is also currently no independent competition authority in Liechtenstein. Appeals under competition law in accordance with the applicable EEA law must therefore be addressed to the ordinary national courts or the ESA or the European Commission. Apart from this, the Office of Economic Affairs is responsible for implementing the competition rules in accordance with Art. 2 Para. 1 of the Act of 23 May 1996 on the Implementation of Competition Rules in the European Economic area<sup>36</sup>, LGBl. 1996 No. 113, insofar as the courts do not have jurisdiction. However, this implementation is essentially aimed at supporting the ESA and carrying out sovereign acts, but not the substantive application and enforcement of the EEA competition rules.

For these reasons, cooperation with or consultation of a competition authority within the meaning of Art. 16 para. 1, second sentence, of the Framework Directive is not possible for this market analysis in Liechtenstein.

## 2.14 Data basis

Registered providers are subject to the obligation to provide information to the regulatory authority (Art. 44 KomG). They regularly provide the AK with information on their activities and infrastructures in Liechtenstein as part of the statistical data collection.

The most important data, which form the basis for this market analysis, are collected by the AK in annual statistical data surveys in the first half of the year for the previous calendar year. The data is available in full from September of the following year; however, follow-up figures are already available from February onwards from an advance data collection. For reasons of proportionality, additional data is only collected between these intervals if this appears necessary due to rapidly changing market conditions or for other special reasons.

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<sup>36</sup> available at <https://www.gesetze.li/konso/1996113000>

In this market analysis, the AK therefore uses data from 2022 as the most recent data and data from 2023 for connections. The AK collected the price information used in the analysis itself through periodic analyses of the providers' websites.

### 3 The broadband access market in Liechtenstein

The broadband access market has a variety of relationships with other generic markets in the overall electronic communications market. The functional relationships with other markets are explained below and the status of regulation is discussed.

#### 3.1 Relationships between the broadband access market and other electronic communications markets

The relevant markets and their interrelationships are shown in the generic market chart (Figure 3).

The market for Internet broadband connections in the fixed network, which is usually bundled with telephony and/or TV services at end customer level in the mass market, is based on active and passive wholesale services.

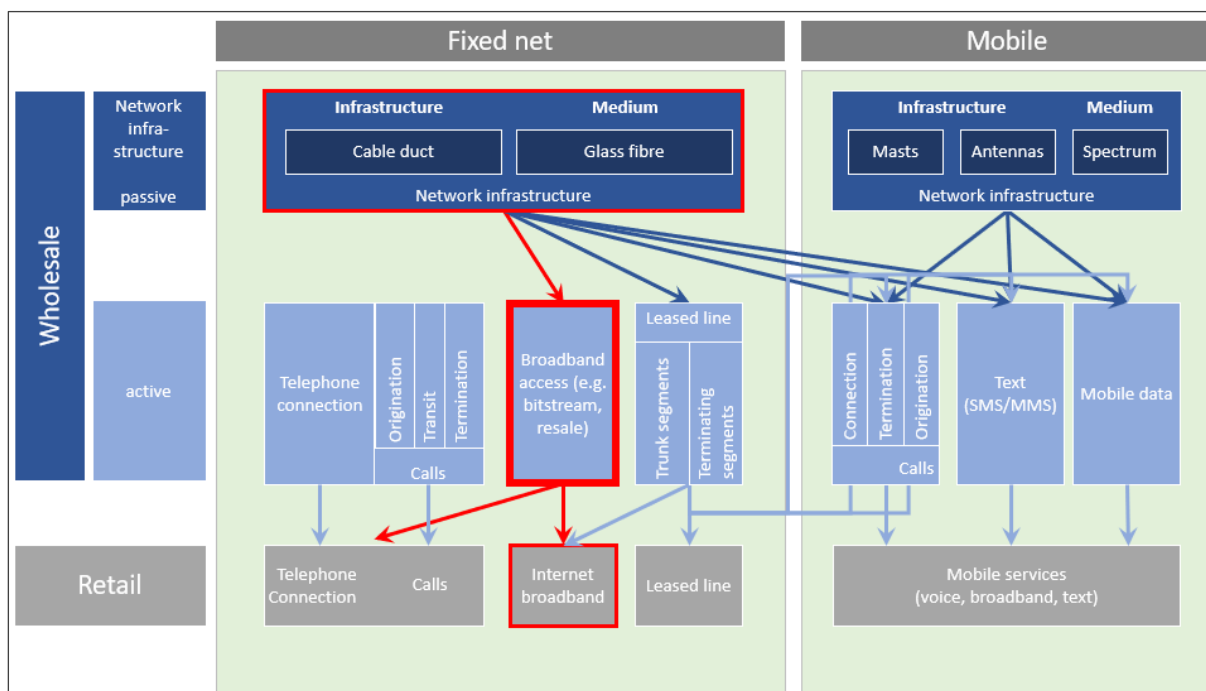


Figure 3: Overview of the overall market - hierarchy and dependencies of the generic markets [Source: AK]

The wholesale market for broadband access is directly upstream of the end customer market for Internet broadband connections. Due to the digitisation of telephony (VoIP<sup>37</sup>) and the provision of VoIP voice services via broadband connections, broadband connections are also linked to the fixed-line telephone connection market. The active broadband wholesale services are either provided by the providers themselves or purchased from wholesale providers.

The most upstream, passive network infrastructure is a basic prerequisite for all services at the downstream wholesale and end customer levels. In the Liechtenstein market, the national network infrastructure, in particular fibre optics and cable ducts for the access and backbone networks, is operated by the LKW and made available to providers under regulated conditions<sup>38</sup>. Chapter 4 presents the market development of the broadband market with regard to retail connections and wholesale access services.

## 3.2 Regulation to date

The regulatory starting point for this market analysis is shown in Figure 4.

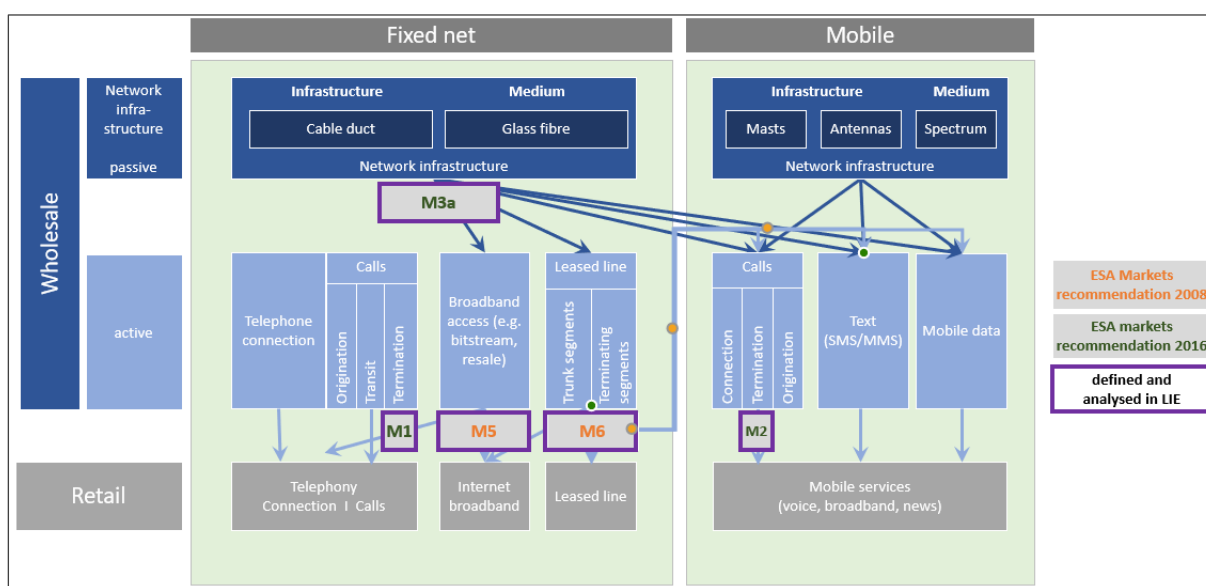


Figure 4: Initial situation of the markets analysed and regulated by the AK [Source: AK]

<sup>37</sup> Voice over Internet Protocol, a generic term for the transmission of voice over packet-switched data networks based on the Internet Protocol. VoIP traffic can take place via a controlled private network, the public Internet or a combination of both networks. The bandwidth requirement is approx. 100 kbit/s.

<sup>38</sup> Regulation of 24 October 2023, available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-subscriber-connection>  
eCom Registry ESA, Case number 90933, available at <https://www.eftasurv.int/internal-market/notifications-and-applications/ecom-notifications/ecom-documents?caseNumber=90933>

The following market analysis is relevant for the broadband access market:

**Analysis of the wholesale market for physical access to local loops provided locally at fixed locations** (wholesale market M3a of the markets recommendation 2016)<sup>39</sup>

- Among other things, the LKWs are obliged to offer access to unbundled subscriber lines (unbundling), to fibre optics in the core network, to cable ducts and to co-location.
- With the ruling on the obligation to provide access on non-discriminatory terms, the cost accounting model, fees and offer conditions by means of a reference offer<sup>40</sup> were also approved.

## 4 The development of the broadband market

The AK derives market developments and trends mainly from annually collected statistical data. In this chapter, following an overview of the providers, the AK first describes the developments at end customer level (Internet broadband connection) and then those at wholesale level (broadband access).

In the following, the AK presents unredacted broadband market figures from the regulated provider TLI. Overall market figures and data contained in public documents or websites are also used without redaction. Other market figures of non-regulated operators from AK data surveys are redacted at ●●●●.

### 4.1 Provider of electronic communication in Liechtenstein

Compared to the small size of the country, the Liechtenstein electronic communications market is served by a large number of providers that cover the mass market and the business customer market with standardised and customised services. Fixed network telephony services are offered by 10 providers, broadband Internet connections by 15 and mobile phone connections by 4 providers<sup>41</sup>. Bundled offers for the mass market based on broadband Internet connections are currently available from the 7 providers TLI (brand "FL1"), Hoi Internet ("Hoi!"), TV-COM ("Dorfnetz.li"), Vestra ICT ("plus.li"), Supranet ("supra.net"), Li-life web+it and Salt (Liechtenstein) ("7acht").

In Figure 5 the main providers are categorised by name or brand name according to their position in the generic market structure, with the providers of bundle products only appearing once under the areas of "Telephone connection / calls" and "Broadband access".

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<sup>39</sup> available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-subscriber-connection>

<sup>40</sup> available at <https://www.llv.li/serviceportal2/amtstellen/amt-fuer-kommunikation/lkw-standardangebot-zugang-zur-infrastruktur-v1.0-clean-copy.pdf>

<sup>41</sup> Values as at the end of 2023, according to the telecommunications statistics published by the AK in February 2024, available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-statistics>

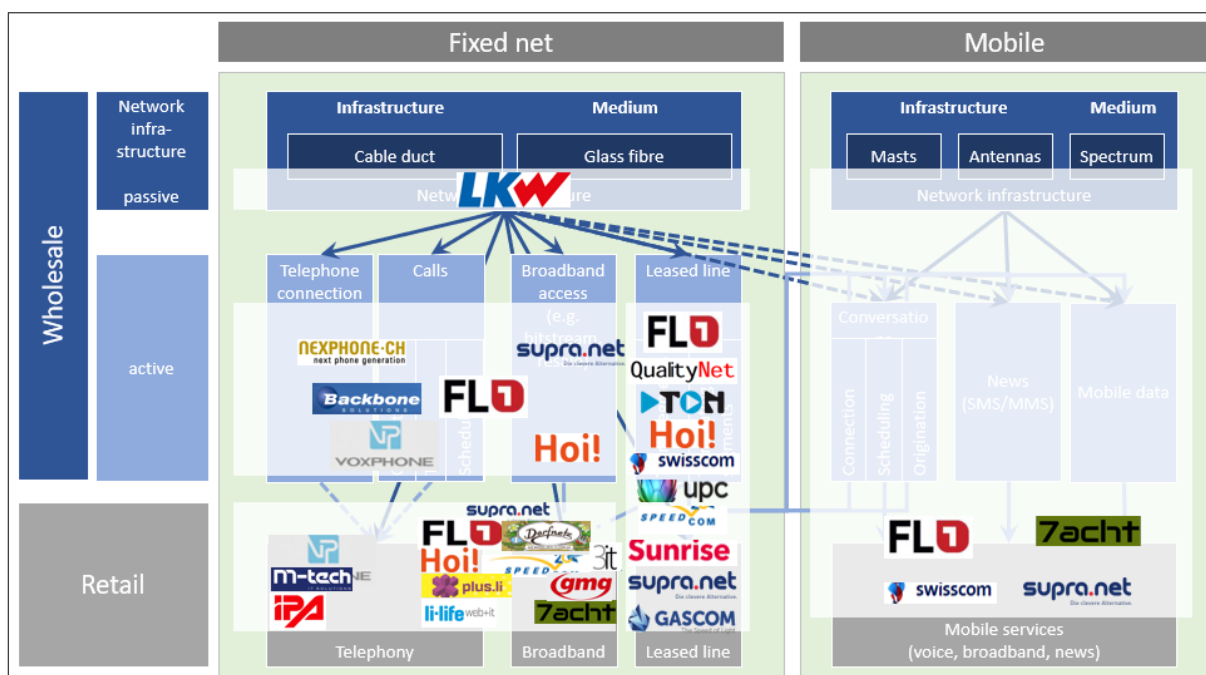


Figure 5: Providers in the Liechtenstein telecoms market [Source: AK]

## 4.2 End customer market Internet broadband connection in the fixed network

A large number of providers have been active in the end customer market for broadband internet access for many years. After a stable phase with 12 providers, further market entries have been recorded since 2020 (Table 1).

Demand for broadband internet connections is increasing continuously, with an annual increase of around 3%, similar to the trend in the number of households and workplaces. The demand rate for households and workplaces was around 73% between 2015 and 2019 and then rose towards 80%.

Connections for mobile internet, which could be used as a substitute for fixed network connections at a fixed location, are not relevant according to the statistics. The number is low and the long-term trend is decreasing.



Values as at 31 December	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Internet broadband connections in the fixed network</b>									
Number of connections	15'538	15'833	16'230	16'712	17'173	18'050	18'550	19'222	19'721
Number of providers	11	10	12	12	12	13	14	15	15
of which with bundled offers <sup>1</sup> in the mass market	4	5	5	6	6	6	6	6	7
<b>Internet connections in the mobile network<sup>3</sup></b>									
Number of connections +423	982	938	1'475	1'430	1'671	1'142	1'100	1'001	989
Number of connections +41 (extraterritorial use in Liechtenstein)	1'963	2'142	1'298	1'081	954	802	778	784	928
Total	2'945	3'080	2'773	2'511	2'625	1'944	1'878	1'785	1'917
<b>Households and workplaces</b>									
Quantity	21'551	21'836	22'263	22'689	23'097	23'483	23'813	24'170	*
Demand rate <sup>2</sup> Fixed network	72%	73%	73%	74%	74%	77%	78%	80%	*
Demand rate <sup>2</sup> Mobile network	14%	14%	12%	11%	11%	8%	8%	7%	*
<sup>1</sup> Internet broadband + telephone and / or TV <sup>2</sup> Connections per household or workplace <sup>3</sup> Connections for mobile Internet, which are used at a fixed location * An asterisk in place of a number means that the number is not available or has not been collected.									

Table 1: Development of the market for Internet connections [Source: AK]

The largest share of demand in terms of download performance is for 100 Mbit/s connections (Figure 6). Over the years 2020-2023, the demand for performance in terms of data throughput increased continuously. The detailed statistical data, currently available up to 2022, show a clear shift towards higher performance categories. As an initial estimate for connections with at least 5 Gbit/s in 2023, the Office assumes more than 500 connections, compared to less than one hundred connections in 2022, when such connections were offered on the mass market for the first time.

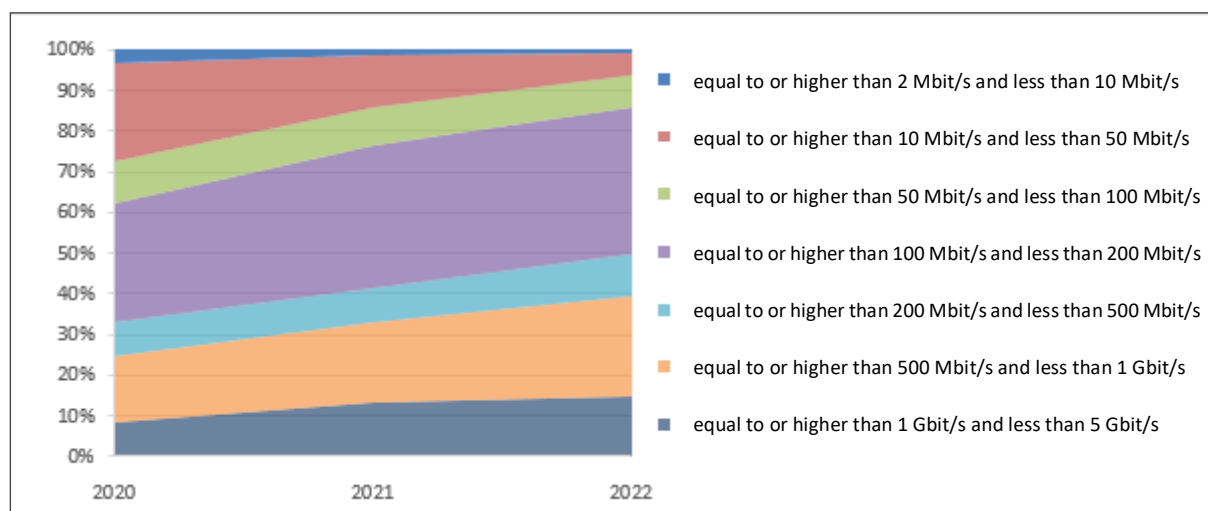


Figure 6: Demand for connections by download capacity [Source: AK]

## TLI (brand "FL1")

As the incumbent, TLI is the provider with the largest range of services and market share in the end customer market. In 2016, its last monopoly in fixed-line telephony fell as a result of number portability and the regulatory obligation to offer VoIP wholesale services, which led to several entries into the telephony market in quick succession. Since the vertical separation of infrastructure and services in 2007, TLI has purchased the passive network infrastructure from the LKW, as have all other service providers. TLI was designated by the government as a universal service provider for the period 2019 to 2029. The universal service includes internet broadband connections and VoIP telephony, among other things.

Over the period of the conversion of access networks to FTTB<sup>42</sup> fibre-optic subscriber line lines from 2017 to 2023, market shares declined continuously according to the public market share statistics<sup>43</sup> of the AK of TLI (Table 2).

	2017 (Start FTTB expansion)	2023 (end of FTTB expansion)
Internet broadband connections	68%	52%
Fixed network telephone lines	97%	62%
+423 mobile phones	75%	57%

Table 2 Development of the market shares of TLI during the FTTB roll-out [Source: AK]

## Alternative providers of Internet broadband connections in the fixed network

Internet broadband connections are offered by 14 other providers in addition to TLI, whereby the AK assigns the 8 providers listed in the public market share statistics to the mass market (Table 3), namely TLI<sup>44</sup>, Hoi Internet<sup>45</sup>, TV-COM<sup>46</sup>, Vestra ICT<sup>47</sup>, Supranet<sup>48</sup>, li-life web+it<sup>49</sup>, Salt (Liechtenstein)<sup>50</sup> and Speedcom (for business customers)<sup>51</sup>. The mass market includes providers that offer service bundles with Internet broadband and other services relevant to households and small businesses, such as telephony or TV, on their websites.

All Internet broadband providers also have access to VoIP and TV wholesale services, meaning that providers can also offer bundled services in competition<sup>52</sup>. Internet broadband

<sup>42</sup> Fibre to the building, glass fibre into the building

<sup>43</sup> The AK's market share statistics for the end customer markets internet connection, fixed-line telephone connection and mobile telephone connection are updated annually for the most recent 4 years and published on the AK website. The market share statistics for the years 2020-2023 have been available since 16 February 2024 at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-statistics>

<sup>44</sup> Telecom Liechtenstein AG, brand: FL1, website <https://fl1.li/de>

<sup>45</sup> Hoi Internet AG, Brand: Hoi!, Website <https://www.hoi.li/>

<sup>46</sup> TV-COM AG, Brand: Dorfnetz.li, Website <https://dorfnetz.li/>

<sup>47</sup> vestra ICT AG, Brand: Plus, Website <https://plus.li/>

<sup>48</sup> Supranet AG, brand: supra.net, website <https://supra.net/>

<sup>49</sup> li-life web+it est., Website <https://www.li-life.li/>

<sup>50</sup> Salt (Liechtenstein) AG, brand: 7acht, website <https://www.7acht.li/>

<sup>51</sup> Speedcom AG, website <https://www.speedcom.li/>

<sup>52</sup> Due to the competitive situation, the existing regulatory measures regarding access to the public telephone network at fixed locations were repealed by decree on 28 October 2022. The market analysis and lifting order are available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-telephone-network>

connections are also available as a bundle with telephony and/or TV from all providers active in the mass market (Table 1).

Values as at 31 December		2017	2018	2019	2020	2021	2022	2023
<b>Total Internet connections</b>		<b>16'230</b>	<b>16'712</b>	<b>17'173</b>	<b>18'050</b>	<b>18'550</b>	<b>19'222</b>	<b>19'721</b>
<b>Provider name</b>	<b>Brand</b>							
Telecom Liechtenstein	FL1	68%	66%	62%	59%	57%	54%	52%
Hoi Internet	Hi!	12%	13%	13%	13%	13%	13%	12%
TV-COM	Dorfnetz.li	5%	6%	8%	9%	9%	9%	10%
vestra ICT	plus.li	-	1%	3%	4%	6%	8%	9%
Supranet	supra.net	9%	9%	9%	9%	8%	9%	8%
li-life web+it	li-life web+it	4%	4%	4%	4%	3%	3%	3%
Salt (Liechtenstein)	7acht	-	-	-	-	-	0%	2%
Speedcom (business customers only)	speedcom	0%	1%	1%	2%	2%	2%	2%
- A dash in place of a number means zero. 0 A zero in place of another number means a quantity that is less than half of the counting unit used Market shares are stated as values rounded to whole %.								

Table 3 Retail market shares of providers of Internet broadband connections operating in the mass-market  
[Source: AK]

### Price development

The analysis of the price development for different performance classes of the market offer shows that the movement towards higher download performance (see Figure 6, above) is also driven by the development of prices. The prices shown in Table 4 and in Table 5 are based on information taken by the AK from the providers' publicly accessible websites and reflect the market offerings of the mass market. For Internet broadband connections with higher download capacities, the lowest prices for connections in the 1- 10 Gbit/s range are consistently lower than the highest prices for less powerful connections with 500- 900 Mbit/s.

Market offer for Internet broadband connections (mass market)		2020 Dec	2021 Dec	2022 Dec	2023 Dec	2024 Jan
<b>Performance range - Download best effort</b>						
Highest download performance offered	Gbit/s	1	1	10	10	10
lowest download performance offered	Mbit/s	5	5	6	6	100
<b>Prices* for 100 Mbit/s</b>						
Highest price	CHF	49.90	49.90	49.90	49.90	49.00
lowest price	CHF	39.00	39.00	39.00	49.90	49.00

Market offer for Internet broadband connections (mass market)		2020 Dec	2021 Dec	2022 Dec	2023 Dec	2024 Jan
<b>Prices* for 500 - 900 Mbit/s</b>						
Highest price	CHF	69.00	69.00	69.00	59.90	69.90
lowest price	CHF	49.00	49.00	49.00	43.66	52.40
<b>Prices* for 1 - 10 Gbit/s</b>						
Highest price	CHF	69.90	69.90	89.90	89.90	89.90
lowest price	CHF	65.00	49.00	44.25	44.25	45.70
* incl. VAT, monthly payment, average per month for contracts concluded in December/January and 24-month minimum term, incl. router						

Table 4 Development of the market offer for Internet broadband connections in the mass market [Source: AK]

The current market supply in January 2024 - competition is particularly intense at the turn of the year - is shown in Table 5. The price shown is based on special offers, is calculated per month for a 24-month contract and monthly payment and applies to offers for which the provider makes the router available.

Provider	Download best effort	Cover	Price incl. VAT 2024-Jan
li-life web+it	100 Mbit/s	national	49.00
Supranet	100 Mbit/s	national	49.00
Telecom Liechtenstein	200 Mbit/s	national	59.90
TV-COM	400 Mbit/s	local (coax)	49.90
TV-COM	400 Mbit/s	national	59.90
li-life web+it	500 Mbit/s	national	59.00
Supranet	500 Mbit/s	national	59.00
Telecom Liechtenstein	600 Mbit/s	national	69.90
vestra ICT	600 Mbit/s	national	52.40
TV-COM	900 Mbit/s	local (coax)	59.90
TV-COM	900 Mbit/s	national	69.90
li-life web+it	1 Gbit/s	national	75.00
Speedcom (for business customers)	1 Gbit/s	national	89.00
Supranet	1 Gbit/s	national	75.00
Telecom Liechtenstein	1 Gbit/s	national	79.90
vestra ICT	1 Gbit/s	national	56.80
Salt (Liechtenstein)	8 Gbit/s	national	45.70
Hoi Internet	10 Gbit/s	national	59.95
TV-COM	10 Gbit/s	national	89.90

Table 5 Offers for Internet broadband connections in January 2024, monthly prices for 24-month contracts [Source: AK]

A comparison of the offers in January 2024 shows how the market offering was supplemented in 2022 and 2024 with significantly more powerful offers with the same or lower price points based on the offers available since 2020 or earlier (Figure 7).

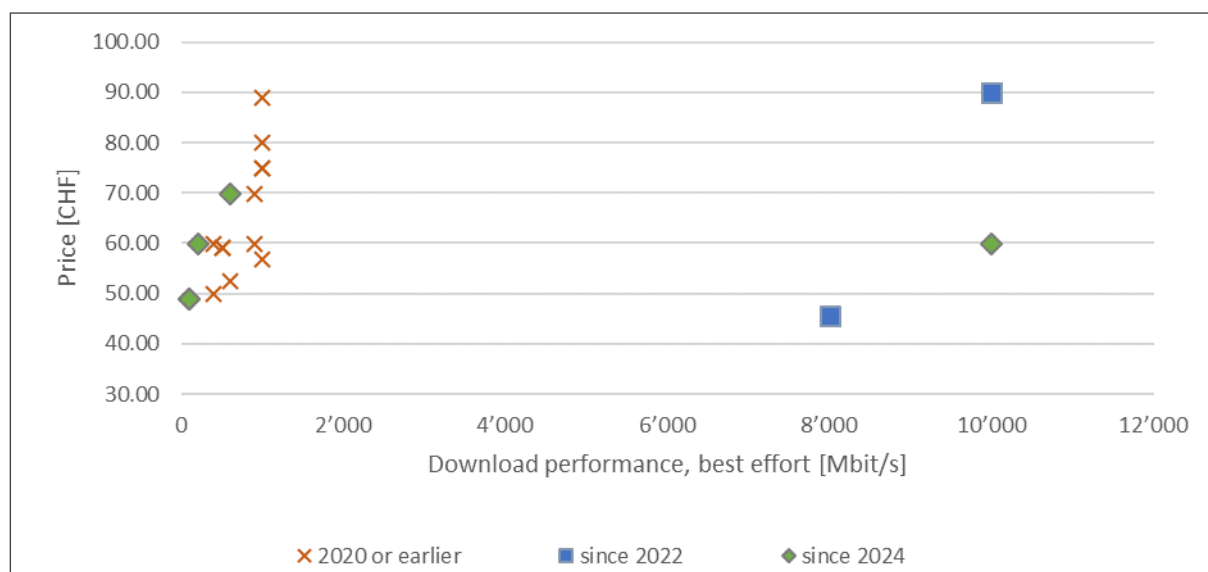


Figure 7 Prices of Internet broadband connections in January 2024, monthly for contracts concluded over 24 months, taking discounts into account [Source: AK]

### 4.3 Wholesale market for broadband access in the fixed network

#### Service provider at wholesale level

With the exception of ●●●●, all providers in the market share statistics (Table 3) provide Internet broadband connections on the basis of their own active communications equipment at the broadband wholesale level (self-supply).

All providers use the passive network infrastructure of LKW. Only TV-COM (brand: “Dorfnetz.li”) also uses lines from its own local HFC coaxial network with coverage of the two municipalities of Eschen Nendeln and Mauren Schaanwald (Figure 8).

The wholesale offer for broadband access in the fixed network is only used to a very small extent overall, by ●●●●, as mentioned above, and by other providers that are not active in the mass market. Currently, providers only provide 3% of Internet broadband connections on the basis of broadband access, i.e. active wholesale services, while they provide all other Internet broadband connections on the basis of passive infrastructure wholesale services from LKW and their own active equipment.

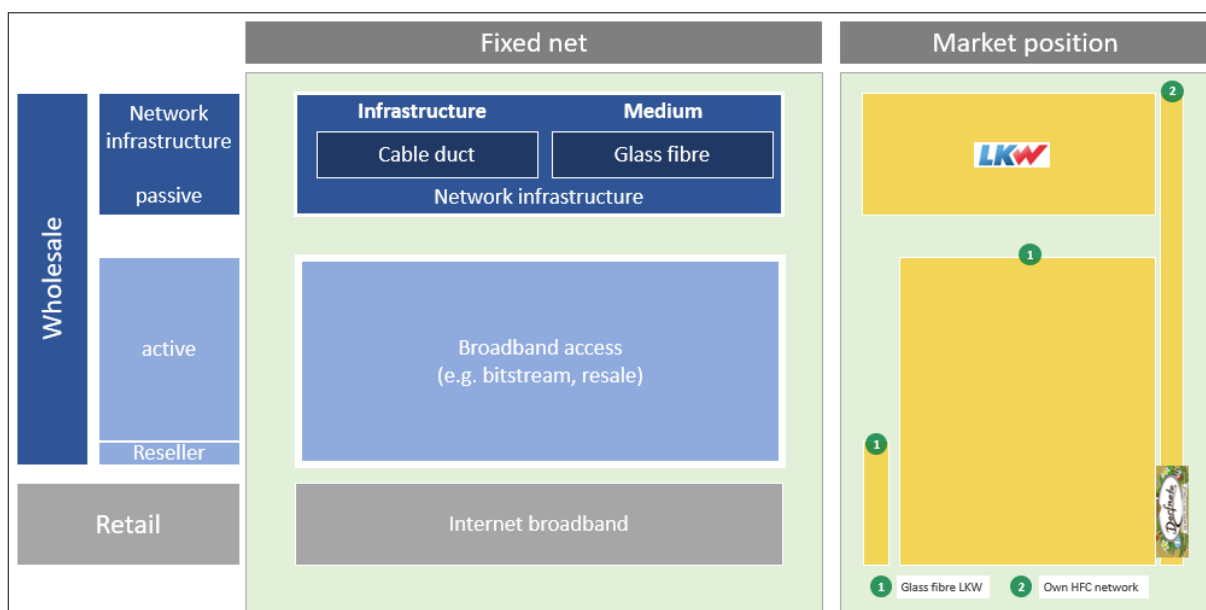


Figure 8 Market position of providers in the retail and wholesale market [Source: AK]

The significance of broadband access for the Internet broadband service at end customer level therefore appears to be rather marginal. Broadband access as a bitstream or resale connection is offered by the (unregulated) companies Supranet and Hoi Internet. According to a data collection conducted in March 2024, the volume of broadband access provided by TLI fell from 58 to zero in the course of 2023 (Table 6).

Values as at 31 December	2020	2021	2022	2023
<b>Wholesale level</b>				
Number of broadband accesses (bitstream, resale)	714	774	679	599
thereof provided by TLI	150	155	58	0
Number of providers (bitstream and resale)	3	3	3	2
Supranet	•	•	•	•
Hoi Internet	•	•	•	•
TLI	•	•	•	
<b>End user level</b>				
Number of Internet broadband connections	18'050	18'550	19'222	19'721
Share with broadband access	4.0%	4.2%	3.5%	3.0%

Table 6 Wholesale offer for broadband access [Source: AK]

## 4.4 Wholesale market for passive infrastructure

### Infrastructure provider LKW

The LKW operates the only passive network infrastructure with nationwide coverage (Figure 8). LKW is the only service in the electronic communications market to provide this network infrastructure under regulated conditions. The infrastructure, primarily unbundled optical fibres in the access network (FTTB subscriber lines) and in the core network (backhaul), is offered at non-discriminatory conditions and cost-oriented charges on the basis of an

approved standard offer, which was newly regulated with the completion of the national FTTB optical fibre roll-out and has been in force since 1 January 2024<sup>53</sup>.

The easy availability of passive infrastructure also allows competitors in the small Liechtenstein market to enter the market without the risk of high sunk network costs and without infrastructure-related economies of scale, and to develop their offerings more independently of downstream, active wholesale products than is the case in other countries. All providers, even the incumbent TLI, create end customer access based on the passive infrastructure of the LKW.

## 5 Market definition

### 5.1 Product market definition of broadband access in the fixed network

In its 2016 Market Recommendation, the ESA defined the relevant product market as Market 3b "Access to local loops provided centrally for wholesale products at a fixed location". As the EFTA Surveillance Authority has already examined the fulfilment of the relevant criteria in this regard in its recommendation, this market is in principle eligible for ex ante regulation in Liechtenstein.

According to point 26 of the ESA Guidelines, the starting point for the specific market analysis should be the assessment of the relevant retail market(s), taking into account demand-side and supply-side substitutability in the next review period from the end user's perspective based on existing market conditions and their likely development. Once the regulatory authority has identified the relevant retail markets and determined whether, without regulation of the upstream markets, the risk of consumer detriment due to lack of competition on the retail market would persist, it should then identify the relevant wholesale markets in order to assess whether they are susceptible to ex ante regulation under Article 16 of Directive 2002/21/EC. It should begin by identifying and analysing the wholesale market that is most upstream of the retail market where the competition problems have been identified and by defining the market, taking into account the demand-side and - where relevant - the supply-side substitutability of the products.

With regard to the review of the existing regulatory measures, the AK therefore first defines the market at end customer level in order to determine the state of competition and then establish the state of competition in the relevant upstream wholesale markets and decide on the necessary measures.

Internet broadband connections at fixed locations form the starting point for the product market definition and market definition at end customer level. The Internet broadband connection is defined in a technology-neutral manner. In principle, it includes all types of internet access realisations. Following the completion of the fibre optic expansion and the

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<sup>53</sup> Regulation of 24 October 2023, available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-subscriber-connection>

associated decommissioning of the copper networks, these are fibre optic-based connections according to the data survey. Wireless access realisations at a fixed location are currently not relevant in the market and will also not be relevant in the future, as explained below. The Internet broadband connection comprises private and business customers.

At the immediate wholesale level, the relevant market for broadband access comprises non-physical or virtual network access, including bitstream access and resale access at fixed locations. This market is downstream of market 3a (access to local loops provided locally at fixed locations, access to network infrastructure) (see Figure 3 on page 21).

The following section examines whether mobile connections are potential substitutes for landline telephone connections and should therefore be included in the market definition. Other, different types of access realisations (e.g. via satellite networks) have not yet been identified by the AK in the Liechtenstein market and are not expected to be mass marketable services in the near future within the time horizon of the market analysis according to the AK's assessment.

### **5.1.1 Substitution of fixed Internet connections with mobile Internet connections**

To assess the substitution potential of mobile internet connections to fixed network internet connections, the AK analyses the following

- the development of demand for broadband Internet connections in the fixed network in relation to market size
- the correlation between the development of fixed and mobile Internet connections

#### **Demand for fixed network connections**

The development of demand from households and workplaces for Internet broadband connections in the fixed network (Table 1 on p. 25) in the period 2015-2023 shows that the demand rate remains stable at 74% over the long term and even increases slightly each year from 2020 onwards. In 2023, the value reached 80%. There are therefore no discernible downward trends that could have set in following the allocation of spectrum for 4G mobile networks in 2015 due to the high data throughput of this wireless standard.

#### **Correlation of the development of fixed and mobile internet connections**

Mobile-based internet connections offered specifically for fixed locations cannot be identified to any relevant extent in the Liechtenstein market: the statistical data collection revealed only zero reports for the category of location-based mobile connections for exclusive internet access. There has been no increase in non-site-based mobile connections for exclusive internet access since the introduction of LTE (4G) in 2015 (Table 1 on p. 25). Based on these long-term market statistics, the AK is therefore unable to recognise any fundamental substitution effects from mobile communications solutions. Although pure mobile broadband connections are available in principle, demand for them is only small and slightly declining: the demand rate of households and workplaces fell from 14% to 7% between 2015 and 2023, which is a clear indication of the lack of fixed-mobile substitution.

Conclusion: There is no evidence of an immediate, near-term substitution of fixed internet connections by mobile internet connections. Most households and workplaces still have a fixed broadband internet connection.



### 5.1.2 Conclusion on the relevant product market

Overall, the studies show that the mobile Internet connection is not a substitute for an Internet broadband connection in the fixed network.

At retail level the AK defines the product market as the market for Internet broadband connections that are realised in the fixed network.

The market directly upstream of this market is defined as wholesale access to broadband connections provided centrally at fixed location. The defined broadband access is technology neutral, comprises access for mass market connections of private and business customers and is realised both as bitstream and as resale access.

## 5.2 Definition of the relevant geographic market

The relevant geographic market pursuant to Art. 21 para. 1 KomG is the geographical area in which broadband connections at a fixed location are offered and demanded under sufficiently similar or homogeneous competitive conditions. As all providers of fixed broadband Internet connections and all providers of wholesale broadband access offer their services at the same conditions throughout Liechtenstein, the entire national territory must be defined as the relevant geographic market.

### Conclusion: Geographically relevant market

For the purposes of this analysis, the relevant geographic market is defined as the entire territory of Liechtenstein. This is in line with the authorisation to provide and operate electronic communications networks and offer electronic communications services on Liechtenstein territory following notification in accordance with Art. 43 KomG<sup>54</sup>.

## 5.3 Conclusion on market definition

Based on the above analyses, the defined market at the retail level includes the fixed-line broadband Internet connection and, correspondingly, at the wholesale level, access to broadband connections provided centrally at fixed location, which is in demand for the provision of broadband Internet connections for the mass market. Access to broadband connections is defined as technology neutral and includes residential and business customer connections; it is realised as bitstream or as resale access. The market covers the entire territory of Liechtenstein. The product/service market definition at wholesale level corresponds to the definition according to the 2016 Market Recommendation (Market No. 3b) and is congruent with the definition of the last market analysis from 2009 (Market No. 5 according to the 2008 Market Recommendation).

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<sup>54</sup> in accordance with the general authorisation pursuant to Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services ("Authorisation Directive"), available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0020>

## 6 State of competition - Three-criteria test

Based on market statistics data, the overall picture of the state of competition shows that effective, sustainable competition has been functioning for many years in the defined market for fixed broadband internet connections. This competition is based on regulated access to the infrastructure of LKW, but not on access to wholesale broadband services. Looking ahead, the AK has no information that the structural characteristics of the electronic communications market could change significantly and that the continued existence of effective competition in the defined market could be called into question in the time horizon of the market analysis.

### 6.1 Barriers to market entry

Market entry into the end customer market and the wholesale market is easy based on the regulated access to the LKW infrastructure. With regard to the development of the number of providers, it should be noted that the number of providers is high relative to the market size with a total of 15 providers, 7 of which are active in the mass market (Table 1 on page 25). In the recent past, Vestra ICT and Speedcom entered the market in 2018 and Salt (Liechtenstein) in 2022 (Table 3 on page 27). The entries took place on the basis of regulated access to the network infrastructure, i.e. at the most upstream market level of the electronic communications market (Figure 3 on page 21). Directly downstream of this market level is the wholesale level for broadband access. The lack of market entry barriers also applies to this level, where 97% of the internet broadband connections are provided by self-supply, and only 3% by access to wholesale broadband services (Table 6 on page 30). The providers provide the active services corresponding to the wholesale level with their own equipment.

It can therefore be assumed that there are no longer any significant barriers to market entry due to economies of scale, sunk costs or minimum efficient operating size.

### 6.2 Tendency towards effective competition

Within the market, the market statistics show a lively competitive dynamic. In the period from 2017 to 2023, the market share of the incumbent TLI fell from an initial 68% to 52% in 2023 (Table 2 on page 26). During this period, TV-COM and the new providers (Vestra ICT, Salt (Liechtenstein), Speedcom) were able to significantly increase their shares (Table 3 on page 27). The high number of providers in the Internet broadband access market results in a fundamentally high countervailing power for end users, who also utilise it, as shown by the above-mentioned shifts in market share (Table 3) and the clear movement towards higher download speeds (Figure 6 on page 25) show. The proportion of connections with a download performance of at least 500 Mbit/s is growing significantly. Initial statistical data for 2023 confirms this trend, as connections with 5 to 10 Gbit/s are already appearing on the mass market. Figure 7 on page 29 shows how the market offering in 2022 and 2024 was supplemented with significantly more powerful offerings with the same or lower price points, which the AK interprets as a sign of intense competition. The market offering thus presents the picture of a competitive market in which providers with increased performance and low price points for high bandwidths are fighting for market share (Table 5 on page 28).

Projecting this trend into the future, TLI's market share is expected to fall below 50% in the next 3-5 years. Even if a market share of 52% may still seem high in absolute terms, the

uninterrupted decline in market share of 2 to 4 percentage points per year since 2017 is a strong indication that TLI's competitive strength in the market for internet broadband connections is no longer greater than that of its competitors. As TLI has left the market for broadband access to the providers Supranet and Hoi Internet since 2023 (Table 6 on page 30), TLI will no longer be able to influence the retail market via the wholesale level.

Based on the development of market shares, the AK therefore assumes that the trend towards effective competition will continue to develop.

### 6.3 Conclusion

Due to the aforementioned lack of barriers to market entry, the first criterion of the three-criteria test is not met. The development of competition suggests that the second criterion is also not fulfilled. The three-criteria test is therefore not met, which means that ex ante regulation of the broadband access market is no longer permissible.

Even without regulation of broadband access at the directly upstream wholesale level, which is based on the determination of sole or joint significant market power, sustainable competition on the broadband retail market can be assumed, meaning that regulation of broadband access is no longer necessary. However, the basis of effective competition in the market under review and in the wider electronic communications market is and remains regulated access to the only nationwide passive infrastructure of LKW. This was newly regulated in October 2023<sup>55</sup>. The regulation of the network infrastructure ensures cost oriented, non-discriminatory access to optical fibres and cable ducts, meaning that the demand at the level for centrally provided access to broadband connections (as bitstream or resale) provided by a small number of two providers is hardly relevant for the state of competition in the AK's assessment (Table 6 on page 30).

At present, the AK does not see any reasons in the forecast that could lead to significant changes in the structure of the market, both in the more general view of the electronic communications market and in the narrower view of the market for broadband Internet access in the fixed network.

**The AK's analysis shows that the retail market for internet broadband connections at a fixed location is competitive even without regulation of broadband access at the wholesale level. Regulation of broadband access at the wholesale level is therefore no longer necessary<sup>56</sup> and the existing measures should therefore be lifted.**

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<sup>55</sup> available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-subscriber-connection>

<sup>56</sup> In accordance with Recital 15 of the 2016 Market Recommendation, "... If, on the other hand, effective competition is identified in the relevant [retail] market in the forecast without ex ante regulation of the corresponding relevant [wholesale] markets, the national regulatory authority should conclude that regulation is no longer needed at the wholesale level. In such a case, the relevant wholesale market in question should be examined with a view to lifting ex ante regulation. If wholesale markets in the supply chain are vertically interconnected, the wholesale market that is at the top of the upstream markets in relation to the retail market in question should be assessed first."

However, regulated access to the network infrastructure, the most upstream market level of the electronic communications market, remains relevant for the competitive orientation of the entire electronic communications market (Figure 3). Due to the high sunk costs of the passive infrastructure (cable ducting, ducts, distribution rooms, cables, etc.), this represents a high and permanent barrier to market entry on the basis of proprietary infrastructure. Since 2007, the entire nationwide network infrastructure has been owned by the LKW through vertical separation and is no longer under the control of the incumbent or other providers. As a result of this process, LKW holds a position of market power. LKW is mandated by the state of Liechtenstein via the owner strategy<sup>57</sup> to offer the infrastructure to all providers as required. The regulation of access to the infrastructure (market analysis M3a-2016<sup>58</sup>) very effectively removes this barrier to market entry and potential market power problems. It allows providers -at the downstream wholesale level as well as at the end customer level to enter the market with low infrastructure investments at cost-orientated and non-discriminatory conditions.

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<sup>57</sup> available at <https://www.lkw.li/userdata/Alle-Download-Dokumente/Allgemeines-Unternehmen/Rechtsgrundlagen/lkw-eignerstrategie-2024.pdf>

<sup>58</sup> Wholesale market for physical access to subscriber lines provided locally at fixed locations, Market 3a of the 2016 market recommendation, market analysis and obligation of measures of special regulation in 2023, available at <https://www.llv.li/en/national-administration/office-for-communications/electronic-communication/market-analyses-and-special-regulation/current-status/access-to-the-subscriber-connection>

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## Annex 3 EC / ESA directives, recommendations, guidelines and working documents

### ESA: EFTA Surveillance Authority recommendations and guidelines

The ESA publishes its recommendations and guidelines for the electronic communications sector on its eCom website<sup>59</sup>.

- Guidelines on market analysis and the assessment of significant market power: EFTA Surveillance Authority Guidelines of 16 November 2022 on market analysis and the assessment of significant market power under the regulatory framework for electronic communications networks and services set out in Annex XI to the Agreement on the European Economic Area (Case No: 82094)<sup>60</sup> (referred to as "[ESA Guidelines](#)" in the market analysis text)
- Recommendation on relevant product and service markets: EFTA Surveillance Authority Decision No 93/16/COL of 11 May 2016. EFTA Surveillance Authority Recommendation on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation under the act referred to in point 5cl of Annex XI to the EEA Agreement (Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services), as amended by Protocol 1 to the EEA Agreement and by the sectoral adaptations in Annex XI to that Agreement [2017/608]<sup>61</sup>, (referred to in the market analysis text as "[Market Recommendation 2016](#)").
- Recommendation on notifications, time limits and consultations: EFTA Surveillance Authority Recommendation of 2 December 2009 on notifications, time limits and consultations pursuant to Article 7 of the Agreement on the European Economic Area (Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services), as amended by Protocol 1 to the EEA Agreement, point 5cl of Annex XI to the EEA Agreement<sup>62</sup>, (referred to as "[Notification Recommendation](#)" in the market analysis text)
- Recommendation of the EFTA Surveillance Authority of 13 April 2011 on the regulation of fixed and mobile termination rates in the EFTA States<sup>63</sup>

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<sup>59</sup> available at <https://www.eftasurv.int/internal-market/notifications-and-applications/ecom-notifications>

<sup>60</sup> available at <https://www.eftasurv.int/cms/sites/default/files/documents/gopro/ESA%20New%20Guidelines%20on%20market%20analysis%20and%20SMP%20assessment.pdf>

<sup>61</sup> Official Journal of the European Union, Legislation, L 84; March 30, 2017, page L84/7; available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2017:084:FULL&from=FR>.

<sup>62</sup> available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:E2011C1013\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:E2011C1013(01))

<sup>63</sup> available at <https://op.europa.eu/en/publication-detail/-/publication/08101044-29a1-11e2-9209-01aa75ed71a1>

## EEA: Liechtenstein's legal framework for electronic communications networks and services

The following directives were implemented in the KomG of 17 March 2006 and in the ordinances based on it:

- "[Framework Directive](#)": Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (EEA Supplement: Annex XI - 5cl.01).<sup>64</sup>
- "[Access Directive](#)": Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (EEA Supplement: Annex XI - 5cj.01).<sup>65</sup>
- "[Authorisation Directive](#)": Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (EEA Supplement: Annex XI - 5ck.01).<sup>66</sup>
- "[Universal Service Directive](#)": Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (EEA Collection of Law: Annex XI - 5cm.01).<sup>67</sup>
- "[Roaming Regulation](#)" means Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile telephone networks within the Union (OJ L 172, 30.6.2012, p. 10), as amended by Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 (OJ L 310, 26.11.2015, p. 1). 10), as amended by Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 (OJ L 310, 26.11.2015, p. 1) and Regulation (EU) 2017/920 of the European Parliament and of the Council of 17 May 2017 (OJ L 147, 9.6.2017, p. 1).<sup>68</sup>
- "[Net Neutrality Regulation](#)": Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and- services and Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union (Text with EEA relevance)<sup>69</sup>

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<sup>64</sup> available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0021>

<sup>65</sup> available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0019>

<sup>66</sup> available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0020>

<sup>67</sup> available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32002L0022>

<sup>68</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R0531>

<sup>69</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R2120>

## EC: Recommendations, guidelines of the European Commission and working documents of the Commission services

- Communication from the European Commission of 7 May 2018, Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services (Text with EEA relevance) (2018/C 159/01).<sup>70</sup>  
(referred to as "EC Guidelines" in the market analysis text)
- Commission Staff Working Document of 27 April 2018, SWD(2018) 124 final, Commission Staff Working Document accompanying the document Communication from the Commission Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services (Text with EEA relevance) {C(2018) 2374 final}.<sup>71</sup>
- Commission Recommendation 2014/710/EU of 9 October 2014 on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation under Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (Text with EEA relevance)<sup>72</sup>
- Commission Staff Working Document of 9 October 2014, SWD(2014) 298, Explanatory Note Accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services.<sup>73</sup>
- Commission Recommendation of 11 September 2013 on uniform non-discrimination obligations and cost accounting methodologies to promote competition and improve the environment for broadband investment (2013/466/EU)<sup>74</sup>
- Commission Recommendation of 20 September 2010 on regulated access to next generation access networks (NGA) (Text with EEA relevance) (2010/572/EU)<sup>75</sup>
- Commission Recommendation of 19 September 2005 on the separation of accounting and cost accounting systems in accordance with the regulatory framework for electronic communications (2005/698/EC)<sup>76</sup>

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<sup>70</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018XC0507%2801%29>

<sup>71</sup> available at under [https://ec.europa.eu/transparency/documents-register/detail?ref=SWD\(2018\)124&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2018)124&lang=en)

<sup>72</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014H0710>

<sup>73</sup> available at [https://ec.europa.eu/transparency/documents-register/detail?ref=SWD\(2014\)298&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2014)298&lang=en)

<sup>74</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013H0466>

<sup>75</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010H0572>

<sup>76</sup> available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32005H0698>



## EEA: Liechtenstein's future legal framework

- «[Code](#)»: Directive 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code, Text with EEA relevance<sup>77</sup>
- «[EC Market Recommendation 2020](#)»: Commission Recommendation (EU) 2020/2245 of 18 December 2020 on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation under Directive (EU) 2018/1972 of the European Parliament and of the Council establishing the European Electronic Communications Code (Text with EEA relevance, notified under document number C(2020) 8750)<sup>78</sup>
- [Commission staff working document of 18 December 2020](#), SWD(2020) 337, Explanatory note accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code {C(2020) 8750 final}<sup>79</sup>

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<sup>77</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018L1972>

<sup>78</sup> available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020H2245>

<sup>79</sup> available at [https://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=72442](https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=72442)

## Annex 4 Abbreviations and short terms

The AK uses the following abbreviated forms in the text, each of which is introduced with the note "(abbreviated form)" when it first appears are introduced:

Short form	Long form / Explanation
AK	Office for Communication
BEREC	Body of European Regulators for Electronic Communications
EC Guidelines	Communication from the European Commission of 7 May 2018 on Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services (Text with EEA relevance) (2018/C 159/01) <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018XC0507%2801%29">https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018XC0507%2801%29</a>
ESA	EFTA Surveillance Authority, EFTA Surveillance Authority
ESA guidelines	EFTA Surveillance Authority Guidelines of 14 July 2004 on market analysis and the assessment of significant market power under the common regulatory framework for electronic communications networks and services set out in Annex XI to the Agreement on the European Economic Area (2006/C 101/01) <a href="https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=OJ:C:2006:101:FULL&amp;from=SL">https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=OJ:C:2006:101:FULL&amp;from=SL</a>
FTTB	Fibre to the building, glass fibre into the building
Authorisation guideline	Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services ("Authorisation Directive"; EEA Collection of Law: Annex XI - 5ck.01) <a href="https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0020">https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0020</a>
KomG	Electronic Communications Act (Communications Act) <a href="https://www.gesetze.li/konso/2006091000">https://www.gesetze.li/konso/2006091000</a>
LKW	Liechtensteinische Kraftwerke, operator of the nationwide passive network infrastructure, provider of passive infrastructure without offering active electronic communications services at end customer or wholesale level <a href="https://www.lkw.li/angebot-und-leistungen/kommunikation.html">https://www.lkw.li/angebot-und-leistungen/kommunikation.html</a>
Market recommendation 2008	EFTA Surveillance Authority Recommendation of 5 November 2008 on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation (2009/C 156/12) <a href="https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=OJ:C:2009:156:FULL&amp;from=IT">https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=OJ:C:2009:156:FULL&amp;from=IT</a> from page 20
Market recommendation 2016	EFTA Surveillance Authority Decision No. 93/16/COL of 11 May 2016: EFTA Surveillance Authority Recommendation on relevant product and service markets in the electronic communications sector susceptible to ex ante regulation <a href="https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=OJ:L:2017:084:FULL&amp;from=FR">https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=OJ:L:2017:084:FULL&amp;from=FR</a>
Notification recommendation	EFTA Surveillance Authority Recommendation of 2 December 2009 on the notifications, time limits and consultations provided for in Article 7 of Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, as amended by Protocol 1 to the EEA Agreement, point 5cl of Annex XI to the Agreement on the European Economic Area <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:E2011C1013(01)">https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:E2011C1013(01)</a>
NRA	National regulatory authority(ies)
Framework Directive	Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services ("Framework Directive"; EEA Collection of Law: Annex XI - 5cl.01) <a href="https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32002L0021">https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32002L0021</a>
RKV	Ordinance of 3 April 2007 on the tasks and powers of the regulatory authority in the field of electronic communications (RKV), LGBl. 2007 No. 68 <a href="https://www.gesetze.li/konso/2007068000">https://www.gesetze.li/konso/2007068000</a>

TLI	Telecom Liechtenstein AG, "FL1" brand, <a href="https://fl1.li/de">https://fl1.li/de</a>
Universal Service Directive	Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services ("Universal Service Directive"; EEA Collection of Law: Annex XI - 5cm.01) <a href="https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32002L0022">https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32002L0022</a>
VKND	Ordinance of 3 April 2007 on electronic communications networks and services (VKND), LGBl. 2007 No. 67, <a href="https://www.gesetze.li/konso/pdf/2007067000">https://www.gesetze.li/konso/pdf/2007067000</a>
VoIP	Voice over Internet Protocol is a generic term for the transmission of voice over packet-switched data networks based on the Internet Protocol. VoIP traffic can take place via a controlled private network, the public Internet or a combination of both networks. The bandwidth requirement is approx. 100 kbit/s.
Access policy	Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities ("Access Directive"; EEA Collection of Law: Annex XI - 5cj.01) <a href="https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0019">https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0019</a>

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