



AMT FÜR KOMMUNIKATION
FÜRSTENTUM LIECHTENSTEIN

Analysis of the market for physical access (M4)

*Wholesale (physical) network infrastructure access (including
shared or fully unbundled access) at a fixed location*

(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 “special regulatory measures” (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 remedy 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 (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location” (the physical access 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 market for physical access, 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		1	Collection and analysis of the necessary data on the market and from undertakings.
	Market analysis in its broad sense	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 1-1: 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 30 April 2008 therefore published, under Art. 40 KomG, its analysis of the market for wholesale unbundled access (including shared access) to metallic loops and

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

sub-loops for the purpose of providing broadband and voice services (the unbundling market). Interested parties were invited to submit comments on the analysis and in particular on the measures of special regulation 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 national consultation period on 4 July 2008: ABILA AG, ICT AG, Liechtensteinische Kraftwerke (LKW), Newsnet AG, Swisscom (Schweiz) AG and Telecom Liechtenstein AG (hereafter "TLI").

On 3 November 2008 the Office for Communication invited interested parties to a further two-week consultation on the second revision of the market analysis, which was drafted based on the previous statements received. Feedback was received from LKW and TLI acknowledging the consulted market analysis without further material comments.

The adoption of a revised Recommendation⁶ on relevant markets by the EFTA Surveillance Authority on 5 November, which took into consideration technological developments, resulted in the re-definition of the previous unbundling market No 11 into a market No 4 for physical network infrastructure access at a fixed location. This necessitated an additional revision of the present market analysis. The Office for Communication, therefore, conducted an additional consultation from 7 April to 15 May 2009 based on the third revision of the analysis of what is now the market for physical access (M4). Comments were received from Liechtensteinische Kraftwerke (LKW), Telecom Liechtenstein AG, Orange (Liechtenstein) AG and Wasserversorgung Liechtensteiner Unterland (WLU).

Any comments received are published on the Office for Communication's website to the extent that they are not subject to confidentiality.⁷ Previous comments were considered when preparing successive revised versions 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 input from the several rounds of consultation are contained in separate evaluation documents made available 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

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 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.

⁷ <http://www.llv.li/amtsstellen/llv-ak-marktanalysen/llv-ak-marktanalysen-konsultationen.htm>

2002/21/EC (Art. 24(2) KomG).^{8,9} 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 give its opinion on 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.

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 portal¹⁰ of the EFTA Surveillance Authority. All public documents relative to national consultations are viewable on the Office for Communication's website.¹¹

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.¹²

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*

⁸ 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).

⁹ 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.

¹⁰ <https://eea.eftasurv.int/portal/>

¹¹ <http://www.ak.llv.li/>

¹² Cf. chapter 4.1.1.

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 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 present market analysis is composed as follows: The first three chapters serve to provide an introduction to the subject-matter to be investigated. Chapter 2 presents the most important developments in the Liechtenstein market for physical access. The objective is to cast light on the market that is to be investigated and its importance. Chapter 3 is devoted to the definition of that market itself. To complement the market definition under the Announcement on market definition, a description is given of products and services as well as a presentation of the regulatory situation up to now. The analysis of competition itself is to be found in Chapters 4 and 5. All indicators relevant to an assessment of market power are investigated in Chapter 4. Chapter 5 undertakes the overall assessment of whether competition obtains from an economic point of view on the unbundling market and whether self-sustaining competition exists without regulation from an economic point of view or, as the case may be, which problems for competition and factors stand in its way. Chapter 6, 7 and 8 are concerned with measures of special regulation. Chapter 6 introduces the regulatory instruments under the KomG and the principles for their application. Chapter 7 discusses the regulatory measures that are appropriate for remedying the problems for competition that have been determined, while Chapter 8 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 questionnaires to operators for the years 2004 to 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, LGBl. 1996 No. 113, under which this 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/EC¹³ is, for these reasons, not possible in the case of the present market analysis in Liechtenstein.

1.10 Designations used

The following terminology will be used in the present market analysis:

- *Incumbent*: The holder of the copper twisted pair access network.¹⁴
- *ULL*: Unbundling of the Local Loop.

¹³ 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).

¹⁴ The former monopolist is otherwise normally understood to be the "incumbent". The access network in Liechtenstein has in the past been operated by different undertakings and is from 2008 under the operative control of LKW under the implementing arrangement to the cooperation agreement between LTN and LKW. The notion of "incumbent" thus refers to the holder of the network(s) at a given point in time.

- *Access partner*: The party benefitting from the fulfilment of obligations to grant physical access. This party will rent the unbundled or shared access line of the incumbent that is subject to those obligations.
- *ISP*: Internet Service Provider. ISPs offer (broadband) internet access to retail customers. They can thereby make use of an incumbent's unbundled or shared subscriber line as access partners.
- An *operator*¹⁵ is understood below as an operator of an electronic communications network. This notion is employed to cover all kinds of electronic communications network providers (without distinction) in this market analysis. ISPs fall into this category just as much as fixed network operators.
- *MDF*: Main distribution frame. This is located at the copper centre of the access network. This is where all local loops in an access area are brought together and the traffic is connected over a concentrator unit (e.g. exchange) to the core network.
- "Access area": the area served by a main distribution frame.

In this market analysis the following short forms are employed for undertakings:

Undertaking	Short form
LTN Liechtenstein TeleNet AG (<i>up to the end of 2007</i>)	LTN
Liechtensteinische Kraftwerke	LKW
Telecom Liechtenstein AG	TLI
Telecom FL AG (until the end of 2007)	Telecom FL
UPC Austria GmbH (formerly Inode AG)	UPC

Table 1-1: Short forms are employed for undertakings

¹⁵ Cf. The definition contained in Art. 3(1)(2), second phrase, KomG.

2 The Liechtenstein market for physical access

2.1 On the notions of unbundling and physical access

Unbundling concerns a regulatory measure that requires the incumbent (which mostly also possesses exclusively the only country-wide fixed access network) to place copper local loops for access to end customers at the disposal of alternative network operators (or Internet Service Providers, ISPs). The obligation to make unbundling possible has existed in Liechtenstein since the entry into force on 1 October 2001 of Regulation No. 2887/2000 (EC) of the European Parliament and the Council of 18 December 2000 on unbundled access to the local loop (the Unbundling Regulation; Liechtenstein Compendium of EEA Law: Annex XI - 5ce.01).¹⁶

Unbundling means that alternative network operators and also other “access partners” such as ISPs or leased line operators do not have to establish their own infrastructure in order to connect their retail customers but can avail themselves of the incumbent’s copper access network (local loops). A local loop is the physical/electrical connection of the retail customer with the switching facility of the network operator. This line, normally a copper twisted pair, leads from the Network Termination Point (NTP) at the customer’s premises to the handover point of the alternative network operator.

Fully unbundled access to the local loop encompasses the connection achieved over a metallic path¹⁷ (electrical switching) from the Main Distribution Frame (MDF)¹⁸ to the end-user’s Network Termination Point, but it can also involve unbundling of sub-loops of the local loop (at the customer premises distribution cabinet, a distribution street cabinet or a junction box). There is shared access when the access partner only uses the line’s higher frequency spectrum for broadband services, leaving the narrowband lower frequency spectrum used for voice telephony in the hands of the wholesale provider (incumbent) so that it can (continue to) offer voice telephony services over it to the retail customer. Customers of unbundling services are alternative communications network operators (access partners) which do not have sufficient Infrastructure of their own in the access area (e.g. copper lines, optical fibre connections, radio) to connect subscribers to their network.

Unbundling as a wholesale service offers its customers a special way of their having the possibility to offer their retail customers as an integrated provider a wide range of retail customer services in a manner that gives them the most far-reaching independence from the incumbent. This concerns, alongside retail customer offerings like voice telephony

¹⁶ LGBl. 2001 No. 157.

¹⁷ The Unbundling Regulation (EC) 2887/2000 in Art. 2(c) and (e) defines the local loop in terms of physical twisted metallic pair circuits; it is these which facilitate use through unbundling of either parts or the whole of the frequency spectrum they carry. Coaxial cables and optical fibre are, for example, not covered within this scope.

¹⁸ This can also take place at an intermediate concentrator or an intermediate access point (IAP).

access, broadband internet access and leased lines, also possible offerings at the wholesale level such as bitstreaming. But such possibilities for vertical integration are not restricted only to access provision services; rather, they extend also to provision of the connection itself. By this means, a provider of voice telephony which relies upon local loop is not (any longer) restricted to employing the origination services of the incumbent. Investment in infrastructure to provide an independent core network will, instead, be necessary.

The revision of the Recommendation on relevant markets by the EFTA Surveillance Authority of November 2008 led to an extended definition of the previous unbundling market to a market for physical network infrastructure access at a fixed location. As will be further elaborated in chapter 3.2, the market for physical access continues to encompass unbundled access to the twisted pair copper subscriber connection, includes now however in a technologically neutral way any physical access (by way of unbundling, shared access or other physical access) to other access networks, such as in particular fibre-optic access networks and cable television distributed networks. Therefore, in what follows, the more comprehensive term “physical access” shall be predominately used, unless specific reference is made to the „traditional“ unbundling of local loops in the copper access network (respectively the optical fibre access network).

2.2 Developments regarding the infrastructure holder for electronic communication in Liechtenstein

Until the end of 2007, the fixed network sector in Liechtenstein was characterized by three undertakings that were originally independent of one another but which finally came together in the common ownership of LTN Liechtenstein TeleNet: LTN Liechtenstein TeleNet (LTN: wholesale), Telecom FL (TFL: retail) and Lie-Comtel (CATV)¹⁹. On 1 January 2008 all three undertakings 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 1978 PTT Treaty 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 loop, were provisioned, maintained and operated by Swisscom in the name and on the account of the Liechtenstein State. In 1998 separation from the Swiss telephone network took place upon the liberalization of the telecommunications sector and with the founding of LTN, which is 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

¹⁹ Lie-Comtel was originally founded as a separate company from LKW but was only a brand name at the time of the transfer to LTN, having been absorbed into LKW. Cable television (CATV) or coax cable TV distribution network.

(100%) by LTN in 2003 following an increase in LTN's capital. The full merger of the two undertakings as "Telecom Liechtenstein AG" took place on 1 January 2008.

Lie-Comtel belonged to Liechtensteinische Kraftwerke (LKW) until the end of 2006. It was the operator under this name of the major part²⁰ of Liechtenstein's cable television network (and an internet provider) until being integrated into TLI at the beginning of 2008. LKW, which is equally 100% State-owned, is also responsible for extension of the copper, optical fibre and CATV networks in Liechtenstein.²¹

In 2006 LTN and LKW signed a "consolidation agreement". The agreement's purpose is to concentrate all retail customer relationships and "intelligent" network components in LTN's hands and to combine all passive network components, including in particular the local loop, transmission lines, cable routes, etc., in LKW's hands. LKW should no longer be active on the retail market, but rather only on the wholesale service market. The agreement was put into effect on 1 January 2007 through handover of all LTN 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 few²² active) CATV network components stayed in LKW's hands).

Thus, from 1 January 2007 LKW has been the holder of all fixed line access networks. These include, alongside local loops on the basis of copper twisted pairs (copper twisted pair access, abbreviated to CUDA in German), also optical fibre connections (fibre access) and CATV connections (coaxial access). In addition LKW operates copper- and optical fibre-based infrastructure for the core network and leased lines (dark copper and dark fibre). LKW provides wholesale services to carriers and providers with this infrastructure. By contrast only TLI is present on the retail market.²³

The present analysis relies upon data collected for the years 2004 to 2007. Seen historically, it was thus LTN that at first held the access network infrastructure and it is its market power on the market for physical access that is investigated. In the light of the changed market and ownership relationships since 1 January 2007 and with a view to a forward-looking analysis, it is LKW's market position as the new holder of the fixed access networks, in particular the copper twisted pair local loop infrastructure and the CATV access infrastructure that must, however, be regarded and investigated.

²⁰ LKW operates a CATV network in nine of the eleven Liechtenstein municipalities: Balzers, Triesen, Triesenberg, Vaduz, Schaan, Planken, Gamprin-Bendern, Ruggell and Schellenberg. The CATV network in Schellenberg belongs to the municipality but is operated by LKW. LKW is below always regarded as being inclusive of the CATV network belonging to the municipality of Schellenberg.

²¹ See <http://www.lkw.li/cfdocs/cmsout/admin/index.cfm?GroupID=159&MandID=1&meID=256&>.

²² „Karin" system, nodes, amplifiers.

²³ See the implementing arrangement of 05.10.2007 to the consolidation agreement (not available to the public).

2.3 Suppliers and demanders of physical access services

LTN published a Reference Unbundling Offer (*Agreement on “access to the local loop”*) in accordance with obligations imposed on it. At the time of the preparation of the present market analysis this Reference Unbundling Offer had been approved by the Office for Communication in the version V.1.7.1 (status: 01.07.2006).²⁴

The passive distribution network was handed over to LKW on 1 January 2007 as a consequence of putting the consolidation agreement between LTN and LKW into effect. LKW is hence from that date the holder of the access network and the supplier of unbundled local loops. An LKW Reference Unbundling Offer (RUO; Version V1.0, status: 28.09.2007) was the subject of a public consultation that was carried out by the Office for Communication towards the end of 2007. LTN’s reference offer will meanwhile continue to be used until the conclusion of the current market analysis procedure and the ensuing approval of a new LKW reference offer.

LKW is presently the only supplier of unbundled local loops. At end of 2007 it provided a total of 21’000 fully unbundled copper access loops.

A survey of operators on the market for physical access reveals the following demanders (wholesale customers) as per the end of 2007:

Undertaking	Unbundled lines 2007
Telecom Liechtenstein AG	20’896 ²⁵
UPC Austria GmbH (formerly Inode AG)	64
ABILA AG	22
TON Total Optical Networks AG	8
Cablecom GmbH	6
Supranet AG	4

Table 2-1: Wholesale customers on the market for physical access

²⁴ TLI’s homepage publishes a version 3.0, status: 1.1.2008:
<http://www.telecom.li/cfdocs/cmsout/admin/index.cfm?GroupID=171&meID=1072> (last retrieved on 11.09.2008).

²⁵ The computation is based on the total number of all copper local loops supplied externally by LKW, deducting the number of loops in use by alternative operators. TLI did not separately report on the number of unbundled lines or otherwise in the operator survey of 2007. Calculating the number of unbundled loops in the alternative based on the number of PSTN, VoB and ISDN base and primary rate connections reported (with regard to the latter the assumption was made that they are realized in each case over 2 twisted pair copper loops; for the sake of simplification it was further assumed that TLI’s xDSL connections are provided over the reported voice telephony lines) results in 19’768 unbundled local loops. For lack of other available data for the preceding years, the illustrations of the development of the demand for unbundled loops in chapter 2.4 is based on the number thus calculated.

As a consequence of the transfer of the access networks to LKW by 1 January 2007, TLI is now also listed as a wholesale customer in the above overview of demanding parties of unbundled local loops.

During the period of review there was no demand for shared access loops in the copper access network.

By the end of 2007 LKW supplied only a small number (21) of access circuits in the local access network to third parties in the form of dark fibre connections (fibre optics). Wholesale customers are TLI and ABILA AG. This number does not include optical fibres used by TLI for leased lines in the access network or for the connection of transmission and switching equipment in the public switched network.

2.4 Market development

The number of unbundled twisted pair copper local loops has developed in the manner portrayed in illustration 2-1 below, according to the questionnaires to operators for the years 2004 to 2007. In the illustration, subscriber access lines used by TLI, which are to be regarded as externally supplied unbundled subscriber loops since the hand-over of the access network to LKW on 1 January 2007, were not considered. This is due to the fact that TLI no longer disposes of an own access infrastructure and LKW itself does not offer any subscriber lines at the retail level. Consequently, 100% of all subscriber lines are provided through unbundling. Any portrayal including the incumbent TLI would therefore be meaningless and would not permit any conclusions to be drawn on the competitive development of the market for physical access, in particular since 2007.

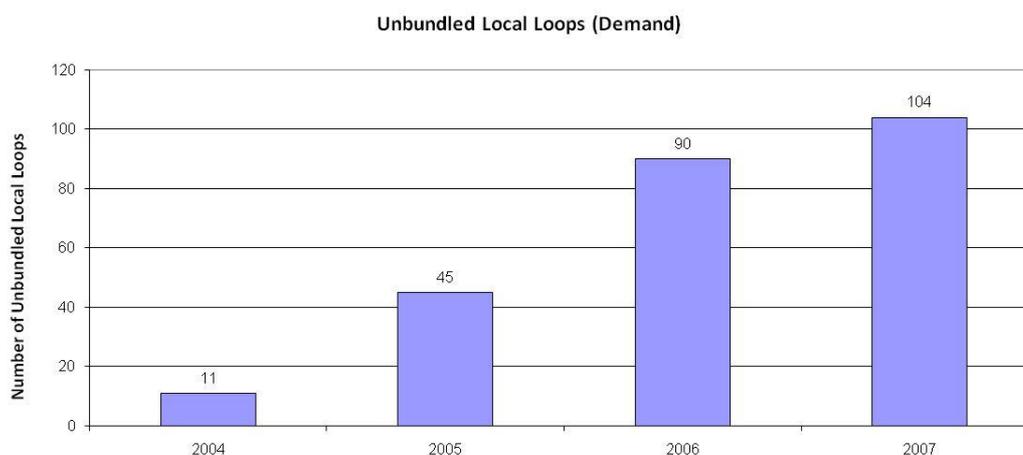


Figure 2-1: Unbundled local loops²⁶

Since the separation between ownership of the access network and the supply of retail subscriber connections in Liechtenstein, all retail subscriber connections are based on unbundled local loops. For this reason, the calculation of the proportion of unbundled

²⁶ Without consideration of TLI's unbundled lines.

local loops in relation to the total number of all subscriber connections in use, as is carried out in other countries to illustrate the state of unbundling, does not make any sense in the case of Liechtenstein, since the proportion would amount to a constant 100% since the year 2007.

Instead, the ratio of unbundled local loops of the incumbent TLI shall be compared with the number of subscriber lines based on unbundling provided by alternative operators. This results in the calculation of market shares in the unbundling market. The calculation is based on the number of PSTN, ISDN base and primary rate and VoB²⁷ connections as reported in the operator surveys.²⁸

The proportion of unbundled local loops in use by alternative operators increased continuously from 2004 to 2007 in relative terms was, however, still very small in absolute numbers with just over 0.5% of all subscriber connections at the end of 2007.

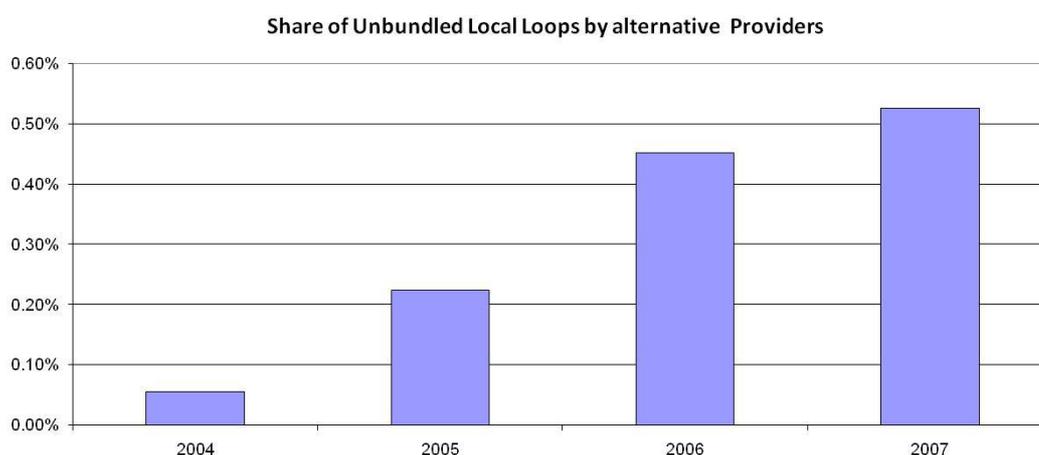


Figure 2-2: The share of unbundled local loops supplied to third parties relative to all local loops

²⁷ Voice over Broadband (VoB), e.g. the product "Connecta" offered by TLI.

²⁸ As regards ISDN primary rate connections, the assumption was made that they are provided over two twisted copper pairs; ISDN primary rate connections therefore counted double. For the sake of simplification it was further assumed that TLI's reported xDSL connections are provided over the reported voice telephony subscriber lines.

2.5 Overview of the local access network

The copper twisted pair access network in Liechtenstein comprises the following access areas:²⁹

Copper Access Network in Liechtenstein	
1. Access network Ruggell (Nr. 726 RDF, 9491 Ruggell)	9. Access network Vaduz (Nr. 1 MDF, 9490 Vaduz)
2. Access network Eschen (Nr. 1 MDF, 9492 Eschen)	10. Access network Rotenboden (Nr. 97 RDF, 9497 Triesenberg)
3. Access network Gamprin (Nr. 186 RDF, 9487 Gamprin)	11. Access network Jonaboden (Nr. 800 RDF, 9497 Triesenberg)
4. Access network Bendern (Nr. 1104 RDF, 9487 Bendern)	12. Access network Steg (Nr. 853 RDF, 9497 Steg)
5. Access network Schaanwald (Nr. 1521 RDF, 9486 Schaanwald)	13. Access network Malbun (Nr. 488 RDF, 9497 Malbun)
6. Access network Nendeln (Nr. 28 RDF, 9485 Nendeln)	14. Access network Matschils (Nr. 678 RDF, 9495 Triesen)
7. Access network Planken (Nr. 19 RDF, 9498 Planken)	15. Access network Triesen (Nr. 1000 RDF, 9495 Triesen)
8. Access network Schaan (Nr. 2666 RDF, 9494 Schaan)	16. Access network Balzers (Nr. 1 MDF, 9496 Balzers)

Table 2-2: Overview access network areas

²⁹ Source: LTN Reference Unbundling in the version V.1.7.1 (status: 01.07.2006) or, as the case may be, the consultation on the RUO; „AVE-Liste FL“ of LKW dated 12.02.2009.

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 also the “SMP Guidelines”),³⁰ 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.

The EFTA Surveillance Authority in its Recommendation on Relevant Markets identified those materially relevant product and service markets in accordance with Art. 15 of the Framework Directive 2002/21/EC³¹ that are susceptible to *ex ante* (anticipatory) regulation. It is assumed that *ex ante* regulation must also be considered in Liechtenstein for these markets – because the EFTA Surveillance Authority has already examined fulfilment of the applicable criteria. 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 departs from that which has been recommended.³²

3.2 Definition of the relevant product market

3.2.1 Recommendation on relevant markets as starting point

The EFTA Surveillance Authority now defines the relevant product market at hand in its revised Recommendation on Relevant Markets of 5 November 2008³³ as “*Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a*

³⁰ 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.

³¹ 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).

³² 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.

³³ 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. Currently only available in English and not yet published in the Official Journal of the European Union. Available at: <http://www.eftasurv.int/fieldsofwork/fieldservices/telecoms/ecom/recommendation-electroniccommunications.pdf>.

fixed location". In comparison to the Authority's preceding Recommendation on Relevant Markets of 2004³⁴ the market concerned is now – in the light of anticipated technological developments – defined in a forward-looking manner in a technologically neutral form. The market still comprises access to fully or partially unbundled twisted pair copper local loops or their shared use. It does, however, anticipate future developments such as the availability of fibre in the access network closer³⁵ to the subscriber as well as the further evolution towards next generation networks in general.

In accordance with Art. 21 para. 1 KomG, the relevant product market is defined in Part A, item 4 of the Annex to the revised Announcement on market definition as "*Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location*".³⁶

The relevant market therefore explicitly continues to comprise twisted pair copper subscriber loops irrespective of the way in which they are used, provided they have either been fully or partially unbundled, are used as self-provided wholesale inputs, or are utilized for shared access. The state of development of LKW's access network indicates that the twisted pair copper access network will continue to provide the basis for wholesale access to the fixed line access network over the adopted review period of the market analysis at hand.

Due to the absence of further alternative access technologies such as powerline communications (subscriber access via the electricity grid) or fixed wireless access (wireless local loop) in Liechtenstein, only access via the existing CATV networks and the fibre optic access network currently being rolled out come into consideration as additional infrastructures for physical access at fixed locations. Below is examined whether these two infrastructures form part of the relevant product market at hand.

3.2.2 Fibre optic access networks (FTTH)

LKW plans to begin the systematic roll-out of direct fibre optic connections (fibre to the home - FTTH) to business users over the course of the 2-3 year period of the current analysis. This process will, however, extend beyond this time to complete and the roll-out of FTTH for residential users will not commence during this period. In the long term, however, all subscribers shall be connected by FTTH.

³⁴ Recommendation of the EFTA Surveillance Authority No. 194/04/COL of 14 July 2004 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, as incorporated into the Agreement on the European Economic Area, OJ L 113, 27.4.2006, p. 18.

³⁵ Glass fibre up to a distribution box or street cabinet (Fibre to the curb - FTTC) or a direct link to the end customer with optical fibre (Fibre to the home - FTTH).

³⁶ The European Commission describes the basic material product market in its explanatory remarks to the Recommendation on Markets, Explanatory Note; Accompanying document to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, SEC(2007) 1483 final, S. 31ff.

LKW plans to roll out FTTH using existing paths and duct capacities. Existing twisted pair copper cables shall only be removed where this is required for reasons of space. The FTTH roll-out will normally be carried out – space permitting – with a planned 4 fibres per connection. LKW is also planning to exploit synergies with its electricity distribution network by using ducts and other facilities of that grid for the deployment of fibre optics.³⁷ It is therefore to be assumed that in the vast majority of cases an alternative connection from the subscriber to the twisted pair copper access network will continue to exist – at least for a longer transitional phase – even after the subscriber has been connected to the fibre optic access network. Due to the anticipated bandwidth demand developments in the analysis period and the given network topology with usually relatively short subscriber lines, coupled with the ongoing technological development of the xDSL standards, it must be assumed that in this period the necessary capacity will continue to be alternatively made available through the use of one or more existing copper access loops.

In the medium and long term, therefore, all subscribers in Liechtenstein will directly be connected via optical fibre up to the network termination point at the subscribers' premises (FTTH). At the same time, a trend towards an increasing number of fibre optic distribution frames compared to the current number of main and remote distribution frames in the copper access network can be observed. This trend is reinforced by the fact that in the future synergies with the electricity distribution network will be used, which in turn will lead to existing paths and distribution nodes of that network being put to shared use, the location of which are regularly in places other than the respective installations of the copper access network.

As is clear from the Explanatory Memorandum³⁸ accompanying the European Commission's Recommendation on relevant markets – to which the EFTA Surveillance Authority in its consultation procedure for the revision of its own recommendation made direct reference –, that the physical access to optical fibres in the local access network is the principal reasons for the adaptation of the underlying market definition in a technologically neutral way. Access to optical fibres of the market dominant operator is explicitly considered to be part of the relevant product market. This is furthermore evident from the past practice of ex ante regulation in the EEA States regarding the revised market 4 of the Recommendation on relevant markets as well as in particular from the comments of the European Commission pursuant to the procedure under Article 7 of the Framework Directive, which also postulate the inclusion of access regulation to optical fibre in the access network. In what follows, it shall therefore be examined whether subscriber connections realized through optical fibres are, at the present time and for a forward-looking horizon of 2-3 years, part of market 4.

From a technical point of view, unbundled (physical) access in the conventional sense to dedicated optical fibres, i.e. individual glass fibres, should primarily be considered for the

³⁷ Unlike with twisted pair copper cables, there is no danger harmful interference when laying optical fibres parallel to power lines.

³⁸ Cf. Footnote 36.

provision of access to the fibre optic access network to supply individual subscribers in a retail point-to-Point FTTH scenario. Just as a twisted pair copper cable connection is directly physically/electrically connected to the access partner, an optical fibre can be directly physically/optically connected to the network of an alternative operator. Due to the deployment of several optical fibres per subscriber connection, there is generally sufficient spare capacity available for this form of unbundling. Alternatively to such a direct optical through-connection, alternative operators could be allocated a certain wavelength of the light spectrum in an optical fibre for exclusive use (Wave Division Multiplexing - WDM). This type of unbundling is analogous to the frequency unbundling currently offered in CATV networks. There is therefore abundant production or transmission capacity available in existing fibre optic cables so as not to restrict the possibility of (frequency) unbundling.

Based on LKW's fibre-optic network roll-out plans described above, it must be concluded that a nationwide fibre-optic access network will exist in Liechtenstein for business customers in the next two to three years, while no such network will be available for residential customers yet. A 5-10% price increase in unbundled local copper loops will consequently result in partial switching to physical/optical or WDM unbundled optical fibres. The retail level will exert competitive constraints as regards the business segment of the market, whereas this will only be the case for residential users later on in tune with the progressive network roll-out.

It can, therefore, be concluded that demand side switching of access partners from twisted pair copper access lines to unbundled fibre-optic subscriber connections will be possible in Liechtenstein during the review period with regard to business users which constitute an important part of the overall market for end user connections. Unbundled access to the fibre-optic access network is therefore to be considered to be part of the relevant product market based on the substitution analysis carried out.

3.2.3 Cable television distribution networks (CATV)

In the context of this analysis cable CATV distribution networks are to be understood as access networks to which subscribers are connected by coaxial cable, even if in parts of the access network optical fibre is being used (Hybrid Fibre Coax - HFC). In general, several subscribers are connected together through the same coaxial cable in accordance with the concept of point-to-multipoint. It is for this reasons that coaxial cables used in CATV networks – in contrast to the twisted pair copper subscriber lines – are a shared resource (shared medium). If a coaxial cable were to be physically/electrically unbundled, i.e. disconnected from the network of one operator and connected to the network of another, this would not only affect the subscriber concerned but at the same time all other subscribers that happen to be connected to the same coaxial cable. Unbundling in the form of directly (physically/electrically) connecting an particular subscriber via the access network infrastructure of another operator, such as is the case with the unbundling of a twisted pair copper subscriber line, is consequently not possible for technical reasons in

coax-based CATV networks. As an alternative technical solution, the CATV network operator may grant an access seeker a dedicated frequency band in the CATV network for exclusive use and supply of its customers (frequency/channel unbundling). This form of access also provides physical access in the sense of the definition of market 4, as it allows the operator requesting access the widest possible freedom in the technical and commercial design and operation of the thus provided connection and traffic products.

Liechtenstein has a CATV coverage rate of about 100% of all households. This is a very high coverage in international comparison. It is therefore evident that with few exceptions all Liechtenstein households dispose in parallel of both a twisted pair copper access as well as a CATV coaxial access and are thus simultaneously connected to two fixed access networks. As a rule, any connection at a fixed location may therefore be provided alternatively over either of the two access infrastructures and neither from a demand nor supply side perspective is the switching impeded for reasons of lack of network coverage

LKW operates a CATV network covering nine of the eleven Liechtenstein communes. Matt Antennentechnik AG operates a CATV network in the other two. Currently none of the two companies offer broadband connections over the CATV infrastructure at the wholesale level themselves. Both networks are, however, already at present used by third parties for the provision of broadband access services, in addition to the distribution of television programmes (by TLI in the case of LKW's CATV network and by TVcable.li Anstalt in the case of Matt Antennentechnik AG). For this purpose, the cable network operator provides the access seeker with one or more frequency channels (8 MHz/channel) in what is known as frequency or channel unbundling. In this way, the access seeker gains physical access to the network infrastructure within the limits of the frequency channel granted access to and is responsible for the technical provision of the broadband or other connection at the CATV head-end and on the end-customer side. The access seeker is thereby offered technical and commercial freedom regarding the connections based thereon comparable to the unbundling of the twisted pair copper loop. The ISP/provider Newsnet AG started providing broadband access based on LKW's CATV network on a commercial basis as from 2nd Quarter of 2009.³⁹ To this end, LKW has agreed the use of an 8-MHz channel with Newsnet AG on commercial terms.

The demand for physical access at wholesale level is derived from the demand at retail level. The CATV network offers already currently broadband access services that are comparable in service terms and price to xDSL broadband connections offered via unbundling.⁴⁰ From a customer viewpoint, broadband connections provisioned over both access networks constitute substitutable services. In case of a persistent 5-10% increase in the price of xDSL products it must therefore be assumed that end users would switch readily to broadband access products provided via CATV networks and vice versa. The purchase costs for the necessary new modem are low in general terms and often

³⁹ Cf. the respective offer on Newsnet AG's website: <http://www.newsnnet.li/internet/kabelinternet/index.html> (last accessed on 27 May 2009).

⁴⁰ For a more detailed assessment reference is made to the Analysis of the broadband market (M5).

subsidised by the operators. They therefore do not pose a significant barrier to switching.⁴¹

At the wholesale level, a switch in demand is associated with additional investment costs. However and in contrast to unbundling in the copper access network, where the unbundling access seeker requires a presence at currently 16 distribution frames incl. the establishment of corresponding DSLAM and transmission facilities and collocations in order to provide a nationwide availability of its service offering, a switch in demand to a CATV access product only requires a presence in one location, the CATV head-end. A single initial investment therefore ensures ubiquitous end-user service availability. It can therefore be concluded that although a switch in demand necessitates new investments in technical equipment for any potential access seeker, the costs associated are relatively low in comparison to establishing a nationwide service presence based on unbundled local loops with many collocation locations. Right from the start significant additional revenue potential is generated by the investments made for access to the CATV network. Since there are only two CATV access network in Liechtenstein, the bigger of which alone covers 9 of the 11 municipalities, it must be assumed that the associated transaction costs for potential unbundled CATV access seekers are manageable.

The supply side substitutability at the wholesale level depends on the CATV access network operator in question's general willingness to grant access to third parties, the costs associated with the granting of access as well as the available production capacity (available capacity / bandwidth). LKW currently already offers third party access to its cable network (to TLI and shortly to Newsnet AG). Also Matt Antennentechnik AG already offers access to TVcable.li Anstalt. It can therefore be said that the willingness to grant access exists and that the initial investments and associated costs have been made already.

As far as the available production capacity is concerned, the provision of a separate frequency channel in the CATV cable system to an access partner comes at the expense of the usable spectrum left to the owner itself. According to the state of information of the Office for Communication there exist still further free capacities in the CATV networks of LKW and Matt Antennentechnik AG. Through the ongoing migration from analogue to digital transmission more capacity will become available.⁴² In the future, the upgrade of the CATV network transmission system DOCSIS (Data Over Cable Service Interface Specification) to version 3.0 from the currently used DOCSIS 2.0 will allow for significantly increased data rates. It can therefore be said that over the course of the next 2-3 years, which form the horizon for the present market analysis, sufficient available capacity for frequency unbundling exists in the CATV networks.

⁴¹ Potentially necessary changes to the in-house installation, such as the replacement of the existing CATV wall-outlets, do also not pose a significant barrier to switching.

⁴² The addition of more bandwidth-intensive high definition television (HDTV) channels to the TV distribution offering may lead to a partial absorption of the capacity freed by the transition to digital program distribution in the future.

It must consequently be concluded that supply-side flexibility exists due to the already granted frequency/channel unbundling access by both LKW and Matt Antennentechnik AG, the fact that the initial investments have already been made and business processes put in place, the manageable demand switching costs and the available existing production capacity. The demand and supply side substitutability is thus not constrained by any insurmountable switching costs or other barriers to switching. The current coverage of the CATV networks provides a geographical network coverage that is comparable with the coverage of the twisted pair copper access network. A non-transitory 5-10% increase in the price of twisted pair copper loop unbundling would therefore lead to a corresponding switch to frequency unbundling in the CATV networks. This finding is supported empirically by the existing utilization and supply of frequency unbundled access to the CATV networks of LKW and Matt Antennentechnik AG.

3.2.4 The relevant product market for the analysis at hand

According to the substitutability analysis carried out above, the relevant product market for the market analysis at hand over the course of the review period of the next 2-3 years encompasses physical access to the twisted pair copper access network, to the CATV access network, and to the optical fibre access network.

Part of the relevant market therefore forms the fully unbundled access to subscriber lines in the twisted pair copper access network, i.e. the twisted pair copper loop from the main distribution frame (MDF) to the network termination point (NTP) at the end-user premises. Unbundling services falling within the ambit of the relevant market also constitute partially unbundled local loops (sub-sections of loops or sub-loops), in particular from the NTP to the end-user premises distribution cabinet, to cable splitters or street cabinets. The shared use of the unbundled subscriber loop (shared access) forms also part of the relevant market.

The relevant market furthermore includes wavelength-unbundled⁴³ and physically/optically unbundled access to existing fibres in the fibre-optic access network from the optical distribution frame to the network termination point at the end-user premises or sections thereof.

Finally, the relevant market comprises frequency unbundled access (assignment of a particular frequency channel for exclusive use) in HFC cable television distribution networks.

The market also includes those copper subscriber lines, fibre-optic cables and CATV frequency channels that are provided by communication operators themselves for the connection of subscribers via own infrastructure to their network (self-supply / captive sales).

⁴³ WDM-unbundling or unbundling of the optical fibre in any other form.

The relevant market comprises all access lines as described above regardless of their usage. It is therefore immaterial in all cases whether the unbundled access lines are used as wholesale inputs to the provision of retail products such as broadband internet access or voice telephony or for wholesale products such as bitstream access or leased lines.

Hence, the relevant product market thus defined is in accordance with market 4 of the EFTA Surveillance Authority's revised Recommendation on relevant markets. There is nothing to indicate in the view of the Office for Communications that the relevant market would not meet the requirements for potential *ex ante* regulation in Liechtenstein nor that national circumstances would call for a diverging definition of its material dimension over the period under review.

3.3 Services and products

The market for physical access comprises the following services:

Infra-structure	Service	Description	Currently provided in Liechtenstein
Twisted pair copper access network	Full unbundling	Access to the subscriber line from the main distribution frame to the network termination point	✓
	Partial unbundling	Access to sub-loops of the subscriber line between the main distribution frame and the network termination point	–
	Shared access	Access to the local loop is provided to the access partner for the provision of high bit rate services in the upper frequency band; voice telephony is (continues to be) provided by the incumbent/holder of the access network	–
Optical fibre access network	Physical/optical unbundling	Access to the fibre-optic subscriber line from the main optical distribution frame to the optical network termination point or of sub-sections thereof (direct optical through-connection)	✓

	Wavelength unbundling (Shared access)	Access to a specific wavelength of the light spectrum in a fibre-optic subscriber line for exclusive use (Wave Division Multiplexing)	–
HFC cable TV distribution network	Frequency/channel unbundling (Shared access)	Access to a frequency band (frequency channel) in a CATV distribution network for exclusive use	✓

Table 3-1: Services on the market for physical access

3.4 Definition of 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, according to the principles of 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 because of a 5-10% price increase for physical access products nor would an access seeker move his operating area to a different region) 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. This dispenses with the need to analyse each market, while proceeding in this manner still leads to the same results.

LKW operates its access networks in principle in the whole of Liechtenstein and provides access to these networks nation-wide under uniform conditions. Thus, in the opinion of the Office for Communications, the conditions of competition are sufficiently homogeneous to allow for the delineation of a single national market.

As far as the CATV access network in the municipalities of Eschen and Mauren in particular is concerned, LKW does not have CATV network coverage in this area, but does cover it with its nationwide copper access network and its fibre-optic access network currently under construction. Matt Antennentechnik AG operates in these two municipalities – and only in these – its own CATV access network. Matt Antennentechnik AG is thus not in a position to provide physical network access based on its own infrastructure in the rest of

the country and it must be doubted that, because of the very high sunk costs that are associated with an expansion of the infrastructure, it would be able to profitably and timely offer physical access in the rest of the country following a 5-10% price increase. A hypothetical monopolist who sets uniform access prices nationwide and must not fear the expansion of any competing access network infrastructure will not be constrained in his price-setting behaviour any differently either at the nationwide level or in the municipalities of Eschen and Mauren. In the area of the later two municipalities, in which Matt Antennentechnik AG operates a competing access network in the form of its CATV network, there are only about one-fifth of the nation-wide access connections. For this reason and due to the limited impact of potential substitution, a nationwide 5-10% price increase would only have a limited impact on the revenue generated and would, therefore, make a nationwide price increase still profitable. Consequently, in the opinion of the Office for Communications, the conditions for supply and demand in Eschen and Mauren are not significantly different in comparison to the rest of the country so as to justify any other geographic market segmentation than a unified nation-wide geographic market definition.

In accordance with Part B of the annex to the Announcement on market definition, the geographically relevant market for the present analysis is defined as the entire national territory of Liechtenstein. This accords with the small size of the national territory and the homogeneous conditions for supply and demand therein as well as with the extent of the access networks on Liechtenstein territory.

3.5 On the notion of self-supply

Self-supply also falls within the definition of the market for physical access at the wholesale level, that is, services, which a vertically integrated undertaking makes available internally.

What is involved here is essentially demand for a wholesale product that is based on derivative demand, that is, demand on the retail market. If the HM Test⁴⁴ is applied at the wholesale level, then one must – in addition to substitutability on the supply and demand sides – also have regard to the consequences on demand on the retail market of a 5-10% price increase on the wholesale service market. Because a 5-10% price increase on the wholesale service market will generally lead to a price increase on the retail market, it will never be profitable if a sufficient number of customers were to change to other providers as a reaction to the price increase. This can usually be assumed when the products at the retail level are attributable to the same market, because a 5-10% price increase is also employed for market definition at the retail level. In this manner it becomes evident that the market power of a hypothetical monopolist that only sells its wholesale product externally will be constrained by those undertakings which only (or also) supply their wholesale service internally. In consequence, the wholesale service market is normally to

⁴⁴ Hypothetical monopolist test (cf. SMP-Guidelines, para. 41).

be defined at least as widely as the retail market; it thus includes both externally and internally produced wholesale services.

Self-supply has great importance in the electronic communication field because of reliance in many cases upon wholesale products (network infrastructure), for which reason the market power of vertically integrated undertakings at the wholesale level can only be adequately evaluated if one includes internally provided services. Exclusion of internally provided services would overstate the market power of undertakings that sell wholesale products externally. This is because their market power at the wholesale level is also constrained by competitors who provide these services exclusively internally (or additionally) and not only by providers who offer their products or services externally. That could lead to a result in no market shares being evident on the corresponding wholesale market in situations where large undertakings satisfy their large purchasing wholesale requirements entirely internally. Furthermore, this would mean that the market share of any existing alternative providers of the wholesale product that sell it (also) externally would be excessive. It would thus be possible for two undertakings that form part of an integrated undertaking to determine to a significant extent the size of the market and of market shares only by means of internal purchase or sale. Such a representation of market shares would not only fail to reflect actual relative strength in economic terms but would in fact contradict it.

An initial part of liberalization in network industries is to open up access by alternative providers to the required wholesale products of the former monopolist (incumbent) in order to allow competition downstream in the production chain. It is these very wholesale services – products that, for example, because of economies of scale⁴⁵ combined with sunk costs⁴⁶ are duplicable only with difficulty (as in the sense of “control over infrastructure not easily duplicated” under Art. 31(1)(m) VKND, which is a criterion for the assessment of significant market power) – frequently form the basis for market power. At the same time such services are often exclusively or in large part only provided internally. Overlooking internally provided services would thus prevent the causes of a market-dominant position from being analysed or addressed appropriately. In an extreme case (if necessary wholesale services are only provided internally) overlooking self-supply can even lead to entire wholesale markets that might provide the basis for a market-dominant position being left out of an analysis.

Provision of subscriber lines is thus to be treated as a wholesale service that communications network operators produce and use themselves in order to connect subscribers by means of an operator’s own infrastructure to its own network.

Both with self-supply and physical access it is immaterial whether the subscriber line in question is used as a wholesale service for the provision of retail products such as

⁴⁵ Economies of scale in production occur if the average costs (costs per unit) fall with rising output volume (advantages of size, economies of scope or economies of concentration).

⁴⁶ Sunk costs are the fixed costs of production that, once incurred, are irreversible, i.e. they cannot be recovered.

broadband internet access or voice telephony or for wholesale products such as broadband access or leased lines. The relevant market includes all metal local loops independent of their manner of use, so long as they are unbundled, are used as a self-supplied a wholesale service, or facilitate shared access. In line with the above remarks the market not only covers already unbundled or shared subscriber lines, but generally all subscriber lines in the twisted pair copper, optical fibre or CATV access networks which are capable of being unbundled or shared.

3.6 Relationship with other markets

Most currently unbundled or shared access lines are used for broadband connections (xDSL or CATV internet access)⁴⁷; classical (narrowband) voice telephony connections over unbundled or shared access lines are of no importance in practice. Physical access to the access network is also employed for the provision of leased lines – as a rule, for the terminating segments. The vertical relationship between unbundling/shared access and broadband access at the wholesale level will be described in the following.

Alternative operators or ISPs could make use of the following potential alternative self-operated access technologies – apart from physical access to the twisted pair copper, fibre-optic or CATV access networks – for the provision of broadband access to end-users, provided these are economically viable: Powerline Communications (PLC; utilizing the electricity distribution network); radio networks (e.g. Wireless Local Area Network, W-LAN; Wireless Local Loop, WLL; satellite links, SAT). Retail broadband access could also be provided over access infrastructure operated by another operator by purchasing broadband access as a wholesale input from that operator.

Bitstreaming is generally taken to denote a wholesale product in the copper access network that for example allows an ISP not having its own access network to offer broadband access services (e.g. to the internet). The provision of the xDSL equipment and normally also traffic routing to a network interconnection point (Point of Presence, POP) takes place through the wholesale provider, by contrast to unbundling.⁴⁸ Bitstreaming is normally associated with xDSL. If, however, a broadband wholesale product is taken from the wholesale provider without any technical alteration then being made this amounts to simple resale.

If alternative access infrastructure like that described above is not available to the alternative operator or if its establishment is not expedient (cf. in this regard also Chapter 4.6.2 “The natural monopoly in the access network”), then it is physical access to existing infrastructure (unbundling or shared access) that will come into question as a variant of access, whose main feature with respect of other kinds of access that could be purchased as a wholesale service (e.g. broadband access) is that physical access allows competition

⁴⁷ DSL stands for Digital Subscriber Line, x for any number of further technologies whose abbreviations act as a prefix such as A for Asymmetric, S for Symmetric, etc.

⁴⁸ Further remarks on bitstreaming and on the distinction with regard to simple resale are contained in the analysis of the market for broadband access (M5).

at several levels in the value chain. Taking up physical access as a wholesale service offers an alternative operator or ISP a great deal of flexibility and autonomy compared with other wholesale products. To be able to offer products such as voice telephony access (POTS/ISDN or VoB, Voice over Broadband) and broadband internet access over an unbundled or shared access line allows the alternative operator to take advantage of economies of scale, to offer an attractive bouquet of products, and to have the possibility of differentiating between products through especially adding services and features and in terms of quality (e.g. transmission capacity, overbooking factor, peering on the internet, etc.). Unbundling and shared access represent forms of access that closely resembles using one's own network. The physical access to network infrastructure hence (generally) offers the greatest possible meaningful economic real net output ratio for alternative operators or ISPs and in this way strengthens the establishment of sustainable competition (on the different real net output ratios cf. Figure 3-1).

As mentioned by way of introduction, physical access generally supports the sale of broadband services to retail customers. Alongside physical access, broadband connections are also used at the wholesale level in order to realize broadband services other than over one's own local loop infrastructure. Both physical access and broadband access at the wholesale level create the basis for broadband retail customer services. These two wholesale products could be seen as substitutes for one another. It will now be explained why this, however, is only partially true and the two wholesale products cannot be attributed to a common market.

In order to grant physical access, the subscriber line of the retail customer in question is connected (electrically/optically) with the network of the access partner in specific rented space at (as a rule) the main distribution frame⁴⁹ (collocation facility). The unbundling partner has in this regard to undertake considerable investment in the adaptation of the collocation facility, the introduction of the partner's own network (backhaul)⁵⁰ and in installing its own switching equipment. These investments can only pay for themselves in the copper and fibre-optic access networks once a sufficiently large number (critical mass) of retail customers wish to be unbundled at the main distribution frame location in question (access area) by the access partner. As regards the frequency unbundled access to CATV networks, these investments have generally only to be made at the CATV head-end.

Due to the high initial investment costs, especially in the twisted pair copper and the fibre-optic network, one ought⁵¹ to be able to resort to the next step in the value chain (cf. Figure 3-1), i.e. wholesale broadband access, for as long as the alternative provider's additional investments for unbundled access are not (yet) worthwhile. With broadband access, the investments required of the alternative operator or ISP are limited at the

⁴⁹ This is to be found either at a peripheral concentrator or at the switch of the incumbent.

⁵⁰ This can also be realized over leased lines.

⁵¹ Cf. The market analysis and proposed regulatory measures for the wholesale market for broadband access (M5).

wholesale level essentially to its own network infrastructure⁵² up to a point of access, though in the case of simple resale the need disappears for any investment in one's own infrastructure.

Finally, broadband xDSL and CATV connections (e.g. to the internet, VoB) are sold at the retail level. The following figure casts light on the relationships between the links in the value chain in the twisted pair copper access network that have been explained.⁵³

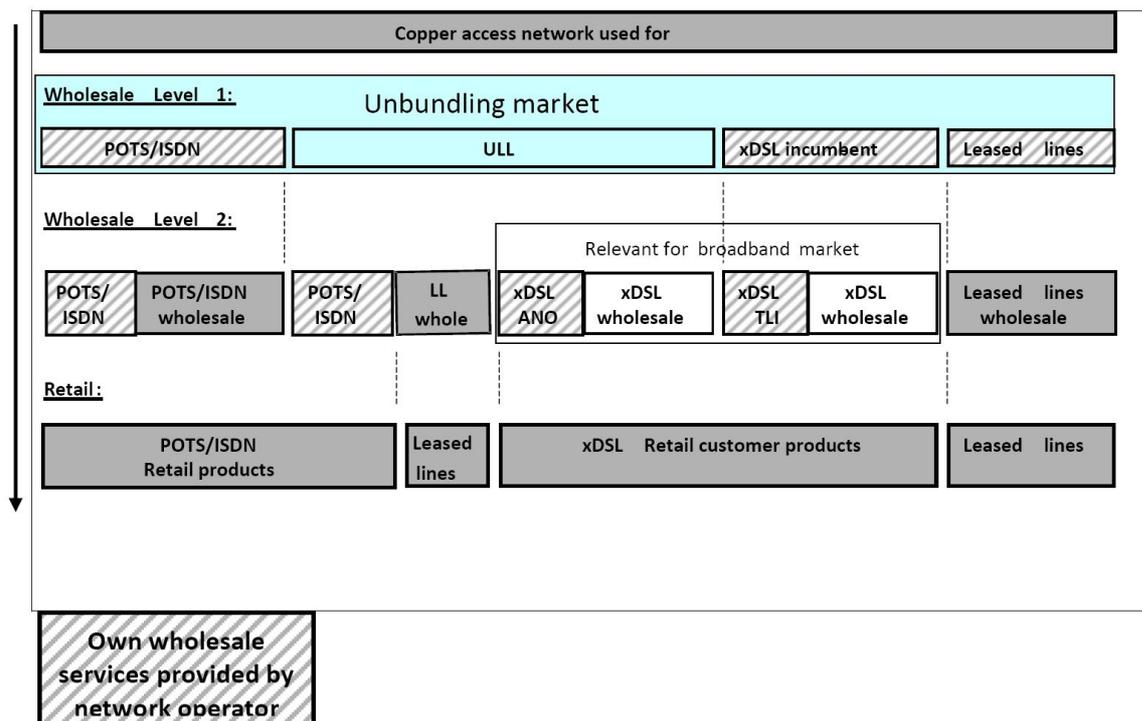


Figure 3-1: Vertical relationship between the relevant markets in the twisted pair copper access network

At Wholesale Level 1, LTN employed the twisted pair copper access network for provision of its own wholesale products or leased local loops to access partners (e.g. Inode/UPC) until the end of 2006. From the beginning of 2007 LKW has been providing the unbundled local loops (for the first time also to TLI). At Wholesale Level 2, TLI deploys its broadband transmission facilities (xDSL) and the associated network in order to be able to sell its own products to retail customers, or it provides these services as a wholesale product to its partners (e.g. internet service partners).

The kind of relationship between wholesale markets (upstream) and retail markets (downstream) is crucially dependent upon parameters such as:

- quality,
- tariffs,

⁵² This can also be realized over leased lines.

⁵³ In the interests of clarity, leased lines, fibre-optic and CATV networks and other access technologies will not be considered.

- the timing of provision and
- the circumstances of competition.

Thus, the possible technical quality of retail products will for instance be directly dependent upon the quality of the wholesale service that is provided. Retail customer tariffs contain within them, on the other hand, the services purchased on the wholesale markets as essential cost parameters. Providers that are active on both wholesale and retail markets thereby have fundamentally different possibilities in generating what they offer (integration, development of new services etc.) compared to providers that rely solely on the purchase of wholesale products for the provision of their retail products.

Figure 3-1 shows that the two markets (unbundling and broadband access at the wholesale level) must be attributed to different parts of the value chain. Thus, an unbundled local loop can, for example, be employed as a wholesale service for offering broadband access at wholesale level. That both kinds of access refer to different parts of the value chain in itself makes it necessary to regard them as separate markets and to investigate them accordingly.

A further relationship between unbundling and broadband access at wholesale level arises from their both being – on condition of consistent pricing – capable of contributing in a complementary manner to self-sustaining competition. On the one hand broadband access at wholesale level facilitates an access partner (access wholesale customer) to enter the market. By means of broadband access at wholesale level customers can be acquired and serviced and the investment risk can be lowered before opening up a specific access area. Apart from this, an access partner can through unbundling complete its offering on the retail market from a geographical point of view by being everywhere where it would be (still) unprofitable to unbundle due to lack of critical mass.⁵⁴ It can rather win customers there by means of broadband access at the wholesale level, thereby obtaining a national presence as well as retail products it can sell nationally. Broadband access at wholesale level can thereby reinforce unbundling.

3.7 Description of the current regulatory situation

In conformity with the legal requirements of the European Economic Area (EEA), unbundled access must, from entry into force of the Unbundling Regulation (EC) No. 2887/2000⁵⁵ on 1 October 2001, be assured to all the incumbent's subscriber connections in the twisted pair copper network in Liechtenstein.

LTN Liechtenstein TeleNet AG published a reference offer corresponding to the obligations placed on it, entitled "Contract on 'access to the local loop'". At the time this market analysis was prepared, this reference unbundling offer was available on what is now TLI's

⁵⁴ According to the Reference Unbundling Offer there are 16 Main Distribution Frames in LTN's twisted metal pair access network, now that of LKW.

⁵⁵ EEA Legal Compendium: Annex XI – 5ce.01; LGBl. 2001 No. 157.

homepage in the version approved by the Office for Communication, Version V.1.7.1 (status: 01.07.2006).⁵⁶ The reference offer contains the technical, organizational and commercial details (including prices) that are laid down in the Annex to the Unbundling Regulation. After the transfer of the access infrastructure to LKW at the beginning of 2007 the last-mentioned reference offer remains applicable until the approval of a new LKW reference offer by the Office for Communication.

Since the unbundling regulation explicitly only applies to the twisted pair copper access network, physical access to other network infrastructures, such as fibre-optic access or CATV distribution networks, is not yet subject to ex ante regulation. Existing access to fibre-optic cables of LKW and frequency channel access to LKW's and Matt Antennentechnik AG's CATV networks are therefore currently provided without any special regulation.

⁵⁶ Now Version 3.0 with the logo of TLI at <http://www.telecom.li/cfdocs/cmsout/admin/index.cfm?GroupID=171&meID=1072> (last retrieved on 23.01.2008). Formally approved by the Office for Communication in the version V.1.7.1 of 1.7.2006.

4 Market power

4.1 Undertakings with significant market power

4.1.1 Single dominance

Under 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;
- 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 Guidelines⁵⁷ 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 a 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: *“when 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.”*⁵⁸ 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 into the other market, thereby strengthening the overall market power of the undertaking (on “leveraging”, see Art. 22(2) KomG).

⁵⁷ Cf. SMP Guidelines of the EFTA Surveillance Authority, paras. 19 and 113.

⁵⁸ 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 “[C]riteria 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 Art. 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) – forgoes an offensive competition strategy aimed at short-term individual gains in favour of a more profitable outcome in the longer term for all the participants involved.

The ECJ Court of First Instance in its decision in the *Airtours* Case⁵⁹ 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 players and 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.⁶⁰ 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

⁵⁹ Case T-342/99, *Airtours/First Choice*, ECJ Reporter. 2002, II-2585.

⁶⁰ Art. 31(3)(a) VKND as well as the SMP Guidelines of the EFTA Surveillance Authority, paras. 75-78.

threshold (because of other factors). The consistent case law of the European Court of Justice has held that at 50% – leaving extraordinary circumstances to one side – market power can be taken as proven.⁶¹

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.⁶²

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 scale⁶³ 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 large 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.

According to the operator survey carried out, TLI, UPC, ABILA, TON Total Optical Networks, Cablecom and Supranet are presently buying unbundled access to the twisted pair copper access network (see Table 2-1). Since the transfer of the copper access network from LTN (now TLI) to LKW in early 2007, TLI is by far the biggest wholesale customer. On the demand side for unbundled fibre-optic cables TLI and ABILA are active as wholesale buyers. Until recently TLI was the only actual buyer of frequency unbundled access to LKW's CATV network. Since 2nd quarter of 2009, however, the ISP/provider Newsnet AG is also commercially offering broadband access products based on LKW's CATV network.⁶⁴ TVcable.li Anstalt is buying frequency unbundled access to Matt Antennentechnik AG's CATV network in the municipalities of Eschen and Mauren.

⁶¹ Cf. Para. 75 of the Guidelines of the EFTA Surveillance Authority.

⁶² 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.

⁶³ MES – Minimum Efficient Scale.

⁶⁴ Cf. footnote 39.

Since 1 January 2007, the twisted pair copper access network formerly owned by LTN is owned and operated by LKW.⁶⁵ On the supply-side (i.e. with external third party offers) there is solely LKW that is providing wholesale unbundled access to the copper network, given that it is the only provider who disposes of an (ubiquitous) twisted pair copper access infrastructure. Since there is no other operator that is operating a twisted pair copper access network, LKW has a 100% share of the market, also considering self-supply.

Taking into consideration the fibre-optic access network and the CATV distribution networks in accordance with the current market definition which has been enlarged to include all physical access to network infrastructure at fixed locations, the following market shares emerge:

Access infrastructure	Availability	Market Share of LKW
Twisted pair copper	Ubiquitous, nationwide	100 %
Optical fibre	Little availability (FTTH)	100 % (to the extent available)
CATV	Ubiquitous, nationwide ⁶⁶	78 % ⁶⁷
All relevant physical access infrastructures (Copper + Fibre + CATV)	Ubiquitous, nationwide	92.5 % ⁶⁸

Table 4-1: Market shares of LKW in access infrastructures

Nationally, Matt Antennentechnik AG disposes of a market share of 7.5% of all physical network accesses and of 20-22% of all access provided over CATV networks. However, it operates its CATV network exclusively in the municipalities of Eschen and Mauren and, therefore, cannot act as a nationwide supplier of alternative physical access across the whole of Liechtenstein.⁶⁹ It must therefore be considered that this operator does not dispose of significant market power due to its currently low market shares and the limited

⁶⁵ Had no regulatory obligation to offer unbundled access to the copper local loop existed, LTN (and now LKW) would in all likelihood not have offered this type of access. The present market would then have been limited to self-supply only (cf. Ch. 3.5).

⁶⁶ LKW operates a CATV distribution network in 9 of 11 municipalities, Matt Antennentechnik AG in the other two communes Eschen and Mauren.

⁶⁷ Based on the number of households or the population, LKW reaches a 78-80% and Matt Antennentechnik AG a 20-22% area coverage assuming a 100% availability of CATV.

⁶⁸ Calculated on the basis of all physical network access actually provided at the end of 2007 (total of 34'613 accesses, of which 2'601 CATV accesses provided by Matt Antennentechnik).

⁶⁹ If one is to look at the market in the municipalities of Eschen and Mauren by itself, TLI has a share of 63% and Matt Antennentechnik AG of 37% of all access lines. This calculation is based on an extrapolation by percentage of the resident population in the absence of any separate data collected for each municipality. The so-calculated market shares are therefore only indicative in nature. In any event, the Office for Communications is of the opinion that the conditions for supply and demand in Eschen and Mauren are not appreciable different in comparison to the rest of the country so as to justify any other than a nation-wide definition of the geographic scope of the relevant market.

geographic availability of its offering. Matt Antennentechnik AG is consequently no longer to be considered in the further analysis of market power.

LKW has a nationwide market share of 78% to 100% taking into account all physical access to fixed network infrastructures. Due to the very high market shares and in the absence of any extraordinary circumstances, LKW must be presumed – in accordance with current practice – to have a dominant position on the market for physical access. In what follows, additional further relevant indicators of market power of LKW will be investigated.

4.3 Maturity of the market

An important aspect for the assessment of the competitive situation on a market is its maturity (Art. 31(1)(e) VKND), because the interpretation of several indicators of competition (market shares, barriers to market entry, price trends, etc.) is to a major extent dependent on whether the market has only recently formed or is already in the growth, consolidation or mature phase.

Phases of market maturity can be observed and distinguished by reference to different indicators over time like the number of market players, market entrants, market exits, total turnover, total volume, and prices. Because, on the one side, unbundled access to the copper access network is based on a regulatory obligation and, on the other, only LKW (respectively before that LTN) had a country-wide twisted pair copper access infrastructure, it was only the former LTN that was a provider of unbundled copper local loops (also taking account of self-supply). At the beginning of 2007 the local loop infrastructure passed from LTN to LKW. There are no further observable relevant instances of entry into and exits from the market (establishment of an operator's own twisted-pair local loops) and none are expected in the (near) future.⁷⁰ Owing to the fact that the unbundling prices have been determined by regulation up to now, little can be read into changes in them with regard to the maturity of the market; nor can much be read into total turnover, which will change in proportion to the number of unbundled local loops.

Only from the demand-side growing number of unbundled lines (not counting self-supply) can the existence of a growth phase be inferred. The figures in Chapter 2.4 show the development of unbundled lines over time (excluding self-supply).

Because LKW is the only provider of unbundled copper local loops in Liechtenstein, little of substance can be brought to an evaluation of the competitive situation from estimating what phase of maturity the market is in.

⁷⁰ If an operator wished to establish its own access network despite the high market entry barriers (cf. Chapter 4.6), it would hardly do so on the basis of twisted pairs but rather by using other technologies (e.g. FTTH) which will be able to satisfy increasing demand over the long term for transmission capacity (bandwidth).

4.4 Vertical integration

The degree of vertical integration (Art. 31(1)(i) VKND) is relevant for evaluating market power in so far as vertical integration can produce advantages in favour of an undertaking with respect to its competitors, above all if a necessary and not easily duplicable input is involved at the wholesale level (cf. Chapter 4.6.3). The degree of vertical integration also determines to a major extent the incentives towards anti-competitive behaviour vis-à-vis competitors (cf. Chapter 4.7). Vertically integrated undertakings with market power at the wholesale level can above all have an incentive to eliminate competitors from a downstream market.

Until the end of 2006 the former LTN was formally speaking not a completely vertically integrated undertaking. In the access area all retail products (voice telephony access, broadband access, leased lines) were sold by Telecom FL. However, Telecom FL was a 100%-owned subsidiary of LTN before being completely integrated into TLI on 1 January 2008 and reported to a joint management team. LTN and Telecom FL must therefore be seen as being in reality a vertically integrated undertaking until the end of 2006. When the implementing arrangement to the consolidation agreement was put into effect on 1 January 2007 the passive network infrastructure was transferred to LKW. That formally removed the vertical integration. However both TLI and LKW continue to be wholly owned by a single owner, the Liechtenstein State (see discussion below).

As the sole operator of a twisted pair copper access infrastructure LTN – or now LKW – has a very high level of market power in an economic sense. As an “integrated” provider (in a corporate association sense) LTN would have a very high market share of fixed network connections for voice telephony. This indicates incentives towards anti-competitive behaviour with respect to competitors at the retail level (cf. Chapter 4.7). Access to unbundled lines represents accordingly an important countervailing precondition for there being several service offerings at the retail level.

LTN’s vertical integration on both the wholesale unbundling and the retail markets where it was active, together with the wholesale services it provided itself for the retail market entirely internally, leveraged control over infrastructure that was not easily duplicated on the market for physical access on to the relevant retail markets (access, voice). Because LTN disposed of the sole country-wide access network, it was *de facto* the only undertaking that could sell across the country without being reliant on the wholesale services of another. Operators wanting to serve customers in areas not provisioned by themselves were by contrast dependent upon wholesale inputs by LTN.

Taking account of the circumstances after 1 January 2007, the situation can be stated as follows: The passive network infrastructure has passed over to LKW, which has become the sole holder of the country-wide copper twisted pair access network. If one disregards the “corporate association” of LKW and TLI by virtue of their shared 100% ownership, then LKW and TLI are two separate undertakings. The transfer of the local loop infrastructure from the former LTN (now TLI) to LKW can thus be regarded as vertical separation. In the

absence of vertical integration of the access network holder LKW the incentive to certain anti-competitive behaviour, such as denial of access to unbundled lines, has clearly been lessened. On the other hand, there remain strong doubts especially with regard to excessive pricing (cf. Chapter 4.7). The same considerations apply to the fibre-optic access network currently being rolled-out as well as the CATV distribution network which is also owned by LKW.

4.5 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 still be exercised (e.g. in the form of excessive prices) vis-à-vis consumers or wholesale customers in the case of unbundling. This in part depends *de facto* on the degree of bargaining power the customer has (countervailing buying power). *Ceteris paribus*, this will be greater if the customer/wholesale customer is responsible for a large segment of the undertaking's turnover, if switching over to other operators is possible and not attended by significant costs, or if the corresponding service can be easily provided by oneself.

No such countervailing buying power prevailed with unbundling of the copper local loop. For one thing, LTN was until the end of 2006 the only provider of unbundled lines, making a switch to another provider impossible. For another, the turnover from unbundling amounted to only a very marginal amount in LTN's overall turnover; it was thus not reliant on this turnover. Furthermore, a similar wholesale service cannot by reason of the high barriers to market entry be easily provided by oneself economically (cf. Chapter 4.6).

Finally, the customers for unbundled lines possess no bargaining power vis-à-vis LTN. Rather, the possibility for unbundling had to be imposed by regulation.

Since 1 January 2007 LKW holds the twisted pair copper access network infrastructure and is thereby the sole provider of unbundled copper lines. Switching to another provider is impossible. LKW's main area of business is the production and distribution of electricity. The commercial rental of telecommunications infrastructure is, however, gaining importance after the transfer of the relevant infrastructure by the former LTN to LKW. LTN or, today, TLI is as a result of the transfer by far the largest customer of unbundled lines. Countervailing buying power from the side of TLI towards LKW will nevertheless not arise because of the lack of alternative suppliers of unbundled copper local loops. Apart from this, the relationship between TLI and LKW has been largely determined by the consolidation agreement.

Besides that LKW also operates the only alternative access network available nationwide, the CATV distribution network. A fibre-optic access network, currently in its initial stages of nationwide roll-out, is also only deployed and operated by LKW. Consequently, it must be concluded that also no countervailing bargaining power exists with regard to these two access infrastructures due to the lack of available alternatives.

In a final evaluation it must be concluded that the wholesale customers seeking physical network access have no bargaining power vis-à-vis LKW.

4.6 Barriers to market entry and potential competition

Barriers to market entry (Art. 31(1)(b) VKND) 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.⁷¹ The higher the barriers to market entry therefore are (i.e. the more difficult market entry is), the higher – *ceteris paribus* – the level of market power the established undertaking will potentially have. Market power can in particular be supposed to exist where the market concentration is high and at the same time high barriers to market entry prevail. What is decisive for the assessment of market power is, however, finally also the level of competition behind these entry barriers.

In its Recommendation on Markets the EFTA Surveillance Authority distinguishes between two kinds of barriers to market entry, namely structural and legally determined ones. 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 barrier to entry* 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 that hinder the latter's market entry. The most important structural barriers to market entry on the market for unbundling can be seen as economies of scale (see Art. 31(1)(h) VKND and para. 78 of the SMP Guidelines) in conjunction with sunk costs. 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 level of the sunk costs that cannot finally be recouped upon a possible departure from the market, and this will influence the decision to enter the market. Thus, the risk associated with market entry will *ceteris paribus* be greater the higher the proportion that sunk costs occupy in fixed costs is and the higher the economies of scale are. Moreover, sunk costs also play a decisive role in regard to the theory of contestable⁷² markets. This teaches that a market can only be regarded as contestable (implying that no undertaking can persist in raising prices above costs) if there are no or only negligible sunk costs.

Economies of scale and sunk costs obtain on the market for physical access above all as a result of the costs for laying lines (e.g. excavation costs; cf. Chapter 4.6.1).

A further, predominantly structurally determined barrier to access for a provider of physical access services can arise through economies of scale in combination with

⁷¹ Cf. SMP Guidelines, para. 81.

⁷² A contestable market is one where there is a possibility of market entry by a potential competitor. This will depend upon the barriers to market entry that exist.

demand-side switching costs on the part of undertakings that buy access services. For undertakings arriving newly on the market, achieving an efficient output volume (when economies of scale are intensively exploited) will be made much more difficult by demand-side switching costs where significant economies of scale do exist, which will in particular be the case if the number of customers or the volume demanded on the market does not grow significantly. This again leads to an asymmetry of costs between the established undertaking and the market entrant.

Demand-side barriers to switching on the market for physical access are above all to be found when a change from LKW will not be possible owing to lack of alternative access providers. Even if there were other providers of unbundled or shared access lines than LKW, the demand-side barriers to switching would have to be qualified as being very high, because the access partner will in any case face the high sunk costs that the other provider concerned would have had to make. Thus investment costs for instance at collocation locations as well as for connecting up to an unbundling partner's own network infrastructure (backhaul) are associated with the access partner's sunk costs themselves.

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 legal barriers to entry on the market for physical access one may cite the necessary authorizations (or, earlier, licences) and obligations laid down by law for the provision of public telecommunications services, as well as barriers in connection with rights of way and prohibitions on works involving excavating land. Because Art. 4 KomG provides for freedom to take up and stop activities in connection with networks and services, and doing so is only subject to an administrative obligation of notification, there are no (significant) legal barriers to market entry. Some barriers to market entry can nevertheless arise as a result of needed building or excavation permits, permits to use public land, or proceedings to secure expropriation.

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 the *behaviour of an undertaking*.⁷³ For example, an undertaking with market power on a market may try to leverage this market power on to another (horizontally or vertically associated) market. Moreover, an undertaking with market power can attempt to defend the market in question against market entry (entry deterrence). The most important practices in this connection are

- (i) on the one hand, vertical leveraging of market power (from a wholesale service market on to a downstream market) through refusal of access to needed infrastructure that is not easily duplicated, margin squeezes, discrimination by

⁷³ „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.

means of other parameters like quality, product characteristics, delaying tactics, etc.,

- (ii) on the other hand, horizontal leveraging of market power through cross-subsidization or bundling,
- (iii) and entry deterrence through predatory pricing, increasing demand-side switching costs, exclusive contracts or over-investment.

Vertical leveraging of market power on the market under consideration is for instance to be looked at not only because of vertical integration on the market for fixed access to the public telephone network (Market 1 of the Announcement on market definition). As regards incentives towards behaviour that tends to restrict competition, see Chapter 4.7.

To evaluate the relevance of barriers to market entry one should also finally consider dynamic aspects such as technical progress that could lead to certain barriers losing their importance in the long run. Even looking to the years ahead (particularly the next two or three), there are no technological changes to be expected that could decisively reduce the economies of scale and the sunk costs due to laying cables.

Inquiry into the indicators “market share” and “barriers to market entry” also allows one – above all in relation to wholesale service markets – to conclude whether an undertaking has control over infrastructure that is not easily duplicated (Art. 31(1)(l) VKND). This can then be assumed if there are both a high market share and high barriers to market entry. Both features are present in the case of LKW’s physical access infrastructures, in particular the twisted pair copper and the CATV access networks, as first shown in Chapter 4 and as will be shown secondly in the remarks in Chapter 4.6.3 concluding the discussion of sunk costs and the natural monopoly in the access network.

4.6.1 High sunk costs

Sunk costs are fixed costs of production that, once incurred, are irreversible; that is, they cannot be recovered. Network industries (network infrastructure in general and access networks specifically) are typified by high sunk costs. Major investments are involved in the form of excavation works and the restoration of surfaces and, if closed down, they cannot be reused and hence not be resold. It will also hardly seem sensible in the case of a close-down or reduction in capacity to dig up cable that has already been laid. Nevertheless, entire networks or self-standing parts of them are resalable. Because this situation is so specific, there will be no market price for them that can be ascertained. Only a competitor would come into question as a potential buyer and it would at most only be prepared to pay a price that corresponds to the equivalent of the discounted returns. The question would have to be asked in regard to such an investment decision why it would not be possible for the current owner of the network to continue business on a profitable basis. If it cannot, that is, it is revealed that close-down is more advantageous, then no one else would be prepared to pay a price that would cover the sunk investments.

It is just this circumstance related to high sunk costs in network industries (network infrastructure) that represents a major risk for the potential investor, which must be compensated for through higher returns. For an investor that has already made the investment in high sunk costs, this will mean that it will wish to recover the highest possible profit margins over the longest time possible, even if a more recent investment decision would have been negative. This leads to a situation of (buried) over-capacity that the operator will also sell at prices that go below the (historical) full cost. Entry on to the market by new operators will as a result be made unattractive or impossible, while established operators will neglect investments to expand the network and apply stricter criteria for upgrades relative to what they can save. Network industries are in this regard not much different from other industries where over-capacity occurs. The only difference is due to the higher sunk cost and the long (technical) lifetime of such investments, which means that the process of concentration lasts much longer (optimization in reducing exit costs through maximizing profits).

4.6.2 The natural monopoly in the access network

Natural monopolies appear where the long-term average costs curve reaches its minimum at such a high output volume that a high proportion of or indeed the total market demand ought to be covered and thus (viewed statically) two providers can never coexist for long. The “minimum efficient size” of a technology-dependent undertaking will be relatively highly dependent on market demand. A natural monopoly will thus assert itself if the costs of production are subadditive for every output unit in the relevant field. In the academic literature (public) utility companies like gas or telecommunication companies, which are known for their high fixed costs and low marginal costs, are frequently cited as examples of a natural monopoly.

In the access network, excavation costs, which depend essentially on population density (and partly also on topography), account for the bulk of costs. As long as it is cheaper to integrate subscribers into the existing access network rather than to provision them separately, there will be unexploited advantages of bundling because of “neighbourhood effects” determined by population density; even a dynamic view of things would not change anything in this regard. A situation exists whereby demand for connection services in a geographically bounded area can be provided most cost-effectively by only a single network operator, simply because a high subadditivity⁷⁴ of the costs exists. The current capacity in LKW’s access networks still holds large reserves for use over time and with regard to broadband utilization (such as by means of xDSL technologies and their future evolution). Entry on to the market by a further, identical access network operator would lead to duplication of the fixed costs for network construction. Capacity would also be doubled in the long term and thus no longer be optimal in term of costs or efficient; in the

⁷⁴ Subadditivity is a situation in which the production of goods by a single undertaking can be more cost-effective than by several. Subadditivity is a basis for natural monopolies.

case of the access network one is therefore speaking of a – regionally circumscribed – natural monopoly.

The access network monopolist also enjoys network-specific market power, because, despite non-fulfilment of the conditions for the permanence of a natural monopoly – for instance by reason of inefficient factor combination or internal subsidies – direct entry on to the market by a potential new entrant will not occur. Sunk costs cause an asymmetry between the established network operator and the potential competitor which the incumbent can use strategically to deter market entry. Because it is faced with (its own) high sunk costs, these are – by reason of their no longer being subject to influence and hence no longer relevant for taking decisions – insignificant for the purposes of (unregulated) pricing and it will undercut the competitor's price until its (longer term) lower price limit of reversible average costs has been reached.⁷⁵ These considerations follow the approach of “step-wise marginal cost calculation”, which considers the timeframe-dependent reducibility of fixed costs in ascertaining marginal return. Because a positive marginal return represents the lowest price level at least in the short to medium-term – at least, a sufficiently long period for keeping competitors away – a potential competitor can anticipate that it will not be possible for it to recover the full average costs and thus the investments it has to make.

The current cable access networks in Liechtenstein are essentially limited to either that of the established operator (LTN or LKW since 2007) or the cable television networks (CATV), which can be adapted for a return channel so as to enable exploitation of the economies of scope for electronic communications services. Construction of an access network only for voice telephony would be unthinkable without such bundling. The CATV networks parallel to the copper twisted pair network of the established operator were originally implemented solely for transmission of television signals and not for the provision of telecommunications services – thus for another market. It is also characteristic that cable television network operators sell their services exclusively in their respective areas. A natural monopoly is obviously also involved there⁷⁶ or at least the above mentioned network-specific market power exists that discourages competitors from entering into competition with an incumbent operator by means of similar infrastructure in the same geographical area.

Some have argued that a natural monopoly does not occur with telecommunications networks simply because the technology of alternative network operators differs from that of the established operator. This situation, however, contradicts the premise for investigation of natural monopolies that all market players face the same cost drivers and presumably also the same underlying technology. It is also argued that different networks and network components in core networks complement each other in a modular way and

⁷⁵ Variable costs represent the short-term lowest price level also in a competitive market. A price at this low level (margin return ≥ 0) can serve deterrence strategically, but does not have to be so intended, since it can also be a reaction to a competitor in a competitive environment.

⁷⁶ These are, however, partially in competition with other infrastructures in respect to the services sold on the retail market.

interact as layers; there is also an argument that specific market segments are served by specific technologies. Even the access network is cited as a relevant example, as is the fact that several households have available to them a number of parallel access technologies, such as coaxial cable and simple copper twisted pairs.

In response, it should be observed that cable television networks (CATV) were originally constructed for transmission of television programmes. Network construction and operation in Liechtenstein was carried out in particular by municipalities and later by LKW, thus by public sector associations or companies.⁷⁷ There is also no (relevant) geographical area in Liechtenstein in which the two cable television network operators operate in parallel. CATV networks are typically exclusive in their coverage areas.

The possibility of offering voice telephony and broadband internet access services in addition to television channels, and, with this bundle of products, the possibility to obtain economies of scope, only opened up late in the day with the adaptation for return-channel capability of an infrastructure that emerged mainly through historical monopolies. Without such bundling it would have been unthinkable to roll out an access network in order to offer telecommunications access services; such networks were not even established for telecommunication (by private undertakings).

Currently there are no additional fixed access network infrastructures in Liechtenstein with ubiquitous coverage using alternative technologies such as for example FTTH. Optical fibre connections are especially used for the provision of leased line services to larger undertakings or for connections in and between core networks, but not in (ubiquitous) access networks.⁷⁸ Because the construction costs in access networks depend greatly on excavation works and surfacing, but rather less on the type of line, it would be unthinkable today for a network operator to lay down lines based on twisted pairs instead of using future-oriented technologies like optical fibre.

Even if different technologies were to be in competition with another, this would hardly produce a long-term equilibrium. Eventually a particular technology could prove most efficient over the long term, allowing it to offer different services over a common infrastructure services and so exploit economies of scope (e.g. FTTH). Specialization is on the other hand successful only if the stand-alone cost⁷⁹ of a specialized competitor lies below the incremental costs⁸⁰ of the established operator for the services in question. If a technology asserts itself in the long term as being the most efficiently productive, and if

⁷⁷ The only exceptions to this are the CATV networks in the communes of Mauren and Eschen, which were established by Matt Antennentechnik AG, a private company.

⁷⁸ As described in Chapter 3.2.2, LKW are planning the roll-out of a nationwide FTTH network connecting business users during the review period. The widespread availability of fibre-optic cables for businesses will, however, take considerable time and LKW does not plan to start rolling out FTTH for residential before that.

⁷⁹ Stand alone cost refers to any fixed costs and costs that vary with volume which arise only through production of a production or service. Economies of scope cannot therefore be involved.

⁸⁰ Incremental costs mean fixed costs and costs that vary with volume and which will disappear upon withdrawal of the entire product or service in question.

subadditivity of costs applies (such as e.g. with excavation costs), the basic conditions for a natural monopoly will remain despite the introduction of new technologies.

4.6.3 Control over infrastructure not easily duplicated

One can speak of control over infrastructure that is not easily duplicated (Art. 31(1)(l) VKND) if certain infrastructure necessary for the provision of services is in the hands, exclusively or to a large extent, of a single undertaking (for which the indicator is market share) and high barriers exist to the establishment of alternative infrastructure (for which the indicator is market entry barriers). Such control enables 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 on to downstream or neighbouring markets.

LTN could be seen as a vertically integrated undertaking until the end of 2007 and was the only network operator in Liechtenstein to have country-wide access network.

Since the beginning of 2007 LKW has the only country-wide access networks (both the copper twisted pair access network as well as in most areas the CATV network). Other operators, which generally have no access infrastructure of their own, are reliant on LKW's physical network access as a wholesale input.

Conclusion in relation to Chapter 4.6:

Establishment of a local access network infrastructure is associated with high sunk costs. In addition, access networks in general exhibit a high subadditivity of costs, meaning high structural barriers to market entry and that potential competition cannot (also for the foreseeable future) develop in the market for physical access.

Also intermodal competition in access networks is – mainly due to the fact that LKW now owns both nationwide fixed access infrastructures (the twisted pair copper and the CATV access networks) in Liechtenstein – not to be expected, in contrast to several EEA States which also have high CATV availability (but separate ownership of the CATV networks). The market for physical access is thus not a contestable market. One can therefore proceed from the premise that a resistant natural monopoly exists.

LKW consequently has control over an infrastructure that is not easily duplicated with regard to its twisted pair copper and CATV access networks (in the absence at the same time of countervailing buying power).⁸¹

⁸¹ As well as in future with regard to the FTTH access network as its roll-out progresses.

4.7 Incentives to behaviour that tends to restrict competition

If a vertically integrated undertaking⁸² has market power in relation to a necessary wholesale product, it can be assumed that it will use this market power by not selling the wholesale product to other undertakings at all (denial of access),⁸³ or by selling it at excessive prices (prices significantly above costs), or (especially if not otherwise possible – but also possibly simultaneously) by trying to eliminate other undertakings from retail markets. This can take place through a margin squeeze or through delaying provision of service, providing it at a worse quality, refusing access to information, setting inappropriate contractual conditions or by other measures. The undertaking with market power on the wholesale service market can thus increase the costs of its competitors, raise the price on the retail market and hence increase its own profits. At the same time the market shares of competitors will decline or they will be completely eliminated from the market.⁸⁴

An undertaking with significant market power that is active on a wholesale service market will seek to obtain monopoly rents in the sense of maximum profits on the wholesale service market. Such monopoly rents will place a burden on the wholesale customers and finally on retail customers. In the case of an undertaking with significant market power on the wholesale market, it will still be able to defend its monopoly rents successfully at the wholesale level (in the absence of alternative Infrastructures) even if it is a vertically integrated provider that is in competition with its rivals at a downstream level in the value chain (retail market, possibly also a wholesale service market). Functioning competition at the retail level is thus on its own insufficient to guarantee excessive retail prices are not charged, since allocative inefficiencies (at the wholesale level) may persist.

A vertically integrated undertaking with significant market power that provides a necessary wholesale service or product (input) for its competitors at a point downstream in the value chain has various ways to impede competition (foreclosure) at that point in the value chain (retail market, possibly also a wholesale market). To do so requires an incentive, that is, it must for instance be possible for the undertaking to increase its own profits by eliminating its competitors from the retail market.

If perfect competition reigns on the downstream market a monopolist at the wholesale level will then have no incentive towards foreclosure if it can use its pricing at the wholesale level to skim off profits from the retail level and thereby maximize its gains.

If this precondition that the wholesale monopolist can skim off profits from the retail market is not, however, fulfilled, then there will in principle be incentives towards foreclosure:

⁸² The degree of vertical integration, under Art. 31(1)(i) VKND and para. 78 of the SMP Guidelines, is an indicator for the assessment of market power. It is in particular relevant in connection with vertical leveraging of market power.

⁸³ It is recalled here that unbundling of the copper local loop is only offered on the basis of legislative/regulatory obligation.

⁸⁴ Possibilities and incentives for vertical leveraging of market power are discussed in ERG Remedies (2006): “Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework”, ERG (06)33, http://erg.ec.europa.eu/documents/docs/index_en.htm, Part 2.3.1 and Part 5.2.

If the undertaking with significant market power is subject to a regulatory condition that imposes cost-oriented access (unbundling obligation) then it no longer has the possibility to skim off profits from the retail market. The incentive will instead arise to raise the costs of rivals and to discriminate between the competitors and its own retail arm as regards provision of the wholesale service. This can take place by influencing the quality parameters or product characteristics. The undertaking with significant market power can in this manner increase its profits both via its market share on the retail market and through the retail price that applies there; it can even be in a position to (re-)monopolize the retail market.

But incentives towards foreclosure can also arise in the absence of regulation if a monopolist on the wholesale service market expects potential competition at the wholesale level. This could be the case if an undertaking entering the market at the retail level were in a position (later) to achieve vertical integration upwards and then itself become active on the wholesale service, once it had gained a critical number of customers so as to reduce the risk from sunk costs in investments.

If an alternative provider is present at the wholesale level,⁸⁵ the undertaking with significant market power then has incentives to effect a margin squeeze. The demand of wholesale customers for access provision services from alternative providers will reduce the profit of the established operator. If the undertaking with significant market power sets the retail price correspondingly lower this can have the effect that competitors at the retail level cannot cover their costs (including those for the wholesale product itself). The consequence would be foreclosure on both the retail and the wholesale market (as long as the alternative provider of access cannot undercut the price of the established operator on a sustained basis).

The assessment of incentives for behaviour that will limit competition on the Liechtenstein market for physical access will take place next in two parts: first, we shall look back to the incentives for LTN until the end of 2006 and then we shall investigate the incentives for LKW from 2007 onwards:

In assessing potential competition on the market for physical access in the absence of regulation the incentive upon LTN until the end of 2006 is particularly relevant, this being to hinder possible competition in markets downstream across the entire value chain by means of a basic refusal to unbundle. Alternative operators enjoy through unbundling a higher degree of autonomy and flexibility; sufficient unbundling would allow them to place LTN under pressure from their own products, especially on downstream retail markets. LTN thus had no interest in allowing such competition and in thereby losing turnover, moreover, just where (wholesale) sales would bring in increased added value (such as from origination, termination and customer basic subscriptions) that could also be lost by LTN.

⁸⁵ With unbundling this behaviour is, however, of secondary importance because a natural monopoly is concerned in the case of the access network in question.

There was therefore an incentive towards anti-competitive behaviour on the part of LTN vis-à-vis competitors, at the wholesale as well as at the retail level. Unbundling was not offered by LTN voluntarily. It was rather required by legislation and imposed by regulation.

Once refusal to provide the access service was unsuccessful (due to the imposition of the regulatory obligation to provide access to the unbundled copper local loop), LTN had an incentive to use excessive (unregulated) pricing to stop competitors from taking advantage of the possibilities afforded by unbundling (flexible retail customer offerings) or to hinder them. Pricing behaviour motivated in this way results in competitors having a higher cost structure – with the consequence that they can no longer sell their products by covering their costs (bringing the danger of a margin squeeze). In addition, excessive prices lead to allocative inefficiency, unjustified monopoly rents for the incumbent and general economic harm to the disadvantage of the retail customers that have to absorb the excessive prices.

With the imposition of cost-oriented prices⁸⁶ there remained for LTN the possibility to use non-pricing parameters to hinder competitors in providing their services. This can, for example, take place through delay in service provision or refusal to provide essential additional services (e.g. collocation) or by applying excessive prices for their supply, or through the provision of the wholesale service at poor quality, or by (unilateral) imposition of (technical) norms and standards whose implementation will not be suited to competitors or will only lead to higher costs for them.

It is particularly the one-off rental fee for the initial connection of an unbundled line – which is very high by international comparison (see Chapter 8.2.2) and which alternative competitors but not LTN⁸⁷ have had to pay – that is an important reason, in the view of the Office for Communication, for there having been practically no use made to date of the possibility of unbundling for the provision of alternative broadband retail products.

According to the latest information (the consolidation agreement between LTN and LKW foresees that LKW will not supply the retail market) LKW will in all probability not be providing electronic communications services as a vertically integrated undertaking or be active downstream from unbundling in the value chain (e.g. bitstream access). Because of this, there remains only slight incentive for it as holder of the local access network infrastructure since 2007 to engage in behaviour that tends to restrict competition, in particular with regard to refusal to provide access. There still, though, does remain the danger of it setting excessive prices and – depending in particular on the actual state of relations between LTN (now TLI) and LKW – the danger of external discrimination.

Because the aforesaid mitigation of incentives to anti-competitive behaviour can only be expected when LKW and TLI are sufficiently separated from another, a great deal of

⁸⁶ This behaviour can, however, also be practiced in combination with excessive pricing.

⁸⁷ As to LTN – because of its ownership of the access network – no one-off rental fees were payable such as those alternative operators had to pay according to the RUO. Any costs that were associated with first-time connections were in any case regularly absorbed by LTN on the basis of special marketing measures (waiver of the connection fee).

importance is to be attached to such a sufficient separation with respect to the common ownership of the two undertakings. This concerns not only the formal separation of persons (bodies) and information, but also personal ties that could lead to preferential treatment for TLI and so instigate similar incentives towards anti-competitive behaviour.

Conclusion:

There were until the end of 2006 strong incentives for LTN to engage in behaviour that would tend to inhibit competition. If there had been no regulatory obligation to provide unbundling (i.e. applying a “green field approach”), this would probably have manifested itself as follows based on the incentives that existed: refusal to unbundle, demanding excessive prices, exercising influence on non-pricing parameters like quality and in regard to delivery times, and internal and external discrimination. There were thus incentives for LTN either to offer no (non-discriminatory) wholesale product or to offer such a product only under discriminatory and excessive pricing conditions.

From 1 January 2007 LKW has been the holder of the passive network infrastructure. Vertical separation exists thereby between network infrastructure and (retail) services. Such separation can in principle reduce the incentive to refuse access (foreclosure). On the other hand, TLI and LKW are connected with one another through a common owner and must therefore in principle be regarded as associated undertakings. How far this structural separation of networks and services actually prevents foreclosure remains to be observed precisely in the future. If there is not incentive towards foreclosure, there ought then to be no reason for LKW to refuse unbundled access to alternative providers or to place them at a disadvantage vis-à-vis TLI. In any case, there remains a danger that LKW will charge excessive prices because of its dominant position in a natural monopoly market.

4.8 Further indicators

Further indicators of market structure are those such as market shares, overall size of undertakings as well as access to finance. These have no relevance for the market for physical access in as far as copper unbundling was imposed as a wholesale product through regulation and LKW (or LTN to the end of 2006) thus became the only provider of unbundled copper lines (due to its being obligated to do so). LKW is the only operator of a twisted pair copper access network so far as self-supply is concerned. LKW’s market share (and before it, LTN’s) on the market for unbundled copper local loops thus amounts to 100%. Taking into account the CATV distribution network that is available in 9 out of 11 municipalities and the fibre-optic access network being rolled-out, LKW disposes of a share of 92.5% of the market for physical access (cf. Table 4-1).

Investigation of concentration ratios (e.g. through the HHI⁸⁸) does not provide any additional insights due to the very high market share of LKW and in particular the fact that

⁸⁸ Herfindahl-Hirschman Index (HHI).

no competitor with a nationwide access infrastructure exists. One can also dispense with an investigation of price-cost margins, because local loop unbundling prices are imposed through regulation on a cost-orientation basis. Comparisons with other providers are excluded by reason of the absence of any corresponding offerings.

Similarly, further indicators of the underlying conditions that obtain, such as norms and standards and market transparency, have little meaning for the market for physical access, since unbundling is a wholesale product generated by regulation. LTN was earlier placed under an obligation to submit a reference local loop unbundling offer for the purpose of transparency. The reference unbundling offer had to be approved by the Office for Communication and contains all the arrangements concerning the provision of this service. These include technical and implementation arrangements alongside prices. The same considerations apply to LKW.

One can mention other factors in regard to behaviour, but they play no role in the market for physical access. Pricing behaviour (the scope for pricing to a large extent independently of competitors), advertising, sales and marketing, but also investments can provide indications of how an undertaking is attempting to position itself vis-à-vis its competitors. The greater the freedom of action a single undertaking enjoys and the greater the effect such measures have, the sooner it can be supposed that the undertaking has (a certain) market power.

Since local loop unbundling is a wholesale product created by regulatory obligation, the indicators mentioned above will not be employed: Prices are determined by regulation and pricing behaviour on the part of LTN is therefore not observable. Likewise, this wholesale product is not promoted while the sales arrangements do not seem any different from those for other wholesale products. Investment does play an important role for a functioning twisted pair access network, but in the market under consideration no behaviour can be inferred from this that would lead to a strengthening or retention of the incumbent's market power.

Only in the absence of corresponding regulatory obligations will the above-mentioned indicators have any meaning – in particular prices and non-pricing (technical and technical implementation) parameters – since then the possibility exists to discriminate against downstream competitors in the value chain through refusal to unbundle, by means of pricing strategy and/or through the corresponding design of non-pricing parameters. Incentives to such behaviour arise from vertical integration and are dealt with in Chapter 4.7.

5 Overall evaluation

5.1 Absence of effective competition

According to Recital 27 of the Framework Directive an analysis of the state of competition should include consideration of “[...] whether the market is prospectively competitive, and thus whether any lack of effective competition is durable”. If there is no effective competition, then it must be asked whether the tendency in the market itself is perhaps towards effective competition over time. If one understands effective competition in this connection as being self-sustainable, infrastructure-based competition, then one must observe in this connection (above all in regard to the wholesale service market being considered, which lies at the bottom of the value chain) the degree and the evolution of infrastructure investments.

Infrastructure-based competition is de facto non-existent in the case of fixed access infrastructures. As shown in the above discussion LKW is (and LTN was up to the end of 2006) the only provider of unbundled lines and is the only operator of such networks. Nor can infrastructure-based competition be expected in the (foreseeable) future, due to presence of the features of a natural monopoly, as shown in Chapter 4.6.2.

With unbundling one is concerned with a regulatory measure that obligates the incumbent to make local loops available to alternative network operators (and, as the case may be, ISPs) for their access to the retail customer. This obligation to offer unbundled copper local loops has applied in Liechtenstein from entry into force nationally of the Unbundling Regulation (EC) 2887/2000 on 1 October 2001. The (wholesale) unbundling market only came into existence thanks to this (obligational) regulatory measure.

The following indicators are relevant for evaluating market power on the market for physical access (see Art. 31(1) VKND and paras. 76-79 and para. 81 of the SMP Guidelines):

Market shares: In Liechtenstein only LKW (or LTN up to the end of 2006) offers access to unbundled subscriber lines. It therefore has (taking account too of self-supply) a share of 100% of the market for physical access (92.5% taking into consideration CATV access networks). LTN would have had no incentives to offer unbundled local loops in the absence of a regulatory obligation. Even if LTN and now LKW were to offer this service without being obligated to by regulation (i.e. voluntarily), there would be no self-sustaining competition (because of the underlying natural monopoly over the access network). This observation applies also to LKW’s CATV network. The frequency unbundled access to that network is essentially a historical consequence of the existing consolidation agreement between these two companies.

Barriers to market entry: High barriers to market entry exist by reason of high sunk costs and the subadditivity of costs in the access network. This is not therefore a contestable

market. No major developments (revolutionary technological breakthroughs) are expected in the fixed network access domain over the foreseeable future. The barriers to market entry will therefore stay very high in future and no self-sustaining competition is hence to be expected.

Control over infrastructure not easily duplicated: Until the end of 2006, LTN was active both on the wholesale market for unbundling and on the retail market for access services, while also supplying itself internally with all wholesale services for the retail market. Its vertical integration therefore leveraged control over infrastructure on the market for physical access that is not easily duplicated on to the retail market as well. Because LTN disposed of the only nation-wide access network capable of supporting unbundling, it was *de facto* the only undertaking which could sell it on a country-wide basis; it was also itself not reliant upon third-party wholesale inputs. Operators that wished to provision customers in areas they did not serve were on the other hand dependent upon LTN for wholesale inputs. There were hence clear incentives up to the end of 2006 towards behaviour liable to restrict competition.

Taking a forward looking perspective, LKW as new holder of the network infrastructure from the 1 January 2007 has no incentive towards behaviour that tends to restrict competition in the form of refusal to provide access, eliminating other undertakings from retail markets through margin squeeze or through delays in providing service or provision at poor quality. This, however, is only true if LKW itself does not enter the retail market or elsewhere downstream in the value chain from the unbundling and shared access level and remains sufficiently separate from LTN, and also behaves in a corresponding manner; the state of affairs will be kept under observation by the Office for Communication. This will include in particular the consistent and demonstrable prevention of LKW bestowing an advantage upon TLI.

Due to having sole control over an infrastructure not easily duplicated LKW has, however, the incentive to apply excessive prices to the disadvantage of wholesale and retail customers, to extract monopoly rents or to employ resources inefficiently.

Other criteria, such as the overall size of undertakings, access to finance and pricing behaviour, are not or are only marginally relevant for the market for physical access.

Overall assessment: The subscriber line provided over the twisted pair copper network, the CATV access network or the fibre-optic access network represents a “bottleneck resource” due to the high barriers to market entry and is at the same time an indispensable wholesale product (“essential facility”) for the provision of numerous services. LKW has high and resistant market power in an economic sense on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location, Market 4 in the 2009 Announcement on market definition. The development of effective competition on the market under consideration cannot be expected in the foreseeable future (mainly because of the special feature of the access

network as a natural monopoly), even if one takes into account possible technological alternatives.

5.2 Existing or potential problems of competition

In light of the transfer of the twisted pair copper access network from LTN to LKW on 1 January 2007, discussion of current and potential problems for competition must once more be looked at retrospectively for LTN and prospectively for LKW, respectively. The fundamental problems of competition will be clarified by reference first to LTN. Major differences arise between the two undertakings as to incentives towards behaviour that tends to restrict competition due to the fact that LKW, by contrast with LTN (or TLI today), is not a vertically integrated undertaking; that is, it does not envisage entry on to the retail market and does not wish to offer wholesale services at any point in the value chain downstream from unbundling (e.g. bitstream). This will be elucidated in regard to problems of competition that may be expected in future in regard to LKW.

Against the background of the lack of effective competition and taking account of LTN having previously been active as an integrated undertaking on a country-wide basis, one must pose the question as to what the consequences on this market would have been of removing the obligation to assure unbundled access for competition. The analysis of incentives shows clearly that LTN had no incentive to offer unbundling voluntarily as such or under non-discriminatory conditions. The following problems of competition were thus relevant until the end of 2006:

➤ **Refusal to provide access:**

Thanks to unbundling, alternative operators have more autonomy and flexibility. Adequate unbundling would have allowed them to put pressure on LTN with their own products, in particular on downstream retail markets. LTN therefore had no interest in facilitating such competition and thereby losing turnover.

(Competition problem C1)

➤ **Excessive Pricing:**

If refusing the access service had not, however, been possible (because unbundled access was imposed by regulation) LTN then had an incentive by means of excessive (unregulated) pricing to keep its competitors from using the possibilities open to them through unbundling (flexible retail customer offerings) or to hinder them. Pricing behaviour motivated in this manner could have produced a higher cost structure for competitors – with the result that they would not have been able to market their products in a way that would cover their costs (with the risk of a margin squeeze). One would also have had in combination with this the risk of leveraging of market power on to the retail level and price discrimination.

(Competition problem C2)

Even if a margin squeeze is not applied to competitors, the undertaking having significant market power can keep the price high on both the wholesale and the retail level. Allocative inefficiencies arise through applying prices above costs to the disadvantage of retail customers.

(Competition problem C3)

➤ **Non-pricing parameters:**

LTN had, moreover, the possibility to hamper its competitors in providing their service through non-pricing parameters. This can, for example, occur through delaying service provision, by denying essential additional services (e.g. collocation), by demanding excessive prices for them, by providing the wholesale service at degraded quality, by (unilaterally) imposing (technical) norms and standards whose implementation is not suited to competitors or can only be achieved at too high a cost, by withholding access to certain necessary information, or by laying down inappropriate contractual conditions. All of these measures taken by a market-dominant undertaking raise a competitor's costs. Particularly if a cost-oriented price for access is imposed, one can assume that the undertaking with significant market power will try to increase its profits through such "non-pricing" forms of behaviour.⁸⁹

(Competition problem C4)

Under a forward looking perspective, the incentive to adopt behaviour that tends to restrict competition does not now arise to such a degree, provided that LKW as the current holder of the passive access network infrastructure remains sufficiently separate from TLI (vertically). In this way LKW ought to have a sufficient interest to offer access services to all wholesale customers under the same conditions (acting in conformity, therefore, with the present consolidation agreement/implementation arrangement). Refusal to provide access, practising a margin squeeze and raising a rival's costs do not emerge as problems for competition in the absence of corresponding incentives. There remains, then, the main potential problem for competition the charging excessive prices and inefficient allocation of resources (competition problem C3). As a monopolist for fixed line connections LKW has in particular – in the absence of corresponding controls – no incentives to increase its efficiency of production or to keep prices at a cost-oriented level. The undesired allocative economic inefficiencies that arise from this prejudice public welfare.

The further possibility exists that discrimination might occur to the benefit of TLI (competition problem C4), thanks to the closeness between the two undertakings and the fact that TLI is LKW's largest customer.

⁸⁹ Cf. ERG Remedies (2006), pp. 70-72.

If, however, it should transpire in practice that LKW treats individual customers less favourably or even denies access to them (competition problems C1 and C2), this would be evidence that LKW also has incentives to adopt the other forms of behaviour that have been mentioned which restrict competition. LKW and TLI would then have to be regarded as an integrated undertaking sharing incentives to adopt behaviour that tends to restrict competition for the purposes of the problems for competition and as regards the regulatory measures that respond to them, irrespective of formal structural and ownership arrangements.

The choice and evaluation of regulatory options (Chapter 7) as well as the operationalization of the regulatory instruments (Chapter 8) are limited in the following to the situation prevailing after 1 January 2007, because by their very nature the imposition of measures is only relevant for the future. We shall proceed for the time being from the assumption of sufficient vertical separation between LKW and TLI. We shall thus in the following address remedies related to LKW and particularly competition problems C3 and C4.

6 Regulatory instruments

6.1 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 physical access, only the provisions in Arts. 34 to 38 VKND and Art. 43 VKND are relevant for purposes of further discussion.

6.2 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/EC⁹⁰ and Art. 17(2) of the Universal Service Directive 2002/22/EC⁹¹), 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/EC⁹²) the ERG⁹³ 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.⁹⁴ These four principles are presented in the following passages. 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 competition concerns identified in the market analysis, to be apposite and necessary for its resolution, and to represent the least onerous 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.

⁹⁰ 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).

⁹¹ 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).

⁹² 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).

⁹³ 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 regularly attend ERG meetings.

⁹⁴ ERG Remedies, 2006: "Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework", ERG (06)33, http://erg.ec.europa.eu/documents/docs/index_en.htm, pp. 51-67.

6.2.1 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 least onerous 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.

6.2.2 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.⁹⁵ 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.

6.2.3 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.

⁹⁵ 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).

6.2.4 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 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.

7 Choice and assessment of regulatory options for the physical access market

The starting point in selecting the most appropriate regulatory instruments is the problems for competition identified in Chapter 5: *Refusal to provide access (C1), excessive pricing (C2 + C3) and applying non-pricing parameters in a manner that hinders competition (C4)*.

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

7.1 General remarks on the selection of regulatory options

Regulatory instruments will accordingly be selected and evaluated in the light of the principles mentioned above. Firstly, the regulatory instrument (or combinations of them) 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 least onerous 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.

The problems for competition identified in Chapter 5 are of such a kind that 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) is much less pertinent than Principle 2 (Where the infrastructure of the market-dominant undertaking cannot be replicated, the exercise of market power vis-à-vis consumers must be prevented): This is because the establishment of a network infrastructure is associated with high sunk costs. Apart from this, there is in general a high subadditivity of costs in the case of access networks, producing high structural barriers to market entry and preventing potential competition from developing on the market for physical access (also in the foreseeable future). The market for physical access is not a contestable market, and one can therefore proceed from the premise of the existence of a resistant natural monopoly (see Chapter 4.6). Owing to this, the primary aim in imposing remedies cannot be to promote competition on the market for physical access itself, but must be the removal of the problems for competition determined in the

market analysis as well as the negative consequences for competition on downstream markets, particularly to retail customers.

7.2 Access

The problem of market power being leveraged vertically from the market for physical access on to the corresponding retail markets can be removed most quickly through ensuring access to an appropriate wholesale product. Unbundled or shared access to the subscriber line can reduce the barriers to market entry on retail markets substantially and assist (existing or new) instances of market entry and thereby increase competition. So far as LKW's national access networks are concerned, these are infrastructures that are not easily duplicated (see Chapter 4.6.3). An obligation to provide access does not, however, appear to be necessary because it is not necessary to counteract vertical leveraging of market power on the retail market or otherwise downstream from unbundling in the value chain due to the absence of such activities on the part of LKW.⁹⁶

The fundamental object of an obligation to provide access (Art. 37 VKND) is to prevent refusal of access/interconnection (denial of access; competition problem C1) and – if a particular variant of access does not yet exist – to specify the conditions of access/interconnection (for the wholesale product). For this reason Art. 37 VKND contains detailed provisions as to which obligations related to access can be imposed upon an undertaking (technical interfaces, collocation, etc.). The obligation to provide access is an effective instrument for putting an end to blanket refusal to interconnect (competition problem C1) or to prevent non-pricing anti-competitive practices (competition problem C4) and is thus suitable and also necessary to ensure access to unbundled and shared local loops.

In principle one should also give consideration to the obligation of non-discrimination (Art. 34 VKND) to assure access to an appropriate wholesale product. But the obligation to provide access in Art. 37 VKND contains much more concrete dispositions on the entire matter of access. Application of Art. 34 VKND is suited rather to establishing the conditions under which access should be assured (especially non-pricing parameters; competition problem C4); these are not within the scope of Art. 37 VKND. The obligation of non-discrimination is thus to be regarded as an ancillary remedy. The complexity of the access product concerned makes a comprehensive specification imperative for regulation to be effective. A comprehensive regulatory structure to provide for unbundling (the RUO) has already established itself in regulatory practice over previous years and is also appropriate and proportionate in relation to the measures to be adopted under the present procedure.

⁹⁶ Cf. ERG Remedies (2006), Part 5.2.

7.3 Price

As was ascertained in Chapter 5.2 LKW has an incentive to charge excessive prices. It must be assumed that LKW can increase its profits when it raises its price above costs because it cannot be expected that it will suffer a corresponding loss of turnover, which is why it also has an (economic) incentive to behave in that manner (competition problem C3). LKW furthermore has no incentives as monopolist for the supply of fixed line connections – in the absence of corresponding controls – to improve the efficiency of production. In this way the public welfare will be impaired through the undesirable economic allocative inefficiencies that arise. Price control is therefore required.

7.3.1 Controls on charges 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 market risk. 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 costs and an appropriate return on investment. The Office for Communication can impose upon the undertaking a cost accounting system 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 the allocative inefficiencies (excessive prices) in connection with competition problem C3; an efficient access price will ensure that no excessive profits are gained from this service. Such an obligation also corresponds – in line with principle 1 – to the nature of the main problems of competition identified in the competition analysis, most particularly the problem of “excessive charges”.⁹⁷

A pricing methodology must be employed if the regulatory authority – in the context of an arbitration procedure or at its own initiative – imposes access tariffs. In this connection the following are relevant:

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

⁹⁷ Cf. In this regard also ERG Remedies 2006, p. 108 *et seq.*

7.3.2 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). LKW has sole control over infrastructure that is not easily duplicated on the market and thus enjoys high market power. Depending on which cost-accounting method is used, imposition of cost-oriented prices can, though, involve a great deal of effort and be highly intrusive for the undertaking concerned.

The allocative distortions that have been determined to constitute a problem for competition stand in close relation to the incentive to raise access tariffs above the competitive level (competition problem C3). A primary goal for regulation must therefore be to correct this market deficiency and to establish tariffs 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 plus a mark-up for common costs and overheads. 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 exits, 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 leaves retail customers worse off.

The best approximation to this “correct price” from an accounting point of view is the long-run average incremental cost (LRAIC). LRAIC comprises the incremental costs for the handover of a local loop plus a mark-up for overheads. It takes account of the investments an efficient operator would make as well as an appropriate (i.e. fair market) yield on capital invested in light of the associated risks.

Art. 38(2) VKND allows the Regulatory Authority to prescribe a cost accounting system for this purpose that is independent of that of the undertaking concerned so as to ascertain what the costs of efficient service provision are. Bottom-up engineering models are well suited to the efficient design of access networks’ 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 lapse of time in order to establish access tariffs. 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.

Historical full cost accounting is a simpler cost-accounting model and should thus 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. One should also emphasize that where the underlying infrastructure is not replicable (Principle 2) and the historical costs of production are lower than current construction costs – as is the case with the twisted pair copper access network and the CATV access network – this method will lead inherently to a lower cost base than the LRAIC approach. Because running costs for maintenance and extension of the infrastructure go to the actual costs in a full cost accounting system, the right incentives are in principle⁹⁸ nevertheless produced for the regulated undertaking to conduct maintenance and extension works. This provides in particular the right incentives for LKW's planned roll-out of optical fibre in the access network.

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 to disclose higher costs, it is necessary for the Regulatory Authority to identify any inefficiencies and to make a deduction for them. Benchmarking in particular should be taken into consideration for the identification of such inefficiencies and this is described below (see Chapter 7.3.4).

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 (excessive prices). In light of those problems and applying Principle 2, the imposition of cost-oriented access tariffs is hence an appropriate and necessary measure.⁹⁹ Instead of employing a bottom-up engineering model applied by the Regulatory Authority – which in the view of the Office for Communication would be clearly disproportionate both in relation to the size of the market and the operators in light of the required resources and time – an obligation of cost-oriented provision of access to the local loop should be imposed based on historical full cost accounting. Benchmarking should be used as an ancillary method, for the identification of inefficiencies.

7.3.3 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). This method is not suitable for bringing excessive access prices down to a cost-oriented level and is therefore

⁹⁸ Should the historical full costs in a field where there are significantly rising prices offer insufficient incentive for plough-back (for maintenance of the enterprise as an ongoing concern), one may need to employ a nominal rate of interest for capital costs (at historical costs of acquisition). This would include a specific adjustor for inflation that takes account of price development for input factors.

⁹⁹ Cf. In this regard ERG Remedies 2006, pp. 73 *et seq.*

primarily relevant for markets on which excessive prices will be eliminated in the foreseeable future through self-sustaining competition developing (principle 3).¹⁰⁰

Retail-minus complies with the requirement of non-discrimination as regards pricing and is suited to countering margin squeezing (competition problem C2), as earlier remarked, but is not useful for responding to competition problem C3.

7.3.4 Benchmarking

With the third method for determining prices, benchmarking, comparative values are used. Such a comparison can be performed by consulting the prices on national and international markets¹⁰¹ for comparable services. Care must be taken when making the comparison to ensure the comparability of markets drawn on and if necessary to compensate, in establishing the access prices that will be imposed, for salient differences in the services that are being compared (differences in costs, in network capacity, in technology, in country-specific price levels, etc.). 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 possible for example in the market entry phase, when the undertaking concerned will experience falling average costs (and/or rising returns to scale).¹⁰²
- And/or if a sufficiently sound statistical basis exists for price comparison and thus the market-dominant undertaking's prices (costs) can be estimated.

The last sentence of Art. 38 (2) VKND foresees that the Office for Communication can, for the establishment of cost-oriented prices, consider prices on comparable markets that have been opened up to competition. This comparative, international methodology for determining charges is referred to as benchmarking. The main advantages of this methodology that one may cite are the minor level of intrusion for the undertakings

¹⁰⁰ Cf. In this regard ERG Remedies 2006, p. 78.

¹⁰¹ See the last sentence of Art. 38(2) VKND.

¹⁰² 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.

concerned, the relatively low effort involved, and rapidity in determining the relevant charges as well as their transparency and reliability.

If a cost-accounting model is employed by an undertaking subject to an obligation of cost-orientation for the purpose of determining prices, an incentive will arise to disclose costs that are too high. Due to lack of competitive pressure, the undertaking has furthermore no incentive to provide its services through deploying resources efficiently. X-inefficiency (e.g. the danger of gold plating) occurs. In order to identify such inefficiencies and disclose excessive costs and to impede them both, international benchmarking should be used in Liechtenstein as an ancillary method for determining cost-oriented access tariffs.

This instrument fulfils, in the view of the Office for Communication, the principle of proportionality¹⁰³ and ought therefore to be appropriate¹⁰⁴ as an ancillary measure for controlling excessive prices (competition problem C3).

7.3.5 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).

7.3.5.1 Price discrimination

One must assess alongside the “non-pricing” dimension of the obligation of non-discrimination (see Chapter 7.4) 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 access partners (external discrimination);
- b) The market-dominant access network operator discriminates between itself and access partners (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 LKW is, as a market-dominant undertaking, 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 market-dominant undertaking grants its access partners the same conditions beginning from the same point in time.

¹⁰³ In accordance with Art. 33 VKND.

¹⁰⁴ Cf. In this regard ERG Remedies (2006), p. 73 *et seq.*

The prohibition of external (price) discrimination (case (a)) is not capable, however, of resolving competition problems C2 and C3 since the market-dominant undertaking's freedom to determine prices is not restricted by such an 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 more influence on the (external) level of access tariffs 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 squeezing 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 (competition problem C2). If the undertaking with significant market power rents local loops to its competitors on the retail market at a higher price than at the internal costs that arise for itself (and which will implicitly be absorbed internally), it will expose its competitors to a margin squeeze. It will be impossible for its competitors, no matter how efficient they are, to be as competitive and for them to sell retail products as profitably as it does. In this way the access network operator is in a position to leverage its market power on the market for physical access on to the retail market (for broadband access, voice telephony access). This can be prevented by imposing an obligation of non-discrimination. Concretely, the access network operator would be obligated to sell unbundled local loop access services 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 within the framework of the obligation of non-discrimination is suited to putting an end to competition problem C2. This instrument is not, however, appropriate for resolving the problem for competition of prices that produce allocative inefficiency (excessive pricing – competition problem C3).

Before the end of 2006, an internal prohibition of discrimination would have been indicated in respect of LTN as an instrument against margin squeezing. Looking to the future, however, because LKW has been the holder of the local loop from 1 January 2007 and has no retail arm that is active on the retail market, the risk of market power being leveraged has disappeared. It is hence not necessary to impose a prohibition on internal discrimination or to carry out a margin-squeeze test.

Provided that LKW in future neither becomes active on the retail market nor is to be regarded as an associated undertaking with TLI, it is therefore only necessary to oblige LKW to treat all access partners in the same way, that is, to impose an external prohibition of discrimination.

7.3.5.2 Discrimination in relation to quality

By assuring access to infrastructure that can only be duplicated with great difficulty and by establishing a cost-oriented access price one will have in principle created the prerequisites for equal conditions for 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.¹⁰⁵ Using non-pricing parameters in this manner would thus offer the possibility of practising foreclosure to the undertaking with significant market power, that is, by refusing in effect to provide access (competition problem 4).

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 physical access to network infrastructures is a complex product 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

¹⁰⁵ Cf. ERG Remedies (2006), part 2.3.1.2.

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.

Because LKW – by contrast with LTN until the end of 2006 – is not a vertically integrated undertaking, there is, under a forward-looking perspective, no danger of alternative providers being hampered through non-pricing parameters. If – for whatever reason – LKW were to give preferential treatment to a wholesale customer, in particular TLI, with respect to the latter's competitors, there would then be insufficient vertical separation. Competition problem C4 would come to the fore in such a case. An obligation of non-discrimination can counter this problem for competition effectively.

Since unequal treatment would make the existence of competition problem C4 obvious and one would have to call for imposition of an obligation of non-discrimination to address it, it will be unimportant for the undertaking in question whether such an obligation is imposed beforehand formally at the level of sectoral regulation. The imposition of such an obligation of non-discrimination is therefore in any case proportionate.

The implementation arrangement to the consolidation agreement between LKW and LTN contains, at the private law level, a requirement of non-discrimination. For the Office for Communication to impose the same kind of regulatory obligation cannot perforce be seen as an additional burden and is therefore proportionate.

7.3.6 Accounting separation and the obligation of non-discrimination

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) 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 case the necessary information in the relevant market, namely prices at the product level, cannot

be made sufficiently transparent by means of these obligations, a dual obligation under Art. 34 VKND and Art. 36 VKND will not be suitable 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 so 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).

The obligation of non-discrimination together with the obligation of accounting separation is suited to resolving competition problem C2. This instrument is, however, not appropriate for remedying the problem for competition of pricing that leads to allocative inefficiencies (excessive prices – competition problem C3). 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.

7.4 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 nature of problem that has emerged and be commensurate and justified in light of the regulatory principles of Art. 5 (2) KomG.

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 see whether they represent the least onerous form of intervention while still being capable of remedying the problems of competition that have been ascertained.

When evaluating measures for their proportionality in its narrow sense, the reasonableness of measures and their degree of intrusiveness must finally be considered. Particularly the imposition of an obligation to provide access only as a contingency (as a measure with a condition precedent – *Eventual-Massnahme*) and the selection of historical full cost accounting aided by benchmarking for ascertaining cost-oriented access tariffs – instead of the intrusive and effort-intensive bottom-up LRAIC model – act as guarantees for this. The other measures which are to be adopted, namely the imposition of obligations to ensure non-discrimination and transparency constitute *per se* minor encroachments in an operator's private autonomy and are accompanied by low implementation costs for the undertaking concerned. In any case access to the twisted pair local loop is already subject to regulation: cost accounting systems have already been implemented and reference offers published.

7.5 Conclusion

Under a forward-looking perspective for LKW as holder of all nationwide passive access infrastructures and as a sufficiently (vertically) separated undertaking from LTN and now TLI since 1 January 2007, the only significant problems of competition are potentially excessive prices (competition problem C3) and potential (external) discrimination (competition problem C4). In this connection it is only the discussion regarding cost-oriented charges (Chapter 7.3.2), benchmarking (Chapter 7.3.4) and the obligation of non-discrimination (Chapter 7.3.5) that is relevant. ECPR pricing, a margin-squeeze test and accounting separation in combination with the obligation of non-discrimination can only be employed in the case of vertically integrated undertakings.

Suitable regulatory instruments (price controls by means of cost-oriented charges assisted by historical full cost accounting; benchmarking as an ancillary measure; the obligation of non-discrimination; the obligation of transparency including a reference offer and accounting separation) can therefore operate to counteract the competition concerns of charging excessive prices and practicing discrimination associated with the exercise of market power vis-à-vis customers.

As concerns LKW the following measures are therefore apposite and indicated to meet the competition problem of excessive prices (C3):

- price controls (Art. 38 VKND) by means of cost-oriented prices, based on historical full cost accounting; and
- benchmarking (Art. 38(2) VKND) as an ancillary measure; and
- accounting separation (Art. 36 VKND) as an ancillary measure.

In order to ensure that LKW does not give preference to particular wholesale customers, in particular TLI (competition problem C4), the following measures are apposite and indicated:

- an obligation of external non-discrimination (Art. 34 VKND); and
- the publication of a reference offer (Art. 34(3) VKND); and
- an obligation of transparency (Art. 35 VKND).

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 scope of the market definition of the market for physical access. New products, development only in future but which 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.

8 Operationalization of regulatory instruments for the market for physical access

Under a forward-looking perspective for LKW as holder of the passive local loop infrastructure and as a sufficiently (vertically) separated undertaking from TLI, the only significant problems of competition are potentially excessive prices (competition problem C3) and potential discrimination (competition problem C4).

Price controls are in principle appropriate with respect to LKW by means of cost-oriented prices in order to remove the problem for competition (C3); benchmarking and accounting separation should be used as ancillary measures.

The problem for competition of potential discrimination (C4) can be remedied by an obligation of non-discrimination that includes the obligation to publish a reference offer as well as by an obligation of transparency.

The following amplifications can be made to the measures discussed in Chapter 7:

8.1 Unbundled and shared access to the subscriber loop

Although LKW has been the holder of the nationwide twisted pair copper and CATV access networks (as well as a fibre-optic access network currently being rolled-out) – all of which are infrastructures not (easily) duplicable – it would seem that the imposition of an obligation to provide access is not necessary because there is no vertical leveraging of market power to be counteracted – in the absence of any foreseeable activity by LKW on the retail market or at a point further down in the value chain from unbundling and shared access.

Were LKW, contrary to expectation, to become active directly or indirectly on the retail market or downstream from unbundling or shared access in the value chain or if it were to deny access, partially or entirely, to unbundled or shared local loops or to additional services associated with them, the Office for Communication will simply impose access to the relevant infrastructures on the basis of the present market analysis and fact-finding it undertakes. The imposition of such an obligation to provide access is thus already contemplated in the present procedure as a measure with condition precedent (Eventual-Massnahme) and will not require a fresh market analysis.

The requirements as to the conditions under which unbundling in the copper access network is to be assured have to conform at least to the standard specified in Annex II to the Access Directive 2002/19/EC and in the Unbundling Regulation (EC) No. 2887/2000.

Reasonable requests for access to copper local loops (full access), including shared access and access to sub-loops (partial unbundling) and the services under the Annex which are necessary for it (e.g. collocation, backhaul, etc.), are in principle to be accommodated. The

Office for Communication should be called upon to rule on questions regarding the reasonableness of a request that is not within the scope of a reference offer.

The conditions under which access is to be assured (in particular regarding technical matters and those concerning technical implementation but also concerning provision supply time limits and contractual penalties) must be aligned with previous decisions of the Office for Communication, that is, particularly the relevant content of the most recent unbundling requirements and the content of the last approved LTN reference offer. This will provide, in principle, continuity of the essential factors governing unbundling of the copper local loop and thereby be of decisive importance for access partners' planning security. Access partners entering into or having an unbundling agreement with LKW should never be placed in a worse position with respect to past measures or agreements. As a matter of principle, frequency/channel unbundled access (Shared Access) to the CATV distribution network and the physical/optical (Full Access) or frequency unbundled access (Shared Access) to the fibre-optic access network, where this is already rolled-out, as well as access to necessary associated services shall continue to be made available. The Office for Communication can be called upon with regard to questions of reasonableness of requests for access that are not covered by a standard reference offer.

When unbundled and shared subscriber lines are being made available it will also be of essential importance to wholesale customers that they have associated services available to them. These include first and foremost collocation and backhaul. Collocation connotes, alongside the provision of the necessary space associated with unbundled and shared lines, also availability of numerous technical facilities like connection panels, tie cables, hand-over distribution frames, power supply, air conditioning etc. Because the wholesale customer has to route the traffic generated by its unbundled and shared local loops, it will need a connection to its own network to do so (backhaul). While it is true that it could lay its own lines for this purpose, this can only be anticipated in particular instances owing to the absence of economies of scale. The wholesale customer will therefore be reliant on the wholesale provider's backhaul services. Backhaul could be realized, for example, over leased lines or etherlink products. In so far as any of the individual associated services are attributable to another market than the present one being regulated, the specific regulation is referred to that is applicable to the services on those markets.

As to the preparation and assessment of the conditions under which unbundled and shared local loops are to be made available to access partners, the Office for Communication bases itself upon the *Principles of implementation and best practice regarding LLU of the Independent Regulators Group (IRG PIBs on LLU)*.¹⁰⁶ The principles laid down in them, that must particularly be taken into account in the interest of harmonization throughout Europe, concern the making available of information and the access to or the establishment of information systems, service level agreements including

¹⁰⁶ IRG: "Principles of implementation and best practice regarding LLU", last amended May 2002, <http://www.irg.eu/admin/attachs/176.pdf>.

time limits (e.g. for provision, fault handling etc.) as well as key performance indicators (KPIs), rationing rules in case of scarcity of collocation space, and obligations of attestation regarding non-availability of collocation space and connection panels on the main distribution frame.

All of the measures that have been mentioned appear to be necessary in order to prevent an economically undesirable increase in transaction costs.

8.2 Price controls

Although undertakings ought in principle¹⁰⁷ 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 upon cost-oriented charges as concerns access tariffs in particular. A simple obligation, such as to introduce cost-oriented prices, without simultaneously also setting the charges 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 market for physical access.

One must also consider the ensuing effects of cost accounting and charge control measures across and between different 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 ensure 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.

A possible margin squeeze that is exercised in respect of unbundling must therefore be investigated as the occasion arises. Because unbundled and shared loops are in practice solely used¹⁰⁸ for broadband connections, it is obvious that examination of a reference offer for broadband access at the wholesale level in the framework of a retail-minus investigation should also scrutinize the question of a margin squeeze in regard to unbundling and shared use.

8.2.1 Cost-oriented prices

LKW has sole control on the market for physical access over infrastructure that is not easily duplicated and – in the absence of countervailing buying power – this brings with it a high degree of market power. It hence has an incentive to raise access tariffs above the

¹⁰⁷ Cf. Recitals 5 and 6 and Art. 4 of the Access Directive 2002/19/EC.

¹⁰⁸ A margin-squeeze test is also to be applied as occasion requires in regard to unbundled subscriber lines if these wholesale products are also deployed as leased lines or as terminating segments of leased lines.

competitive level (competition problem C3). The main aim of regulation must therefore be to correct this deficiency in the market and to set access tariffs at the level of the competitive price. Instead of using a LRAIC model based on a bottom-up engineering approach and imposed by the Regulatory Authority – which in the view of the Office for Communication appears inappropriate in light of the necessary resources and time it would consume – the obligation of cost-oriented provision of physical access to twisted pair copper, CATV and fibre-optic subscriber lines and of associated services thereto should be based upon historical full cost accounting.

If such a cost-accounting model is operated by the undertaking subject to the obligation to set cost-oriented prices, an incentive will arise to display (too) high costs. The undertaking also has no incentive to provide the services by means of efficient use of resources, due to the lack of competitive pressure. The danger of gold-plating and other inefficiencies then emerges. In order to be able to ascertain and impede this, as well as the statement of excessive costs, the Office for Communication envisages employing benchmarking in an ancillary role in order to be able to revise as appropriate the cost data LKW presents. This will also relate to various parameters that are important for cost accounting, such as the period for depreciation and interest on capital costs.

LKW is not allowed to give preferential treatment to any wholesale customer and must supply all its services – also in respect of the prices and costs to be calculated for them – under non-discriminatory conditions (equal treatment under equal conditions). Discounts must not be granted.

The associated services are to be subject to computation in a transparent manner on the basis of predefined cost-oriented charges or cost estimates that are dependent upon effort expended and which have been approved by the Office for Communication.

LKW is thus also to be obligated to offer backhaul services at such prices in its standard reference offer that will allow the wholesale customer to offer competitive retail products. This is subject to any specific measures of special regulation in other markets in relation to individual backhaul services.

8.2.2 Monthly rental charges for copper loops by international comparison

As explained in Chapter 7.3.4 international benchmarking is to be employed as a supporting methodology for the establishment of cost-oriented access tariffs in Liechtenstein. The question of comparability arises in this connection, especially as to whether the same scope of service is attached to the respective prices. As concerns monthly rental fees for the availability of copper twisted pairs, one can in any event assume that the investment costs in the form of depreciation and capital costs as interest on the tied-up capital are contained in the unbundling prices which are used for comparison among the EEA States that are referred to. The situation may be different for dealing with costs such as for servicing, maintenance and fault-clearing. Some of these services are included in the monthly rental fee in some Member States, while in others these services are charged for according to the effort involved as the occasion arises. Since

there is, however, no detailed information on this, one can only draw upon the charges which are given for international comparison in the sources that are available. The potential mistakes that can be made in this manner should, on the other hand, be sufficiently small to be able to disregard them, because in an investment context excavation costs represent by far the largest segment of costs in access networks and thus depreciation and capital costs compose the bulk of the monthly fees. A direct comparison of monthly rental fees is hence admissible and justified.

Analogous to the above considerations with regard to twisted pair copper loops apply in principle to the charges for physical access to the fibre-optic access network and CATV access network once and to the extent that such comparative data for these access infrastructures becomes available.

As far as twisted pair copper loops are concerned, the European Commission states in its 14th Implementation Report¹⁰⁹ an EU average at October 2008 of 9.28 EUR (14.48 CHF)¹¹⁰ as the monthly rental fee for fully unbundled local loops (full access) and 2.62 EUR (4.14 CHF) for shared use (shared access).

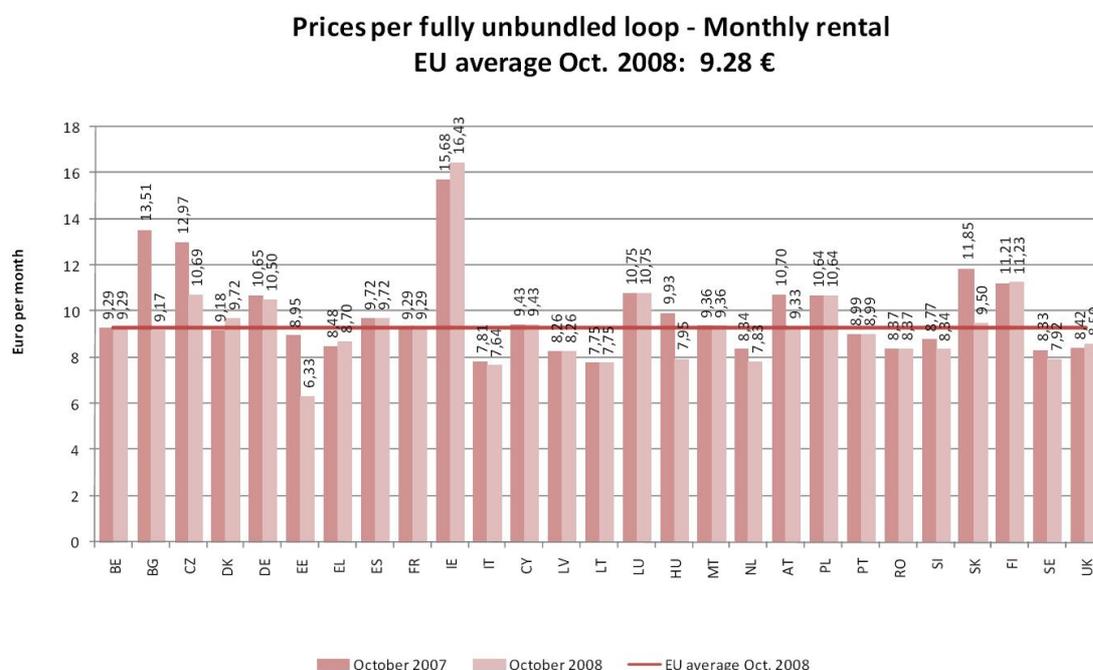


Figure 8-1: Average monthly rental fee in the EU for full access¹¹¹

¹⁰⁹ Progress Report of the European Commission on the Single European Electronic Communications Market 2008 (14th Report), SEC(2009) 376.

¹¹⁰ A European Central Bank exchange rate of 1.5818 CHF/EUR at 1 October 2008 is employed for reasons of comparability with the European Commission's data from October 2008 that were collected and expressed in Euros.

¹¹¹ *Staff Working Document (Volume 2)* to the 14th Progress Report of the European Commission on the Single European Electronic Communications Market 2008, SEC(2009) 376, p. 122.

Prices per shared access - Monthly rental EU average October 2008: 2.62€

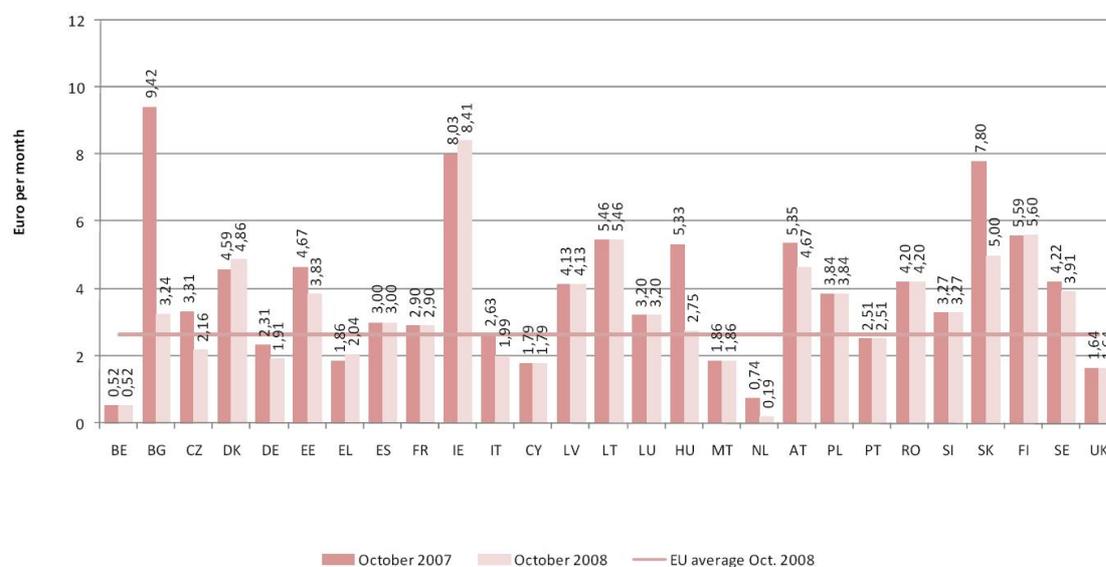


Figure 8-2: Average monthly rental fee in the EU for shared access¹¹²

The EU average at October 2008 for a one-time connection charge for a fully unbundled local loop was 57.54 EUR (91.02 CHF) and that for shared access was 54.17 EUR (85.69 CHF).

Prices per fully unbundled loop - Connection EU average Oct. 2008: 57.54 €

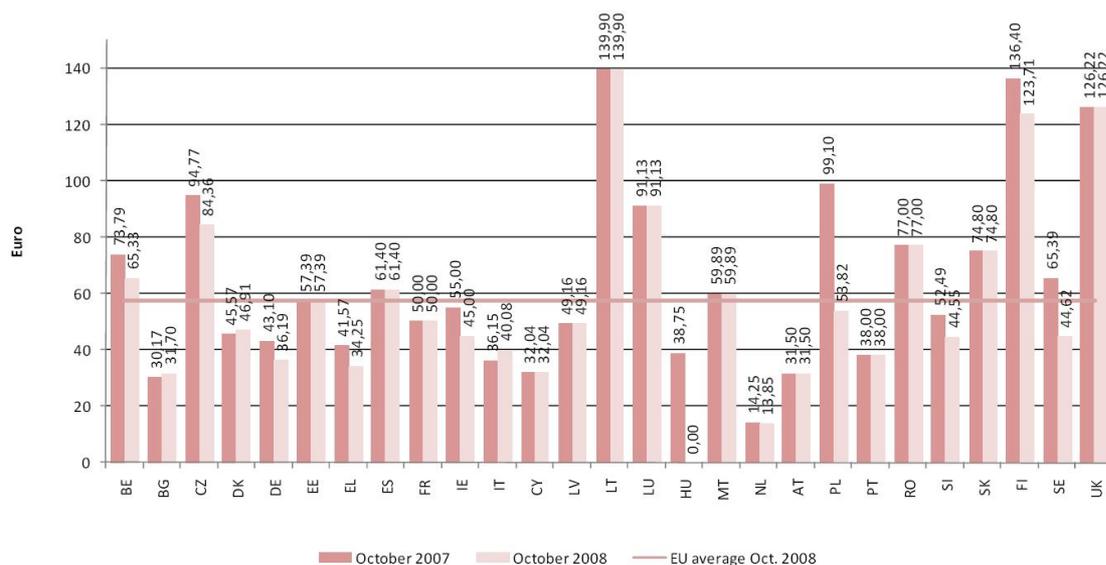


Figure 8-3: Average one-time rental fee EU for full access¹¹³

¹¹² Ibid, p. 124.

¹¹³ Ibid, p. 121.

Prices per shared access - Connection
EU average October 2008: 54.17€

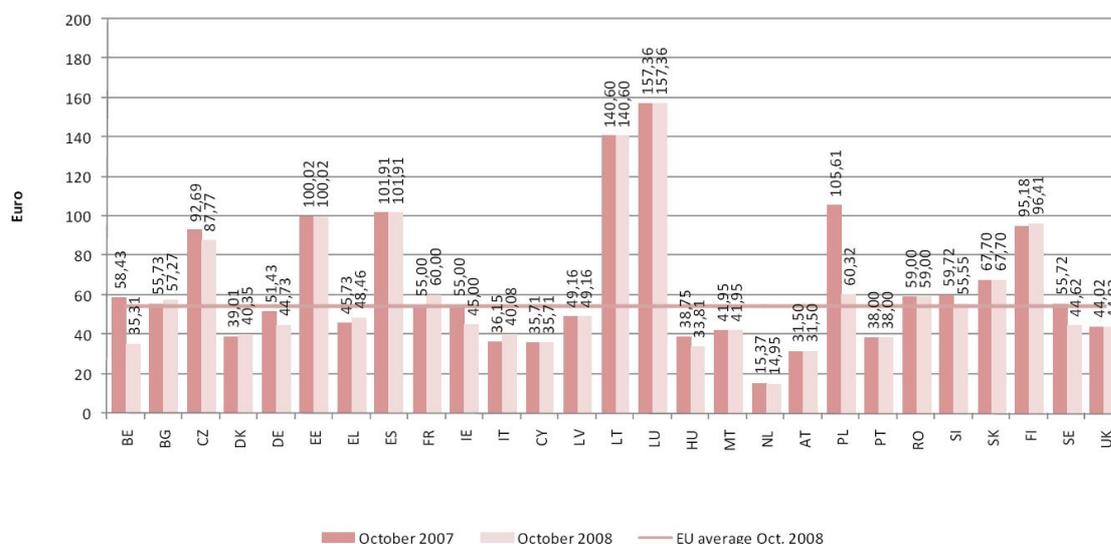


Figure 8-4: Average one-time rental fee EU for shared access¹¹⁴

By comparison, the monthly rental fee in Liechtenstein for a fully unbundled copper local loop (2-wire) is 16 CHF (10.12 EUR), based on the last RUO to have been approved (the LTN RUO - V1.7.1 of 01.07.2006). No separate price is given in the reference offer valid up to today for shared access. The one-time installation charge for unbundling under the RUO is 320 CHF (202.30 EUR). LKW has proposed a one-time rental fee for all types of twisted pair copper loop unbundling of 200 CHF (126.44 EUR) in its draft RUO submitted to the Office for Communication for approval on 28 September 2007 – whose consideration has been suspended by the Office for Communication until the conclusion of the present special regulation procedure. The proposed monthly charges remain unchanged.

If one compares the European Commission's average price for the EU at October 2008, which is calculated on the basis of validated data of the relevant National Regulatory Authorities, with the current charges that apply in Liechtenstein for access to the copper local loop, this shows that the monthly rental fee in Liechtenstein is higher by 9%. The one-time fee for the initial provision of unbundling is 252% – or 120% under LKW's proposal – more than in the EU. While the current monthly rental fee is around one-tenth above the EU average, the one-time set-up charge is twice respectively three times more expensive in Liechtenstein.

By comparison the currently applicable charges in Switzerland for the one-time provision of fully unbundled copper local loops are 99 CHF for an already active line or 79.60 CHF for an inactive one.¹¹⁵ Under its decision of 22 September 2008 the Swiss Federal

¹¹⁴ Ibid, p. 123.

¹¹⁵ Cf. Swisscom (Schweiz) AG's price list, applicable from 1.8.2008 (Version 1-4); <http://www.swisscom.com/ws/products/FMGProdukte/TAL/index.htm>.

Communications Commission (ComCom) set new unbundling prices for the incumbent, based on a LRIC cost-accounting model. These are 45.21 CHF for the one-time provision of an active line connection and 18.18 CHF for the monthly rental of local loops.¹¹⁶

In assessing cost orientation within the framework of the upcoming approval of LKW's Reference Unbundling Offer, the Office for Communication – in order to avoid undesired inefficiencies in the provision of service – will base itself on the applicable EU average values for the one-time and monthly unbundling tariffs respectively. In so far as comparable values exist, benchmarking will equally be applied to the access to fibre-optic and CATC access networks and associated facilities.

8.2.3 Provisional determination of access charges to copper local loops

The following charges should apply for the core unbundling services in the twisted pair copper access network until presentation and final approval of a cost-accounting model that is compliant with requirements and of an LKW reference offer based on it:

	One-time rental fee	Monthly rental fee
Full Access		
2 wires	100 CHF	16 CHF
4 wires	100 CHF	28 CHF
8 wires	100 CHF	52 CHF
16 wires	100 CHF	100 CHF
Shared access		
2 wires	100 CHF	0 CHF / 16 CHF ¹¹⁷

Table 8-1: Provisionally determined access tariffs in the twisted pair copper access network

The above charges will be considered in the framework of the approval of LKW's reference offer. The charges will be reviewed and, if necessary, be adjusted upon submission of LKW's cost-accounting model.

In setting the above monthly rental fees for shared access to the copper local loop the Office for Communication will place the retail customer at the centre of its focus: It should on the one hand be ensured that the costs of local loops are fully covered according to the

¹¹⁶ Cf. The press release of the Swiss Federal Communications Commission (ComCom) of 24 September 2008 and the Decisions addressed to Swisscom (Schweiz) AG of 9 October 2008, available under: www.comcom.admin.ch.

¹¹⁷ If, for purposes of shared access, voice telephony service has already been established and is in operation on an access line that is to be unbundled, then no (additional) monthly charge is to be charged for use of the higher frequency spectrum for high bitrate services. Only in cases in which the lower band is not used for voice telephony services will an appropriate monthly rental fee be payable.

cost-accounting standard that is imposed, but on the other hand it should be avoided that the retail customer¹¹⁸ is charged above these costs or more than once.

Under this approach the costs of a subscriber line that is already used for voice telephony will be fully covered at 16 CHF/month. No extra costs for the voice telephony provider arise that need to be covered for the additional use of the higher frequency spectrum of the subscriber line for broadband service. If one were – as TLI proposed in its comments of 27 June 2008 – to charge a further 12 CHF/month (or any other mark-up) for shared or additional use of the line for broadband access, there would then be an excess above the actual costs of the line connection. In order to avoid the retail customer paying too much in such a case, the retail customer would have to receive a monthly credit or reduction of the connection charge for its existing voice telephony connection of the same amount and would instead be billed the same amount per month by the (alternative) provider of the broadband access. Otherwise, the retail customer concerned would be in a worse position, because it would be paying more than the real costs for its subscriber line.¹¹⁹

The adjustment payments that have just been mentioned would in this case either have to be balanced between TLI and the alternative operator directly or by including LKW in the balancing or through separate settlement respectively. For the retail customer who is concerned the danger arises with both variants that the corresponding savings in costs will not be (fully) passed on to the customer. To avoid such a complicated settlement system and to protect retail customers the Office for Communication therefore envisages a much simpler and more transparent system under which the entire monthly rental costs for the local loop are attributed either to the voice telephony access or to the broadband access, depending on whether voice telephony access (already) exists simultaneously or only broadband access is provided over the subscriber line.

Those (one-time) costs which arise for the set-up and provision of shared access have in any case to be borne by the alternative provider and simply will not arise for TLI as provider of voice telephony services but will do for LKW as provider of shared access. TLI also appears to assume this, judging from the current published version of its RUO (Reference Unbundling Offer V3.0 status: 01.01.2008, p. 52 *et seq.*), that is, that for shared access the alternative provider will provide the splitter at its hand-over distribution frame and will return the lower frequency spectrum of the subscriber line back to TLI at its switch for provision of the voice telephony connection. Furthermore, it is foreseen in the RUO which LKW submitted for approval on 28 September (at pages 38 and 42) that, in the case of shared access, the monthly rental fee is to be collected from the access partner that uses the base band (the lower part of the spectrum on the subscriber line) or has the

¹¹⁸ Or in first place the alternative operator that will then have to pass on these costs to retail customers (due to competition at the retail level with TLI).

¹¹⁹ It should be mentioned in addition that in the case of the approach suggested by TLI the extra 12 CHF/month for use of the higher frequency spectrum on the local loop would also have to be charged internally and vis-à-vis the operator's own retail customers in order to avoid discrimination where TLI provides both a voice telephony connection and a broadband connection. The customer would in other words be charged for its voice telephony connection and there would be additional costs for the broadband connection.

“voice telephony subscriber relationship”. LKW seems therefore also to be proceeding in accordance with the charging system proposed by the Office for Communication and does not foresee an additional monthly charge.

8.2.4 The access charges for CATV and fibre-optic access networks

The access to CATV and fibre-optic access networks does not fall within the scope of application of the Unbundling Regulation and – for this reason – there has so far not been any specific access or tariff regulation in place in Liechtenstein with regard to these infrastructures.

There is (currently) no benchmarking data available for the physical access to these access infrastructures, which now form part of the relevant product market at hand, such as is the case for access to the copper local loop. Also, access to these infrastructures has not yet been part of an approved standard offer. In the present procedure no preliminary determination of access tariffs is therefore made and the determination of cost-based charges is left to the approval of LKW’s relevant cost accounting model and standard reference offer by the Office for Communication.

8.3 Obligation of non-discrimination and the standard reference offer

Physical access to the subscriber loop in the twisted pair copper, CATV and fibre-optic access networks of LKW, including physical (electrical/optical) fully unbundled access, shared access and access to sub-loops (partial unbundling) as well as access to the necessary associated services (e.g. collocation, backhaul etc.) are to be provided on a non-discriminatory basis. The publication of a standard reference offer is required.

LKW is to assure provision to access partners of all services, information and conditions that are associated with unbundling and shared access under conditions that are of no poorer quality and are at prices that are no higher than those available to TLI or other undertakings (equal treatment under the same conditions). Discounts are not to be provided.

Where the physical access to an access infrastructure is subject to availability or capacity constraints, LKW shall ensure equal access for all access seekers under the given constraints. LKW shall ensure efficient use of scarce capacity by the access partners through adequate measures preventing improper use by an access partner to the detriment of other access partners or access seekers. An abusive use constitutes for example the demand for all or part of the unused capacity for the purpose of preventing or obstructing access of other undertakings or of measures that have the same effect.

The reference offer must contain all conditions of access (cf. in this regard Chapter 8.1). It is to be submitted to the Office for Communication for its prior approval and is to be published by LKW.

The reference offer should cover the normal case for (physical) access to subscriber loops in the twisted pair copper, CATV and fibre-optic access networks, including shared access

and access to sub-loops (partial unbundling) and the associated services that are required (e.g. collocation, backhaul etc.). Due to the current roll-out status, the planned availability of several optical fibres per access connection and the projected moderate demand during the review period, the Office for Communications refrains for the time being – for reasons of proportionality – from requiring LKW to include WLD-access (wavelength unbundling) to the fibre-optic access network in its standard reference offer.¹²⁰ All services are to be offered in a sufficiently unbundled manner so that they are organized in such a way that an access partner has only to pay for those services that it actually requires. The standard reference offer must conform to the requirements explained in Chapter 8.1.

In order to deal with the problem of customers' switching costs, details are to be provided, among other things, on the minimum contract duration, the cancellation notice period and the manner by which extension of the contact may be taken up.

LKW's submission of the reference offer for approval must take place without delay after entry into force of the duly notified decision containing the measures of special regulation. The last reference offer that has been approved will remain valid until the time of such approval.

8.4 The obligation of transparency

If access partners bring instance(s) of non-compliance with the obligation of non-discrimination to the Office for Communication's attention, the Office is in a position proactively to monitor compliance. Its observations can lead to initiation by it of proceedings to end the discriminatory behaviour. The Office for Communication can in this regard require in particular provision of the following information:

- The number of preliminary requests, requests/orders and instances of provision that have been processed in the reporting period concerned together with their respective duration;
- A list of all preliminary inquiries, requests for quotation and orders that have not been responded to positively, and of provisioning that has not been carried out, with a detailed description of the background and, as the case may be, necessary actions that are required on the access partner's side to proceed to a positive outcome;
- A full list of all collocation arrangements that are in being or have been ordered at the time of reporting, including details on their respective current status (ordered, offer made, under implementation, handed over) as well as on the respective dates of the last changes in status;
- The detailed invoices are to be provided which have been issued in the reporting period for collocation arrangements (those implemented and handed over). These

¹²⁰ However, WLD-access will have to be granted upon reasonable request if the situation arises, such as for example when fully unbundled access to the fibre-optic access network should not be possible due to lack of available optical fibres.

are to be in the same form as issued to the access partner, accompanied by details of the date of handover, the mode of collocation, the access partner concerned and the collocation location.

The transmission of these data to the Office for Communication appears appropriate for monitoring the most important aspects concerning compliance with the obligation of non-discrimination.

8.5 Accounting separation

Because LKW is not a vertically integrated undertaking, the question of accounting separation does not arise as to the separation of steps in the value chain. Rather, it is the regulated domains that ought to be separated from unregulated ones and all regulated products from each other within the regulated domain. A self-standing cost-accounting model is also to be applied for purposes of price controls. The introduction of one is in any case appropriate for LKW and not excessive.

Accounting separation must take place according to a breakdown that at least accords with the specification of markets under the Recommendation on 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:

- 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 to review the cost accounting.

The Office for Communication will specify the details for the concrete implementation.