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FÜRSTENTUM LIECHTENSTEIN

Analysis of the broadband market (M5)

*Market for broadband access
(wholesale market)*

(Final version)

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1. Introduction

1.1 Legislative basis

By virtue of Art. 20 of the Law concerning Electronic Communication (KomG)¹ the Office for Communication is required to examine whether effective competition obtains upon the electronic communication markets in Liechtenstein. If effective competition does not exist, that is, one or more providers possesses significant market power, the Office will apply such measures of special regulation (under Art. 23 et seq. KomG) as are needed in order to remove the problems for competition that have been determined to exist. This procedure is termed market analysis.

The Office for Communication has defined, and the Government has published in the Official Gazette,² the scope of the service and/or product markets that are to be investigated in accordance with Art. 21(1) KomG. This was done taking into consideration the relevant markets recommended by the EFTA Surveillance Authority.

The existence of significant market power – corresponding to a position of dominance in a market under general EEA competition law – has to be determined by taking into account in particular the criteria laid down in Art. 31 VKND.³

If the Office for Communication determines that one or more providers have significant market power in a defined market, the Office has the power to impose such measures of special regulation under Arts. 34 to 43 VKND as are necessary and proportionate and suited to removal of the problems for competition obtaining on the market in question.

The following market analysis investigates in first place the question of whether self-sustaining competition exists in an economic sense in the market for “*wholesale broadband access*” (broadband market) or, as the case may be, whether self-sustaining competition would prevail in an economic sense without regulation. Such factors and problems as may stand in the way of such self-sustaining competition will be identified. The presence of economic market power will be investigated in this connection; in particular the criteria of Art. 31 (1) to (3) VKND will be considered according to their relevance for the market in question. Proceeding from a determination of providers having significant market power and the identification of relevant problems for competition on the wholesale broadband market, the necessary measures of special regulation will be imposed that are suited to remedying the problems for competition that have been determined.

¹ Law of 17 March 2006 concerning electronic communication (Kommunikationsgesetz; KomG), LGBl. 2006 No. 91.

² Announcement of 3 February 2009 on the determination of relevant material and geographical electronic communications markets (market definition), LGBl. 2009 No. 69.

³ Ordinance of 3 April 2007 on electronic communication networks and services (VKND), LGBl. 2007 No. 67.

1.2 Market analysis process

The procedure for the market analysis and the imposition of measures of special regulation is made up of the following steps:

Process of special regulation in general	Market analysis in its broad sense	1	Collection and analysis of the necessary data on the market and from undertakings.	
		2	Definition of the relevant markets in a national context from a material and geographical point of view.	
		3	Determination of (any) SMP undertakings.	
			4	Identification of any current and potential problems for competition.
			5	Elaboration of any measures of special regulation that are to be imposed.
			6	Consultation of interested groups nationally, i.e. undertakings which will be affected by planned measures.
			7	Submission of the market analysis for review by the EFTA Surveillance Authority and NRAs in the EEA.
			8	Imposition of any necessary measures by means of administrative decision.
			9	Surveillance over the implementation and observance of the measures which have been imposed.

Figure 1: Overview of the overall process of special regulation

The above overview presents the process of special regulation as a whole. Market analysis in its broad sense here⁴ is understood to include adoption of any necessary regulatory measures, and so extends across steps 2 to 8 in the above overview.

1.3 National consultation

To the extent that the Office for Communication foresees adoption of measures of special regulation that are likely to have significant effects on the market concerned, it is obliged to announce this to interested parties in conformity with Art. 24 (1) KomG and to give such parties the opportunity to make their position known within a reasonable period. The Office is for this purpose empowered to hold public consultations (Art. 46 KomG).

The Office on 25 April 2008 therefore published, under Art. 40 KomG, its analysis of the market for wholesale broadband access. Interested parties were invited to submit comments on the analysis and in particular on the measures of special regulation

⁴ One can define market analysis in its narrow sense as relating to steps 2 to 4.

proposed in it during a public consultation period in accordance with Art. 24 (1) in conjunction with Art. 46 (1) KomG and Art. 24 (1) RKV.⁵

The following undertakings submitted comments by the end of the first national consultation period on 27 June 2008: ABILA AG, ICT AG, Liechtensteinische Kraftwerke (LKW), MTtel AG, Newsnet AG, Swisscom (Schweiz) AG and Telecom Liechtenstein AG. The Office for Communications conducted an additional second national consultation from 7 April to 15 May 2009 based on a revised version of the market analysis. Liechtensteinischen Kraftwerke, Telecom Liechtenstein AG, Orange (Liechtenstein) AG and Wasserversorgung Liechtensteiner Unterland submitted comments. All comments are, in so far as they are not subject to confidentiality, published on the Office's website.⁶ The comments were considered when preparing the present final version of the market analysis in so far as they were in the Office's view of importance and/or called for a response. A summary as well as discussion of the relevant inputs in both rounds of consultation are made available as separate evaluation documents on the Office's website.

1.4 EEA-wide consultation

If the Office for Communication intends to adopt measures of special regulation which are likely to have effects on trade between EEA States, the Office has then in addition to the national consultation exercise to consult the EFTA Surveillance Authority and the other NRAs in the EEA beforehand in conformity with Art. 7 of the Framework Directive 2002/21/EC (Art. 24(2) KomG)^{7,8} This EEA-wide consultation serves transparency and the consolidation of the single market.

During a first phase, the EFTA Surveillance Authority is given a period of one month to make comments upon the analysis submitted to it and on any planned measures. If the Authority expresses a reasoned doubt as to the compatibility with EEA law of measures that have been submitted, it can extend this period by two months in order to allow further investigation of the matter. If no such doubts exist, the Office for Communication can adopt the measures that were submitted. On the other hand, if the EFTA Surveillance Authority comes to the conclusion within the extended period that the market definition or the analysis of significant market power is contrary to EEA law, it may forbid the Office for Communication from bringing the planned measures into force.

⁵ Ordinance of 3 April 2007 on the responsibilities and powers of the Regulatory Authority in the field of electronic communication (RKV), LGBl. 2007 No. 68.

⁶ <http://www.llv.li/amtstellen/llv-ak-marktanalysen/llv-ak-marktanalysen-konsultationen.htm>

⁷ 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"; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5cl.01).

⁸ For the details of the procedure for submission according to Art. 7 of the Framework Directive see also: Recommendation of the EFTA Surveillance Authority No. 193/04/COL of 14 July 2004 on 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, OJ L 113, 27.4.2007, p.10.

As concerns the form of particular measures of special regulation, that is, the obligations which are imposed upon providers, the EFTA Surveillance Authority has solely the competence to comment upon them, not to reject them. If the EFTA Surveillance Authority does comment upon a draft measure, then the Office for Communication has to take its comments into utmost account.

All relevant documents and published information relative to the submission of measures of special regulation by the Office for Communication are accessible via the electronic portal⁹ of the EFTA Surveillance Authority. All public documents relative to national consultations are viewable on the Office for Communication's website.¹⁰

1.5 Fundamental considerations regarding market analysis

From an economic point of view, significant market power refers to the power of an undertaking to raise prices without having to suffer significant loss of turnover. Under the thesis of equivalence employed by the EFTA Surveillance Authority and the European Commission, effective competition obtains upon a market when no undertaking on the market has significant market power.¹¹

In the following market analysis the notions "effective competition", "functional competition" and "real competition" are used interchangeably. "Effective" in this regard is above all to be understood in the sense of "self-sustaining competition": that is, effective competition requires that competition will exist in this market also in the absence of *ex ante* regulation (anticipatory regulation), taking consideration of, however, *ex ante* regulation on other markets that is relevant for this market. According to this understanding, the market analysis has to assess the conditions for competition in the market in question as if no *ex ante* regulation relating to it existed (this approach is also known as a "green field approach"). Were this not to be done, there would be a danger that a market is found to exhibit effective competition when in fact this finding has been determined primarily through existing regulation and not by competitive forces. This in turn might have the consequence that (at least in the medium term) structurally determined deficiencies in competition occur and dominant operators on a market exploit their position to the disadvantage of consumers.

1.6 Composition of the market analysis

The market analysis is composed as follows: Chapter 2 presents the most important developments in the Liechtenstein broadband sector as well as the present regulatory situation. Chapter 3 discusses definition of the market in accordance with the Announcement on market definition and describes the products and services on the

⁹ <https://eea.eftasurv.int/portal/>

¹⁰ <http://www.ak.llv.li/>

¹¹ Cf. Guidelines of the EFTA Surveillance Authority of 14 July 2004 on market analysis and the assessment of significant market power under the regulatory framework for electronic communications networks and services referred to in Annex XI of the Agreement on the European Economic Area, OJ C 101, 27.04.2006, p. 1.

market. The analysis of competition itself is to be found in chapter 4, where all indicators relevant to an assessment of market power are investigated. Chapter 4.8 undertakes the overall assessment of whether competition prevails from an economic perspective on the market under investigation or whether self-sustaining competition would exist without regulation or again which problems of competition and factors may stand in the way of such competition. Chapters 5, 6 and 7 are devoted to measures of special regulation. Chapter 5 introduces the regulatory instruments under the KomG and the principles for their application. Chapter 6 discusses the regulatory measures that are appropriate for remedying the problems for competition that have been determined, while chapter 7 finally formulates the concrete measures of special regulation.

1.7 Time frame

The time frame for the present market analysis is two to three years ahead. The Office for Communication will continue to keep the market concerned under observation during this period and, if necessary, will initiate a fresh market analysis. Art. 21 (2) KomG lays down that the conditions for competition in the markets identified in the Announcement on market definition are to be reviewed at least once every four years.

1.8 Sources of data

The data that provided the basis for the following market analysis were collected by the Office for Communication by means of a questionnaire to operators concerning the years 2004-2007. The collection of market data takes place each year in the summer in relation to the preceding calendar year. Collection of the sampled data between such intervals is normally only conducted additionally if this is indicated by a rapid change in market conditions or by other special reasons, because to do otherwise would be excessive.

The latest available data from the respective annual data collection exercises have been used. To supplement them, data obtained under the previous legal framework have been used as necessary. No further reference will be made in the following market analysis to these data or to the data collected during the survey of operators; only other, external, sources of data (such as those needed in the context of international price comparisons) will be referred to specifically. Additionally, the Office for Communication keeps the market in question, like other relevant markets, under constant observation. The present analysis therefore, further, relies on the Office's current information and data.

1.9 Competition authority

Liechtenstein has no national competition law beyond the rules of competition applicable under the EEA Agreement. Nor does Liechtenstein have an independent competition authority at present. Legal recourse in competition cases is therefore to be sought in accordance with the applicable EEA law before the ordinary national courts or by reference to the EFTA Surveillance Authority or the European Commission. The exception to this is the Office for Trade and Transport by virtue of Art. 2 (1) of the Law of 23 May

1996 on the Implementation of the Rules of Competition in the European Economic Area, LGBI. 1996 No. 113, under which that Office has responsibility for the implementation of competition rules where the courts do not have jurisdiction. This responsibility is, however, essentially directed towards support to the EFTA Surveillance Authority and the undertaking of actions by the State, and not towards the material application and enforcement of EEA competition rules.

Cooperation with or consultation of a competition authority in the sense of the second sentence of Art. 16(1) of the Framework Directive 2002/21/EC¹² is, for these reasons, not possible in the case of the present market analysis in Liechtenstein.

¹² 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"; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5cl.01).

2. The Liechtenstein broadband sector

Broadband services are normally regarded as being means of access to the internet by which higher bandwidths can be achieved than through analog or ISDN access. In Liechtenstein broadband access is offered over both the copper network via DSL¹³ and coaxial cable (CATV¹⁴ networks).

The shape of Liechtenstein's fixed network sector was characterized until the end of 2007 by three undertakings: LTN Liechtenstein TeleNet (LTN), Telecom FL (TFL) and Liechtensteinische Kraftwerke (LKW).¹⁵ On 1 January 2008 all three undertakings (in LKW's case this being only its telecommunications retail arm) were merged into Telecom Liechtenstein AG (hereafter „TLI“) and now exist only under this name.

Until 1998, the provision of telecommunications in Liechtenstein took place under the PTT Treaty of 1978 between Liechtenstein and Switzerland. The network in Liechtenstein was an integral part of the Swiss telephone network (of Swisscom). The network components situated in Liechtenstein, including the local access network, were provisioned, maintained and operated by Swisscom in the name and on the account of the Liechtenstein State. In 1998 the separation from the Swiss telephone network took place upon the liberalization of the telecommunications sector and with the founding of LTN, a 100% State-owned company limited by shares and organized on the basis of private law.

LTN was only entrusted with the operation of the network. The retail customer relationship that had belonged to Swisscom was transferred to Telecom FL following an invitation for tenders in relation to basic service provision. Telecom FL was then acquired (100%) by LTN in 2003 following an increase in LTN's share capital. The full merger of the two undertakings as „Telecom Liechtenstein AG“ took place on 1 January 2008.

Lie-Comtel¹⁶ belonged to Liechtensteinische Kraftwerke (LKW) until the End of 2006, when it was acquired by LTN. It provided cable television services (and internet access services) under its own name in the major part¹⁷ of Liechtenstein until its integration into TLI at the beginning of 2008. LKW, which equally is 100% State-owned, is responsible for roll-out of the copper, optical fibre and CATV networks in Liechtenstein.¹⁸

In 2006 LTN and LKW signed a „consolidation agreement“. The agreement's purpose is to concentrate all telecommunications retail customer relationships and „intelligent“ network components in LTN's hands and to combine all passive network components,

¹³ Digital Subscriber Line.

¹⁴ Cable television.

¹⁵ LKW is below always regarded as being inclusive of the municipality of Schellenberg's CATV network. The CATV network in Schellenberg belongs to the municipality but is operated by LKW.

¹⁶ Lie-Comtel was originally founded as an autonomous LKW subsidiary but was at the end of 2006 reintegrated into LKW and existed from then on only as a brand name.

¹⁷ LKW operates a CATV network in nine of the eleven Liechtenstein municipalities: Balzers, Triesen, Triesenberg, Vaduz, Schaan, Planken, Gamprin-Bendern, Ruggell and Schellenberg.

¹⁸ See <http://www.lkw.li/cfdocs/cmsout/admin/index.cfm?GroupID=159&MandID=1&meID=256&>.

including in particular the local access network, transmission lines, cable routes, etc., in LKW's hands. LKW should no longer be active on the telecommunications retail market, but rather only on the wholesale service market. The agreement was put into effect on 1 January 2007 through handover of LTN's passive network infrastructure to LKW. At the same moment Lie-Comtel was integrated into LTN (handover of customer relationships and taking over of the services platform as well as active network components; passive (and a few¹⁹ active) CATV network components stayed in LKW's hands).

Today, TLI offers broadband connections over DSL (ADSL, ADSL2+, SDSL) to retail customers in all of Liechtenstein as well as wholesale broadband products to ISPs. TLI's wholesale broadband product bouquet "Bit Stream Access" corresponds, on the one hand, to a true bit-stream product that permits ISPs to provide their own internet connectivity in the sense defined by the European Regulators Group (ERG)²⁰ as well as, on the other hand, to a simple resale product. These wholesale products are currently used by eight alternative providers (so-called partnering ISPs): Kyberna AG, Li-Life EDV + Internet Est., newsnet AG, Supranet AG, M-Tech AG, Green AG, Quality Net AG and AllCommunications AG (previously Tele2 AG). The wholesale broadband product arose under regulatory pressure, but has to now not been subjected to price regulation.

Matt Antennentechnik AG is active in parts of Liechtenstein as an additional CATV operator alongside LKW. There is no overlap between the area supplied by Matt Antennentechnik AG (Mauren/Schaanwald and Eschen/Nendeln) and that of LKW's CATV network. Both firms taken together cover practically 100% of households in Liechtenstein. Neither firm currently offers wholesale broadband connections by itself. TLI does, however, offer broadband services based on LKW's CATV infrastructure (LKW is itself no longer active on the retail market), while TVcable.li Anstalt offers broadband access services to retail customers over Matt Antennentechnik AG's CATV network.

In addition to the fixed access networks (for DSL, CATV), broadband internet is also offered in Liechtenstein by mobile radio operators based on UMTS/HSDPA.

Other forms of broadband access like WLL, WLAN (except at hotspots), WiMax, WiFi, power line, optical fibre (FTTH) or satellite are currently either not offered in Liechtenstein or not to any relevant extent.

The development of the number of broadband connections in Liechtenstein is presented in Figure 2 (data are not available for broadband access over mobile). At the end of 2007 there were 7,571 DSL connections and 3,178 CATV broadband connections, making 10,749 broadband connections in all. As in many other European countries, the number of broadband connections is growing strongly, although growth slackened somewhat in 2007. DSL connections as a proportion of all broadband connections are rising slightly over time and stood at 70.5% at the end of 2007.

¹⁹ „Karin“, nodes, amplifiers.

²⁰ ERG (2005) Revised Common Position on wholesale bitstream access (includes a chapter on cable network access), ERG (03) 33Rev2, p. 4 *et seq.*, http://erg.ec.europa.eu/documents/docs/index_en.htm.

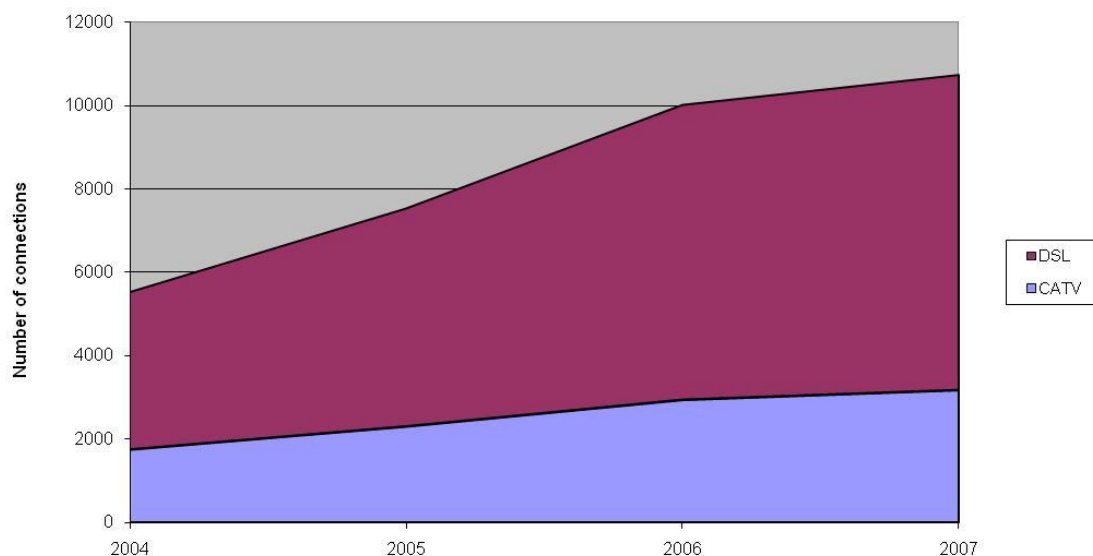


Figure 2: Broadband connections in Liechtenstein 2004-2007 according to technology

Broadband penetration was therefore 30.4% at the end of 2007 by reference to the number of inhabitants.²¹ If one were to introduce this number into the OECD *Broadband Statistics* of June 2008²², Liechtenstein would then take ninth place and be significantly above the OECD average (see Figure 3, which adapts the OECD's table to include Liechtenstein). However, the growth in broadband connections in Liechtenstein by comparison with Switzerland, for example, has weakened somewhat since 2007.²³

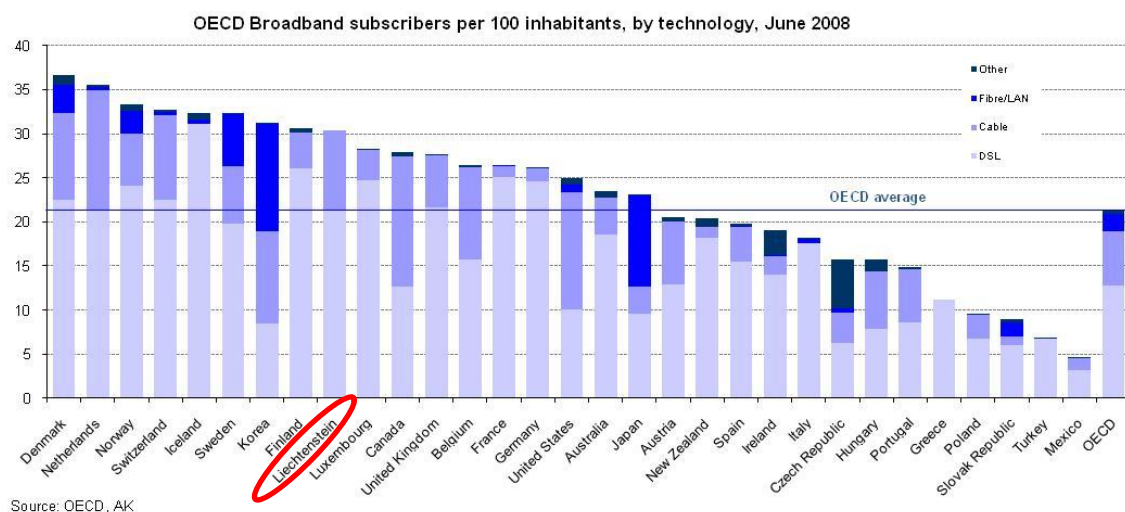


Figure 3: Broadband connections per 100 inhabitants

²¹ Number of broadband connections: 10,749; number of inhabitants: 35,322 (statistics of the Office for Economics at June 2008).

²² See <http://www.oecd.org/sti/ict/broadband>.

²³ In 2006 Liechtenstein shared fifth place with Switzerland at 28.5%.

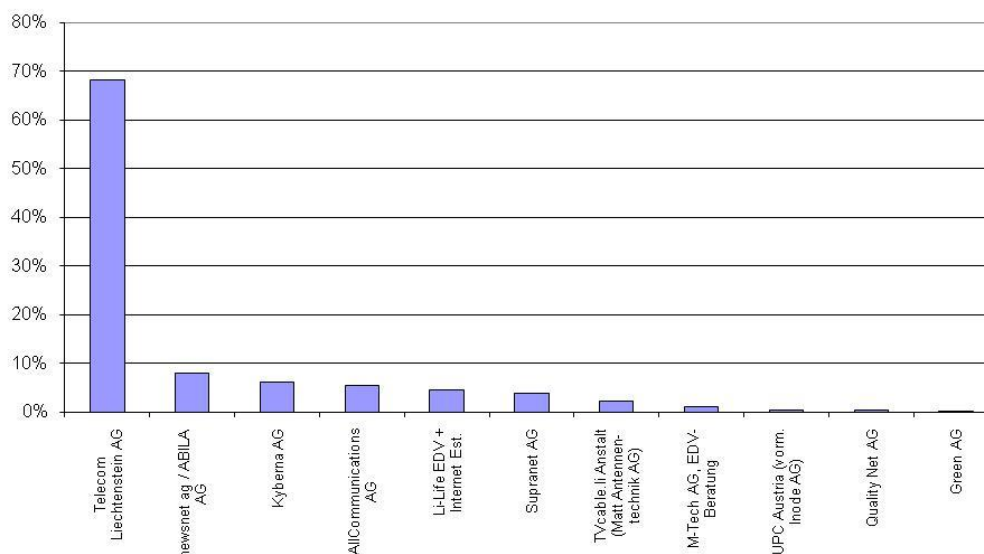


Figure 4: Market shares in the broadband retail market 2007

Figure 4 shows the market shares in the broadband retail market for 2007. At 68.3% TLI has by far the largest market share. The providers newsnet, Kyberna, AllCommunications, Li-Life EDV + Internet and Supranet each have a market share of between 3% and 8%, with TVcable.li Anstalt having only a little more than 2% over Matt Antennentechnik AG's CATV network.²⁴ All other broadband services providers have a market share of 1% or less. The market share of the unbundler UPC Austria (previously Inode), which currently appears only to focus on business customers,²⁵ is significantly less than 1%.

²⁴ Only Matt Antennentechnik reported the number of broadband connections on its CATV network in response to the questionnaire to operators. Seen legally, however, it would appear that only TVcable.li Anstalt offers such broadband connections on the retail market.

²⁵ All products are symmetric and are marketed under the name xDSL Business gold. The product at the lowest price (512/512 at 10GB) for CHF 89 is also significantly more expensive than the "beginner" products of other operators. Product features such as 8 to 16 static IP addresses, web hosting and server administration are similarly aimed at business customers, cf. <http://www.inode.li/produkte/index.html>.

3. The market under investigation

3.1 Preliminary remarks concerning market definition

Under the Guidelines of the EFTA Surveillance Authority on market definition and the assessment of significant market power (hereafter the “SMP Guidelines”),²⁶ the basis for the definition of the materially relevant market is a test of substitutability on the demand and supply sides of the product or service in question. Products will all belong to the same market when both consumers and providers see them as sufficiently interchangeable. A generally acknowledged procedure for determining this is provided by the so-called SSNIP test (small but significant non-transitory increase in price) or the test of the hypothetical monopolist (HM test).

The EFTA Surveillance Authority in its Recommendation on Markets²⁷ identified in accordance with Art. 15 of the Framework Directive 2002/21/EC²⁸ those materially relevant product and service markets that are susceptible to ex ante (anticipatory) regulation. It is assumed that for these markets – because the EFTA Surveillance Authority has already examined whether the applicable criteria are fulfilled – ex ante regulation will also come into consideration in Liechtenstein. Because of this, the Office for Communication does not have to repeat this examination as competent regulatory authority, unless it has reasonable doubt as to the criteria’s specific concordance with the national context or the definition of the relevant national product market deviates from that which has been recommended.²⁹

3.2 Definition of the materially relevant market

The market „wholesale broadband access“ was defined by the Office for Communication taking into consideration the Recommendation on Markets of the EFTA Surveillance Authority and item 5 of Part A of the Annex to the Announcement on market definition that was promulgated under Art. 21(1) KomG in the national official gazette.³⁰ The market

²⁶ Guidelines of the EFTA Surveillance Authority of 14 July 2004 on market analysis and the assessment of significant market power under the regulatory framework for electronic communications networks and services referred to in Annex XI of the Agreement on the European Economic Area, OJ C 101, 27.04.2006, p. 1).

²⁷ EFTA Surveillance Authority Recommendation of 5 November 2008 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with 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 communication networks and services), as adapted by Protocol I thereto and by the sectoral adaptations contained in Annex XI to that Agreement. The EFTA Surveillance Authority’s revised Recommendation on Markets is currently only available in the original, English version and had not yet been published in the *Official Journal of the European Union* at the time this market analysis was compiled. It is available at: <http://www.eftasurv.int/fieldsofwork/fieldservices/telecoms/ecom/recommendation-electroniccommunications.pdf>

²⁸ 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”; Liechtenstein Compendium of EEA Law (“EWR-Rechtssammlung”): Annex. XI – 5cl.01).

²⁹ Cf. The comments of the EFTA Surveillance Authority of 6 September 2005 on the draft of the first Norwegian decision on mobile termination markets, chapter 3.2.

³⁰ Announcement of 3 February 2009 on the determination of relevant material and geographical electronic communications markets (market definition), LGBl. 2009 No. 69.

corresponds to Market No. 5 in the EFTA Surveillance Authority's Recommendation on Markets.

According to item 5 of the Annex to the EFTA Surveillance Authority's Recommendation on Relevant Markets, this market comprises „non-physical or virtual network access including 'bit-stream' access at a fixed location.“

It should further be discussed which products or services fall under this market definition as well as whether self-provided services should be included in the market.

As a preliminary exercise to market analysis, market definition has as its objective the identification of all relevant and significant competitive forces which influence the behaviour of firms that are active on the market. Two kinds of competitive forces are above all to be considered: demand-side substitutability and supply-side substitutability.³¹ Demand-side substitutability denotes the degree to which the buyer is likely to switch to other products or services in response to a 5-10% price increase, whereas supply-side substitutability denotes the degree to which firms that do not yet produce the item concerned are likely to undertake its production in response to such a price increase.

The standard tool for market definition is the test of the hypothetical monopolist (HM test). This test poses the question whether a non-transitory 5-10% price increase above the competitive level would be profitable for a hypothetical monopolist on the market in question. It is the smallest set of products or services in regard to which such a price increase can be maintained profitably that forms the relevant market. If the price increase cannot be maintained, then there will appear to be further products or services that restrain the hypothetical monopolist and thus these should also be included in the market.

Even though market definition at the wholesale level is conceptually indistinguishable from market definition at the retail level (the hypothetical monopolist test applies in both cases), two questions are posed regarding market definition at the wholesale level that need to be dealt with in the present chapter: (i) the influence of retail markets, or of the market definition of retail markets, on market definition at the wholesale level and (ii) whether self-provided services (i.e. ones produced internally by a firm) are to be included in the market.

As concerns the first question, it can be stated that definition of a wholesale market is not only dependent upon demand-side and supply-side substitution on the wholesale level but also upon substitution at downstream levels (in the present case, at the retail level). The reason for this is that a price increase on the wholesale level will normally also lead to a price increase on the retail level, which may induce customers to switch to other products that are not produced by means of the corresponding wholesale product and whose price has hence not risen on its basis.

In regard to self-supply, a similar argument in essence applies. Thus, a hypothetical monopolist that only provides wholesale services to others cannot increase its prices

³¹ See the SMP Guidelines, para. 50 *et seq.*

profitably if this would lead to a price increase at the retail level and a sufficiently high number of customers were to switch to vertically integrated firms as a reaction to this price increase. In such a case self-supply services must also be included in the market. The extent to which substitution occurs can be determined by reference to the elasticity of demand. Demand elasticity indicates the (percentage) change to the quantity sold as a reaction to a (percentage) change in price.

3.2.1 Bitstreaming as the point of departure

According to item 5 of the EFTA Surveillance Authority's Recommendation on Relevant Markets and to the Announcement on market definition the wholesale market for broadband access comprises:

„[...] non-physical or virtual network access including ‚bit-stream‘ access at a fixed location. This market is situated downstream from the physical access covered by market 4 listed above [i.e. unbundling], in that wholesale broadband access can be constructed using this input combined with other elements.“

Bit-stream access (bitstreaming) hence furnishes the point of departure for the definition of the relevant market. Bit-stream access connotes a wholesale product that enables, for instance, an internet service provider as wholesale customer to offer broadband connections (in most cases to the internet) to its retail customers without having its own access network. As a rule bitstreaming is mentioned in connection with xDSL. The provision of xDSL equipment takes place through the wholesale provider, as does, in most cases, traffic forwarding to a network handover point. With xDSL, bitstreaming comprises at least the DSL transmission path between the subscriber modem and the DSLAM.³² Beyond this, the wholesale provider is able to carry the data traffic (bit-stream) further on its infrastructure (e.g. SDH) by employing overbooking factors in order, for example, to pass traffic through several regional PoPs or a single national PoP for delivery to the ISP customer.

Bit-stream access, however, does not include those wholesale products that fall under pure resale: In that case, even internet connectivity (data traffic/peering on the public internet) is performed by the wholesale provider and the ISP has no influence on the technical parameters for xDSL access. For an ISP that is a resale customer all that remains as services it provides itself are functions such as billing, branding, marketing and sales; it deploys no³³ network infrastructure of its own (whether established by itself or hired) and thus has no means to influence the technical configuration or quality of the retail services. It accordingly has no possibilities of product differentiation; the wholesale product is resold having the same technical parameters.

³² Digital Subscriber Line Access Multiplexer (a modem on the „office“ side, at the switch or main distribution frame or hand-over point).

³³ Of importance here is only the infrastructure deployed for broadband access, not that for such additional services as email, web hosting, etc.

However, as soon as an IP address belonging to the ISP's address space is used, the downlink traffic will also be delivered to that ISP. The internet connectivity of the ISP hence produces an effect, for which sufficient dimensioning (backhaul, peering) will be of decisive importance for technical parameters (download rate, jitter, delay, etc.) with respect to available capacity in terms of bandwidth. Understood in this way, this form of bit-stream access does allow (at least partial) product differentiation, in contrast to pure resale.

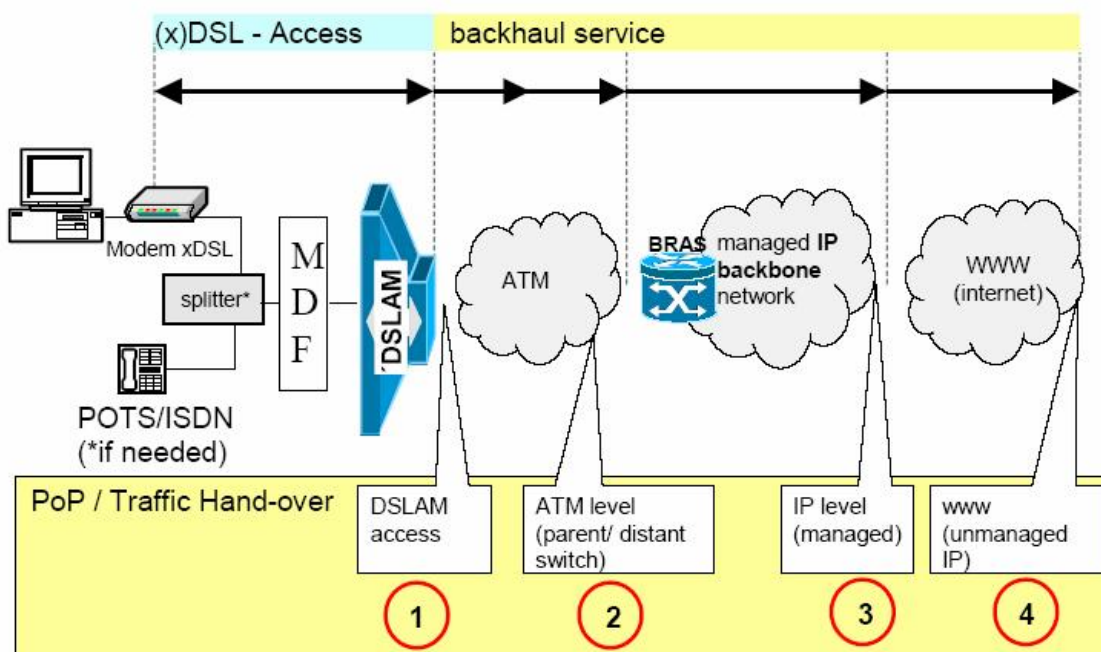


Figure 5: Forms of bit-stream access according to the ERG (2005)

In line with the ERG's scheme in its *Common Position on Bitstreaming*³⁴ (see Figure 5) bit-stream access therefore encompasses both the part designated as „(x)DSL Access“ and backhaul service for forwarding data traffic. Bitstreaming is provided from the retail customer modem up to handover at the PoP. Points 1, 2³⁵, and 3 are relevant for handover. Handover at Point 4 does not fall within bit-stream access; this instead involves simple resale.

Bandwidth:

Bitstreaming covers those wholesale products that make broadband (as opposed to narrowband) retail customer connections possible. Narrowband connections are normally employed for the provision of voice telephony services in the form of POTS³⁶ or ISDN³⁷. A bandwidth of at most 64 kbit/s (a voice channel) can be attained with narrowband connections via POTS and, via ISDN, 128 kbit/s (2 voice channels) or 144 kbit/s (2 voice

³⁴ Cf. Footnote 20.

³⁵ Contrary to the ERG's 2005 reference model, ATM has in the meantime ceased to be employed in Liechtenstein. SDH has instead been deployed in the core network. ULAF+ is additionally employed in the connection network.

³⁶ Plain Old Telephone Service.

³⁷ Integrated Services Digital Network.

channels + D-channel) for internet dialup traffic, for instance. A bandwidth of 144 kbit/s thus represents the upper limit for narrowband.

On the other hand, bandwidths only slightly above 144 kbit/s are today hardly considered broadband in light of the already much higher download rates that are offered today – these being mostly at 1024 to 4096 kbit/s and above. One might therefore entertain using as a lower limit for broadband a download rate such as 256 kbit/s, which is currently offered with entry level products (both over DSL and CATV).

If one places the upper limit for narrowband at 144 kbit/s download and a lower limit for broadband of 256 kbit/s download, there will remain between these values additional bandwidth that is not classified and which is left undefined relative to a market. To avoid such a situation, bandwidth greater than 144 kbit/s download will be classed as broadband. Bit-stream access therefore encompasses bandwidth greater than 144 kbit/s download. It does not seem sensible to set an upper limit because the maximum bandwidth achievable and the bandwidth offered on the market continue to increase over time. On this basis, the market definition would cover any higher amounts of bandwidth than are offered today.

Overbooking:

This term means that, by exploiting the statistical probability that not all retail customers will be using their broadband access at the same time, one can estimate that the bandwidth to be reserved in the backhaul network (e.g. SDH) can be less than the total bandwidth of all retail customer connections. A concentration of data traffic thus takes place in order to conserve capacity; the retail customers who are online at any particular time share the available capacity in function of the current traffic load factor (shared capacity).

If available capacity is guaranteed for an end-to-end connection (dedicated capacity), there will therefore be no use of overbooking factors; one is instead as a rule speaking of leased line services with this kind of access, whether at the retail level or in terms of trunk or terminating segments at the wholesale level.

Bitstreaming is thus characterized by bringing overbooking factors to bear in the backbone network (the backhaul service) in relation to the transport of data traffic.

Symmetric – asymmetric:

Broadband connections are offered at both the retail and the wholesale levels in asymmetric mode (different bandwidths for uplink and downlink connections) such as over ADSL and in symmetric mode, e.g. over SDSL. Differentiation between symmetric and asymmetric carriage thus does not form a distinguishing feature for bitstreaming.

Bitstreaming hence comprises both symmetric and asymmetric broadband access at the wholesale level.

Supply and demand-side substitution

If an operator has implemented DSL technology in its network and has concluded the necessary arrangements to offer bit-stream products, it is essentially easily possible then to offer symmetrical and asymmetrical connections with varying bandwidths and different overbooking factors. Supply-side substitutability thus exists at least among the above-mentioned forms of bit-stream products. For this reason no sub-division into a market for private customers and one for business customers is made at the wholesale level. No demand has been known to arise at the wholesale level for services that are specifically tailored to business customers and which are not covered by the definition given above.

Substitutability can also occur on the demand side, above all in regard to different bandwidths. If the price of a particular bandwidth increases at the wholesale level and is passed on to the retail level it will then be probable that a certain proportion of retail customers will switch to neighbouring products (so far as bandwidth is concerned). One can to all intents and purposes assume the existence of a substitution effect across the entire range of bandwidths, since one is speaking of different gradations of bandwidth (512 kbit/s, 1024 kbit/s, 2048 kbit/s, 3072 kbit/s, 4096 kbit/s, etc.).

TLI's current „Bit Stream Access (Broadband)“ offer under its latest approved Reference Unbundling Offer (RUO)³⁸ must, in the sense of the market definition given above, be categorized on the one hand as an offer of pure resale and on the other – according to TLI's information that more than two-thirds of its ISP customers provide internet connectivity themselves – as a bit-stream access product in the sense of the ERG model's access point 3 (see Figure 5). So far as pure resale is concerned, the ISP only undertakes functions such as marketing and sales, billing, web hosting and provision of email addresses, but not backhaul services or provision of internet connectivity. Access at point 3 entails that the ISP is itself responsible for internet connectivity, even though it cannot influence the other parameters for xDSL access.

3.2.2 Access over cable TV networks

No broadband access at wholesale level is currently offered over CATV networks in Liechtenstein.³⁹ Despite this, one can presume that CATV networks may exercise considerable competitive pressure on sellers of bit-stream products. This will be so, if:

- (i) CATV operators were also to start providing bit-stream access or open access⁴⁰ products to ISPs as a reaction to a 5-10% price increase for bit-stream products, or

³⁸ See <http://www.telecom.li/cfdocs/cmsout/admin/index.cfm?GroupID=171&meID=1072>, status 1.7.2006, pp. 46 and 62 respectively and the current reference offer that was consulted http://www.liv.li/unbundling_offer_ltn_version_2007-09-10.pdf, p. 16 *et seq.*

³⁹ According to its statements, LKW essentially offers on its CATV network access to high frequency (HF) channels as a wholesale access product. Alternative providers are in principle able to produce broadband products themselves on the basis of this input factor. The HF channels LKW offers do not themselves, however, constitute broadband access and are thus not to be included in the relevant market currently under consideration, but rather in the market for physical access. For purposes of completeness it should be mentioned that, at the time the present analysis was compiled, newsnet AG was negotiating frequency channel access with LKW.

- (ii) competition between broadband internet over CATV networks and over DSL were so intense at the retail level that a price increase at the wholesale level would be unprofitable. A (non-transitory) price increase on the wholesale level would in particular also lead to a price increase on the retail market (in the presence of a sufficiently competitive retail market). If this were to cause a sufficiently large number of customers to switch over to CATV broadband products, demand for bit-stream products would fall and the price increase would not be profitable.

Regarding (i): While sale of open access products as a reaction to a 5-10% price increase for bit-stream products cannot be discounted, it is improbable because of the costs (both technical and organizational) of providing them externally.

Regarding (ii): CATV networks over which broadband internet can be offered are available throughout practically all of Liechtenstein. Analyses in other countries have shown that internet connections over DSL and CATV are good substitutes for each other at the retail level and thus are to be attributed to the same market. While there have been no equivalent investigations for Liechtenstein, it is all the same possible to compare the features of the products that are offered over DSL or CATV. In pursuit of this aim, the prices, up- and download rates and associated download volumes have been collected for a total of 88 products sold by eleven operators⁴¹. When one compares the products of the CATV network-based providers TVcable.li Anstalt and TLI (its „Powersurf“ product) with those of DSL providers this shows that the CATV-based providers sell similar bandwidths to those offered by DSL providers over ADSL2+ (e.g. 3, 4, 6 and 8 Mbit/s) and that these products in both instances are mainly provided at a flat rate (i.e. products with no download volume limits). In this connection, the products sold by CATV-based providers are in part significantly cheaper than those of DSL providers. Considering the similarity of products and pricing differences, it can be assumed that CATV products exercise significant competitive pressure on DSL products at the retail level.

When one compares TLI's (previously LTN's) wholesale prices in its RUO (p. 46) with the retail prices of partnering ISPs, these determine – depending on the particular product or firm – a wholesale cost component in the retail price amounting to 50%-85%.⁴² A 10% price increase at the wholesale level (i.e. regarding a bit-stream access product) would thus most likely express itself in a 5%-8.5% price increase at the retail level. Taking account of the similarity of CATV and DSL products it is probable that such a price increase would lead to sufficient substitution of DSL by CATV at the retail level, so that the price increase would also not be profitable at the wholesale level. This speaks in favour of including CATV connections in the relevant market.

⁴⁰ In CATV networks, the expression “open access” is often used for broadband wholesale products instead of “bit-stream”.

⁴¹ AllCommunications (previously Tele2), Telecom FL, Kyberna, TVcable.li Anstalt (Matt Antennentechnik AG), Lie-Comtel, Krypton, UPC Austria (previously Inode), Li-Life EDV + Internet, newsnet, supranet, Green ((previously TIC THE Internet Company), M-Tech.

⁴² To make this comparison the prices for flat-rate products for the firms AllCommunications (Tele2), Kyberna, Krypton and newsnet were consulted. The other partnering ISPs offer either different bandwidths than those set out in the RUO (status: 01.07.2006) or do not offer flat-rate tariffs.

However, such a conclusion cannot safely be drawn in a conclusive way because no investigations or data exist regarding the purchasing behaviour of broadband users in Liechtenstein. For this reason and having a view to the reservations held by the European Commission concerning inclusion of CATV connections in the wholesale broadband market⁴³ it seems reasonable in the market analysis to look at both a market that does include CATV connections and a „pure DSL market“ that does not. In the end, however, it becomes clear that inclusion of CATV connections does not lead to any different result either in the SMP analysis or in establishing regulatory measures. The final conclusion regarding this question can consequently be left open without any consequences for the results of the market analysis at hand.

3.2.3 Access over mobile networks

With the introduction of UMTS⁴⁴ and, most of all, HSDPA⁴⁵ it is possible to provide similarly high bandwidths to those currently used in the fixed network over mobile connections, by means of a laptop (or PC) and data card or USB modem (with UMTS up to 384 kbit/s, with HSDPA in theory up to 1.8 Mbit/s, 3.6 Mbit/s or 7.2 Mbit/s in each case according to the software upgrade, but in practice mostly up to 1 Mbit/s).

In Liechtenstein mobile broadband over UMTS and HSDPA is offered by the operators Mobilkom Liechtenstein, Orange and Swisscom. The HSDPA networks are essentially available everywhere in the populated valley area.

If one examines the prices of Mobilkom Liechtenstein, which offers the highest transmission rates over its HSDPA network at 3.6 Mbit/s, one finds that the Mobilkom Liechtenstein „Start“ package (CHF 39 for 1 GB), for example, is certainly comparable with ADSL „beginner“ offers; however, the offers for „Medium“ (CHF 49 for 2 GB) and „Profi“ (CHF 75 for 4 GB) represent less value for money than comparable ADSL+ products (e.g. 5000/300 flat-rate for CHF 49 or 7000/500 flat-rate for CHF 75 from TLI). This picture is compounded in as much as tests in other countries have shown that the maximum download speed with mobile broadband is rarely or never achieved, whereas this is more often the case than not in the fixed network.⁴⁶ The newly introduced Mobilkom product „Unlimited“ offers unlimited download volumes according to the „fair-use principle“ up to 20GB for CHF 49 per month and could exercise further pressure on fixed broadband connections.

Mobile broadband over UMTS/HSDPA was only introduced recently (2007), for which reason there are still no data regarding its use, while its development for the coming 2-3 years cannot practically be forecasted. In the current launch phase, a relatively small

⁴³ See, for example, the comments of the European Commission on the corresponding analyses for the UK, Ireland, Austria and a number of other countries.

⁴⁴ Universal Mobile Telecommunications System; this is the third generation mobile radio standard.

⁴⁵ High-Speed Downlink Packet Access.

⁴⁶ For Austria, see for example „Breitband-Internet. Das blaue vom Himmel“, *Konsument*, Instalment 10/2007, <http://www.konsument.at/konsument/detail.asp?category=Computer+%2B+Telekom&id=32174>.

number of users are able to obtain high download speeds, but this could change with a rising number of customers. This is because the air interface represents what one may call a „shared medium“, meaning that the download speed is divided among the users in a particular cell. In light of the fact that mobile broadband connections are nevertheless (at least in particular segments) quite capable of developing into a substitute for fixed network broadband connections, their further development must be kept in view. From today's standpoint it is, however, improbable that mobile broadband is a sufficiently close substitute on the retail market for fixed broadband connections for it to be classifiable in the same market at the wholesale level.

3.2.4 Self-supply

The question is also posed as to whether firms' internally furnished services (self-supply) are to be included in the relevant wholesale market. In principle, a similar argument applies in relation to self-supply to that advanced at the beginning of chapter 3.1. Thus a hypothetical monopolist which provides wholesale services solely to others cannot profitably increase its prices if this will lead to a price increase at the retail level and so cause a sufficient number of customers to switch to vertically integrated firms in reaction to the rise in price. In such a case self-supply services must also be included in the market.

Because the products of vertically integrated operators (TLI) and non-vertically integrated ones (partnering ISPs) are – owing to the fact that one is speaking of pure resale products – very similar (the same download rates and volumes plus similar prices), it can be expected that this situation will at all events produce sufficiently extensive substitutability at the retail level. TLI's self-provided services and those of the unbundling operator UPC are thus to be included in the market.

Similar arguments apply to self-provided connections in the case of CATV networks. If the substitution between CATV and DSL connections at the retail level is sufficiently great, self-supplied CATV connections are also to be included in the market.

3.2.5 The geographically relevant market

The geographically relevant market is the geographical area in which the relevant product is sold and bought under sufficiently similar or homogeneous conditions of competition.

The methodological principles for geographical market definition correspond to those for product market definition. Once again, one must ask whether, applying the HM test, a hypothetical monopolist in a particular region is sufficiently constrained in its pricing behaviour because of supply or demand-side substitution on the part of a firm in another region. Were one to apply the test's criteria strictly, this would lead to very small geographical markets, because there will normally be insufficient demand-side substitution (no consumer will be willing to change residence to another region and no provider would change its service area because of a 5-10% price increase for broadband products) while supply-side substitution will also be limited (it is hence doubtful whether

market entry in a neighbouring geographical area that entails high sunk costs would be profitable after a 5-10% price increase).

Since it is not useful to analyse a multitude of very narrowly defined markets separately, markets should be aggregated into one market where competitive conditions are sufficiently homogeneous.⁴⁷ This dispenses with the need to analyse each market, while proceeding in this manner still leads to the same results.

Since the largest provider of broadband connections (TLI) is active across Liechtenstein and offers its services at uniform prices, the competitive conditions are – in the view of the Office for Communications – sufficiently homogeneous to define a single national market. The price and technical characteristics of the broadband access products currently offered in Liechtenstein (including in the municipalities of Eschen and Mauren) are sufficiently similar so that there is no indication of any geographically diverging conditions for supply and demand that would support any other conclusion than a nationwide geographic market delineation.

Regarding the activities of the TVcable.li Anstalt / Matt Antennentechnik AG in particular, these are limited to the municipalities of Eschen and Mauren due to the actual coverage of its CATV network. Since TLI also disposes in these communities over a nationwide DSL service, it could, if the case were to arise, constrain Matt Antennentechnik AG / TVcable.li Anstalt in its price setting behaviour. Similar constraints are exerted by already active or potential unbundlers and bitstream providers. Due to the high sunk costs associated and the given limited market potential, the development of an additional access infrastructure in this area in response to a 5-10% price increase is not to be expected.

As for the reverse influence on the exercise of TLI's market power in the whole of Liechtenstein, it must be assumed that due to the high sunk costs and time associated with network expansion no alternative providers (including TVcable.li Anstalt / Matt Antennentechnik AG) would be in a position to offer ubiquitous nation-wide broadband services based on own network infrastructure in response to a 5-10% increase in price of DSL broadband connections that would render the nation-wide price increase unprofitable. Based on existing as well as contemplated access obligations in the market for physical access (market 4) to the CUDA and CATV access networks, however, it is to be assumed that TLI would be constrained in its price setting behaviour by existing or new entrants making use of physical access no differently in the rest of the country - if at all – than is the case in Eschen and Mauren. But even if one were to employ a green-field approach by disregarding any upstream access products in the market for physical access, the conditions of competition prevailing regarding TLI would continue to be uniform nationwide since, as described, its broadband access products are generated, designed and priced uniformly, and a nation-wide 5-10% increase in price would continue to stay profitable overall even in light of partial substitution due to the limited number of connections in relative terms in the municipalities of Eschen and Mauren (about one-fifth

⁴⁷ See SMP Guidelines, para. 57.

of all nation-wide connections). For all these reasons, the Office for Communication regards a uniform national geographic market definition as appropriate. There are no sufficient reasons present that would require a segmentation of the geographic market.

In accordance with Part B of the Annex to the Announcement on market definition the geographically relevant market for the present market analysis is therefore defined as being the entire national territory of Liechtenstein. This is in harmony with the small size of the national territory and the homogeneous conditions of supply and demand that prevail in it as well as with the geographical extent of the access network on Liechtenstein soil.

3.3 Connection to other markets

Links between markets can arise because of essentially the following reasons:

- Markets can be connected with each other *horizontally* if substitutional or complementary relationships between the products on the markets exist and/or the products are offered as a bundle.
- Markets can be connected with each other *vertically* if they form part of the same value chain.

The market for broadband access at the wholesale level indicates no horizontal connections with any other relevant market of an order that would be relevant for analysis under the Recommendation on relevant markets. Vertical links do exist with the market for unbundling. ISPs' unbundled local loops are used to offer broadband internet access (mostly via DSL) at the retail level. TLI also uses the unbundled local loop to provide other ISPs with a resale broadband product. These vertical links, together with the vertical relationships between other relevant markets, are portrayed in Figure 6.⁴⁸

⁴⁸ Leased lines and CATV networks as well as other access technologies are disregarded for purposes of clarity. They bring no additional understanding to the present remarks.

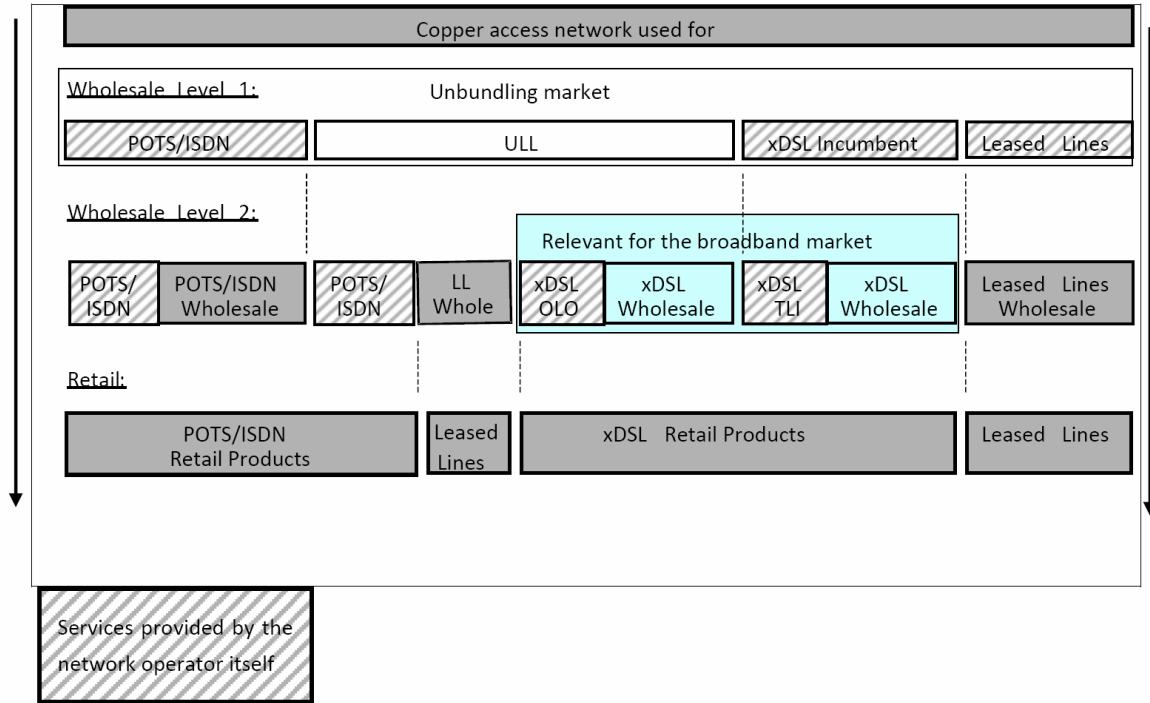


Figure 6: Vertical relationship between the relevant markets

4. Market power

4.1 Undertakings with significant market power

4.1.1 Single dominance

Pursuant to Art. 3(1)(3) KomG an “undertaking with significant market power” is “an undertaking that either individually or jointly with others enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers”.

In connection with the assessment of whether an undertaking individually enjoys a position of significant market power (“single dominance”), the Office for Communication is required to consider “in particular” the following criteria according to Art. 31(1) VKND:

- a) The size of the undertaking, its size in relation to the relevant market, as well as changes in the relevant positions of market players over time;
- b) The magnitude of barriers to market entry as well as the degree of potential competition as a result;
- c) The degree of countervailing buying power;
- d) The degree of demand and supply elasticity;
- e) The maturity of the market;
- f) Technological advantages or superiority;
- g) Any advantages in organization of sales and operations;
- h) The existence of advantages resulting from economies of scale, scope and concentration;
- i) The degree of vertical integration;
- j) The degree of product diversification;
- k) Access to capital;
- l) Control over infrastructure not easily duplicated;
- m) Market behaviour in general, such as pricing policy, marketing approach, bundling of products and services or the establishment of barriers.

Art. 3(1)(3) KomG is coextensive with the applicable requirements under EEA law: Art. 14(2) of the Framework Directive stipulates that an undertaking will be deemed to be an undertaking with significant market power *„if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength*

affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers“.

The national as well as the EEA legal framework address the dichotomy between “significant market power” in Art. 3(1)(3) KomG and “effective competition” in Art. 20(1) KomG by means of the so-called “thesis of equivalence”: no effective competition prevails if at least one undertaking with significant market power is found to be present. Thus the EFTA Surveillance Authority in its Guidelines⁴⁹ states that the conclusion that genuine competition exists on a relevant market is equivalent to the finding that on this market there is no operator that has a dominant position individually or jointly with others. “Effective competition” is defined to the effect that on the relevant market there is no undertaking that enjoys a position equivalent to dominance individually or jointly with others (cf. Recital 27 of the Framework Directive).

The above-mentioned Guidelines on Market Analysis and the Assessment of Significant Market Power are pertinent in rendering the market analysis operative: In contrast to general competition law, sector-specific regulation pursues an *ex ante* approach – the assessment of competitive relationships proceeds from the premise that no regulation exists (the “green field approach”). The EFTA Surveillance Authority hence states the following in its Guidelines: *“[W]hen assessing ex ante whether one or more undertakings are in a dominant position in the relevant market, NRAs are, in principle, relying on different sets of assumptions and expectations than those relied upon by a competition authority applying Article 82 of the Treaty and Article 54 of the EEA Agreement ex post, within a context of an alleged committed abuse. Often, the lack of evidence or of records of past behaviour or conduct will mean that the market analysis will have to be based mainly on a prospective assessment. [...]The fact that an NRA's initial market predictions do not finally materialise in a given case does not necessarily mean that its decision at the time of its adoption was inconsistent with the Framework Directive.”*⁵⁰ Footnote 74 in the Guidelines states in addition that *“NRAs do not have to find an abuse of a dominant position in order to designate an undertaking as having SMP”*.

If an undertaking has significant market power on a particular market, it can then also be considered as an undertaking with significant market power on a closely related market horizontally and vertically or geographically, where the links between the two markets are such as to allow the market power held in one market to be leveraged on to the other market, thereby strengthening the overall market power of the undertaking (on “leveraging”, see Art. 22(2) KomG).

⁴⁹ Cf. SMP Guidelines of the EFTA Surveillance Authority, paras. 19 and 113.

⁵⁰ Cf. SMP Guidelines of the EFTA Surveillance Authority, paras. 71 and 72.

4.1.2 Collective market power (joint dominance)

Two or more undertakings can be assumed to have significant market power jointly if they – even in the absence of structural or other links between them – are active in a market whose character displays incentives for coordinated behaviour (Art. 31(2) VKND).

To assess whether two or more undertakings together enjoy significant market power (“joint dominance” or “collective dominance”), the Office for Communication has to consider “in particular” the following criteria:

- a) The extent of market concentration, the distribution of market shares and their change over time;
- b) The level of market entry barriers and the resulting degree of potential competition;
- c) The degree of countervailing buying power;
- d) The market transparency that exists;
- e) The maturity of the market;
- f) The homogeneity of products;
- g) The basic cost structures;
- h) The degree of demand and supply elasticity;
- i) The degree of technological innovation and the level of maturity of the technology;
- j) The presence of unused capacity;
- k) The existence of informal or other links between market players;
- l) The mechanisms for counter-measures;
- m) The degree of incentive for price competition.

The formulation “in particular” clearly indicates that the list of criteria in Art. 31(1) VKND is not exhaustive; Annex II of the Framework Directive states explicitly that its list of “Criteria to be used by national regulatory authorities in making an assessment of joint dominance in accordance with Article 14(2)” is “*not an exhaustive list, nor are the criteria cumulative*”.

In assessing whether two or more undertakings have joint dominance on a market, the National Regulatory Authorities have in particular to act in accordance with EEA law and in this connection are to take utmost account of the EFTA Surveillance Authority’s Guidelines on Market Analysis and the Assessment of Significant Market Power that have been published under Article 15 of the Framework Directive.

The legal character of collective market power is – at any rate according to present case-law – to be equated with the economic concept of “tacit collusion”. Under this, it is understood that undertakings’ “parallelism” – without an explicit accord, but in awareness of their mutually responsive behaviour and at the cost of the other side of the market

(consumers) – aims at pursuing an offensive competition strategy by sacrificing short-term individual increases in turnover because this will be profitable over the longer term for all the vendors involved.

The ECJ Court of First Instance in its decision in the *Airtours* Case⁵¹ formulated, respectively confirmed, in the context of a merger review the following three criteria as a test for determining collective market power:

- i) The existence of sufficient market transparency to determine deviations from coordinated behaviour;
- ii) The presence of credible retaliatory mechanisms in case of such deviations;
- iii) The ability of current or potential competitors or customers to undermine the coordinated behaviour.

The core element of collusion resides in the tension between the collective rationality of undertakings (raising common gains through parallelism) and individual rationality (short-term gains through deviation from a collusive arrangement). A strategy of deviating from the collusive arrangement or of veering away from parallelism constitutes cheating. Collusion is only possible on markets having sufficiently narrow market structures (oligopoly markets) and witnessing accompanying correspondingly strong responsive behaviour. But the market outcome on such markets is also dependent upon a series of other market factors which tend to promote (e.g. by creating an “incentive to collude” for undertakings) or to impede (e.g. by creating an “incentive to cheat” for undertakings) collusion.

4.2 Market shares

Market shares provide a natural point of departure for the investigation of competitive relations on a market and are regarded especially in case-law as an essential indicator for market power.⁵² The economic significance of this indicator flows above all from the theory of monopolies and oligopolies as well as from empirical evidence for the linkage between market shares and profitability (in the shape of the price-cost margin). There is thus both theoretically and empirically a positive connection between an undertaking’s individual market share and its price-cost margin. Neither the empirical nor the theoretical literature, however, sheds light on from which level of market share onwards “significant market power” may be suspected (or even proven) to exist. In the case law, the following thresholds have established themselves: With a market share below 25% it can be presumed that the undertaking in question does not have a position of (individual) dominance. A market share of 40% will raise, according to the practice established by the European Commission and EFTA Surveillance Authority, suspicions about the existence of a dominant position, while in some cases market dominance will exist also below this threshold (because of other factors). The consistent case law of the European Court of

⁵¹ Case T-342/99, *Airtours/First Choice*, *ECJ Reporter*. 2002, II-2585.

⁵² Art. 31(3)(a) VKND as well as SMP Guidelines, paras. 75-78.

Justice has held that at 50% – leaving extraordinary circumstances to one side – market power can be taken as proven.⁵³

A high market share on its own does not, however, mean the existence of a market-dominant position; in reaching a judgement an essential aspect is also the development of market shares: It is therefore important, for example, to observe the market share of an undertaking not only at a particular point in time but also to look at the change in market shares over time. If the market share is high and stable over a long period of time (or even growing), the existence of market power is more likely to be assumed than when the market share is sinking or subject to significant fluctuations. Beyond this, the market share has also to be placed in relation to the market shares of competitors. If the undertaking in question has a markedly higher market share than even the largest of its rivals, the finding of a dominant market position is then more probable than in cases in which several undertakings have high market shares. It goes without saying that – in order to obtain a comprehensive picture – even in cases of very high market shares still further indicators must be examined; in particular the causal factors underpinning the high market share must be investigated.⁵⁴

The structure of the market and thus the number of market players as well as their market shares depends on advantages of scale, sunk costs and the minimum efficient scale⁵⁵ of an undertaking. If for instance there are high advantages of scale, then ceteris paribus a higher concentration is also to be expected. In extreme cases the industry will be a natural monopoly, i.e. costs will (from a static perspective) be optimal if only one undertaking is in production. Since high advantages of scale can thus lead both to high concentration and to high market entry barriers, market power can fairly be assumed where significant advantages of scale exist.

The firms which are active on the wholesale market for broadband access are all those which have connections based on their own infrastructure or unbundling and provide them externally to ISPs or internally within their own businesses. These are TLI (provision based on LKW unbundled connections to partnering ISPs and internally to itself) and UPC Austria (unbundling). If one also considers CATV-based providers, then TVcable.li Anstalt (or, as the case may be, Matt Antennentechnik AG) and TLI as a provider over LKW's CATV network must also be included.

The development of market shares including CATV connections is presented in Figure 7. According to this, TLI has a very high and static market share that was 97.5% at the end of 2007. The share of TVcable.li Anstalt/Matt Antennentechnik AG was slightly more than 2% and that of UPC below 0.5%.

⁵³ Cf. SMP Guidelines para. 76.

⁵⁴ By way of example, a higher market share on an innovative market in a very early stage of the market would be differently assessed than in an already saturated market with switch-over costs.

⁵⁵ MES – Minimum Efficient Scale.

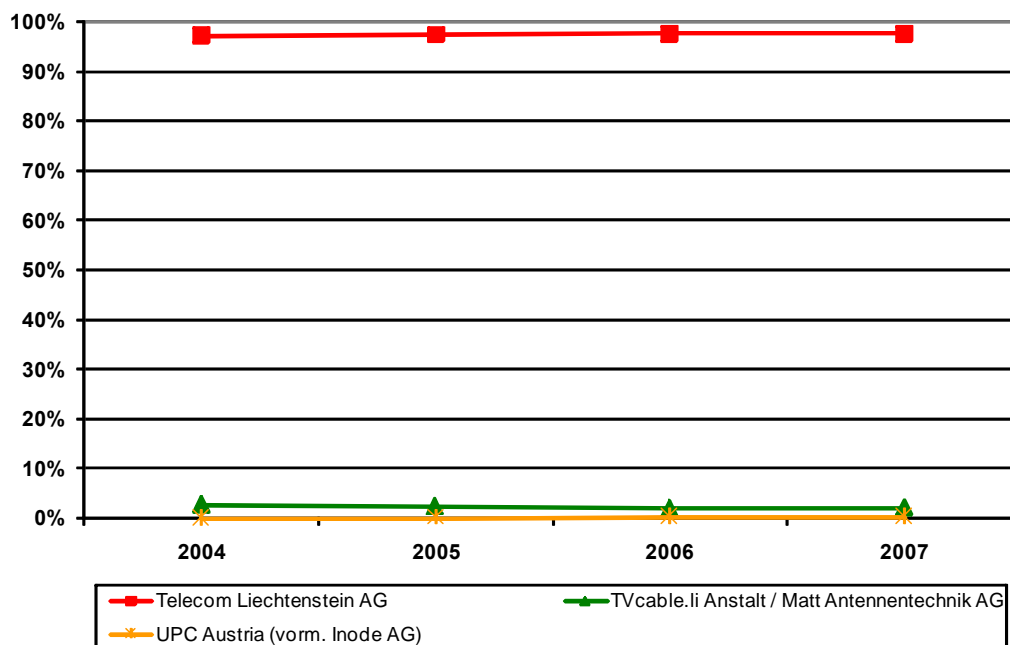


Figure 7: Development of market shares 2004-2007

If one excludes CATV from the market, then TLI's market share becomes almost 100%, because this would leave only UPC as a competitor.

It can be seen, therefore, that, with or without inclusion of CATV connections, TLI's market share will be nearly 100%.

Conclusion: Both the level of market share as well as the development of market shares clearly indicate the existence of a dominant position for TLI. This applies equally when considering CATV connections as for a "pure DSL market". Since merger of Lie-Comtel into today's TLI there is no longer any major competitor on the wholesale market for broadband access. Even though TLI's very high market shares lead one to presume the existence of a position of single dominance on the market, further important criteria for the existence of significant market power should nevertheless be examined as well.

4.3 Barriers to market entry and potential competition

Barriers to market entry (Art. 31(1)(b) VKND and paras. 79 and 81 of the SMP Guidelines) can be defined as any factors that permit undertaking(s) active on a market to raise their prices above costs without thereby facing additional instances of market entry.⁵⁶ The higher barriers to market entry therefore are (i.e. the more difficult market entry is), the higher – ceteris paribus – the level of market power of the established undertaking(s) will potentially be. What is decisive for the assessment of market power is, however, not merely the existence of such barriers but also the level of competition that happens

⁵⁶ Cf. SMP Guidelines, para. 81.

behind them. Market power can particularly be supposed to exist where the market concentration is high and at the same time high barriers to market entry prevail.

In its Recommendation on Relevant Markets the EFTA Surveillance Authority distinguishes between two kinds of barriers to market entry, namely structurally and legally determined barriers. A third group of barriers will additionally be discussed here, being those arising from the behaviour of an undertaking (strategic or endogenous barriers to market entry).

A structurally determined obstacle to access occurs if, at a given level of demand, the state of the art and the corresponding cost structure are such that asymmetries between established operators and market entrants are produced which hinder market entry. The most important structural barriers to market entry on the wholesale market for broadband access can be seen as economies of scale⁵⁷ (see Art. 31(1)(h) VKND and para. 78 of the SMP Guidelines) in conjunction with sunk costs.⁵⁸ Although economies of scale do not form barriers to market entry per se, they have the effect that operators must have a high output volume when they enter the market in order not to be at a cost disadvantage vis-à-vis the established undertaking. If there is uncertainty regarding the undertaking's success on the market, the risk associated with market entry will rise with the size of the sunk costs that cannot be recouped upon a possible departure from the market.

Entry into the market for broadband access at the wholesale level can take place in two ways: (i) by a firm establishing its own infrastructure up to the retail customer or (ii) through unbundling. As concerns the establishment of a firm's own infrastructure, particularly high market entry barriers exist when this involves cabled infrastructure. Since massive economies of scale obtain in the access network and establishing such a network is associated with major sunk costs, the prospect is very improbable of any new market entry (of relevant dimension) in the next 2 to 3 years on the basis of a firm's own cabled infrastructure to cover large areas of Liechtenstein. For historical reasons two parallel cabled infrastructures (CUDA/DSL and CATV) are already present practically everywhere (in almost 100% of households). Establishment of a third infrastructure is not likely viewed from today's standpoint.

In the case of wireless technologies such as WLAN⁵⁹ or WLL⁶⁰/WiMax the level of the sunk costs is mostly much lower than with cable technologies because no excavation works are necessary (unless perhaps for connecting up base stations) and the equipment can in part be reused at other locations (in contrast to a subscriber line buried underground). Wireless technologies such as WLAN or WLL/WiMax are, however, not currently in use in Liechtenstein for the provision of broadband connections. There are also no known plans

⁵⁷ Economies of scale in production occur if the average costs (costs per unit) fall with rising output volume (advantages of size, economies of scope, economies of concentration).

⁵⁸ Sunk costs are the fixed costs of production that, once incurred, are irreversible, i.e. they cannot be recovered.

⁵⁹ Wireless Local Area Network.

⁶⁰ Wireless Local Loop; Fixed Wireless Access (FWA); wireless subscriber connection.

on the part of firms for the deployment of such networks, although frequencies are available for this purpose.

The current regulation of the unbundling market reduces the barriers to market entry in the wholesale market for broadband access through means of unbundled access to the subscriber line, but an alternative operator will still have to assume considerable sunk costs in order to extend its network to the main distribution frame. Apart from this, other investments – that will also be sunk – will have to be made for the establishment or adaptation of collocation facilities. Finally, connection will also be necessary between the collocation facilities and the entrant's own network. Currently, only one operator (UPC) uses unbundling to provide broadband connections, but its market share is less than one per cent.

Legally determined barriers arise not from economic conditions, but from legislative, administrative or other State-imposed measures that have a direct impact on the conditions of access and/or the position of operators on the market in question. As relevant legal barriers for the market in question one may observe – in relation to cable technologies – barriers in connection with rights of way and prohibitions on works involving digging up land. These result from the need to acquire, on the one hand, the necessary rights of way over third parties' land so as to install infrastructure and, on the other hand, from prohibitions on digging up applied by those regional entities in whose respective area the infrastructure is intended to be established. Both cases present market barriers owing above all to the time that must be spent in overcoming these hurdles; this is because services can only be offered to the public later than planned and because any initial losses will increase.

Barriers to market entry may, though, not only be due to legal or structural factors (ones that cannot be influenced by the undertaking), but can result from a firm's behaviour.⁶¹ Leverage by LKW/TLI of market power from upstream markets would need above all to be examined in relation to the present market; in this case the upstream market concerned would be that for unbundling. The place for this is in the course of the analysis of the market for physical access. The possibility of such strategic behaviour occurring cannot be excluded in light of the fact that UPC has access to all main distribution frames but only has a market share of < 1%. Such behaviour might also include placing obstacles in the way of providing connections between collocation facilities and UPC's network (backhaul). However, the explanation for UPC's low market share could also reside in its corporate strategy, which appears currently to be only focused on business customers (see chapter 2).

Conclusion: Seen as a whole, the wholesale market for broadband access is – owing mainly to economies of scale and sunk costs – distinguished by high entry barriers. This

⁶¹ „The behaviour on the market in general, such as in relation to pricing, marketing policy, bundling of products and services or the establishment of barriers“ is contained in Art. 31(1)(m) VKND as a criterion for the assessment of a market-dominant position.

remains the case also taking into account regulation of the market for unbundling and physical access.

4.4 Control over infrastructure not easily duplicated

One can speak of control over infrastructure that is not easily duplicated (Art. 31(1)(l) VKND and para. 79 of the SMP Guidelines) if certain infrastructure necessary for the provision of services is in the hands, exclusively or to a large extent, of a single undertaking and high barriers exist to the establishment of alternative infrastructure. Such control can enable the undertaking (in the absence of countervailing buying power) to exercise market power, because it is the only provider of the service and neither actual nor potential competition exists. It may in addition be possible for the undertaking to leverage its market power onto downstream or adjacent markets.

The former LTN's passive network infrastructure was transferred to LKW on 1 January 2007. LKW has thus from that time onwards been the sole company to have an ubiquitous (copper and CATV) access network. However, TLI, and formerly LTN, has a broadband network that is difficult to replicate because TLI still holds the nation-wide DSLAMs, collocation facilities and (active) components for backhaul that are, along with the subscriber connection (which is now obtained as a wholesale input), necessary for provision of broadband access. LKW and TLI are furthermore both 100%-owned by the State and are therefore inherently associated undertakings; they coordinate their respective fields of activities on the basis of contractual arrangements and directives issued by their common owner. The only competitor having its own infrastructure up to the retail customer is Matt Antennentechnik AG, which is only active in the municipalities of Eschen/Nendeln and Mauren/Schaanwald – where, however, only around 20% of Liechtenstein's population live. UPC, which uses unbundling, does have access to all main distribution frames, but at most of the main distributions frames it lacks a connection to its own network. Even with unbundling, only a small part of the infrastructure can therefore be regarded as being replicated.

Conclusion: TLI is therefore the only firm to have a comprehensive network for the provision of broadband internet services that is difficult to replicate and is thus the only firm to have control over infrastructure that is not easily duplicated. This applies notwithstanding the fact that TLI has since the beginning of 2007 had to obtain unbundled subscriber lines and, as the case arises, further passive network components from LKW on a wholesale basis in order to generate a broadband product.

4.5 Vertical integration

The presence of vertical integration (Art. 31(1)(i) VKND and para. 79 of the SMP Guidelines) is relevant for evaluating a market dominant position on the present market in so far as it produces to a significant degree incentives for anti-competitive behaviour against competitors.

It is hence, for example, a finding in the economic literature⁶² that vertically integrated firms with market power on the wholesale level have an incentive either to charge an excessive price for the wholesale product or to eliminate competitors from the downstream market. Incentives towards an elimination strategy can in particular arise if the firm having market power on the wholesale level cannot exercise its power in an unfettered manner. If, for example, access is regulated and if access prices are cost-oriented, the firm cannot then charge excessive prices at the wholesale level and cannot therefore exercise its market power. But the undertaking with market power at the wholesale level will still have a range of other means at its disposal to distort competition on the retail market. It could thus provide its competitors on the downstream market with, for example, the (necessary) product at lower quality than it provides to itself internally; it could deny access to particular information that is needed; it could delay provision of service; it could impose unreasonable contractual conditions; or it could bundle the product with other ones in order to raise the costs for its competitors or to reduce their turnover. If a cost-oriented access price is imposed, it can then be assumed that the firm will be able to increase its profits through such forms of behaviour. If the undertaking is in fact able to increase its competitors' costs, this will lead to an expansion of its market shares as well as to an increase in prices on the retail market, which will in turn lead to higher profits for the vertically integrated undertaking.

TLI can be regarded as a vertically integrated firm in as much as it offers both bitstreaming and resale products on the broadband wholesale market and broadband connections to retail customers. In addition, the commonly owned associated firm LKW holds the passive infrastructure and offers unbundling.

TLI can thus have, as a profit-maximizing undertaking, an incentive to charge excessive prices at the wholesale (bitstreaming) and retail levels. Currently insufficient competitive pressure appears to be exercised either by unbundling operators or from the side of other infrastructures (CATV, mobile networks) that would hinder such behaviour. If, however, there were regulation of bit-stream products that imposed cost-oriented prices, there would then be – as just described – an incentive to place other firms at a disadvantage when supplying them with wholesale products and to eliminate them from the retail market. The disadvantage can take different forms and manifest itself in, for example, delayed provision, lower quality or worse service performance. Nor can it be excluded that a margin squeeze could be applied. With a margin squeeze, wholesale and retail prices are set by the vertically integrated firm in such a way that an efficient ISP cannot cover its remaining costs.

Conclusion: As a vertically integrated undertaking that is subject to no significant competitive pressure from other operators, TLI has the possibility and the incentive either

⁶² Cf. Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework, Final Version May 2006, ERG (06) 33, p. 70 et seq., http://www.erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf.

to charge excessive prices or – if that were not possible due to regulation – to place ISPs at a disadvantage in providing them with bit-stream products.

4.6 Countervailing buying power

If an undertaking potentially possesses market power due to lack of pressure from competition, this does not automatically mean that the market power can actually be used vis-à-vis customers (e.g. in the form of excessive prices). This will namely depend upon the degree of bargaining power the buyer has (countervailing buying power). The greater the countervailing buying power, the narrower the scope a firm having potential market power will have to use its power.

The economic literature shows that, the more alternatives a customer has to buying from its present supplier, the greater the customer's countervailing buying power will be. These alternatives may consist in:

- switching to another supplier;
- reverse integration and self-supply of the service;
- facilitating market entry at the wholesale level;
- relinquishing consumption of the good in question;
- use of particular pricing mechanisms, such as auctions.

Equally, countervailing demand-side power will augment if the seller has few alternatives to selling to a particular buyer. This can occur where:

- the buyer accounts for a high proportion of sales and it would be difficult to sell the capacities elsewhere that not selling to it would release;
- the buyer occupies a gatekeeper position such as in regard to particular geographical areas or particular customer groups that the seller itself is unable to reach.

Countervailing buying power can also be enhanced if the buyer is subject to less time pressure or has better information available to it than the seller.

Because many of the factors mentioned have to do with the size of the buyer, countervailing buying power will generally be greater when the buyer accounts for a large part of the seller's turnover.

In terms of the present market, the first thing to examine is the degree of countervailing buying power vis-à-vis TLI that is held by ISPs who are potential buyers of bit-stream products. It can be presumed that ISPs' bargaining power vis-à-vis TLI is at present little developed for several reasons: Switching to another supplier is not possible because no other operator offers a wholesale product or, as the case may be, possesses infrastructure with ubiquitous coverage. Vertical „reverse integration“ and wholesale self-provision by means of unbundling are certainly possible, but fraught with high barriers due to the high sunk investment costs; these options are therefore very improbable ones. The other

mechanisms for the exercise of countervailing buying power mentioned above are also not relevant on the wholesale market for broadband access.

Conclusion: ISPs have little or no countervailing buying power that they can exercise, because it is not easily possible either to change to another supplier or to undertake self-provision of the service.

4.7 Further indicators

In the following, further indicators of significant market power under Art. 31(1) VKND will be discussed briefly, though these are of only secondary importance for the present market.

Prices:

A firm's pricing policy is an essential economic behavioural parameter and can thus also be relevant for an assessment of market power. For this reason essential indicators of the intensity of competition that is present on a market are, for example, price movements over the course of time, the price differentials between individual operators and patterns of observed price reactivity.

An analysis of pricing behaviour is, however, problematic with the present market for several reasons:

- A large part of the services is provided internally or among associated undertakings, which is why no market price is observable.
- Only one firm (TLI) offers a wholesale product.

Current prices can be surveyed at the retail level, but price movements over time are not available, while the small number of competitors having their own infrastructure does not permit meaningful comparison of prices either.

Performance measurements:

In a market exhibiting viable competition no firm will over the long term be able to increase prices significantly above costs and thereby to generate excess profits. An indicator that is directly based on the relationship between prices and costs is so-called price-cost margins at the level of the market under investigation. However, the information necessary to make calculations at this level of detail are for the most part unavailable. A closely related problem in connection with firms offering a range of products is the allocation of common costs. For these reasons it was not possible to undertake the corresponding calculations in relation to the present market.

Advantages in marketing and sales organization:

Given that the market for broadband access is a wholesale market, there is no need for a particularly elaborate sales and marketing organization (like, for example, a branch network) for selling the products; no substantial advantages accordingly ensue for

particular operators. Nor does the sales and marketing organization at the retail level play a significant role for the assessment of market power on the present market.

Advantage through technology:

Even though different technologies are employed on the ground in the present market, the possibilities for product design are sufficiently similar that it can be deduced that no firm possesses a relevant technology-related edge.

4.8 Overall evaluation

The following indicators were taken especially into account in evaluating market power on the wholesale market for broadband access in accordance with Art. 31(1) VKND and paras 76-79 and para. 81 of the SMP Guidelines:

- Market shares;
- Barriers to market entry;
- Control over infrastructure that is not easily duplicated;
- Vertical integration;
- Countervailing buying power.

Overall evaluation: Taken together, all of the criteria that have been taken into account point to TLI having market power on the market for broadband access. This conclusion is formed by taking a forward-looking perspective that, among other things, is based on the development of market shares and on the development that can be expected in terms of the deployment of infrastructure by alternative operators. The existing regulation of the unbundling market was also taken into consideration; this does reduce the barriers for entry into the wholesale market for broadband access, but does not alter the conclusion reached regarding the presence of market power. The existence of a collectively dominant market position can be excluded by reason of strongly asymmetrical market shares and requires therefore no further examination.

Consequently, TLI is designated as an undertaking having an individually dominant market position on the wholesale market for broadband access.

4.9 Existing or potential problems of competition

Potential problems of competition on the market for broadband access at the wholesale level are:

- (i) Erecting barriers to market entry vis-à-vis (potential) competitors,
- (ii) The leverage of market power on to adjacent markets, as well as
- (iii) The exercise of market power vis-à-vis customers (especially in respect of pricing).

As regards (i): Denial (particularly in regard to price and quality) of adequate access to a wholesale broadband product can become a barrier to market entry on the wholesale

market for broadband access. If no such product is available, then unbundling is the only possibility open to ISPs who do not have their own access network infrastructure. Because unbundling involves obvious economies of scale and relatively high sunk investment costs, the market entry barriers are very high for such ISPs. If a wholesale product is, however, available an ISP can enter the retail market with lower (sunk) investment costs and then later, once a certain “critical mass” has been achieved, turn to unbundling (ladder of investment). Availability of a wholesale product thus reduces the barriers surrounding unbundling and consequently facilitates entry into the market for broadband access (by means of unbundling). It follows therefore that denial of adequate access to wholesale products elevates the market entry barriers, which ultimately poses an obstacle to the emergence of self-sustaining, infrastructure-based competition.

As regards (ii): TLI is in a position not only to heighten the barriers to market entry on the wholesale market for broadband access by means of denying adequate access to a wholesale broadband product (particularly in regard to price and quality), but it can also extend its market power on to the retail market. If regulation of access existed that foresaw cost-oriented prices for wholesale products, then it would not be possible to exercise market power on the retail market either, because of the competitive pressure from ISPs. However, if ISPs’ access to wholesale products can be refused or impaired, it is possible that ISPs could be eliminated from the retail level and that market power could be exercised vis-à-vis retail customers.

As regards (iii): The exercise of market power vis-à-vis customers manifests itself most notably in excessive prices. It can be presumed that, in the absence of price regulation, TLI is in a position to raise the prices for wholesale broadband products, but in addition to increase its own internal charging and thus also its retail prices above the competitive level, and to do so without suffering significant loss of business.

5. Regulatory instruments

5.1 Regulatory instruments under the KOMG

Under Art. 20 KomG the Office for Communication is to take the necessary measures to remove or reduce the negative consequences of a lack of effective competition in the electronic communications markets. For this purpose it imposes upon operators with significant market power – in accordance with Art. 23 KomG in conjunction with Arts. 34 to 42 VKND – one or more of the following measures of special regulation:

- The obligation of non-discrimination (Art. 34 VKND);
- The obligation of transparency (Art. 35 VKND);
- The obligation of accounting separation (Art. 36 VKND);
- The obligation to assure access to network facilities and network functions (Art. 37 VKND);
- Price control and cost accounting obligations related to access (Art. 38 VKND);
- Obligations regarding services for retail customers (Art. 39 VKND);
- Obligations regarding the provision of leased lines (Art. 40 VKND);
- Obligations regarding retail customer tariffs (Art. 41 VKND);
- Obligations regarding carrier selection and carrier pre-selection (Art. 42 VKND).

According to Art. 43 VKND the Regulatory Authority can impose other obligations of interconnection and access than those laid down in Arts. 34 to 42 VKND on undertakings having significant market power where there are extraordinary circumstances. In such a case the Regulatory Authority must make a corresponding request to the EFTA Surveillance Authority. The EFTA Surveillance Authority's decision forms the basis for that of the Regulatory Authority.

Because a wholesale service market is concerned in the case of the market for broadband, only the provisions in Arts. 34 to 38 VKND and Art. 43 VKND are relevant for purposes of further discussion.

5.2 Principles for the application of regulatory instruments

So far as adoption of regulatory instruments for the regulation of competition is concerned (measures of special regulation), the Office for Communication is obliged to consider the goals for regulation under Art. 1(2) KomG as well as the principles contained in Art. 5(2) KomG.

As in the pertinent provisions of the EEA legal framework (Art. 8(1) of the Framework Directive 2002/21/EC, Art. 8(4) of the Access Directive 2002/19/EC⁶³ and Art. 17(2) of the Universal Service Directive 2002/22/EC⁶⁴), the principle of proportionality is explicitly referred to as one that must be complied with. The principle of proportionality states that the means used to achieve a particular goal are not to exceed that which is necessary and appropriate for doing so. In order for a measure of the Regulatory Authority to conform to the principle of proportionality, there must firstly be a goal laid down in Art. 1 KomG (or the applicable principles under EEA law) which the measure pursues. The measure used to achieve this goal has secondly to be necessary for so doing. It may not, thirdly, represent an unreasonable burden for the operator concerned. The measure taken should thus be the minimum needed to achieve the relevant goal.

On the basis of the goals contained in Art. 8 of the Framework Directive and in conjunction with further provisions in the relevant Directives (especially Art. 8 of the Access Directive and Arts. 10 and 11 of the Authorisation Directive 2002/20/EC⁶⁵) the ERG⁶⁶ has in cooperation with the Services of the European Commission (Directorates-General Competition and Information Society) established four principles that should be observed in the application of regulatory instruments.⁶⁷ These four principles are presented below. Wherever possible a link is made to the regulatory instruments set forth in Arts. 34 to 43 VKND.

The chosen regulatory instruments have, on this basis, to correspond to the nature of the problem for competition that has been revealed in the market analysis, to be suited and necessary for its resolution, and to represent the mildest means for doing so. If the infrastructure of the market-dominant undertaking cannot be duplicated, the exercise of market power vis-à-vis consumers must be prevented through, for example, assuring access by alternative operators. If it can be assumed that this infrastructure can be duplicated by other undertakings within an appropriate timeframe, regulatory instruments should then promote the transition to sustainable infrastructure-based competition. Finally, regulatory instruments should be designed to be incentive compatible, that is, the incentive to keep to them should be greater than the incentive to cheat.

⁶³ Directive 2002/19/EC of the European Parliament and the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5cj.01).

⁶⁴ Directive 2002/22/EC of the European Parliament and the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services ("Universal Service Directive"; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5cm.01).

⁶⁵ Directive 2002/20/EC of the European Parliament and the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5ck.01).

⁶⁶ European Regulators Group: It was established as an advisory body to the European Commission under Decision 202/627/EC of the European Commission of 29 July 2002 (OJ L 200, 30.07.2002. p. 38; EWR-Rechtssammlung: Anh. XI – 5ci.01). The Office for Communication and the EFTA Surveillance Authority sit as permanent observers/experts in the ERG.

⁶⁷ ERG Remedies, 2006: "Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework", ERG (06)33, http://www.erg.eu.int/documents/index_en.htm#ergdocuments, pp. 51-67.

5.2.1 Principle 1

NRAs must produce reasoned decisions in line with their obligations under the Directives.

The decision of the Regulatory Authority should be transparent and sufficiently reasoned. Consistent regulatory practice within the EEA should be assured through cooperation of National Regulatory Authorities among themselves and with the European Commission or EFTA Surveillance Authority.

The regulatory instruments that are chosen must correspond to the nature of the problem for competition (Art. 33 VKND). The identification of problems of competition and their underlying causes takes place in the market analysis.

A further fundamental principle is that of proportionality (Art. 33 VKND). The chosen obligation must be apposite and necessary and represent the mildest solution. If one or more undertakings is found to have a position of significant market power (SMP position) on a relevant market defined in accordance with Art. 21 KomG, the presumption will apply that application of regulatory remedies inherently contributes to public welfare. It is thus not necessary to prove that actual benefits to public welfare will occur. However, where several alternatives (or a combination of regulatory instruments) are suitable, those measures must be chosen that – given equivalent efficacy in attaining the relevant goal – are the least burdensome for the undertaking(s) concerned. Comparison between different regulatory instruments is normally based upon a qualitative analysis, although quantitative analysis may be used in support.

Owing to the fact that the efficacy of certain regulatory instruments will only become clear over time, it can in the meantime be necessary to employ other or additional regulatory instruments in order to ensure the fulfilment of objectives over the long term.

If several regulatory instruments are imposed at the same time one may need to take into account the interaction between them. One has furthermore to keep in view repercussions on other markets and the regulatory measures that apply there.

Finally, one has to have regard to the balance between generality and specificity in drawing up regulatory instruments. Whilst detailed obligations produce greater legal security they are also inflexible and run the risk of having to be revised or adapted frequently. General obligations are for their part more flexible, but introduce uncertainty as to their interpretation and often have to be fleshed out later on.

5.2.2 Principle 2

Where the infrastructure of the market-dominant undertaking cannot be duplicated, the exercise of market power vis-à-vis consumers must be prevented.

Whereas Principle 1 sets down general rudiments for the use of regulatory instruments, Principle 2 is concerned with a situation, in which the SMP undertaking has at its disposal

infrastructure that is needed for the provision of particular services and in regard to which its duplication cannot be assumed within a reasonable time on the part of other undertakings.⁶⁸ In such cases the National Regulatory Authorities are obliged to prevent market power being exercised vis-à-vis consumers.

This requirement can be secured by assuring in particular that alternative operators have access to the SMP undertaking's non-duplicable infrastructure. In this way market entry and competition can be encouraged lower down in the value chain and the exercise of market power can be prevented. When establishing an appropriate price for access it must also be ensured that the SMP undertaking which has to assure access to its infrastructure has sufficient incentive to maintain and improve the infrastructure.

If access to the wholesale product is ensured, it must in addition be ensured that the SMP undertaking does not distort or prevent competition on the downstream markets. This could occur, for example, through price discrimination at the wholesale level (which can lead to a margin squeeze), through discrimination in relation to quality or through delaying tactics. All of these forms of behaviour are to be prevented through use of suitable regulatory instruments.

Access to wholesale products can be assured pursuant to Art. 37 VKND. If an obligation to provide access is imposed it will usually also be necessary to establish an appropriate price for the access product on the basis of Art. 38 VKND. In order to be able to separate activities at particularly the wholesale level from those at the retail level, accounting separation may be applied as a supporting obligation (Art. 36 VKND). Art. 34 VKND (obligation of non-discrimination) can be applied to prevent different kinds of discrimination between the same undertaking and its competitors on the retail market; the same provision covers publication of a reference offer. If it can be expected – for example, due to switching costs – that competitors will only become established at the retail level slowly, transitional obligations may be needed under Art. 39 VKND (obligations concerning services for retail customers) in order to prevent exercise of market power vis-à-vis consumers.

5.2.3 Principle 3

If replication of the incumbent's infrastructure is viewed as feasible, the available remedies should assist in the transition process to a sustainable competitive market based on infrastructure competition.

Principle 3 applies to situations in which the SMP undertaking alone disposes (to a large extent) of the infrastructure needed to provide a particular service but where it can be assumed that this infrastructure can be duplicated by other undertakings within a reasonable time. In such cases regulatory instruments should encourage the transition to sustainable infrastructure-based competition.

⁶⁸ Infrastructure is duplicable if the establishment of alternative infrastructure(s) is technically possible and economically meaningful and can take place within a reasonable time. Such an assessment can only be made on a case-by-case basis.

The incentives for alternative operators can be influenced mainly through the composition of access products (Art. 37 VKND) and through prices for access (Art. 38 VKND).

Since new undertakings are usually able to establish themselves only gradually on the market and face higher capital costs at the beginning, it may be appropriate to facilitate access at different levels in the network hierarchy so as to make it possible for new entrants on a market to undertake their investments in stepwise fashion. Once an alternative operator has acquired a critical mass and is it possible for it to produce the wholesale service more efficiently than the SMP undertaking, it can then – given an appropriate management strategy – be assumed that it will make further network investments.

Additional regulatory incentives could be fashioned to provide alternative operators with an incentive to invest, such as through dynamic pricing for access (low at the beginning but rising over time) and/or by placing time limits on the availability of certain access products. However, if the SMP undertaking's infrastructure is not duplicable on economic terms, the risk here will be that either inefficient investments will be made or alternative operators will leave the market. This possibility must be weighed against the risk that duplication of infrastructure fails to take place, even if it were desirable in general economic terms.

If there is great uncertainty as to the degree of duplicability that can take place, a "neutral" approach is to be preferred, according to which two or more access products are to be made available at cost-oriented prices.

If several access products are available at the same time, then particular regard should be paid to the consistency of prices for access. It must also be ensured that the change from one access product to the next can take place smoothly (especially in terms of retail customer perceptions).

5.2.4 Principle 4

Regulatory instruments remedies should be designed, where possible, to be incentive compatible (i.e. the incentive to comply should be greater than the incentive to cheat).

If there is a choice of several regulatory options, heed should be taken that the one(s) to be used are the most incentive compatible. If regulatory instruments are not incentive compatible, this can result in need for repeated intervention or further regulation later on. Regulatory instruments must therefore be prepared in a way that the disbenefit associated with non-compliance is so great that it will be preferable to comply with regulation.

Based on these principles, the further discussion will now be directed towards the choice and application of suitable regulatory instruments from an economic point of view.

6. Choice and assessment of the regulatory options for the wholesale broadband market

The starting point in selecting the most appropriate regulatory instruments is the problems for competition that have been identified in the market analysis: (i) the erection of market entry barriers vis-à-vis (potential) competitors, (ii) the leveraging of market power into adjacent markets, and (iii) the exercise of market power vis-à-vis customers (especially through pricing).

The first step will be to identify those regulatory options that are suited to remedying the problems for competition that have been determined.

6.1 General remarks on the selection of regulatory options

Regulatory instruments will be selected and evaluated successively in the light of the principles mentioned above. Firstly, the regulatory instrument (or combinations of instruments) will be identified that corresponds to the nature of the problems of competition that have been found to exist and is suited to eliminating them. If several alternative instruments (or combinations of instruments) are suited to eliminating the problems of competition, that instrument (or combination) will be chosen in a second step – according to the principle of proportionality – which represents (in a cost-benefit sense) the mildest means (Principle 1). The second step can be overlooked if in the first step only one regulatory instrument (or combination) is identified as being suitable.

Art. 33 VKND lays down, in an explicit embodiment of the general administrative law principle of proportionality, that measures of special regulation must correspond to the kind of problem that has emerged, be appropriate in light of the regulatory principles of Art. 5 (2) KomG, and be justified.

6.2 Access

The problem of market power being leveraged vertically from the wholesale market for broadband access on to the retail market as well as the problem of the erection of market entry barriers on the wholesale market can be removed through ensuring access to an adequate wholesale product. Access to a wholesale product can reduce the barriers to market entry on the retail market substantially and so serve additional entry on to the market and increased competition. In addition, the barriers to market entry will be reduced at the retail level through availability of a wholesale product and ultimately also at the wholesale level by means of – in conjunction with the regulation of the unbundling market – the “ladder of investment”. Access to a wholesale product will thus in the long term promote the emergence of effective competition on the market for broadband access at the wholesale level (even if, as expressed in the market analysis’ assessment, effective competition cannot be expected within the next 2 to 3 years).

Because TLI has market power on the wholesale market for broadband access and disposes of an infrastructure that is not easily duplicated,⁶⁹ it appears that an obligation to provide access is necessary and that it is the only effective means with which to counteract leveraging of vertical market power and to foster competition downstream in the value chain (Principle 2).⁷⁰

Art. 37 VKND contains detailed provisions as to which obligations related to access can (in particular) be imposed upon an undertaking with significant market power regarding access to network facilities and network functions; it also specifies what the regulatory authority has to consider when imposing these obligations. An obligation pursuant to Art. 37 VKND is therefore appropriate for assuring access to a suitable wholesale product.

In principle, one should also mention Art. 34 VKND (obligation of non-discrimination) in connection with ensuring access to a wholesale product. An obligation of non-discrimination would indeed be a possibility in relation to TLI's bit-stream wholesale product, since TLI already provides it to itself and to other ISPs. But, because Art. 37 VKND contains much more extensive provisions on the issue of access, Art. 34, which does not contain such detailed definitions and requirements, is to be preferred.⁷¹

6.3 Price

As established in chapter 4.8, TLI has an incentive to charge excessive prices. One may assume that TLI can increase its profits if it raises its price above costs because it need not expect a corresponding loss in turnover after making such a price increase, this being the reason why it has an (economic) incentive to do so. If refusal to provide access were not an effective option (due to an access obligation imposed by regulation), TLI would be in a position to subject its competitors on the retail market to a margin squeeze through applying price discrimination on the wholesale market (provision of services externally at higher prices than internally). Applying a margin squeeze would offer a market dominant undertaking the opportunity of foreclosure, that is, to deny access in effect. Price control is accordingly necessary.

6.3.1 Controls on prices and cost accounting for access

Art. 38 VKND foresees that the Office for Communication can impose price controls and cost accounting obligations on market-dominant undertakings. In order to determine the correct level of the access price it has to consider such criteria as efficiency, investments already made, the return on capital and the market risk that exists. Beyond that, Art. 38 (2) VKND contains provisions regarding the burden of proof: the undertaking subject to cost orientation has to show that the charges it imposes are computed on the basis of its

⁶⁹ Cf. In this regard the conclusions in chapters 4.3 and 4.4.

⁷⁰ Cf. ERG Common Position on Remedies (2006).

⁷¹ However, the imposition of an obligation of non-discrimination is in fact necessary here in order to counteract other problems of competition. See in this connection chapters 6.3.5, 6.3.6 and 6.4.

costs and an appropriate return on investment. The Office for Communication can impose a cost accounting system upon the undertaking that is independent of the undertaking's own one.

Art. 13 of the Access Directive requires national regulatory authorities to construct cost accounting and price control measures in such a way that these promote efficiency and sustainable competition and maximize consumer benefits.

This obligation allows – if applied correctly – an efficient access price to be determined. The measure is thus in principle suitable for eliminating both allocative inefficiencies (excessive prices) and problems of discrimination or of margin squeeze in connection with price; an efficient access price will ensure that no excessive profits are gained from this service.

A pricing methodology must be employed if the regulatory authority – in the context of an arbitration procedure or at its own volition – imposes prices. The following approaches are relevant in this connection:

- (i) cost-oriented prices (cost-plus regulation);
- (ii) ECPR (Efficient Component Pricing Rule);
- (iii) benchmarking (price comparison).

6.3.2 Cost-oriented prices

Cost-oriented prices are most proportionate in situations where the undertaking with significant market power can charge excessive prices and market power will not be restrained in the long term by competitive forces (Principle 2). TLI's consistently high market share (>97%) indicates that TLI cannot be expected to experience effective competitive pressure from other infrastructures or through unbundling in the coming 2 to 3 years.

The allocative distortions that have been determined to constitute a problem for competition stand in close relation to the incentive to raise the prices for the bit-stream product above the competitive level. The goal of regulation must therefore be to correct this market deficiency and to establish prices at the level of the competitive price – the level at which public welfare is maximized. The “correct price” from an economic point of view will be at the level of an efficient operator's long-term marginal costs to provide the service (Long-Run Average Incremental Cost – LRAIC) plus a mark-up for common costs and joint costs. In a market displaying effective competition a “single market price” will emerge in the long run due to the operation of market forces (e.g. market entries, market withdrawals, quantitative adjustments, adjustments in the factors of production). This will be oriented towards the long-term marginal costs of the industry that arise to satisfy overall demand efficiently (with the lowest costs). This long-term competitive equilibrium leads to maximization of overall economic welfare. Any deviation from this level diminishes overall welfare.

In establishing a cost-oriented price, it is necessary to take account of the investments an efficient operator would make as well as an appropriate (i.e. fair market) return on capital invested in light of the associated risks. Imposing cost-oriented prices is especially appropriate for dealing with the competitive problem of excessive pricing. A margin squeeze can also to some extent be prevented in this way (so long as the margin squeeze is not determined by pricing at the retail level).

Art. 38(2) VKND allows the Regulatory Authority to prescribe a cost accounting system that is independent of that of the undertaking concerned so as to ascertain what the costs of efficient service provision are. Bottom-up engineering-type models are well suited to the efficient design of access networks' network topology, as successfully shown through their use by numerous European regulators. The effort involved in development of such a model, and in collecting valid cost input data for use with it, is substantial and requires the regulator to expend large amounts of money and human resource. Apart from this, its use entails a considerable delay in order to establish broadband prices. These disadvantages become still more pronounced in the special circumstances of Liechtenstein's small size and, in the opinion of the Office for Communication, produce a clearly disproportionate outcome in relation both to the size of the market and the operators.

Fully allocated historical cost accounting is a simpler cost-accounting model and should be considered. By comparison with the LRAIC approach it does have certain disadvantages at the level of principle but offers a range of advantages from the point of view of implementation. Use of this instrument could, however, result in negative incentive structures for the undertaking subject to such regulation (e.g. the risk of gold plating), if the actual historical costs that have been incurred by the undertaking concerned (top-down) are considered. As a result efficiency losses could be induced thereby that are caused by regulation. In order to counteract corresponding incentives for the regulated undertaking to deploy resources inefficiently and so to disclose higher costs, it is necessary for the Regulatory Authority to identify any inefficiencies and to make a deduction for them.

In calculating the bit-stream price it therefore appears appropriate to add the additional costs for the provision of the bit-stream product that actually occur. Because investments in the broadband network have taken place only relatively recently, it can be assumed that the degree of historically induced inefficiencies will be small. This approach therefore appears suitable for establishing cost-oriented prices with a reasonable amount of effort.

No other instrument (that is less burdensome) than the obligation of cost-orientation is suited to remedying the price-related aspects of the competition problems that have been identified. In light of those problems, and applying Principle 2, the imposition of cost-oriented prices on the wholesale market for broadband access is hence an appropriate and necessary measure.⁷²

⁷² Cf. In this regard, ERG Common Position on Remedies (2006), p. 73 *et seq.*

6.3.3 ECPR prices

ECPR prices would above all be proportionate if self-sustaining competition is likely to develop in the foreseeable future. ECPR prices are ascertained from the costs of the service plus any opportunity costs that will arise for the market-dominant undertaking if it offers the service to a competitor on the retail level. Under certain conditions ECPR can be reduced to “retail-minus” (the retail price minus the retail costs). Retail-minus conforms to the requirement of non-discrimination as regards pricing and is suited to countering margin squeeze. Retail-minus is not, however, suitable for bringing excessive access prices down to a cost-oriented level and is therefore primarily relevant for markets on which excessive prices will be eliminated in the foreseeable future through self-developing and self-sustaining competition (Principle 3).⁷³

6.3.4 Benchmarking

With the third method for establishing prices, benchmarking, comparative values are used. Such a comparison can be performed by consulting the prices on national and international markets⁷⁴ for comparable services. Care must be taken thereby to ensure the comparability of markets drawn on and, if necessary, to compensate in establishing the prices that will be imposed for salient differences in the services that are under comparison (differences in costs, in technology, in country-specific price levels, etc.). In addition, only countries should be used for comparison that themselves impose cost-oriented prices.⁷⁵

The markets used for the comparison do not have to be, and will not be, completely identical. This would also not be realistic and would automatically rule out benchmarking as an admissible method for price determination. Whatever salient differences there are should therefore instead be considered at the point when concrete prices are being decided upon. Benchmarking can in particular be used as a method to ascertain prices:

- If the effort involved in implementation is unacceptably high (in relation to the particular problem of competition concerned) for the regulatory authority or the undertakings in connection with the price determination procedures mentioned above.
- Or if the results of the costs that have been elicited are implausible due to the basic data or because the results deviate significantly from the prices that would normally appear on a (competitive) market. This kind of implausible result is

⁷³ Cf. In this regard, ERG Common Position on Remedies (2006), p. 78.

⁷⁴ See the last sentence of Art. 38(2), VKND.

⁷⁵ Cost-oriented prices also usually include capital costs, which is why a reasonable return on capital invested is already allowed for.

possible for example in the market entry phase, when the undertaking concerned will experience falling average costs (and/or rising returns to scale).⁷⁶

- And/or if a sufficiently sound statistical basis exists for price comparison and thus the market-dominant undertaking's prices (costs) can be estimated.

Benchmarking of the prices for the different Liechtenstein bit-stream products does not seem practicable by reason of the technical complexity and the very varied actual characteristics of bit-stream products (bandwidths, data volumes, etc.) in different markets or countries.

6.3.5 The obligation of non-discrimination

The obligation of non-discrimination (under Art. 34 VKND) has the function of preventing discrimination between different customers of a service. In the present context one must distinguish between:

- discrimination with respect to the parameter of price (price discrimination);
- discrimination with respect to other parameters than price (discrimination in relation to quality).

Price discrimination

One must assess alongside the "non-pricing" dimension of the obligation of non-discrimination also the aspect of non-discrimination in regard to price.

In connection with price discrimination the following cases are to be distinguished:

- (a) The market-dominant access network operator discriminates between different ISPs (external discrimination);
- (b) The market-dominant access network operator discriminates between itself and ISPs (internal discrimination).

In the case of (a), price discrimination can lead to a competitive distortion on the (downstream) retail market. There is an incentive to conduct such price discrimination particularly where associated undertakings and strategic partnerships are concerned. Since TLI is in principle in a position to exercise (external) price discrimination, an "external prohibition of discrimination" should be imposed that ensures in an effective manner that the potentially market-dominant undertaking puts in place the same conditions for all ISPs beginning from the same point in time and that this obligation cannot be circumvented through skilful contract drafting.

The prohibition of external (price) discrimination (case (a)) is not suited, however, to dealing with a margin squeeze or to eliminating excessive prices since the market-dominant undertaking's freedom to determine prices is not restricted by such an

⁷⁶ In such a "temporary" market entry phase the average costs can be far above "usual market" prices (even above those a profit-maximizing monopolist would apply) and are thus not usable. This argument is above all relevant in connection with new entrants.

obligation. Such an obligation serves only to ensure that all customers obtain the service at the same (possibly excessive) price so that a level playing field will prevail for competition on the respective retail markets only among themselves and not vis-à-vis the undertaking having significant market power.

An “internal/external prohibition of discrimination” under case (b) could potentially have greater influence on the level of prices and thus provide a possible alternative to price control/cost-orientation (under Art. 38 VKND); this is an obligation on the market-dominant undertaking to offer the service to all external customers at the same price as that for its own retail arm. There would be two possible points to proceed from in order to ascertain the internal transfer price for this purpose:

- Use of a margin-squeeze test on the basis of retail prices;
- Use of an obligation of accounting separation.

Application of the (internal/external) prohibition of discrimination as a remedy for margin squeeze is, as a means of implicit price determination, a suitable instrument to inhibit leveraging of market power on to other markets through a margin squeeze. If the undertaking with significant market power provides its competitors on the retail market wholesale broadband products at a higher price than for which costs arise for itself internally (and which will implicitly be absorbed internally), it will expose its competitors to a margin squeeze. It will be impossible for its competitors, even if they are just as efficient, to offer retail products that are as competitive and profit-producing. In this way the market-dominant firm is in a position to leverage its market power from the wholesale market for broadband on to the retail market. This can be prevented by imposing an obligation of non-discrimination. Concretely, the broadband operator would be obligated to sell wholesale products to its retail arm under the same conditions as to an external operator, subject to the additional condition that the retail arm charges a retail price that covers its costs on the basis of this internal transfer price. A margin squeeze test within the framework of the obligation of non-discrimination is suited to preventing a margin squeeze.

Discrimination in relation to quality

By assuring access to infrastructure that can only be duplicated with difficulty and by establishing a cost-oriented access price one will have in principle created the preconditions for non-discriminatory competition on the downstream market (the retail market). But the undertaking having market power at the wholesale level will still have a range of other means (other than price) at its disposal to distort competition on the retail market. It could thus, for example, provide its competitors on the downstream market with a product at lower quality than it provides itself internally; it could deny access to particular information that is needed; it could delay provision of service; it could impose unreasonable contractual conditions; or it could bundle the product with other ones in order to raise the costs for its competitors or to reduce their turnover. If a cost-oriented price for access is imposed – and price therefore no longer remains a parameter that the

undertaking having significant market power can influence competition with – it can then be assumed that the undertaking having significant market power will attempt to increase its profits through resort to such forms of behaviour. If the undertaking is in fact able to increase the costs of its competitors, this will lead to an expansion of its market shares as well as to an increase in prices on the retail market, which will in turn lead to higher profits for the vertically integrated undertaking with market power at the wholesale level.⁷⁷ Using non-pricing parameters in this manner would thus offer the undertaking with significant market power the possibility of practising foreclosure, that is, by refusing to provide access in effect.

The undertaking will therefore have an (economic) incentive to engage in the practices mentioned above for the purpose of leveraging market power on to related markets. For this reason imposition of an obligation of non-discrimination (Art. 34 VKND) is necessary to ensure the effectiveness of regulation. This should cover all parameters associated with the provision of the wholesale product. Publication of a reference offer (Art. 34(3) VKND) is required for providing the necessary level of detail and for operationalization of both the obligation of non-discrimination and the obligation to provide access. This is because bitstreaming involves a complex product (also from a technical point of view). Due to the complexity of the product it is imperative to ensure a comprehensive specification of it for regulation to be effective.

Even with an obligation of non-discrimination, a regulated undertaking could still have an incentive to behave in a discriminatory manner if such behaviour will either remain undiscovered or will be discovered too late, or if enforcement of non-discriminatory behaviour will take a certain amount of time. If any of these possibilities were to transpire this could mean that the undertaking would be able in the meantime to raise the costs of alternative providers by means of discriminatory practices and strategies (delays in supply and fault processing, defective quality, extended bilateral procedures regarding (claimed) lack of possibility to provide service, non-transparent billing etc.). Such costs would expose alternative providers to a (factual) margin squeeze and thus in the final analysis to foreclosure, whereby competition would be obstructed. An obligation of transparency (Art. 35 VKND) is required under such conditions in order to be able to ensure compliance with the obligation of non-discrimination. The device of an obligation of transparency will allow the Regulatory Authority to call for data at regular intervals regarding compliance with the obligation of non-discrimination in order, if necessary, to be able to apply short-term measures to enforce compliance with it.

6.3.6 Accounting separation

Obligations regarding price controls and cost accounting for access are contained in Art. 38 VKND. Art. 38 VKND is the suitable vehicle for setting an appropriate price for access at the wholesale level. Alternatively, the obligation of non-discrimination (Art. 34 VKND)

⁷⁷ Cf. ERG Common Position on Remedies (2006), part 2.3.1.2.

requires consideration in conjunction with the obligation of accounting separation (Art. 36 VKND); these are possible bases for the imposition of access prices in the present connection. The internal charging prices could be made transparent through an obligation for accounting separation; these could then be made to apply also to external transactions by imposing the obligation of non-discrimination (internal/external prohibition of discrimination in relation to the parameter of price). Because in the present instance the necessary information cannot by means of these obligations be made sufficiently transparent in the relevant market, namely for prices at the product level, a dual obligation under Art. 34 VKND and Art. 36 VKND will not be suitable on its own for setting the price for access. It would certainly be conceivable to impose accounting separation for the entire undertaking at the product level, which is what would be necessary in order to restrict sufficiently the liberty of action of the undertaking subjected to regulation regarding the allocation of costs and revenues to the relevant fields of business. This is the case because the regulated undertaking would have an economic incentive to apply excessive transfer prices. However, such a measure which aims at the product level would be disproportionate, because other areas would also be affected that are not subject to regulation and the burden for the undertaking with significant market power would in general be far greater than when only certain products are subjected to price controls and cost accounting. One cannot therefore proceed from the assumption that the obligation of accounting separation will suffice to render the necessary information for determining prices transparent at the required degree of detail (at the product level). Set against this background, either the obligation of non-discrimination in conjunction with accounting separation must be judged as being insufficiently effective as an instrument to remedy the problems of competition that have been identified or the obligation would have to be interpreted in such a broad and exaggerated manner that it would in the end be tantamount to being a price control under Art. 38 VKND.

The question can be raised in this general context as to what a non-discriminatory internal transfer price can be for a vertically integrated undertaking. The problem lies in attributing costs to products according to what is objectively justified in light of the input involved. From a theoretical point of view it is essentially only the incremental costs which will be involved; common costs by definition do not permit unambiguous attribution to a particular product, meaning that the regulated undertaking has the possibility and the incentive to attribute all kinds of common costs to the regulated product, which could lead to so-called "stand alone" costs being disclosed. Accounting separation can at best produce a consensus on what "plausible" and defensible attribution of common costs may be. Such attribution would then have to be ensured over the course of time through regular control of compliance in order to be able to prevent situationally motivated shifts away from it.

Ascertainment of cost orientation by means of a (short) procedure is only possible where undertakings have a large number of products if there are regular checks of "separated accounts" in the framework of accounting separation. Only then can the cost-orientation of pricing for particular products or groups of products be examined within a brief time on

a case-by-case basis to ensure that costs are not taken from unregulated into regulated business areas (or the other way round).

Considering these aspects, the obligation of non-discrimination taken together with the obligation of accounting separation is not the most suitable measure; a price control under Art. 38 is therefore to be preferred. But accounting separation can be employed as an ancillary measure for the ascertainment of cost-oriented charges. Accounting separation will enable the Regulatory Authority to detect cross-subsidization between the regulated and unregulated areas of an undertaking. Given that TLI will foreseeably also have market power on other markets, and that accounting separation will also come into consideration there, the obligation of accounting separation can be viewed as being commensurate, particularly because the incremental costs associated with this regulatory instrument will be small on the present market (and significant synergies exist).

6.4 Proportionality of the measures

Art. 33 VKND lays down, in an explicit embodiment of the general administrative law principle of proportionality, that measures of special regulation must correspond to the kind of problem that has emerged, take the regulatory principles of Art. 5 (2) KomG appropriately into consideration, and be justified.

The suitability of the measures of special regulation which can be adopted to remedy the problems of competition that have been identified has already been discussed in detail in the preceding sections of this chapter.

Further, the different measures of special regulation that are available were examined in the above sections of this chapter in such a way as to ascertain whether they represent the least onerous form of intervention while still being capable of remedying the problems of competition that have been identified.

When evaluating measures for their proportionality in its narrow sense, the reasonableness of measures and their degree of intrusiveness must finally be considered. Selection in particular of fully allocated historical cost accounting for ascertaining cost-oriented prices for broadband access – instead of the intrusive and labour-intensive bottom-up LRAIC model – ensures such proportionality. The other measures which are to be adopted, namely the imposition of obligations to ensure non-discrimination, to require issue of a reference offer and to provide transparency constitute *per se* minor encroachment in an operator's private autonomy and are accompanied by low implementation costs for the undertaking concerned.

6.5 Conclusion

The following measures of special regulation are accordingly to be imposed upon TLI as an undertaking with significant market power on the wholesale market for broadband access in order to remedy the problems of competition that have been identified:

- The obligation to provide access to bit-stream products (Art. 37 VKND);
- The obligation to orient the prices for access to costs (Art. 38 VKND);
- Price controls and an accompanying margin-squeeze test (Art. 38 VKND);
- Accounting separation (Art. 36 VKND);
- The obligation of external and internal non-discrimination (Art. 34 VKND);
- The publication of a reference offer (Art. 34(3) VKND); and
- An obligation of transparency (Art. 35 VKND).

The problem of competition of market power being exercised vis-à-vis customers through excessive prices, as well as that of leverage of market power on to the retail market by means of denying adequate access (foreclosure) to wholesale broadband products, can both be counteracted through this combination of regulatory instruments.

There are no other regulatory options that are suited to remedying the problems of competition mentioned. The measures of special regulation that have been identified are in consequence the smallest set of regulatory measures that are capable of remedying the potential problems for competition that may exist and conform thereby with the principle of proportionality.

The necessity for each individual measure will be evident from the explanations given above. The present instruments are complementary, not alternatives to each other. Each one serves – as explained above – to meet particular parts of the identified problems for competition. Only through applying all of the instruments can it be ensured, in the view of the Office for Communication, that the problems of competition that have been identified will actually be remedied or prevented.

These obligations are applicable for all products that fall within the definition of the market for broadband access. New products developed in future that would fall under this market definition, will equally be within the compass of the obligations because they would otherwise not be subject to regulation despite the non-duplicability of the product.

7. Operationalization of regulatory instruments for the wholesale broadband market

The following amplifications can be made to the measures discussed in Chapter 6:

7.1 Access to bit-stream products (incl. naked DSL)

The bit-stream products TLI offers should facilitate bitstreaming in the sense of the ERG's definition (see Figure 5 on page 18). This means that the data stream is handed over by TLI to the ISP at one or more predefined points, and the ISP itself then provides internet connectivity (at least). The "Bit Stream Access (Broadband)" product currently offered by TLI in its RUO is to be classified, on the one hand, as a pure resale product and, on the other – in so far as the ISPs purchasing the wholesale product concerned provide their own internet connectivity – as a bit-stream product at access point 3 according to ERG's definition. Even a pure resale product is fundamentally suited to affording market entry at the retail level and therefore has a part to play in working against the problems of competition that have been identified. However, it is only true bit-stream products – with which the ISP generates greater value than with pure resale and at the same time obtains more influence on the design and the quality parameters of the products being provided – that are capable of fostering investment and sustainable, infrastructure-based competition. Such products can be seen as a rung on the ladder of investment between resale and unbundling. Nevertheless, it is necessary in the medium term to maintain the resale product in order to give ISPs that current make use of it sufficient time to make the arrangements needed for employing a bit-stream product. Nor can it be ruled out that the investments that are needed will not be worthwhile for some (especially small) ISPs⁷⁸ and that they will continue to be dependent upon a resale product.

Reasonable requests for access to bit-stream products in different bandwidths, together with the necessary ancillary services must always be allowed. The regulatory authority should be consulted on questions of reasonableness where products or services are not covered by the reference offer. Access to bit-stream products must not be bundled; that is, the access seeker should not be obliged to pay for services or to rent network elements which it is able to provide itself or does not need.

In order to establish equal conditions of competition at the retail level it is in addition necessary to ensure access to „naked DSL“ products at the wholesale level whose parameters (upload speed, download speed, data volumes) are in line with products that are commonly available on the market or self-provided by TLI. There must be no tying in the case of a naked or pure DSL products between obtaining a broadband internet product from TLI or from a bit-stream ISP at the retail level and obtaining fixed network voice telephony (or a corresponding PSTN or ISDN subscriber line) from TLI. The naked DSL

⁷⁸ All eight „partner ISPs“ in 2007 ordered less than 1,000 connections from LTN, five ordered less than 500.

products shall technically be designed in such way that alternative operators are able to offer access and use of voice telephony in the form of Voice over Broadband (VoB) and broadband internet access as a one-stop shop like TLI,⁷⁹ without having to resort to unbundling. This is particularly important in view of the product "Connecta" offered by TLI which, based on existing regulation in place, can currently not be reproduced by alternative operators in this form because their customers would still have to purchase an additional fixed-line voice connection from TLI. The product "Connecta" is, however, precisely characterized by the fact that the customer can buy a broadband connection without simultaneously having to buy a PSTN/ISDN subscriber line on top of that. "Connecta" must itself be classified as a naked DSL product at its core, even if it provides additional functionalities, such as in particular a VoB connection. Against this background, any refusal by TLI to offer naked DSL products would have to be considered discriminatory on the one hand, since it readily self-provides such a product internally in the form of "Connecta". On the other hand, refusal to provide such products externally would abet the risk of leveraging of market power onto related markets and harm the development of competition in the retail markets for fixed voice telephony, especially in the form of VoB.

Because of the preference many customers have for one-stop shopping or for receiving a single billing, one may expect a competitive impetus towards such a facility both on the retail markets for fixed-voice telephony (access and calls markets) as well as on the retail market for broadband internet access. Availability of such a product in general lowers the barriers to market entry at the retail level, preventing leverage of market power, and promotes the emergence of effective long-term competition (through unbundling) on the wholesale market for broadband access. It also supports competition in the retail markets for fixed voice telephony, since only through access to naked DSL products will alternative suppliers be placed in a position to offer access to and use of voice telephony in the form of VoB as well as broadband internet from one source, as TLI does, without having to resort to unbundling. Since TLI already provides itself internally with a naked DSL product in the form of its "Connecta" product, the obligation for it to offer corresponding wholesale products without discrimination also to others is in any case not disproportionate.

So as to give wholesale buyers of naked DSL access the possibility to offer such services – which require compliance with quality of service (QoS) parameters like delay, jitter or packet loss – to their retail customers, TLI must offer different classes of traffic. The respective quality criteria that are specified are to be assured continuously between the customer premises equipment (CPE) and the wholesale access seeker's hand-over point. The availability of high-quality traffic classes is in particular a precondition for provision of IP-based voice services at PSTN quality. The reference offer must contain provision for

⁷⁹ See, e.g., the TLI product „Connecta“: <http://www.telecom.li/cfdocs/cmsout/admin/index.cfm?GroupID=171&meID=807>.

access to the corresponding naked DSL products and the details of the technical, organizational and commercial terms of supply.⁸⁰

The access afforded must at the least enable ISPs to emulate TLI's products technically and commercially. When TLI introduces new products or new retail prices it must also at the same time introduce corresponding wholesale products or wholesale prices if ISPs cannot produce a corresponding retail offer on the basis of existing wholesale services. „At the same time“ is to be understood as meaning that ISPs are able to come onto the retail market contemporaneously (i.e. at least on the same day) with TLI (with the new product or the new prices). This implies that the new wholesale products (e.g. changes in bandwidth) or prices are available at latest on TLI's product launch date on the retail market and that ISPs are informed about the change by TLI early enough in advance. With products that are novel technically TLI should plan for correspondingly longer lead times so that it can comply with the requirement that ISPs are able to make their appearance on the market at the same time.

With a view to establishing information obligations and lead times, TLI on 15 December 2008 concluded a settlement concerning “changes to services offered to ISPs” with several ISPs in the context of an arbitration proceeding conducted by the Office for Communication. The following general minimum obligations should be imposed on TLI on the basis of that settlement agreement:

- 1) TLI will conduct at regular intervals, at least once a year as well as when needed, informal „round table“ talks with ISPs, at which the ISPs will be informed about planned product innovations or changes in products, especially regarding price-related and technical changes.
- 2) TLI will notify the ISPs in writing at least 8 weeks in advance of planned changes, such as in particular price changes and changes in the technology field.
- 3) TLI will notify the ISPs in writing at least 4 weeks in advance about the definitive changes.

Corresponding provisions, which respect the above requirements as to providing timely information and ensuring the provision of the corresponding wholesale products, must be included in the reference offer.

7.2 Price controls

Although undertakings ought in principle⁸¹ to negotiate in good faith on access and interconnection terms on a commercial basis, the problems of competition determined in the market analysis have regardless of this to be remedied as quickly and as effectively as possible. The undertaking having significant market power has no incentive to agree (quickly) upon cost-oriented charges as concerns bit-stream prices in particular. A simple

⁸⁰ The reference offer should also regulate the matter of the location and ownership of the necessary filters and/or splitters.

⁸¹ Cf. Recitals 5 and 6 and Art. 4 of the Access Directive 2002/19/EC.

obligation to introduce cost-oriented prices, without simultaneously also setting the prices, would thus fall short of the mark. The threat of possible later intervention by the Office for Communication if commercial agreement failed would also put off resolving the problem of excessive prices over costs and would not produce the required transparency and legal certainty. Setting the level of charges is thus the only appropriate means for remedying or preventing excessive prices on the wholesale broadband market.

One must in connection with cost accounting and pricing also consider the efficacy of outcomes across and between markets. If one wishes to avoid undesired distortions from the point of view of competitive economics, such as between providers (integrated or not) or between different wholesale products, it will then be necessary to take care that the prices of products provided at different levels in the value chain are mutually consistent. The requisite consistency should be ensured by means of performing a margin-squeeze test periodically. When doing so, the test should pay regard both to a possible margin squeeze between retail prices and bit-stream prices and to a margin squeeze between bit-stream prices and unbundling prices.

7.2.1 Access price

The calculation of the price for access should, in accordance with the above remarks, be based on the additional (actual) costs that arise for the provision of the bit-stream-product.

Because as a rule – with the exception of “naked DSL” and in the case of SDSL wholesale products – the base band of the subscriber line is already used for voice telephony and one-off or monthly rental fees are already applied under that service, there are no further costs to be taken into account for the additional provision of the bit-stream product in relation to the same line. It is only for „naked DSL“ and for SDSL products, which require an additional subscriber line, that the monthly charge for the unbundled subscriber connection and pro rata one-off charges need to be considered (plus any pro rata costs for setting up collocation facilities and their rental).

The following costs arise for the provision of the bit-stream product:

- Splitters;
- Equipment for broadband transmission on the subscriber line (user modem⁸², DSLAM);
- Bridging the distance from the main distribution frame/DSLAM to the ISP’s network node (backhaul – e.g. by means of SDH);
- Infrastructure at the hand-over point (e.g. collocation at the hand-over point – one-off charges and running costs);
- Any other equipment that is needed for transmission (e.g. BRAS⁸³, routers).

⁸² In so far as this is not provided by the end user.

⁸³ Broadband Remote Access Server.

A further question is whether a price needs to be set for each wholesale product individually or whether the obligation for cost-orientation should apply across all products. It is to be noted here that the variable costs of different products (even if they have different bandwidths) are in all probability not so different from one another as is portrayed in the structure of the retail prices. There ought, rather, to be higher mark-ups at the retail level on the variable costs/marginal costs with products having higher bandwidths than is the case with products having lower bandwidths. This would not be reflected by setting cost-oriented prices on a product by product basis. However, because such mark-up structuring (higher mark-ups according to inelasticity of demand) appears reasonable in principle, it should not be impeded by overly detailed regulation. It therefore seems appropriate only to impose the obligation of cost-orientation to all products taken as a whole, and not to calculate a price for every single product. At the same time this will leave TLI not unnecessarily fettered in its pricing freedom, which is in accordance with the principle of proportionality.

For reasons of consistency, all bit-stream products should as regards their price furthermore be oriented in principle towards the price of „neighbouring“ products in terms of their technical performance parameters. A different price should therefore reflect different technical performance parameters. This means that, for example, technically superior products are not to be offered at a lower price than technically inferior products, and vice versa.

7.2.2 Principles for the application of the margin squeeze test

An examination of margin squeeze should take place both between broadband access at the retail level and broadband access at the wholesale level and between broadband access at the wholesale level and unbundling.

The basis for calculation of the wholesale price that should be charged is the respective weighted retail price that is actually paid by the customer. To calculate the deduction from the retail price to give the wholesale price (the margin) the following avoidable costs at the retail level should be examined in particular (on the basis of TLI's cost accounting):

- Marketing and sales;
- Billing, including bad debt;
- Invoicing;
- Product development and management;
- Customer service/call centre;
- Connection costs, including for international connection;
- Costs for additional services such as web hosting, provision of email addresses, etc.;
- Other common costs attributable to the retail level.

In calculating the access price those costs should also be considered that TLI incurs additionally because of providing access. These are in particular (again on the basis of TLI's cost accounting):

- Costs of billing at the wholesale level;
- Administrative costs;
- Additional investments that arise because of external provision.

The margin computed in this way is then subtracted from TLI's retail prices in order to determine the wholesale price that should be charged. This price is then contrasted with the wholesale price that is actually charged and which subsists in retail proceeds minus any discounts and promotional offers. If the retail price changes, then the margin has also to be recalculated in the light of the costs set out above. The reference offer must be adjusted if there are major changes to avoidable costs.

The method of calculation just described applies in relation to all of the products offered at the wholesale level. In addition to that it is necessary for the wholesale price of *each* product to lie so far under the (net) retail price of a derivative product that an efficient operator can at least cover its variable costs. Otherwise TLI would be able to prevent ISPs from offering a particular product on the retail market in practice, because ISPs will usually not be able to demand a higher retail price than TLI's and thus a negative profit margin would result for them. This applies also to promotional offers that are limited in time, because these cannot otherwise be matched by ISPs. When considering individual products, marginal costs thus form the relevant standard in calculating a lowest margin, whereas the full costs form the criterion for them taken altogether.

Going beyond the examination of margin squeeze as described, the levels in the value chain between broadband access at the wholesale level (bit-stream) and wholesale subscriber line unbundling should also be examined. To calculate the wholesale price that should be charged, the costs of implementing broadband connections by means of unbundling are to be used. Reference is to be made in this regard to the prices offered publicly by TLI or by LKW to unbundling partners or ISPs in arriving at the costs for individual elements of service (e.g. the monthly rental charge for the subscriber line, one-off charges, collocation rent, backhaul, etc.). Charges which are dependent on time and effort (e.g. setting up collocation facilities, etc.) are to be set according to time and effort actually charged for on an averaged basis. In relation to services and investments that are to be made solely by the unbundling partner, which are equally to be taken into account, it is necessary to collect corresponding data from arbitration proceedings or consultations. This also applies to all avoidable costs at the retail level in so far as these cannot be extracted from TLI's cost accounting in a replicable manner.

The principle that is applicable also in this case is that the price for each product must be high enough that an efficient operator offering the product at the retail level at least covers its variable costs. Otherwise an ISP would generate a negative profit margin and be effectively prevented from offering certain products. TLI, which will normally have lower

variable costs than an ISP obtaining wholesale services, could, on the other hand, generate a positive profit margin. Taking all products together, the full costs of an efficient operator must be covered. This is also true for promotional offers.

If the calculations do show a margin squeeze, it is necessary to reduce the wholesale price to a point where the situation is free of margin squeeze and where one cannot be expected to arise for a sufficiently long time in future. To achieve such a reduction one must take into consideration not only the monthly rental charges but also other charges, such as leased line prices for backhaul services.

Because the underlying volume (sold broadband connections at the retail and wholesale levels) is subject to constant change it is necessary to apply a margin squeeze test at regular, sufficiently short, intervals.

7.3 The obligation of non-discrimination and the reference offer

7.3.1 The reference offer

Access to bit-stream products is to be provided on a non-discriminatory basis. The publication of a reference offer for bit-stream products is required to render sufficient precision and to operationalize the obligation of non-discrimination. The reference offer (including prices) is to be submitted to the Regulatory Authority for its review prior to publication. Publication must take place no later than two months following imposition of the obligation. The existing resale product (in LTN's last RUO to be approved, called „Bit Stream Access [Offer] (Broadband)“) is to be maintained also following publication of the new reference offer in order to give ISPs time to make the necessary changes.

The reference offer should include at least the bit-stream variants 1 to 3 in Figure 5 (see p. 18); the data stream to the ISPs in this connection at a handover point is to be handed over either by means of SDH⁸⁴ or IP/ethernet, according to the ISP's needs. The handover point should be chosen that is easily reachable for ISPs.

The reference offer which is to be published by TLI should cover all the common bandwidths and it should include of all the commercial, technical, organizational and legal provisions necessary for the provision of bit-stream products. The offer should encompass at least all of the bandwidths which are currently contained in TLI's "Bit Stream [Offer]" as well as those actually offered by TLI (internally). In addition, several naked DSL products and pure resale products as described in chapter 7.1 should form part of the reference offer. Discounts are impermissible.

Any one-off or switch-on charges must equally be cost-oriented and are to be set out in the reference offer; care must be taken that they are charged in a non-discriminatory manner in practice with respect to both external customers and TLI internally. This must

⁸⁴ According to Telecom Liechtenstein, ATM should have been replaced by other technologies in 2008.

be made explicit also in relation to any marketing operations under which these one-off charges are waived for retail customers.

Because the Office for Communication is empowered to require that changes be made to the reference offer and an obligation of transparency is being imposed, the Office will be able to view all necessary documents. It can in this way undertake an inspection of compliance with the measures imposed (e.g. as regards price controls).

The reference offer has to cover the common forms of access. Other services are to be provided by TLI on the basis of a case-by-case assessment of the reasonableness of the request, if necessary upon intervention by the Office for Communication.

7.3.2 Migration

The reference offer must in particular also contain provisions on the conditions and prices for migration between different products at the wholesale level.

This requirement extends, among other things, to provisions on process optimization concerning:

- (i) Change by a (bit-stream) ISP's retail customer to another product;
- (ii) Change of a retail customer to (another) (bit-stream) ISP;
- (iii) Migration (of individual or several) retail customers of an ISP from bit-stream products to unbundling;
- (iv) Migration from the „Bit Stream Access“ that is currently available (see TLI's RUO) to the new bit-stream offer;
- (v) Migration to naked DSL.

As regards (i): The customers of (bit-stream) ISPs, as with TLI's customers, should be able to change over from one product to another in a simple and inexpensive way and, so far as possible, without interruption of service. TLI is therefore not permitted to render such a changeover more difficult through imposing additional conditions; nor may costs be charged to the customer that are not charged in the case of a switch between TLI products. The process of migration must be arranged technically and organizationally just as efficiently as that which applies to internal TLI services.

As regards (ii): By facilitating the changeover of a TLI customer or the customer of a (bit-stream) ISP to another (bit-stream) ISP, the switching costs will be reduced and by virtue of this market entry barriers on the retail market will ultimately be lowered. The same approach should therefore apply for the change of a retail customer to another (bit-stream) ISP as under point (i) in relation to an ISP's retail customer's changeover from one (bit-stream) product to another.

As regards (iii): Service to retail customers should also be maintained so far as is possible in the case of an ISP's changeover from a bit-stream product to unbundling. Efficient scenarios for migration are indispensable for promoting investment in infrastructure, because additional investment in unbundling in the sense of the "ladder of investment"

will only be made if the costs are not too high and there is no risk of losing existing customers. By means of inefficient or expensive migration TLI and LKW would be able to increase the barriers to market entry at the wholesale level; they thus have a (economic) incentive to handicap ISPs during migration. Migration from a bit-stream-product to unbundling is unlikely to be possible for all of an ISP's customers at the same time or to be economically feasible and desirable. The possibility for the migration of individual or several customers of an ISP must therefore be foreseen.

As regards (iv): In order to facilitate a seamless transition for ISPs from the current resale or bit-stream product to the new bit-stream product, the conditions of migration must not be disadvantageous for the ISP. Otherwise TLI would be in a position to hinder ISPs' investment and their climb up the „ladder of investment“.

As regards (v): Finally, it must be ensured that, also in the case of a customer's giving notice to terminate a TLI voice telephony connection, the migration to naked DSL is implemented so far as is possible free of interruption with respect to the broadband access.

Provisions regarding the conditions and prices of migration are to be included in the reference offer that will allow the Office for Communication to undertake their review and, as the case may be, alteration. This concerns in particular the parameters for:

- the maximum period for the implementation of the migration (from the time of the ISP's request or that of the retail customer, as the case may be) and
- the maximum period of interruption of service to the retail customer.

7.4 Accounting separation

Accounting separation must take place according to a breakdown that at least accords with the specification of markets under the Recommendation on Relevant Markets. So as to be able to discern an unjustified distribution of costs that are not directly attributable between regulated and unregulated domains or between different regulated domains, it is necessary that accounting separation also covers unregulated domains and thus portrays the undertaking as a whole. In this manner it will also be possible, for example, for the Regulatory Authority to discern if costs are being charged for twice and hence to exclude this practice. The following minimum elements of information are to be provided corresponding to the requirements of the Office for Communication for the required operationalization of accounting separation:

- sales;
- costs (differentiated according to staff costs, costs for depreciation on fixed assets, capital costs and other costs);
- a detailed assets analysis of the undertaking, key figures on staffing, cost drivers such as in particular the number of lines and other necessary information for reviewing cost accounting.

The Office for Communication will specify the details for concrete implementation in this regard.