



OFFICE FOR COMMUNICATIONS
PRINCIPALITY OF LIECHTENSTEIN

Analysis of the Market for physical access to infrastructures in the core network

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*Wholesale market for the physical access
to network infrastructures for high capacity
transmission routes in the core network*

Final version

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1 Introduction

1.1 Legal basis

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

The AK has defined the scope of the service and/or product markets that are to be investigated in the context of the market analysis in accordance with Art. 21 (1) KomG. This was done while taking into consideration the Recommendation on Relevant Markets 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.²

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

The following market analysis defines in the first place the market for physical access to infrastructures in the core network and assesses whether the three criteria for its *ex ante* regulation are a given. Following this, the question is examined as to whether competition exists in an economic sense on the market in Liechtenstein or, as the case may be, whether self-sustaining competition would prevail without regulation. Such factors and competition problems as may stand in the way of such self-sustaining competition are identified. The presence of economic market power is investigated in this connection; in particular the criteria of Art. 31(1) to (3) VKND are considered according to their relevance for the market in question. Proceeding from the determination of providers having significant market power and the identification of relevant problems for competition on the physical access market in the core network, the necessary measures of special

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

² Ordinance of 3 April 2007 on electronic communication networks and services (VKND), LGBl. 2007 No. 67.

regulation are assessed that are suited to redressing the problems for competition that have been determined.

1.2 Market analysis process

The procedure for the market analysis and the imposition of measures of special regulation consists of the following steps:

Complete process of special regulation	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	Structure and design 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 and the planned measures for review by the EFTA Surveillance Authority and the regulatory authorities in the EEA.	
	8	Imposition of any necessary measures by means of an administrative decision.	
	9	Control of the implementation and compliance with the measures which have been imposed.	

Figure 1: Overview of the overall process of special regulation

The above overview presents the process of special regulation as a whole. Market analysis in its broad sense here³ is understood to include the adoption of any necessary regulatory measures if need be, and so extends across steps 2 to 8 in the above overview.

³ One can define market analysis in its narrow sense as relating to steps 2 to 4.

1.3 National consultation

To the extent that the AK foresees the 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 AK is for this purpose empowered to hold public consultations (Art. 46 KomG in conjunction with Art. 24(1)a RKV⁴).

The consultation procedure in accordance with Art. 24(1) and Art. 46(1) KomG for the purpose of the market analysis is a non-adversarial administrative procedure *sui generis*. It serves to assess the conditions for competition and the promotion of transparency by means of early and public discussion of the measures planned by the AK. Following the consultation procedure, an adversarial special regulation procedure in accordance with Art. 23(1) KomG is conducted, in the context of which the AK imposes individual concrete "*obligations by imposition (measures of special regulation)*" on an undertaking with significant market power.

On 24 April 2013, the AK published its *ex officio* analysis⁵ of the wholesale market for "physical access to infrastructures in the core network" and invited interested parties to submit comments on the analysis and the measures of special regulation proposed in it in the context of a public consultation.

Up to the end of the consultation on 7 June 2013, comments were submitted by the following undertakings: UPC Cablecom GmbH, Newsnet Internet Services AG, Telecom Liechtenstein AG, TON Total Optical Networks Anstalt, Liechtensteinische Kraftwerke and Wasser- und Elektrizitätswerk Buchs.⁶ The AK evaluated the comments submitted in the document "Evaluation of the National Consultation Comments" from 7 August 2013.

All comments are, in so far as they are not subject to confidentiality, published on the AK's website.

The filed comments were taken into consideration when preparing the final version of the market analysis in so far as they are in the AK's view of importance and/or entail consequences. In accordance with Art. 47(1) KomG the "*participation in a public consultation [...] does not constitute any legal rights above and beyond it*".

⁴ Ordinance of 3 April 2007 on the tasks and powers of the regulatory authorities in the area of electronic communications (RKV), LGBL. 2007 No. 68.

⁵ http://www.llv.li/pdf-llv-ak-20130422_marktanalyse_physischer_zugang_kernnetz-konsultativfassung.pdf

⁶ Accessible at http://www.llv.li/amtstellen/llv-ak-marktanalysen/llv-ak-marktanalysen-konsultationen/llv-ak-marktanalysen-konsultationen-marktempfehlung_neu/llv-ak-marktanalysen-konsultationen-mkern.htm

1.4 EEA-wide consultation

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

During a first phase, the EFTA Surveillance Authority is given a period of one month to review the present draft analysis and the planned measures. If the Authority expresses a reasoned doubt as to the compatibility with the applicable 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 AK 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 submitted or the analysis of significant market power is contrary to applicable EEA law, it can forbid the AK from bringing the planned measures into force.

With regard to the structure and design of the concrete measures of special regulation *per se*, i.e. the obligations which are imposed on the providers, the EFTA Surveillance Authority has solely the competence to comment on them, not to reject them. If the EFTA Surveillance Authority does comment on a draft measure submitted, then the AK has to take its comments into utmost account.

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

1.5 Basic aspects of the market analysis

From an economic viewpoint, the position of significant market power is related to an undertaking's power to increase prices without having to suffer significant sales losses. In

⁷ Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services ("Framework Directive"; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5cl.01).

⁸ For the details of the notification procedure according to Art. 7 of the Framework Directive see also: *EFTA Surveillance Authority Recommendation of 2 December 2009 on notifications, time limits and consultations provided for in Article 7 of the Act referred to at point 5cl of Annex XI to the Agreement on the European Economic Area (Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services), in the amended version adapted by Protocol I to the EEA Agreement (2011/C 302/05)*, OJ C 302 dated 13.10.2011, page 12

⁹ <https://eea.eftasurv.int/portal/>

¹⁰ <http://www.ak.llv.li/>

accordance with the thesis of equivalence from the EFTA Surveillance Authority and the European Commission, effective competition prevails on a market when no undertaking on the market possesses a position of significant market power.¹¹

In the following market analysis, the terms "effective competition", "functioning competition", "competition that is effective" are used synonymously. "Effective competition" presupposes that the competition also exists without any *ex ante* regulation (anticipatory regulation) on this market, but taking into consideration *ex ante* regulations on other markets of relevance for this market. If the competition on one market is also not dependant on regulations on other markets, not only is the competition effective, but also self-sustaining. Accordingly in the market analysis, the conditions for competition are to be assessed as if no *ex ante* regulations affecting this market exist (this is also termed the "*greenfield approach*"). Otherwise the danger exists that effective competition is ascertained for a market although the market outcome is primarily determined by existing regulation and not by competitive forces. The consequence of this would be that (at least over the medium term) structurally driven competition deficits arise and market dominant operators abuse their position to the detriment of the customers.

1.6 Composition of the market analysis

The market analysis is composed as follows: After the general section in the present Chapter 1, an introduction to the subject matter under investigation is provided in Chapter 2. Initially, the essential developments in the markets under investigation are described before, commencing with the definition of the relevant markets from a material and geographical point of view, the products and services contained in them as well as the regulatory situation to date are presented. Likewise in this chapter, the existence of the requirement for *ex ante* regulation is assessed. The analysis of competition itself occurs in Chapter 4, in which the question of the effectiveness of the competition as well as the presence of market power is answered. Doing so, all aspects for the assessment of relevant market power indicators are examined. In section 4.8, the overall evaluation is conducted as to whether effective competition prevails on the markets under investigation, self-sustaining competition exists from an economic viewpoint without regulation, or which competition problems and factors are in conflict with this as the case may be. In the event that no effective competition prevails, the most fundamental market power abuse potentials and competition problems are then analysed and the regulatory measures that are required for redressing the competition problems that have been ascertained as the case may be are discussed.

¹¹ Cf. section 4.1.1.

1.7 Timeframe

Art. 21(2) KomG lays down that the conditions for competition in the defined markets are to be reviewed regularly by the AK. The timeframe for the present market analysis amounts to two to three years. The AK will continue to keep the markets concerned under further observation during this period and, if necessary, initiate a fresh market analysis.

1.8 Sources of data

The essential data that provide the basis for the following market analysis were collected by the AK for the years for 2004 to 2012 by means of an annual questionnaire to operators. The collection of market data takes place each year in the spring/summer in relation to the preceding calendar year. For reasons of proportionality, any collection of the requested data between these intervals is normally only conducted additionally if this seems to be indicated due to a rapid change in market conditions or by other special reasons.

No further reference is made in the following market analysis to these data or to the data collected during the survey of operators; all other external sources of data are only referred to specifically as necessary. Additionally, the AK keeps the markets in question, like other relevant markets, under constant observation. Hence the present analysis also relies on the AK's further 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 referring the matter to the EFTA Surveillance Authority or the European Commission respectively. The exception to this is the Office of National Economy 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 that Office has responsibility for the implementation of competition rules to the extent that the courts do not have jurisdiction. This responsibility is, however, essentially directed towards supporting the EFTA Surveillance Authority and the undertaking of actions by the State, and not towards the material application and enforcement of EEA competition rules.

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

¹² Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services ("Framework Directive"; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5cl.01).

2 Development of the fixed network infrastructure in Liechtenstein

The fixed network sector in Liechtenstein was characterised until the end of 2007 by three separate undertakings: LTN Liechtenstein TeleNet AG (LTN; for wholesale services), Telecom FL AG (TFL; for retail services) and LIE-COMTEL AG (for CATV services).¹³ On 1 January 2008, all three undertakings were merged into Telecom Liechtenstein AG (hereunder called "TLI") and now exist only under this name. The passive network infrastructure was transferred over the course of this restructuring from LTN into the ownership of Liechtensteinische Kraftwerke (hereunder called "LKW").

Before then, the provision of telecommunications in Liechtenstein took place up to 1998 under the PTT Treaty of 1978 between Liechtenstein and Switzerland. The network in Liechtenstein was an integral part of the Swiss telephone network (Schweizerische Post-, Telefon- und Telegrafienbetriebe or the subsequent Swisscom AG). The network infrastructure situated in Liechtenstein was provided, maintained and operated by Swisscom in the name and on the account of the Liechtenstein State. Its owner was the Liechtenstein State. In 1998, separation from the Swiss telephone network took place upon the liberalisation of the telecommunications sector and with the founding of the former LTN.

LTN was only entrusted with the operation of the network. The retail customer relationship was transferred to the former Telecom FL AG, which belonged to Swisscom, following an invitation for tenders in relation to the provision of basic services. Telecom FL was then taken over 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. TLI remains under complete State ownership.

Before integration into TLI at the beginning of 2008 under the name LIE-COMTEL, the cable television (and internet) provider for the majority of Liechtenstein¹⁴ belonged to LKW until the end of 2006. LKW, which is as well 100% State-owned, is also responsible for the development and maintenance of the copper, optical fibre and cable TV infrastructure in Liechtenstein.

¹³ Lie-COMTEL AG was originally founded by Liechtensteinische Kraftwerke (LKW) as a stand-alone undertaking but existed at the time of the transfer to LTN only as a brand name and business that was part of LKW. The CATV network remained with LKW also after the transfer of the services platform and customers to TLI.

¹⁴ LKW operates a cable TV network (CATV) 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. Hereunder, LKW is always regarded as being inclusive of the municipality of Schellenberg's CATV network.

In 2006, LTN and LKW signed a so-called "consolidation agreement". The agreement's purpose is to concentrate all retail customer relationships and "intelligent" network components in the hands of LTN (now TLI) and to combine all passive network infrastructure, including in particular the access network, transmission lines, cable ducts, etc., in LKW's hands. LKW should henceforth no longer be active on the retail customer market, but rather only on the wholesale market. The agreement was put into effect on 1 January 2007 through the transfer of LTN's passive network infrastructure to LKW. At the same point in time LIE-COMTEL was integrated into the former LTN by transferring the customer relationships and taking over the services platform as well as the active network components; the passive (and a few active¹⁵) CATV network components remained in LKW's hands.

LKW has thus been the owner of all fixed network infrastructure in both access and core networks in Liechtenstein since 1 January 2007. In addition to nation-wide copper pair (TPCW) based subscriber connections, these also consist of optical fibre (*fibre access*) and CATV (*coaxial access without the municipalities of Mauren/Schaanwald and Eschen/Nendeln*) and – which is relevant for the present market – nation-wide optical fibre based infrastructure for high capacity transmission routes in the core network. LKW uses this infrastructure to provide wholesale services to carriers and providers without itself being active on the retail customer market.¹⁶

In addition to LKW, TV-COM AG (formerly Matt Antennentechnik AG¹⁷) is active in Liechtenstein as a further cable network operator in the municipalities of Mauren/Schaanwald and Eschen/Nendeln. There is no overlap between the area supplied by TV-COM AG and that of LKW's CATV network, but for that with the nation-wide TPCW access network. Both undertakings taken together cover practically 100% of the households in Liechtenstein. TV-COM AG operates a coaxial and optical fibre based access and core network in the municipalities mentioned above.

¹⁵ E.g. nodes, amplifiers.

¹⁶ As per the implementing arrangement to the consolidation agreement of 05.10.2007 (not public) and actual range of services.

¹⁷ The former Matt Antennentechnik AG changed its name on 09.03.2011 to TV-COM AG with its registered office in Eschen.

3 The market for physical access in the core network

3.1 Preliminary remarks on the market definition

In accordance with the Guidelines (hereunder called the "SMP Guidelines") of the EFTA Surveillance Authority on market definition and the assessment of significant market power,¹⁸ 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. Those products all belong to the same market when both buyers 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 – SSNIP) or the test of the hypothetical monopolist.¹⁹

The EFTA Surveillance Authority in its 2008 Recommendation on Relevant Markets²⁰ has identified in accordance with Art. 15 of the Framework Directive 2002/21/EC those materially relevant product and service markets which can be considered for *ex ante* (anticipatory) regulation. It is to be assumed that for these markets – because the EFTA Surveillance Authority has already examined whether the applicable criteria are fulfilled – *ex ante* regulation will also be considered in Liechtenstein. Hence, the AK does not have to repeat this examination as the competent Regulatory Authority, unless it has reasonable doubt as to the criteria's specific concordance with the national context or the definition of the relevant national product market deviates from that which has been recommended.²¹

The AK is to define, to a material and geographical extent, the service or product markets respectively that are to be investigated in accordance with Art. 21(1) KomG in the context of the AK market analysis, while taking into consideration to the greatest degree possible the Recommendation on Relevant Markets by the EFTA Surveillance Authority. If and to the extent that the AK defines markets which deviate from the Recommendation on

¹⁸ Guidelines of the EFTA Surveillance Authority of 14 July 2004 on market analysis and the assessment of significant market power under the common regulatory framework for electronic communications networks and services referred to in Annex XI of the Agreement on the European Economic Area, OJ C 101, 27.04.2006, page 1.

¹⁹ The SSNIP test examines whether the buyer as a reaction to a 5 to 10% increase in the price of a good by a hypothetical monopolist (HM) increasingly demands a substitute product instead so that the price increase is no longer profitable for the HM due to the induced reduction in the volume caused by the elasticity of the demand.

²⁰ EFTA Surveillance Authority Recommendation of 5 November 2008 on relevant product and service markets within the electronic communications sector to be considered for *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 1 thereto and by the sectional adaptations contained in Annex XI to that Agreement, OJ C 156, 09.07.2009, page 18.

²¹ Cf. comments of the EFTA Surveillance Authority of 6 September 2005 on the submission of the first Norwegian decision on mobile termination markets, section 3.2.

Relevant Markets by the EFTA Surveillance Authority, it has to ensure in advance in accordance with the same stipulation that the following three criteria are cumulatively fulfilled (hereunder called the "three-criteria test"):

- a) Significant entry barriers of a structural, legal or regulatory nature persist.
- b) The market does not tend towards effective competition within the relevant timeframe. When assessing this criterion, the level of competition behind the barriers to entry is to be examined.
- c) Competition law by itself is insufficient to adequately address the market failure concerned.

3.2 The term physical access in the core network

Physical access to network infrastructures for high capacity transmission routes in the core network is understood to mean the optical or electrical access to dark fibre and/or unlit optical fibre cables or to an unused wavelength unbundled²² optical/lambda channel of an optical fibre cable in a core network for exclusive usage. It concerns the physical access to the passive network infrastructure on the wholesale level.

Optical fibre cables (and any repeater/transceiver/transponder required) which have been laid but are unlit or unused are those which are not connected to a transmission facility, or which are connected to a transmission facility but which are not in operation.

Physical access to the infrastructure in the core network covers, in addition to the optical access to fibre optic cables, also managed dark fibre/virtual dark fibre with which, based on wavelength division multiplexing (WDM),²³ the optical/electrical access is provided to a single unbundled wavelength of the colour spectrum of the light of an optical fibre for exclusive usage. With the form of access last mentioned, the operator of the physical optical fibre as a rule only feeds in a simple pilot signal for administration purposes, as normally WDM systems, and especially those in the form of DWDM,²⁴ have to be administered centrally due to their susceptibility to interference. Thus the operator administers this system on a physical level, without however providing any transmission capacity.

Glass fibre cables or fibre optical cables (FOC) in a core network are understood to be those lines which run between the FOC optical distribution frames²⁵ nationally or

²² Wavelength division multiplexing (WDM); for a basic description of wavelength unbundling by way of example with an optical distribution frame – ODF), also see section C.4.2 of the BEREC Report "Next Generation Access – Implementation Issues and Wholesale Products", BoR 10 (08), March 2010.

²³ Or in a different technical manner.

²⁴ Dense wavelength division multiplexing.

²⁵ Also called E2000 optical distribution frame, splice box or optical distribution frame.

between an FOC optic distribution frame within the country and one abroad, whereby in the latter case only the section of the line located in Liechtenstein is to be allocated to the market. The FOC can run between FOC optical distribution frames of the same operator or between FOC interconnection points and/or distribution frames of differing operators.

Likewise for the physical access markets, a differentiation is to be made – in line with the corresponding differentiation of the trunk leased line market from that for terminating segments of leased lines – due to the network topography that is a given between the physical access to the infrastructure in the core network and that to the access network. While the physical access to the infrastructure in the access area has already been defined and examined in M4, the present analysis is solely concerned with the physical access to infrastructures in the core network.

As per the information level available to the AK, either no or no noteworthy twisted copper pair based lines (TPCW) are available or in use anymore (LKW has not reported the provision of any TPCW lines in the core network at all anymore since 2010). Furthermore, these cannot be used as high capacity transmission routes with the transmission distances typical in the core network, for which reason unused or unlit TPCW lines²⁶ in the core network, to the extent that they are available, are not to be treated further as part of the market which is the subject matter of the investigation.

Likewise as a rule in hybrid coaxial/optical fibre CATV networks, fibre optics are used for the core network and coaxial cables for the point-to-multipoint access network. Thus the fibre optical cables in the CATV core networks are also part of the present market.

Microwave radio links in the core network are not part of the relevant market as they provide specific transparent transmission capacities. Thus they are to be allocated instead to the trunk leased line market.

3.3 Delimitation from other markets

The wholesale market for the physical access to network infrastructures for high capacity transmission routes in the core network relates in the same way to the trunk leased line wholesale market (M14 old) as does the wholesale market for the physical access to network infrastructures at fixed locations (M4) to the wholesale market for terminating segments of leased lines (M6). Both the physical access to the core network as well as the physical access to the access network each represent an infrastructure wholesale product for the corresponding downstream leased lines market.

This delimitation is also confirmed by the application of the SSNIP test: a price increase in the market for dark fibre in the amount of 5-10% leads *ceteris paribus* to a price increase in the downstream leased lines market, which is technically based hereupon, as the dark

²⁶ "Raw copper" or sometimes also called "dark copper" on the basis of the FOC .

fibre represents the main input parameter for the costs of a leased line. Because of this increase in price of the downstream product, it is not to be expected that purchasers of dark fibre would switch to a leased line product as a consequence of a 5-10 % price increase.

This is affirmed by the fact, that in addition to the switching costs all previous investments that were required for the self-provision of transmission capacity by means of dark fibre would be wasted. These investments include, but are not limited to, the purchase of the necessary transmission equipment on both sides of the dark fibre, any necessary repeaters, all construction costs for the collocations where the optical fibre is accessed, the costs of control and quality assurance systems and other project costs and in particular personnel costs.

As these investments have already been made and as it can be assumed that in the case of an increase in the price of dark fibre access also the leased lines based hereupon would become more expensive, a switchover is unlikely.

Moreover, there are weighty differences between dark fibre products and trunk segments of leased lines from a technical point of view. In the case of dark fibre, the access seeker is required itself to operate the necessary hardware in appropriate collocations, which have to be built separately; he alone is responsible for quality management (QoS, monitoring) and is largely free in the design of the technical parameters. In this way, the access seeker produces itself and according to his own specifications a data transmission service from passive infrastructure. In contrast, trunk segments of leased lines provide transparent transmission capacity, but are much less flexible in their technical design. In particular, the available bandwidth is only a fraction of that which can be provided over a dark fibre using own transmission equipment. In general, it should be noted that for a leased line the bandwidth provided, the quality management and the technical parameters cannot be altered by the purchaser; he is limited to purchasing the data transmission service in the quality that it is offered by the provider. While dark fibre is an OSI layer 1 product, a leased line is a layer 2 or 3 product depending on its technical design. In summary, it must be concluded that the two products dark fibre and (trunk-) leased lines differ significantly in terms of their usage characteristics, in particular from a demand side perspective.

Due to the price correlation and the differences in utility, it is unlikely that the purchaser of a dark fibre will switch to a leased line due to a 5-10% price increase. The two products are thus not to be allocated to the same product market.

Therefore, the market for access to the infrastructure in a core network for high capacity transmission routes, which is the subject matter of the investigation, is to be delimited as follows from the downstream trunk leased line market: Unlit or unused optical fibres are not part of the corresponding leased line markets because, on the one hand, they provide

no specific transparent transmission capacity²⁷ and differ in terms of their usage characteristics on the other hand. To the extent that these unlit or unused fibres are located in the access network domain, they are not to be assigned to the market under investigation but instead to the already defined market for physical access to network infrastructures at fixed locations (M4). By contrast, unlit optical fibres in core networks (dark fibres or optical/lambda channels) are to be assigned to the wholesale market for the physical access to network infrastructures for high capacity transmission routes in a core network and which is defined as the subject matter of the investigation.

3.4 Definition of the material relevant market

3.4.1 The Recommendation on Relevant Markets and the three-criteria test for *ex ante* regulation

The EFTA Surveillance Authority's 2008 Recommendation on Relevant Markets does not give a concrete recommendation to examine the wholesale market for the physical access to network infrastructures for high capacity transmission routes in a core network of the EEA-EFTA States – which is defined as the subject matter of the investigation. Only the complementary "*Wholesale market for (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location*" named in point 4 of the Annex to the Recommendation on Relevant Markets is to be considered for *ex ante* regulation.

However in Recital 22 of the 2008 Recommendation on Relevant Markets, the EFTA Surveillance Authority clarifies that national regulatory authorities can define markets which deviate from those recommended or are not part of the recommendation, provided these correspond to the notice issued by the Surveillance Authority with regard to the definition of the relevant market for the purpose of EEA competition law²⁸ and the SMP Guidelines and fulfil the three-criteria test for *ex ante* regulation.

Commencing with the recommendatory character of the Recommendation on Relevant Markets by the EFTA Surveillance Authority, a regulatory authority thus continues to be free to consider as required markets as relevant for the *ex ante* regulation which are not listed in the Recommendation on Relevant Markets by the EFTA Surveillance Authority, provided it demonstrates the cumulative fulfilment of the three-criteria test in accordance with recommendation point No. 2 under the specific national circumstances:

²⁷ Art. 3(1)(24) KomG defines a "leased line" as "a facility which provides transmission capacity between a network termination point, without however any switching functionality, which the users can themselves control as a component of the leased line offer". Commencing with this legal definition, leased lines are understood to be facilities which provide a precisely defined transparent transmission capacity between two network termination points (symmetric bi-directional) located in Liechtenstein.

²⁸ Decision of the EFTA Surveillance Authority No 46/98/COL of 4 March 1998 on the issuing of two notices in the field of competition on the definition of the relevant market for the purpose of competition law within the European Economic Area (EEA), and on agreements of minor importance which do not fall under Article 53(1) of the EEA Agreement (OJ L 200 dated 16.07.1998, page 46, and EEA Supplement No. 28 dated 16.07.1998, page 1).

The existence of significant persistent barriers to entry, the lack of a tendency towards effective competition and the insufficiency of the means under general competition law to redress the market failure ascertained. This three-criteria test can also be found in Art 21(1) second sentence KomG.

3.4.2 The application of the three-criteria test to the present market

The AK regards the three criteria stipulated in Art 21(1) second sentence KomG to be fulfilled for the admissibility of *ex ante* regulation for the market which is the subject matter of the investigation for the following reasons:

Unlike numerous other EEA states, Liechtenstein has to date not been able to ascertain any duplication²⁹ of infrastructure for high capacity transmission routes in the core network by alternative operators.

A cable connection alternative infrastructure in the core network only exists to an isolated extent, as well as in the form of short and customer-specific line sections with only a sporadic geographic presence as a rule. Likewise, the network of the sole alternative CATV network operator, TV-COM AG, is limited to the area of the two Eschen-Nendeln and Mauren-Schaanwald municipalities. Apart from these exceptions, thus no general duplication of optical fibre routes in the core network has been observed. In other words, alternative operators have not established and expanded their own optical fibre cables in the core network to date.

This lack of an alternative infrastructure can be traced back, on the one hand, to the low market potential and traffic volume and corresponding income on these routes and, on the other hand, especially to the high line construction sunk costs linked to such a duplication, which represent persistent barriers to entry onto this market. For these reasons, the AK also does not expect any duplication of the core network infrastructure in the foreseeable future.

Consequently, it can be ascertained that on the wholesale market for the physical access to network infrastructure for high capacity transmission routes in the core network, no tendency toward (self-sustaining) competition exists and that in the anticipated period under consideration in this market analysis the high and persistent market entry barriers will continue to exist.

Since the sale of the passive network infrastructure of TLI (formerly LTN) to LKW, it is the only undertaking with a fibre optical core network available to it across the complete country. LKW offers physical access to this network infrastructure in the form of dark fibre

²⁹ The determination of the progressive duplication of trunk leased line connections on the basis of alternative infrastructure in numerous EEA states moved the European Commission, and consequently the EFTA Surveillance Authority, to remove the market for trunk leased lines designated as relevant previously for *ex ante* regulation from the revised 2008 Market Recommendations (cf. Commission Explanatory Note, page 38).

externally to third parties at private autonomously set and, by its own account, non-discriminatory conditions. Since 2010, LKW has itself solely offered infrastructure wholesale products in the form of dark fibre and does not offer trunk leased lines on either the wholesale or the retail customer level anymore.

While it is true that TV-COM AG also offers³⁰ dark fibre products, this is however limited geographically to the sole two municipal areas supplied by this undertaking. As a rule, any other operators only have (very) few and geographically very restricted network infrastructures of their own.³¹ Consequently, LKW is the sole operator with a fibre optical core network available to it across the complete country.

Even though LKW, on the one hand, currently does not *de facto* itself provide leased lines on the wholesale level and, on the other hand, guarantees access to its infrastructure under non-discriminatory conditions, it remains true that LKW itself also could be active on the market for trunk leased lines as a provider, which is downstream from the market for physical access in the core network, and thus a competitor, and consequently fundamentally has incentives available to it for anti-competitive behaviour. This can be expressed especially in excessive (or allocation inefficient) prices or by practising margin squeezes. There is no relevant wholesale regulation for the network infrastructure in the core network at present – unlike in relation to the wholesale regulation for access to the physical infrastructure in the access network (M4 Market).

Consequently, it must be concluded that high and insurmountable market entry barriers continue to exist on the wholesale market for the physical access to infrastructures for high capacity transmission routes in the core network.

No tendency towards effective competition can be observed.

The lack of an independent competition authority in Liechtenstein and the fact that any legal action in accordance with general EEA competition law has to be brought before the ordinary national courts or the EFTA Surveillance Authority – should it have jurisdiction – coupled with the probable requirement of an ongoing and detailed intervention in cases of competition problems on this market (and especially to combat the problem of excessive prices) make it obvious that general competition law is inadequate for successfully countering potential competition problems on this market.³²

For these reasons, the AK has ascertained that the three-criteria test as per Art. 21(1) sentence two KomG is fulfilled with respect to the wholesale market for the physical

³⁰ Offer as per <http://www.tv-com.li/glasfaser---lwl/index.html> (last accessed on 26.03.2012).

³¹ This is only used for own requirements as a rule.

³² Even if a competition authority was able to successfully deal with the competition infringements, general competition law would not be suitable for handling the persistent access and price setting or cost accounting problems respectively, as well as the continuous monitoring of the access conditions, including the technical parameters.

access to network infrastructures for high capacity transmission routes in the core network and *ex ante* regulation of this market is to be considered.

3.4.3 Self supply

In addition to those services provided to third parties, self supply which is used for the internal provision of downstream (wholesale or retail customer) products or for own requirements is also fundamentally to be taken into consideration in the present physical access market on the wholesale level. Self supply is part of the market for the reason that the market power of a hypothetical monopolist on the wholesale level is also limited by such an undertaking which provides the wholesale service concerned also or solely internally. A 5 to 10% increase in the price on the wholesale market is then not profitable when the buyer on the wholesale market provides the service itself in reaction to the price increase rather than buys it in (make or buy decision).

Furthermore, self supply is also relevant to the extent that undertakings which provide physical access services in the core network internally can also offer these externally (or in fact do so) and thus the internally provided capacities of these undertakings can potentially competitively restrict the external providers of physical access products in the core network.

For LKW, the inclusion of self supply in the present market is however more theoretical in its significance as it does not use this infrastructure (to the extent under consideration) for self supply nor for any downstream wholesale or retail customer products, and especially not for trunk leased lines.

3.4.4 Conclusion: Definition of the relevant material market

The relevant material market for the physical access to network infrastructure for high capacity transmission routes in the core network includes the optical/electrical access to unlit or unused optical fibre lines (dark fibre) or to an unused wavelength unbundled optical channel (optical/lambda channel) of an optical fibre line between FOC optical distribution frames or access points for exclusive usage.

The market is a wholesale market. The wholesale product consists of physical access to the passive optical fibre network.

On the basis of the explanations provided above and under consideration of the circumstances in Liechtenstein, the substitutability analysis conducted and due to the fulfilment of the three-criteria test as per Art. 21(1) second sentence KomG, the following additional material market is to be defined for *ex ante* regulation consideration:

The wholesale market for physical access to network infrastructures for high capacity transmission routes in the core network.

3.5 The development of the market

3.5.1 Providers

Initially, the providers active on the market for the physical access in the core network are to be identified. In this connection, a differentiation is to be drawn between the (pure) providers of own services (self supply) and those which provide this access service externally to third parties:

Provider	Physical access in the core network	
	Self supply	External product
Liechtensteinische Kraftwerke (LKW)		✓
TV-COM AG	✓	✓
UPC Cablecom GmbH	✓	

Table 1: The providers active on the market for physical access in the core network

Since 1 January 2007 – the date when the country-wide passive network infrastructure was transferred by the former LTN Liechtenstein TeleNet AG – LKW has been the sole provider of a country-wide fibre optic infrastructure in the core network. One unique aspect worth noting is that, due to a lack of activity on the downstream value chain, LKW does not itself use its own infrastructure to provide other communications services (self supply). Since 2010, it has offered infrastructure wholesale products solely in the form of dark fibre and no leased lines anymore on either the wholesale or the retail customer level.

LKW pursues this business strategy without any regulatory obligation being imposed on it, for which reason it remains free in principle³³ at all times to restrict or impede access to the existing wholesale product in the core network (dark fibre) or to become active itself again on the downstream value chain steps, and especially on the leased line markets.

At the end of 2012, LKW reported a total of 2,400 fibre optic links provided in the core network. LKW is the only operator country-wide currently operating 37 fibre optic distribution frames. The network plan is enclosed with this market analysis as an attachment.

TV-COM AG (formerly Matt Antennentechnik AG³⁴) is active solely in the area covered by the two municipalities of Mauren/Schaanwald and Eschen/Nendeln as a cable network

³³ Even if this is not to be regarded as highly probable at present.

³⁴ The former Matt Antennentechnik AG was renamed TV-COM AG on 09.03.2011 with its registered office in Eschen.

operator. In addition to the usage of its own infrastructure for CATV and internet access, the undertaking also offers external leased line services and physical access services (dark fibre).³⁵ With a total of 6 fibre optic routes, TV-COM AG provided only a few such access services in the core network to external buyers in the 2012 reporting year.

UPC Cablecom GmbH is the sole undertaking in Liechtenstein with a very short (about 300 metres long) optical fibre cable route from the Swiss border to the Bendern industrial area, which serves especially for the supply of major clients located there.³⁶

3.5.2 Buyers

Buyers of access products in the core network on the wholesale level are other communications network operators and providers of communications services for self supply (incl. the internal provision of other communications services) or as wholesale inputs for the provision of downstream retail customer services, and especially of trunk leased lines.

3.5.3 Access products offered

The following published access products in the core network are currently offered externally on the market on a wholesale level, i.e. not as pure self supply:

Provider	Products	Price
LKW	Optical fibre FOC: ³⁷ <ul style="list-style-type: none"> - Fibre core; - Fibre pair core; - N x fibre pair core. 	CHF 1.10/p.a./m; CHF 1.475/p.a./m; N x CHF 1.475/p.a./m.
TV-COM AG	- Dark fibre (no more precise specification) ³⁸	Not specified

Table 2: Overview of access products offered on the wholesale level

³⁵ Homepage of TV-COM AG, <http://www.tv-com.li/glasfaser---lwl/index.html>, last accessed on 15.04.2013.

³⁶ As per the data survey at the end of 2012, UPC Cablecom GmbH reported a total of 23 trunk leased line routes, for which reason the AK assumes that these are only provided partly via its own infrastructure as named and UPC Cablecom GmbH utilised additional infrastructure wholesale services from other providers, namely LKW, for this purpose.

³⁷ LKW price list, Services for Carrier / Provider, valid from Dec. 2012.

³⁸ Homepage of TV-COM AG, <http://www.tv-com.li/glasfaser---lwl/index.html>, last accessed on 15.04.2013.

3.5.4 Market sizes

The physical access services as provided in the core network are presented in Table 3.

Provider	FOC fibre	Other forms of access	Total
LKW	2,400	0	2,400
TV-COM AG	10	0	10

Table 3: Number of accesses to the core network on the wholesale level as of 01.01.2013

Access currently occurs solely in the form of a physical allocation of individual FOC fibre and fibre pairs.

3.6 Definition of the relevant geographic market

The geographic scope of the relevant market is in accordance with Art. 21(1) KomG that geographic area in which the relevant product is supplied and demanded under sufficiently similar or homogeneous conditions of competition respectively. Areas in which the conditions of competition are heterogeneous, i.e. in which there are significantly different conditions, are not regarded as a uniform market.

Due to the geographic extent of the core network across the sovereign territory of Liechtenstein³⁹ as well as the small size of the national territory and the country-wide homogeneous conditions for supply and demand resulting from same, the AK has defined the relevant geographic market as the whole national territory of Liechtenstein.

3.7 Regulation relevant to date for access services in the core network

Physical access to the core network, i.e. the access to unlit FOC, is currently not the subject of special regulation.

Since assuming the passive network infrastructure in 2007, LKW has private autonomously offered access to this wholesale input in the form of dark fibre (access to FOC fibre and fibre pairs).

The obligation to provide access to not switched-on/unlit cables by means of measures of special regulation in other markets than the present one, and especially the wholesale market for the (physical) access to network infrastructures (Market No. 4 of the market definitions announced), remains reserved.

³⁹ With international half circuits, the respective section located domestically is part of the market.

4 Market power

4.1 Undertakings with significant market power

4.1.1 Single dominance

Under Art. 3(1)(3) KomG an *"undertaking having significant market power"* is regarded as *"an undertaking that either individually or jointly with others enjoys a position equivalent to dominance, i.e. a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers."* Art. 3(1)(3) KomG is coextensive with the applicable requirements of EEA law under Art. 14(2) of the Framework Directive.

In connection with the assessment of whether an undertaking individually enjoys a position of significant market power (single dominance), the AK is required to consider *"in particular"* the following criteria in accordance with Art. 31(1) VKND:

- a) the size of the undertaking, its size in relation to the relevant market, as well as the changes in the relevant positions of market players over the course of time;
- b) the magnitude of barriers to market entry as well as the degree of potential competition resulting from this;
- c) the degree of countervailing buying power;
- d) the degree of demand and supply elasticity;
- e) the respective maturity of the market;
- f) technological advantages or superiority;
- g) any advantages in the sales and distribution organisation;
- 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.

The national as well as the EEA legal framework have resolved the connection between "significant market power" in the meaning of Art. 3 (1)(3) KomG and "effective competition" in the meaning of Art. 20(1) KomG by means of the so-called "thesis of equivalence", whereby no effective competition prevails if at least one undertaking having significant market power is found to be present. Thus the EFTA Surveillance Authority in its SMP Guidelines⁴⁰ 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 decisive for the conducting of the market analysis: 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 "greenfield approach"). Hence the EFTA Surveillance Authority also states the following in its Guidelines: "*[W]hen assessing ex ante whether one or more undertakings are in a dominant position in the relevant market, NRAs are, in principle, relying on different sets of assumptions and expectations than those relied upon by a competition authority applying Article 82 of the Treaty and Article 54 of the EEA Agreement ex post, within a context of an alleged committed abuse. Often, the lack of evidence or of records of past behaviour or conduct will mean that the market analysis will have to be based mainly on a prospective assessment. [...] The fact that an NRA's initial market predictions do not finally materialise in a given case does not necessarily mean that its decision at the time of its adoption was inconsistent with the Framework Directive.*"⁴¹ 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 enjoys significant market power on a particular market, it can then also be considered as an undertaking having significant market power on closely related markets horizontally and vertically and/or geographically, when the links between the two markets are such as to allow the market power held in one market to be leveraged onto the other market, thereby strengthening the overall market power of the undertaking (on leveraging, see Art. 22(2) KomG).

⁴⁰ Cf. SMP Guidelines, paras. 19 and 113.

⁴¹ Cf. SMP Guidelines, 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 on 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 AK 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 countermeasures;
- m) the degree of the incentive for price competition.

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

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

The legal character of collective market power is – at any rate according to present case law – to be equated with the economic concept of "tacit collusion". Under this, it is understood that undertakings' "parallelism" – without an explicit accord, but in awareness of their mutually responsive behaviour and at the cost of the other side of the market (the consumers) – aims at pursuing an offensive competition strategy by sacrificing short-term individual increases in turnover because this will be profitable over the longer term for all the providers involved.

The ECJ Court of First Instance in its decision in the *Airtours* Case⁴² formulated or confirmed respectively in the context of a merger review the following three criteria as a test for determining collective market power:

- 1) the existence of sufficient market transparency to determine deviations from coordinated behaviour;
- 2) the presence of a credible retaliatory mechanism in case of such deviations;
- 3) 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). The strategy of deviating from the collusive arrangement or of veering away from parallelism is termed 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 on a series of other market factors which tend to promote collusion (e.g. by creating an "incentive to collude" for undertakings) or to impede it (e.g. by creating an "incentive to cheat" for undertakings).

4.2 Market shares

4.2.1 The indicator's significance

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 of market power.⁴³ 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 form of price-cost margins). Thus, there is

⁴² Case T-342/99 *Airtours/First Choice* [2002] ECR II-2585.

⁴³ Art. 31(3)a VKND as well as the SMP Guidelines, paras. 75 to 78.

both theoretically and empirically a positive correlation between an (undertaking's individual) market share and an (undertaking's individual) price-cost margin. Neither the empirical nor the theoretical literature however provide information as to from which level of market share onwards "significant market power" may be suspected (or even proven) to exist. In 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 enjoy a position of (individual) dominance. A market share of 40% will raise, according to the decision-making practice by the European Commission and EFTA Surveillance Authority, suspicions about the existence of a dominant position, while in some cases market dominance could also exist below this threshold (because of other factors). The consistent case law of the Court of Justice of the European Communities has held that at a threshold of 50% – leaving extraordinary circumstances to one side – the existence of market power can be taken as proven.⁴⁴

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 the market shares: Thus, it is 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 the market share over time. If the market share is high and stable (or even growing) over a long period of time, the existence of market power is more likely to be assumed than when the market share is sinking or subject to significant fluctuations. Furthermore, the market share has also to be placed in relation to the market shares of the competitors. If the undertaking in question has a significantly higher market share than even the largest of its rivals, the finding of a market dominant 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, further indicators must still be examined; in particular the causal factors underpinning the high market share must be investigated.⁴⁵

The structure of the market and thus the number of market players as well as their market shares are dependent on economies of scale, sunk costs and the minimum efficient scale⁴⁶ of an undertaking. If for instance there are high economies of scale, then *ceteris paribus* a higher concentration is also to be expected. In extreme cases the industry is a natural monopoly, i.e. costs are (from a static perspective) optimal when only one single undertaking is in production. Since high economies of scale can thus lead both to a high concentration and to high market entry barriers, market power can fairly be assumed where significant economies of scale exist.

⁴⁴ Cf. para. 76 of the SMP Guidelines.

⁴⁵ By way of example, a higher market share on an innovative market in a very early stage of the market would be assessed differently than in an already saturated market with switchover costs.

⁴⁶ MES – minimum efficient scale.

Ultimately, the market share – like all indicators – is only one of several criteria (although an important one) for assessing market power and thus only becomes meaningful in combination with other indicators. Market shares nevertheless remain a special indicator for the underlying market analysis inasmuch as they constitute a necessary but not sufficient condition for determining market power.

4.2.2 Assessment of the indicator

The undertakings listed in Table 4 are currently active on the wholesale market for the physical access in the core network. Their market share is reported in the number of FOC fibres provided and takes into account self supply.

Provider	Number of FOC fibres provided	Market share
UPC Cablecom GmbH	8	0.33%
Liechtensteinische Kraftwerke	2,400	99.26%
TV-COM AG	10	0.41%

Table 4: Market shares as of 01.01.2013

With 99.26% of the wholesale market for the physical access to the core network reported for it, LKW has a market share above that which as per the prevailing case law and practice is to be assumed to clearly be a market dominant position.

Both UPC Cablecom GmbH with 0.33% as well as TV-COM AG with 0.41% report market shares which are far below the critical market dominance threshold of 25%, so that normally there would be no considerations whatsoever with regard to them having a market dominant position. Thus the AK assumes that neither UPC Cablecom GmbH nor TV-COM AG is to be accorded sole significant market power.

Due to the asymmetric market share distribution and the fact that UPC Cablecom GmbH and TV-COM AG provide only a few and, especially in the case of UPC Cablecom GmbH, very short optical fibre lines at geographically restricted locations, the existence of joint market power together with TLI can also be excluded.

Consequently in accordance with current case law and practice, it is to be concluded from the high market share of LKW that – with the exception of extraordinary circumstances – the significant market power of this undertaken is assumed to be proven.

4.3 Relevance of further SMP indicators

The analysis of market shares provides a natural point of departure for the investigation of market power, but is on its own not yet sufficient. The further indicators of market power named in section 4.1.1 can also be of relevance for investigation purposes. This list of criteria is however not exhaustive, and neither are all of its criteria always relevant for purposes of examination in a particular instance. It is far more the case that only those criteria are to be examined that are suitable for use in the concrete applicable case, so as to confirm or rebut a presumption of an undertaking's market dominant position resulting from the analysis of the market shares.

The AK considers it to be useful when examining LKW's potential market power to assess the further indicators hereunder:

- the extent of market entry barriers and the degree of potential competition resulting from this;
- control over infrastructure not easily duplicated;
- the existence of economies of scale, scope and concentration;
- the existence and degree of sunk costs;
- the extent of the countervailing buying power;
- the behaviour on the market in general.

The presence of market barriers over the longer term as well as the absence of potential competition represent necessary conditions for the existence of a market dominant position.

The other indicators of significant market power in accordance with Art. 31(1) VKND cannot, in the opinion of the AK, be ascertained due to a lack of available data, or are not meaningful or of lesser importance with respect to the present market.

4.4 Market entry barriers

4.4.1 The indicator's significance

Barriers to market entry (Art. 31(1)(b) VKND and paras. 79 and 81 of the SMP Guidelines) can be defined as any factors that permit undertaking(s) active on a market to raise their prices above costs without thereby facing additional instances of market entry. From an economic point of view, the presence of long-term market entry barriers is a key criterion for the assessment of a market dominant position. The excess profits of a market dominant undertaking would, were the market entry free of barriers, induce entry by further undertakings and thereby erode the excess profits (or the market dominant position respectively). This mechanism is disabled when entry is denied to potential new market entrants. Thus, the higher the market entry barriers are (i.e. the more difficult

market entry becomes), the higher – *ceteris paribus* – will potentially be the degree of market power the established undertaking has.

Against this background, the existence of long-term market entry barriers is to be interpreted as a necessary condition for the absence of effective competition. What is decisive for the assessment of market power is, however, not merely the existence of such barriers but also the degree of competition that occurs behind these barriers. Market power can be supposed to exist especially where the market concentration is high and at the same time high barriers to market entry prevail.

In its Recommendation on Relevant Markets, the EFTA Surveillance Authority differentiates between two kinds of barriers to market entry, namely structurally and legally determined barriers:

A structurally determined barrier to access is present if, at a given level of demand, the state of the technology and the corresponding cost structure are such that asymmetries between established operators and market entrants are produced which hinder market entry by the latter. High structurally determined barriers to market entry can arise especially in connection with significant economies of scale, scope and concentration (see Art. 31(1)(h) VKND and para. 78 of the SMP Guidelines) as well as with high sunk costs. Although economies of scale do not represent barriers to market entry *per se*, they do have the effect that operators must have a high production volume when they enter the market in order not to be at a cost disadvantage vis-à-vis the established undertaking.

Sunk costs are taken to mean such parts of fixed costs that an undertaking cannot, by reason of a lack of alternative uses or a significant loss of value in the case of reuse, recover in the event of its leaving the market. If uncertainty exists about the success of an undertaking on a market, the level of sunk costs thus affects the decision to enter the market as well. The higher the component of fixed costs that sunk costs represent, the higher becomes the risk with a market entry.

Legally determined barriers arise not from economic conditions, but from legislative, administrative or other institutional factors that have a direct impact on the conditions of access and/or the position of operators on the market in question.

All those aspects which influence the openness to additional market entries in relation to the market for physical access in the core network of relevance for the investigation are described below in general terms. Because an analytical distinction often cannot be made between the different kinds of market barriers, the question is dealt with in a relatively broad fashion.

4.4.2 Control over infrastructure not easily duplicated

One can speak of control over infrastructure that is not easily duplicated (Art. 31(1) VKND and para. 78 of the SMP Guidelines) if certain infrastructure necessary for the provision of the service 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 can permit the undertaking in question (in the absence of countervailing buying power) to exercise market power, because it is the only provider of the service and neither current nor potential competition exists. It may in addition be possible for the undertaking to leverage its market power onto downstream or closely related markets.

Prior to its transfer to LKW on 1 January 2007, the complete⁴⁷ cable-based network infrastructure in Liechtenstein was concentrated in the hands of the previously integrated provider LTN. Since the acquisition of this (passive) network infrastructure by LKW, this is the only undertaking which has a network infrastructure (access and core network) across the complete country at its disposal for the provision of leased line and other services at fixed locations in Liechtenstein, and thus has control over infrastructure not easily duplicated.

However, LKW itself is not active on the downstream retail markets, i.e. it offers neither fixed network access nor leased lines on the retail customer level. But also on the wholesale markets LKW is only active to a limited extent and has not provided (trunk) leased lines anymore since about 2010, but rather solely infrastructure wholesale service products in the form of dark fibre and unbundled subscriber connections.

While the access to LKW's infrastructure in the access domain is subject to special regulation in the context of the market for the physical access to network infrastructures at fixed locations (M4),⁴⁸ the access to LKW's infrastructure in the core network area is not currently subject to special regulation.

Consequently it is concluded that LKW is the sole undertaking with a nation-wide core network at its disposal which is not easily replicated and thus has control over a not easily duplicated infrastructure.

4.4.3 Existence of economies of scale and scope

If market shares show that an undertaking's services far outstrip that of potential competitors quantitatively, the question arises: Can this undertaking, because of its higher quantitative output, provide its services on the market at lower unit costs and so gain a competitive edge over its potential competitors, thus making their entry onto the

⁴⁷ With the exception of LKW's CATV network.

⁴⁸ Cf. administrative decision of the AK applied to LKW dated 16 December 2009.

market more difficult? This tends to be the case for any services that have a cost structure with a high proportion of fixed costs that are spread across the volume. Such economies of scale secure not only a competitive advantage vis-à-vis existing competitors, but make potential competitors' market entry more difficult, as they must first sell a minimum quantity in order to trade on the market profitably (minimum efficient scale). The dominant undertaking's higher margins additionally expose existing and potential competitors to the danger that they will not be able to match short-term price reductions made by the undertaking with significant market power and thus will no longer be competitive.

As already detailed in section 4.4.2 on the control over infrastructure which is not easily duplicated, potential providers of access services in the core network have to effect investments linked to high costs, especially in order to have availability across the complete country. Hence, this high fixed cost element would suggest that LKW can provide physical access services in the core network at cheaper prices than potential competitors and thus can gain or maintain a competitive edge due to its higher quantitative output and ubiquitous presence.

The common and country-wide provision of all the telecommunications infrastructure in the access and core network together with the parallel provision of the electricity infrastructure throughout the complete country permits LKW to achieve economies of scale and scope.

4.4.4 Sunk costs

Sunk costs are fixed costs of production which, once incurred, are irreversible, i.e. they cannot be recovered anymore. Network industries are characterised by high sunk costs. The network infrastructure in general and access networks specifically are to be assessed as sunk costs, in addition to the establishment of collocation facilities for instance. Major investments occur in the form of excavation work and the restoration of surfaces and they cannot be reused and thus not resold in the event of a shutdown. It also hardly seems sensible in the event of a shutdown or reduction in capacity to dig up cables that have already been laid or dismantle collocation facilities.

At the most, entire networks or stand-alone sub-networks are re-saleable. However as this situation is so specific ("asset specificity", a "hold-up" problem), a market price cannot be ascertained for them, or it is set at a correspondingly low level. Only one 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 return. With respect to such an investment decision, the question has to be asked why it would not be possible for the owner to date of the network to continue business on a profitable basis. If it cannot, i.e. if it is shown that a shutdown is more advantageous, then no one else would be prepared to pay a price that would cover the sunk investments.

It is exactly this circumstance of high sunk costs in network industries (network infrastructure) that poses a major risk to the potential investor, which must be compensated for through higher returns. For an investor that has already made the investment, high sunk costs mean that it will wish to recover the highest possible marginal returns over the longest time possible, even if a more current decision to invest would be negative. This leads, in a situation of (buried) over capacity, to the operator also selling at prices that are below the (historical) full costs. Entry onto the market by new operators thus becomes unattractive or impossible, while established operators neglect investments to expand the network and apply stricter criteria for upgrade investments relative to what they can save. In this regard, network industries are substantially different to other industries where over capacity occurs due to the high sunk costs and the long (technical) life of such investments, which means that the process of consolidation lasts much longer (optimisation with respect to the reduction of exit costs).

The general assessment of the high sunk costs associated with network infrastructures described above and the problems for competition that they entail are also of relevance for LKW's core network infrastructure across the complete country. Thus high structural market barriers to entry are a given and potential competition cannot develop (also in the foreseeable future) on the market for the physical access in the core network.

Liechtenstein has – with the exception of a few routes (cf. UPC Cablecom GmbH with its own short duct and TV-COM AG's CATV network in two municipalities) – not experienced any duplication of core or trunk network infrastructure by means of an alternative operator's own infrastructure, and this is also not expected in the foreseeable future in light of the very high sunk investment costs linked to this and the limited market potential. Likewise, there are no alternative network industries or network operators (such as for instance other electricity suppliers⁴⁹ or railroads) in Liechtenstein, for which it would be easier due to their existing network infrastructure and economies of scope to erect their own telecommunications network infrastructure in light of the high sunk costs. Thus except for LKW, no other undertaking has – apart from the few exceptions which are also not across the complete country anyway – its own infrastructure available to it for the provision of access services in the core network.

Thus it can be concluded in summary that the country-wide infrastructure operated by LKW – and especially the core network which is the focus of the present market analysis – is characterised by high sunk costs.

⁴⁹ LKW operates the electricity grid as well as the communications network.

4.5 Countervailing buying power

If due to a lack of competition pressure an undertaking potentially has market power, this does not automatically mean that this market power can also be exerted over the consumers or wholesale buyers (e.g. in the form of excessive prices). In fact this is also dependent on the extent of the bargaining power of the customer/wholesale buyer (the countervailing buying power). Countervailing buying power is *ceteris paribus* then greater when the customer/wholesale buyer is responsible for a large share of the undertaking's revenue, a switchover to other providers is possible and linked to low switchover costs, or the corresponding wholesale service can easily be provided by itself.

LKW is the sole undertaking capable of offering physical access services in the core network across the complete country. As it is thus the only ubiquitous provider of these services, a switchover to another provider, in reaction to a price increase for instance, is not possible.

Furthermore, a corresponding wholesale service cannot be provided by a buyer itself under economic conditions due to the high market entry barriers (cf. section 4.4). Thus the buyer of physical access in the core network does not have any bargaining power at its disposal in relation to LKW.

LKW's main field of business is the generation and distribution of electricity. However the compensated transfer of the telecommunications infrastructure has gained in importance since the acquisition of the corresponding network infrastructure. Despite this it is not even possible for TLI, which is by far the largest buyer of access services in the core network, to exercise countervailing buying power vis-à-vis LKW, as there is no alternative provider of these services and it is also not able economically and in the short term to supply these services to itself. Furthermore, the relationship between TLI and LKW is fundamentally determined by the consolidation agreement and/or by the joint owner respectively.

Thus the buyers of physical access in the core network do not have any bargaining power at their disposal in relation to LKW which could limit the exercising of its market power.

4.6 Market behaviour

LKW's strategy is determined decisively by the consolidation agreement with TLI and the requirements set by the joint owner, the Liechtenstein State. A key consequence of this is the limitation on LKW to conduct activities as a pure wholesale service provider without any contact whatsoever with retail customers.

Thus, although it is in line with the core business especially of LKW to provide other communications undertakings with pure infrastructure wholesale services and not enter into competition with them for retail customers, it is still however true that LKW has a

very wide degree of scope available to it as to which services it offers under which conditions. Thus for instance in the meantime, LKW does not offer leased line services on the wholesale level anymore, and instead limits itself to the provision of physical access services (in both the access and core network).

The AK has currently not received any complaints or other information that LKW is unduly restricting or impeding the access to dark fibre in the core network or treating buyers in a discriminatory manner. At the same time the AK has received information that LKW denies access to civil engineering infrastructure⁵⁰ and categorically refuses requests of other market participants. Since the civil engineering infrastructure is the upstream in the value chain of the market under investigation, this behaviour needs to be taken into due account in any case.

Although LKW does not have any incentive *per se* to restrict access to wholesale products and it seems that at least at present its access services to dark fibre are also offered on the market at non-discriminatory conditions, with the lack of regulatory conditions imposed on it in this regard, it still has the private autonomous possibility available to it to change its business practices at any time and at short notice and to alter the access or the access conditions respectively by exercising its market dominant position.

LKW also only offers access to dark fibre at present, but not to its civil engineering infrastructure for instance.

In any case, LKW has the possibility and the fundamental incentive to exploit its significant market power when determining the access prices. Even if the AK has not received any concrete complaints at present concerning excessive access prices, numerous market participants mentioned in the national consultation held that the costs currently charged - particularly in international comparison - are high and that, hence, the regulated charges should come to be well below the current level. According to the statements made by the Government in the context of the interpellation response No 21/2013 "Sustainable re-orientation of Telecom Liechtenstein AG through a strategic partnership with Swisscom (Switzerland) AG and other measures" are the network deployment costs of LKW substantially above those of Swisscom in neighbouring Switzerland. In order to provide a conclusive judgement on the appropriateness of the access prices, what is required precisely is the assessment of an appropriate cost accounting model.

In summary, it has been determined on the basis of the market behaviour indicator that there are no concrete complaints at present that LKW is exploiting its market dominant position through its behaviour on the market. However, LKW on the one hand refuses access to the upstream civil engineering infrastructure and, on the other hand, there

⁵⁰ Herein after, „civil engineering infrastructure“ is understood to comprise in particular pipe systems, cable canalizations, cable ducts, conduits, or other facilities in which cables are or can be inserted.

exists an initial reasonable suspicion that LKW charges excessive prices and/or exhibits inefficient costs. This assessment occurs subject explicitly to the examination of the underlying costs or of the appropriateness of the prices currently demanded respectively. The issue of (potential) competition problems is examined separately hereunder.

4.7 Joint market power

LKW reports a market share of 99.26% on the wholesale market for the physical access in the core network and thus this is far above the threshold developed in case law and competition practice at which – except in the case of extraordinary circumstances of which none are provided for the undertaking in question – it is to be assumed that the sole significant market power of the undertaking concerned is proven. As LKW for its own part already has a significant market available to it, logic dictates that the existence of joint market power does not need to be assessed anymore in the present case.

However the existence of joint market power by LKW together with other providers can already be excluded due to the powerfully asymmetric market distribution, the highly restricted offer from these providers both geographically and in terms of the customers and the differing interests resulting from this.

4.8 Conclusion market power

LKW is the only undertaking with a ubiquitous core network infrastructure available to it in Liechtenstein.

In accordance with prevailing case law and practice, LKW enjoys a market share of 99.26%, at which it is to be assumed that the sole market dominant position of this undertaking is proven. No extraordinary circumstances were found.

In addition to the very high market share, the existence of long-term and high market entry barriers as well as the lack of potential competitors underscore the existence of a market dominant position.

The establishment and expansion of an alternative core network infrastructure, and especially of one which is nation-wide, is uneconomic due to the very high excavation and other construction costs, which represent sunk costs, and when the limited market potential is considered. Thus it cannot be assumed that in the period under investigation new competitors will enter the market with a noteworthy core network infrastructure. Consequently we are not dealing with a contestable market.

With its ownership of the sole core network infrastructure across the complete country, LKW has control over infrastructure not easily duplicated, as well as the economies of scale and scope linked to this. As a result of this sole control over the infrastructure not easily duplicated, LKW has the fundamental incentive to disadvantage wholesale service

buyers by means of excessive prices and ultimately to indirectly achieve monopoly rents from the retail customers or to use resources inefficiently.

Due to the lack of alternative providers and the economic inefficiency of setting up their own country-wide core network infrastructure, the buyers of physical access in the core network do not have any bargaining power in relation to LKW which is capable of restricting the exercising of its market power.

LKW's behaviour on the market does not provide any concrete cause for complaint at present, however a conclusive judgement in this regard is subject to further assessments, and especially the application and examination of a regulatory cost accounting model. However in any case it is true that at present LKW is free at all times and at short notice to restrict the access to the core network infrastructure or to change the conditions for it – and especially the access prices. Furthermore, LKW could also provide other forms of access, such as for instance the access to the underlying civil engineering infrastructure.

Thus although the current behaviour of LKW on the market does not underscore the assumption of a market dominant position *per se*, it is also not capable of refuting it.

The existence of joint market power by LKW together with UPC Cablecom GmbH and TV-COM AG can be excluded due to the powerfully asymmetric market distribution and the differing interests resulting from this, as well as the marked differences in the respective geographic extent of these operators' own core network infrastructure.

In conclusion to the market power assessment, it can be ascertained that only LKW has significant market power available to it on the market for physical infrastructure access services for high capacity transmission routes in the core network.

5 Current and/or potential competition problems

With a view to the imposition of measures of special regulation, it is of central importance to consider which specific market failures and which current or potential competition problems respectively would be expected (including their implications from the point of view of public welfare economics) with an unregulated market for physical access services in the core network in accordance with the greenfield approach. In this respect, reference must be made to the ERG Common Position on Remedies (2006),⁵¹ which forms the basis for this chapter.

The following (potential) competition problems are to be expected due to a lack of regulatory measures on the market for physical infrastructure access services for high capacity transmission routes in the core network:

- (1) the erection of market entry barriers;
- (2) the leveraging of market power onto closely related markets;
- (3) the exerting of market power over buyers.

The leveraging of market power onto closely related markets is not to be feared so long as LKW continues to be inactive on both the downstream wholesale or retail customer markets for trunk leased lines and terminating segments of leased lines. In this way LKW is not in competition with providers on these retail customer markets, which are at the same time buyers from LKW on the wholesale level.

5.1 Erection of market entry barriers

The denial (especially with regard to the price, quality and geographic availability) of adequate access in the core network on the wholesale level leads to high market entry barriers for alternative providers on the downstream market for trunk leased lines, because the establishment of their own core network infrastructure is linked to very high sunk costs⁵² and is characterised by diseconomies of scale and scope.⁵³ In addition the excavation and other construction work needed for this and the required planning and approval procedures are time consuming.

Due to the subadditivity of the costs for establishing an alternative (country-wide) infrastructure, it can at least be assumed that in the period under observation no duplication of the existing core network infrastructure will occur. Hence the only option

⁵¹ ERG Remedies 2006: *Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework*, Final Version May 2006, ERG (06) 33, http://www.erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf.

⁵² Cf. section 4.4.4.

⁵³ Cf. section 4.4.3.

for alternative providers to be active on the downstream markets, and especially on the market for trunk leased lines, is to be able to avail of the infrastructure wholesale products. If such products are available, then an alternative provider can initially enter the retail customer market with lower (sunk) investments, and then as required once a certain critical mass has been reached subsequently set up its own infrastructure at least partially (ladder of investment). In this way entry to the downstream markets is facilitated thanks to the availability of wholesale products. By denying adequate access to wholesale products, the market entry barriers increase by contrast.

Although LKW currently offers private autonomous access services to the core network in the form of dark fibre, it denies access to civil engineering infrastructure and thus increases the barriers to market entry on the market at hand. Access to civil engineering infrastructure would greatly facilitate competitors providing their own high-capacity lines by deploying own fibre optics in the core network.

Furthermore, without any appropriate regulatory obligations in place, it remains at LKW's discretion to restrict the access again at all times. LKW could instead itself again offer leased line services on the wholesale level, which would contain higher added value and thus have earnings potential. Aside from that, LKW does not currently provide any access for instance to the underlying civil engineering infrastructure, which would significantly decrease the market entry barriers for potential competitors.

5.2 Leveraging of market power onto closely related markets

The leveraging of market power from the infrastructure access market in the core network can occur both horizontally onto closely related markets as well as vertically onto downstream markets in the value chain. As LKW is not a vertically integrated full service provider and is not active at present especially on the retail customer markets, the potential to leverage market power is fundamentally reduced.

Despite this, LKW could for instance leverage its market power on the present infrastructure access market in the core network onto the downstream wholesale market for trunk leased lines. This fact has been taken into account by the AK in the analysis of the market for terminating and trunk segments of leased, in as far as AK will immediately initiate a reanalysis of the leased lines market in case LKW emerges in this market as a provider itself and/or should no longer provide the necessary infrastructure inputs on an external non-discriminatory basis.

5.3 Exercising of market power over buyers

The exercising of market power over the buyers manifests itself especially in excessive prices and in the form of the inefficient use of resources.

Thus it can be assumed due to the existing high market entry barriers that LKW as a profit oriented undertaking without any regulation on its rates is in a position to increase the prices for infrastructure wholesale products above the (fictive) competition level, without having to accept sufficiently large drops in demand. This is so because there is no alternative provider which can provide this service (country-wide) or establish its own infrastructure due to the high sunk costs linked to this and the amount of time required which an alternative represents.

Likewise, LKW can generate excessive costs or prices respectively through the inefficient use of resources (e.g. gold plating). As the provider of infrastructure access services with significant market power, LKW has – without any corresponding controls or competitive pressure – no incentives to increase the efficiency of the production, in addition to setting the price at a cost oriented level. Any economically undesirable allocative inefficiencies which arise as a result of this adversely affect the total public welfare.

Even if no margin squeeze can be exerted over competitors as LKW is not active on either the retail customer level or on the leased line wholesale level, it can still maintain the price at a high level on the wholesale level. By applying prices above the costs, allocative inefficiencies occur at the expense of the wholesale buyers and ultimately of their retail customers as the excessive prices are (or have to be) passed on correspondingly to them.

Numerous market participants mentioned in the national consultation held that the costs currently charged are high and that the regulated charges should come to be well below the current level. According to the statements made by the Government in the context of the interpellation response No 32/2013 "Sustainable re-orientation of Telecom Liechtenstein AG through a strategic partnership with Swisscom (Switzerland) AG and other measures" (Answer to Question 1) are the network deployment costs of LKW substantially above those of Swisscom in Switzerland.

Fundamentally LKW also has the possibility available to it to set discriminatory prices for its services between the buyers, even if it has guaranteed non-discrimination in the implementing agreement to the consolidation agreement.

6 Regulatory instruments

6.1 Regulatory instruments under the KomG

Under Art. 20 KomG the AK 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 on 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 grant access to network facilities and network functions (Art. 37 VKND);
- price controls 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 rates (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 related to interconnection and access than those laid down in Arts. 34 to 42 VKND on undertakings with 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 then forms the basis for that of the Regulatory Authority.

6.2 Principles for the application of regulatory instruments

With regard to the imposition of regulatory instruments (measures of special regulation) for the regulation of competition, the AK 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/EC⁵⁴ and Art. 17 (2) of the Universal Service Directive 2002/22/EC), 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 may not 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 justified 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 suitable for achieving same. Thirdly it may not represent an unreasonable burden for the operator concerned. The measure taken should thus be the minimum needed to achieve the goal in question.

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/EC⁵⁵), the ERG⁵⁶ 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 selection and application of regulatory instruments:⁵⁷

- decisions of national regulatory authorities need to be well reasoned and in line with the goals and obligations of the Directives (*Principle 1*);
- where the infrastructure of the market dominant undertaking cannot be duplicated, the exercise of market power vis-à-vis the consumers must be prevented (*Principle 2*);
- if replication of the incumbent's (i.e. market dominant undertaking's) infrastructure is viewed as feasible, the available remedies (i.e. regulatory instruments utilised) should assist in the transition process to a sustainable competitive market based on infrastructure competition (*Principle 3*);
- remedies should be designed to be incentive compatible, i.e. the incentive to comply should be greater than the incentive to cheat (i.e. evasion) (*Principle 4*).

⁵⁴ 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).

⁵⁵ 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).

⁵⁶ 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, page 38; Liechtenstein Compendium of EEA Law ("EWR-Rechtssammlung"): Annex XI – 5ci.01)*. The ERG was replaced by *Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators for Electronic Communications (BEREC and the Office, OJ L337, 18.12.2009, page 1; not yet assumed in the EEA Agreement)* by the BEREC. The AK and the EFTA Surveillance Authority have a permanent seat in the BEREC and/or previously in the ERG.

⁵⁷ ERG Remedies (2006), pages 51 to 67.

6.3 Selection and assessment of the regulatory options

The starting point for the selection of appropriate regulatory instruments are the following competition problems identified in Chapter 5 of the market analysis: (1) the erection of market entry barriers; (2) the leveraging of market power onto closely related markets; and (3) the exercising of market power over buyers (especially with regard to price setting).

The intention is in a first step to identify those regulatory options which are suitable for redressing the competition problems as determined.

Initially the regulatory instrument(s) (or combinations of instruments) are identified that correspond to the nature of the competition problems that have been found to exist and are suited to eliminating or mitigating them. If several alternative instruments (or combinations of instruments) are suited to eliminating or mitigating the competition problems, that instrument (or combination) will be chosen in a second step – according to the principle of proportionality – which represents (in a cost-benefit sense) the mildest means (Principle 1). The second step can be overlooked if in the first step only one regulatory instrument (or combination of regulatory instruments) 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 in accordance with Art. 5 (2) KomG and be justified.

In relation to the selection of the instrument, for the present market (and the competition problems identified) it is not Principle 3 (*If replication of the incumbent's (i.e. market dominant undertaking's) infrastructure is viewed as feasible, the available remedies (i.e. regulatory instruments utilised) should assist in the transition process to a sustainable competitive market based on infrastructure competition*) but rather Principle 2 (*Where the infrastructure of the market dominant undertaking cannot be duplicated, the exercise of market power vis-à-vis the consumers must be prevented*) which is applicable.

It is hardly possible to replicate the underlying infrastructure in the core network across the complete country, so that the primary aim of imposing regulatory instruments on the market for the physical access to network infrastructure for high capacity transmission routes in the core network cannot be of itself the promotion of any duplication of infrastructure or of infrastructure based competition in the core network. However a second goal – and one especially against the background of the ladder of investment theory – should be in the sense of Principle 3 to also promote investments in the selective (geographically limited) establishment and expansion of an alternative core network infrastructure which, building on the regulated access to LKW's civil engineering

infrastructure in the core network, at least permits limited infrastructure competition on this level.

In this connection, the AK is to also take into consideration the *Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA)*, 2010/572/EU,⁵⁸ to the extent that the principles laid down there can also be applied analogously to the core network.

6.4 Access

The problems of the vertical leveraging of market power from the wholesale market for infrastructure access services in the core network, the subject matter of this investigation, onto the trunk leased line market can be redressed by guaranteeing access to adequate wholesale products. Access to a wholesale product significantly reduces the entry barriers to the downstream market and thus can ensure additional market entries and increased competition on the downstream market. In this way, access to dark fibre promotes long-term effective competition on the trunk leased lines market on wholesale and, subsequently, also on the retail customer level.

But also on the market for infrastructure access services in the core network itself at least selective or geographically restricted alternative investments in the core network can occur via the ladder of investment especially by having an obligation to grant access to the civil engineering infrastructure. Civil engineering infrastructure access reduces the entry barriers for the erection of alternative fibre optic connections in the core network and promotes at least potentially limited competition on the core network infrastructure market itself (even if this is not to be expected within the next 2 to 3 years).

Since LKW has, as demonstrated, sole significant market power over the wholesale market for infrastructure services in the core network and the control over infrastructure which is not easily duplicated, an access obligation seem necessary as well as the sole effective means of countering vertical and horizontal leveraging of market power and promoting competition on the downstream value chain step (Principle 2) as well as ultimately on the wholesale level itself. This is true regardless of the fact that LKW already currently offers access services in the form of dark fibre without any regulatory enforcement, as it is in a position at all times to again restrict this access at its own discretion.

Art. 37 VKND contains detailed provisions on which obligations can be imposed with regard to the access to the network facilities and network functions of an undertaking with significant market power (especially), as well as what the Regulatory Authority has to take into account when imposing this obligation. Thus an obligation under Art. 37 VKND is

⁵⁸ Annex XI, point 26l of the Agreement on the European Economic Area, OJ L 251, 25.09.2010, page 35.

appropriate for guaranteeing access to suitable wholesale products, including the access to civil engineering infrastructure in accordance with letter e) of that provision, on the market for infrastructure access services in the core network.

Fundamentally, Art. 34 VKND (the obligation of non-discrimination) could also be considered in order to secure access to a wholesale product. As LKW already provides certain infrastructure wholesale products in the core network externally to third parties, an obligation of non-discrimination would fundamentally be possible in relation to this product. However as, on the one hand, Art. 37 VKND basically contains more comprehensive details on the access issue, it is to be accorded preference over Art. 34 VKND which does not have corresponding detailed definitions and requirements.⁵⁹ On the other hand however, a pure non-discrimination obligation is not capable of guaranteeing the access to the civil engineering infrastructure for instance as LKW does not offer this at present.

6.5 Price

As already ascertained in section 5.3, there is an incentive for LKW to charge excessive prices. It may be assumed that LKW can increase its profits if it raises its prices above the costs, as no corresponding losses in sales can be expected after a price increase. For this reason, it also has an (economic) incentive for such behaviour. Furthermore as already demonstrated, there is the risk of the inefficient use of resources and higher costs resulting from this. Thus price controls are required.

6.5.1 Price controls and cost accounting for the access

Art. 38 VKND provides that the AK can impose obligations on operators with significant market power with regard to price controls and cost accounting. It has to take into consideration criteria such as for instance the efficiency, the investments made, the return on investment and the current market risk in correctly determining the access prices. Furthermore, Art. 38(2) VKND contains provisions related to the burden of proof issue: It obliges an undertaking with a cost orientation obligation to verify that its rates can be computed from the costs and a reasonable return on investment. The AK can impose a cost accounting system on the operator that is independent from its own cost accounting.

Art. 13 of the Access Directive obligates the regulatory authorities to design measures regarding cost accounting and price controls in such a way that these serve the

⁵⁹ Regardless of this, the imposition of an obligation of non-discrimination is still required in order to counter other competition problems.

requirements for efficiency and sustainable competition and maximise the interests of the retail customers.

On the basis of this obligation the efficient access price can – with the correct application – be set. Hence the measure is fundamentally suitable for eliminating the allocative inefficiencies (excessive prices); the efficient access price guarantees that no excessive profits are earned with this service or inefficient resources wasted.

If the Regulatory Authority should now – in the context of a dispute settlement procedure or by intervention on the part of the authority – set rates, a price determination method is to be applied. In this connection, the following approaches are relevant:

- (1) cost oriented prices (cost plus regulation);
- (2) ECPR (efficient component pricing rule);
- (3) benchmarking (comparative prices).

6.5.2 Cost orientated prices

Cost orientated prices are most suitable and proportionate especially in situations in which the undertaking with significant market power can charge excessive prices and the market power will not be limited by competitive forces over the longer term (Principe 2). The very high market entry barriers, the subadditivity of the costs and LKW's high market share indicates that effective competitive pressure is not to be expected by means of alternative infrastructure in the core network – and in any case not over the coming 2 to 3 years, which is the timeframe for the present analysis.

The risk of allocation distortions which was determined as a competition problem is tightly connected to the incentive to increase the rates for the infrastructure access product above the level prevailing in the case of competition. Hence the goal of the regulation must be to correct this market failure and to set the rates at the height of the (fictive) competition price – the level at which the public welfare is maximised. The "correct price" from an economic perspective is at the height of the long-run average incremental costs – LRAIC – of an efficient operator for the provision of the service in addition to a mark-up for common costs and overhead costs. In a market with effective competition, when viewed over the long-term a "uniform market price" results from the dynamic market forces (e.g. market entries and market exits, volume adjustments, adjustments to the production factors) which is oriented to the long-term average incremental costs of the industry which arise in order to efficiently satisfy the total demand (with the lowest costs). This long-term competitive equilibrium leads to a situation whereby the macroeconomic public welfare is maximised. Any deviation from this level reduces the total public welfare.

When determining a cost oriented price, the investments of an efficient operator are to be taken into account as well as a corresponding (i.e. normal market) return for the capital employed while taking into consideration the risks linked to same. The imposition of cost oriented prices is suitable especially for countering the competition problem of excessive prices.

Art. 38 (2) VKND permits the Regulatory Authority to impose a cost accounting system that is independent from the cost accounting system of the undertaking concerned in order to determine the costs of an efficient provision of the service. Engineering-like bottom-up models are suitable for the efficient design of the topography of the core network. However the effort and outlays to develop such a model and the collecting of valid cost input data for the model is considerable and linked to the usage of substantial financial and personnel resources by the regulator. Furthermore when it is applied, a significant period of time has to be expected before the rates are determined. The disadvantages named above are even more marked in the unique context of the small-scale relationships in Liechtenstein and in the opinion of the AK are clearly disproportionate to the size of the market and the operators.

Historic full cost accounting is to be considered as a simpler alternative cost accounting model. In comparison to the LRAIC approach, this is linked to certain principles related disadvantages, but it does offer a range of implementation advantages. However by utilising this cost accounting instrument, negative incentive structures can arise for the regulated undertaking (e.g. the danger of gold plating) if the actual costs which occur historically for the undertaking concerned (top-down) are taken. The result is that losses in efficiency caused by the regulation could be induced by this. In order to counter corresponding incentives for the regulated undertaking to use resources inefficiently and report higher costs, it is necessary for the Regulatory Authority to identify possible inefficiencies and deduct them. In order to compensate for these inefficiencies, benchmarking especially, which is described further below, can be considered as a "corrective instrument" for the cost oriented computed prices.

No other (milder) instrument is suitable compared to the cost orientation obligation, together with the parallel consideration of corresponding international comparative values (benchmarks), for eliminating the identified competition problem aspects linked to the price. Hence it follows that in light of the identified competition problems and Principle 2, the setting of cost oriented rates on the wholesale market for high capacity transmission routes in the core network is a suitable and necessary measure.⁶⁰

⁶⁰ Cf. in this regard ERG Common Position on Remedies (2006), page 73 et seq.

6.5.3 ECPR prices

ECPR prices would be proportionate especially when the development of self-sustaining competition is to be expected in the foreseeable future. ECPR prices are determined by taking the costs of the service in addition to those opportunity costs which accrue to the undertaking with significant market power when it offers the service to a competitor on the retail customer market. Under certain conditions, the ECPR is reduced to retail minus (retail customer price minus retail costs). Retail minus is in line with the requirement for non-discrimination from a pricing perspective and is suitable for combating any margin squeeze. However the retail minus approach is not suitable for bringing down excessive access prices to a cost oriented level and thus is primarily relevant for markets on which excessive prices are eliminated in the foreseeable future by the development of self-sustaining competition (Principle 3).⁶¹

Notwithstanding the above, LKW is in any case not active on the retail customer market, so that retail minus is to be excluded from the very start as a suitable price determination method under the given market conditions.

6.5.4 Benchmarking

With the third price setting method, benchmarking, the setting of the price occurs on the basis of comparative values. Art. 38 (2) VKND expressly provides prices to be considered in determining the fees that apply in comparable competitive markets.

For such a comparison, the prices on national and international markets⁶² with comparable services can be utilised. Doing so, care must be taken to ensure the comparability of the markets utilised and if necessary any existing striking differences in the services which are taken for the comparison (differences in the costs, in the technology, in countries' specific price levels, etc.) are to be adjusted when determining the rates to be applied. Furthermore, only those countries are to be utilised for the comparison which themselves determine the rates on a cost orientation basis – if necessary in accordance with one of the cost accounting methods recommended by the EFTA Surveillance Authority⁶³ – or in which self—sustaining competition prevails and a market price exists.

The markets utilised for the comparison neither have to nor can they be completely identical. This would also not be achievable in reality and would ignore benchmarking's applicability as a reliable price setting method in the first place.

⁶¹ Cf. in this regard ERG Common Position on Remedies (2006), page 78.

⁶² Art. 38 (2), last sentence, VKND.

⁶³ Cost oriented rates also include capital outlays as a rule, for which reason a reasonable return on capital invested is already taken into account.

When applying benchmarking, AK will make recourse to the costs prevailing in those countries which are similarly well developed in terms of topography and of the state of the network development as Liechtenstein, with additional factors such as wage and price level, the settlement conditions or population density to be appropriately taken into account. Hence any possible striking differences which remain are to be taken into account finally when setting the concrete prices. As a price determination method, benchmarking is applied especially:

- When the implementation effort in connection with the previously named price setting method (in relation to the competition problem) exceeds an extent justifiable for the Regulatory Authority and/or the undertaking.
- Or if the results of the survey of costs are for their own part implausible due to the database and/or significantly deviate from those prices which would normally arise on a (competitive) market. Such a kind of implausible result is for instance possible in the market entry phase when the undertaking concerned is operating in an area with declining average costs (and/or increasing economies of scale).⁶⁴
- And/or when a basis for comparison exists for the price comparison which is sufficiently secure statistically and hence the prices (costs) of the market dominant undertaking can be estimated.

In the current case, international comparative values are available for the prices for the physical access in the core network and/or for the access to the civil engineering infrastructure respectively, for which reason benchmarking should be utilised as an accompanying instrument and applied as a "corrective instrument" to the price calculated on the cost oriented basis.

6.6 Obligation of non-discrimination

The obligation of non-discrimination in accordance with Art. 34 VKND serves to prevent discrimination between differing buyers of a service. A differentiation is to be taken in the current context between:

- discrimination in relation to the price parameter (price discrimination);
- discrimination in relation to a parameter other than the price (quality discrimination).

⁶⁴ In such a "temporary" market entry phase, the average costs can be far above the "normal market" prices (even above those that a profit maximising monopolist would set) and thus they cannot be applied. This argument is relevant especially in connection with new market entrants.

6.6.1 Price discrimination

In addition to the "non-pricing" dimension of the non-discrimination obligation, its application in relation to the price parameter has also to be assessed.

In connection with the price discrimination, a differentiation has to be made between the following cases:

- a) the market dominant undertaking discriminates between different buyers (external discrimination);
- b) the market dominant undertaking discriminates between itself and the external buyers (internal discrimination).

In cases of (a) a price discrimination can lead to a distortion in competition on the downstream retail customer market. The incentive for such a price discrimination is a given especially in connection with associated companies and strategic partnerships.

Because LKW is fundamentally in a position to practice external price discrimination, an "external non-discrimination rule" should be imposed that effectively guarantees that the market dominant undertaking grants the same conditions to all external buyers and does not evade this obligation by means of cleverly drafted contracts.

However the external (price) non-discrimination rule (case a) is not suitable for eliminating excessive prices, because the price setting scope of the market dominant undertaking is not restricted by such an obligation. Such an obligation merely ensures that all buyers purchase the service at the same (excessive depending on the circumstances) price and thus the same conditions (a level playing field) are a given among them for the competition on the respective retail customer markets, but not with respect to the market dominant undertaking.

An "internal/external non-discrimination rule" in accordance with case (b) potentially has more influence on the height of the prices and thus is a possible alternative to price controls/cost orientation under Art. 38 VKND; an obligation on the market dominant undertaking to offer the service to all external buyers at the same price as its own retail arm.

But as LKW is itself not active on the retail customer markets and also does not intend to do so in the period under investigation according to the strategy it has communicated, the imposition of an internal non-discrimination rule can be disregarded at present.

6.6.2 Quality discrimination

While it is true that by guaranteeing the access to infrastructure which cannot be easily replicated as well as by setting a cost oriented access price, the requirements for the same conditions of competition are fundamentally established on the downstream

market, however the undertaking with significant market power on the wholesale level still has a series of other instruments (other than the price) at its disposal in order to distort the competition on the retail customer market. Thus it could for instance provide the product to its competitors on the downstream market at worse quality than is the case when providing it internally, or it could deny the access to specific necessary information which delays the provision or limits it geographically, or it set unreasonable contractual conditions, or even bundles the product together with other products in order to increase the costs for its competitors so as to limit their sales, or it leverages its market power onto a closely related market, which in the present case is the market for trunk leased lines especially.

If a cost oriented access price has been set and thus the price is no longer available to the market dominant undertaking as a competition influencing parameter, it can then be assumed that the market dominant undertaking will increasingly attempt to increase its profits by means of such behaviour. That is to say, if the undertaking is in a position to increase the costs of its competitors, this leads to an expansion of its market share as well as to an increase in the prices on the retail customer market, which in turn leads to higher profits for the vertically integrated undertaking with significant market power on the wholesale level.⁶⁵ Thus any impediment by means of non-pricing related parameters represents an option for the market dominant undertaking to practice foreclosure, to effectively deny access or eliminate others from the market.

As LKW itself is currently not active on the (leased line) retail customer markets and also does not intend to do so in the period under investigation according to the strategy it has communicated, it has no (economic) incentive to implement the practice detailed above of leveraging its market power onto closely related markets. For this reason the imposition of an obligation of non-discrimination under Art. 34 VKND to guarantee the effectiveness of the regulation of the physical access to the core network infrastructure (and especially in the form of access to the existing fibre optic cables), which is related to all of the parameters linked to the provision of the wholesale product, can be disregarded at present.

However in the context of the intended granting of access to the physical infrastructure, an internal non-discrimination rule to guarantee the principle of equivalence, i.e. to have equivalent conditions for the access to and the use of the civil engineering infrastructure by third parties – in the same way as for the use by the regulated undertaking itself – is intended under Art. 34 VKND.

⁶⁵ Cf. ERG Common Position on Remedies (2006), section 2.3.1.2.

6.7 Reference offer and transparency obligation

An obligation to publish a reference offer under Art. 34(3) VKND is required in order to put in a concrete form and/or render operative both the obligation of non-discrimination as well as the access obligation.

Because even with the imposition of an obligation of non-discrimination, a regulated undertaking can still have an incentive to conduct discriminatory behaviour when this behaviour either remains undiscovered or it is even discovered too late, or the implementation of the non-discriminatory behaviour requires a certain amount of time.

In order to be able to guarantee compliance with the obligation of non-discrimination under such conditions, the transparency obligation in accordance with Art. 35 VKND is required. In the context of the transparency obligation, the Regulatory Authority can collect data at regular intervals on the compliance with the obligation of non-discrimination, in order to be able to set short-term measures for its compliance as required.

6.8 Accounting separation

Art. 38 VKND contains obligations with respect to price controls and cost accounting for the access. This provision is suitable as a basis for setting an adequate access price on the wholesale level. Alternatively in the current context, the obligation of non-discrimination (Art. 34 VKND) in conjunction with the accounting separation obligation (Art. 36 VKND) can be considered as potentially coming into question for the setting of the access price.

The internal transfer prices could be made transparent through the accounting separation obligation, which could then with the help of the obligation of non-discrimination (internal/external non-discrimination rule in relation to the price parameter) also form the basis for external transactions. However as the information required in the current case in the market concerned, i.e. prices on the product level, cannot be made sufficiently transparent by means of these obligations – and this not least because LKW is not active at all on the downstream markets and thus no internal transfer prices exist –, the joint obligation in accordance with Art. 34 VKND and Art. 36 VKND is not suitable by itself for setting the access price.

It is true that the imposition of accounting separation for the whole undertaking on the product level could be considered, which would be required in order to sufficiently restrict the scope of the undertaking subject to regulation with respect to allocating the costs and revenues to the relevant business areas. This is so because the regulated undertaking would have an economic incentive to report excessive transfer prices. However this measure which concerns the product level would be disproportionate as other areas would also be affected by it which are not subject to regulation and the

burden is far greater in general for the undertaking with significant market power than is the case when only certain products are subject to price control and cost accounting.

Hence it cannot be assumed that the accounting separation obligation is sufficient in order to make the information required for setting the price transparent in the required degree of detail (on the product level). Against this background, the non-discrimination obligation in conjunction with the accounting separation is to be assessed as either an insufficiently effective instrument to eliminate the identified competition problems or the obligation is interpreted in such a wide and overreaching manner that it is ultimately equivalent to the price control in accordance with Art. 38 VKND.

The question arises in general in this connection of what a non-discriminatory internal transfer price of a (partly) vertically integrated undertaking can be. The issue consists of objectively assigning the costs to the products in accordance with where they arise. From a theoretical perspective, these are first and foremost only the incremental costs, as common costs cannot by definition be clearly assigned to a single product, so that the possibility and the incentive exists in this regard for the regulated undertaking to allocate all common costs to regulated products, which can lead to the reporting of so-called stand-alone costs. At the most, accounting separation can lead to a situation whereby agreement on the plausible and justifiable allocation of common costs is established and guaranteed by means of regular controls of the compliance with this allocation over the course of time in order to prevent any shifts in same motivated by specific situations.

For undertakings with a large number of products, the cost orientation by means of a (short) procedure is only possible when there are regularly assessed separated accounts in the accounting separation framework. Only in this way can an assessment of the cost orientation of individual products or product groups be conducted in individual cases in a short time period and it can be ensured that costs are not shifted from unregulated to regulated business areas (or inversely as the case may be).

From these perspectives, the obligation of non-discrimination in conjunction with the accounting separation obligation are not the most suitable measures; thus a price control in accordance with Art. 38 VKND is preferable. However accounting separation can be utilised as a supportive measure for determining cost oriented prices. Thus it is possible with accounting separation for the Regulatory Authority to identify cross-subsidisation between regulated and unregulated areas of an undertaking. As LKW also has market power available to it over other markets, and especially on the market for the physical access to the access network (M4) and the accounting separation instrument has also been imposed there, the accounting separation obligation can be regarded as reasonable especially as the incremental costs of this regulatory instrument are low on the present market (and there are significant synergies available).

6.9 Proportionality of the measures

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

The suitability of the measures of special regulation to be set to redress the identified competition problem has already been discussed in detail in the earlier sections of this chapter.

Furthermore, in the earlier sections of this chapter the various measures of special regulation available were assessed as to whether they represent the mildest means of intervention still capable of remedying the competition problems determined.

Ultimately when judging the question of the proportionality of the measures in a stricter sense, their reasonableness and/or intervention intensity must be discussed. In particular the computation of cost oriented access prices on the basis of historic full cost accounting – instead of using for instance an intrusive, costly and time consuming bottom-up LRAIC model – as well as the additional utilisation of international comparative values guarantees this. The other measures to be taken, i.e. the imposition of obligations to guarantee non-discrimination, prepare a reference offer, have transparency and accounting separation represent *per se* minor interventions into the private autonomy of an operator and are accompanied by low implementation costs on the part of the undertaking concerned.

6.10 Conclusion

Hence the following measures of special regulation are to be imposed on LKW as the market dominant undertaking on the wholesale market for physical infrastructure access services for high capacity transmission routes in the core network in order to eliminate the competition problems identified:

- obligation to grant physical access to network infrastructures for high capacity transmission routes in the core network (Art. 37 VKND), including the access to the civil engineering infrastructure and the necessary annex services;
- price controls (Art. 38 VKND) by means of cost oriented prices based on historic full cost accounting while taking into consideration international comparative values (benchmarking);
- accounting separation (Art. 36 VKND);
- an external obligation of non-discrimination with respect to granting physical access to the core network infrastructure and an external and internal obligation

of non-discrimination in relation to the granting of access to the civil engineering infrastructure (Art. 34 VKND);

- the publication of a reference offer (Art. 34(3) VKND); as well as
- a transparency obligation (Art. 35 VKND).

With this combination of regulatory instruments, the competition problems of the denial of access – both the current denial of access to civil engineering infrastructure, as well as the theoretically possible direct or indirect denial of access to dark fibre –, the exercising of market power over buyers by means of excessive or discriminatory prices, as well as the leveraging of market power onto the market for trunk leased lines by denying adequate access to wholesale products can be countered.

No other regulatory options exist which are suitable for redressing the competition problems as named. Consequently, the measures of special regulation identified are the smallest set of regulatory measures which are suitable for countering the competition problems as named. This thus corresponds to the principle of proportionality.

The necessity for each individual measure is evident from the details provided above in relation to the individual regulatory measures. The present instruments concern complementary and not alternative ones. Each serves in its own way – as explained above – to counter specific partial problems in connection with the competition problems identified. Only by applying all the instruments can it be guaranteed from the AK's viewpoint that the competition problems identified are actually eliminated or prevented respectively.

The obligations are applicable for all products contained in the definition of the wholesale market for physical infrastructure access services for high capacity transmission routes in the core network. These obligations are equally applicable to new products which first have to be developed but which are also included in this market, as otherwise they would not be subject to regulation despite their lack of replicability.

7 Rendering the regulatory instruments operative

The following more precise specifications of the measures considered in Chapter 6 can be provided:

7.1 Physical access to the core network infrastructure

As LKW's country-wide core network infrastructure concerns a not (easily) duplicated infrastructure and LKW can leverage its market power vertically onto the downstream wholesale market for trunk leased lines, the imposition of an access obligation is necessary.

Thus LKW is obliged to permit the physical access to the passive infrastructure in the core network in response to reasonable demand. In addition to the currently provided access to single (unbundled) fibre optic or individual or several fibre optic pairs, this also includes the wavelength unbundling access (in the event that this should be required for availability reasons for instance) or other future forms of access. Likewise, the access to the necessary annex services (e.g. collocation) is to be granted.

In addition for the further lowering of the market entry barriers, LKW is also obliged to provide access to the available civil engineering infrastructure in the core network (cable routes, cable ducts, manholes, distribution points and other infrastructure facilities for the provision of infrastructure for high capacity transmission routes in the core network). The intention is in this way to facilitate the entry of potential competitors onto the market for transmission or access services in the core network respectively through the use of their own fibre optic cables by means of their own (partial) infrastructure, without themselves having to undertake the excavation and other construction measures which concern the largest share of the high sunk costs and the time required for the construction phase.

The obligation to grant access to the civil engineering infrastructure is also related to the obligation of non-discrimination imposed, as LKW also has to avail of this infrastructure in order to provide the service on the market which is the subject matter of the analysis. The granting of access should occur in accordance with the principle of equivalence (equivalent conditions to those for the usage by the regulated undertaking itself – internal non-discrimination obligation). In this regard, third parties are to be provided with the same information about the civil engineering infrastructure and distribution points, as well as the collocation options. This information should include the organisation and the geographic locations of the physical infrastructure, the technical features of the various elements which the infrastructure consists of, the capacities available as well as those points where collocation is possible.

In the event that there is a justified application or a demand for a reasonable service (so-called reasonable request) that is not covered by the reference offer, recourse shall be available to AK.

7.2 Price controls

Although in principle⁶⁶ the undertakings should negotiate in good faith on a private commercial basis about the access and interconnection conditions, despite this the competition problems identified in the context of the market analysis have to be redressed as quickly and effectively as possible.

With respect especially to the prices for the access to infrastructure wholesale products in the core network, the undertaking with significant market power fundamentally has no incentive to agree cost oriented prices. Hence a pure obligation to have cost orientation without at the same time setting the prices as well would be inadequate. Likewise, the threat of possible later intervention by the AK in the event that no private commercial agreement is reached would unduly protract the redressing of the problem of the excessive prices and not establish the required transparency and legal certainty. Hence the setting of prices is the only suitable means to redress or prevent excessive prices on the market which is the subject matter of the analysis.

7.2.1 Access price

On the market for the physical access to the infrastructure in the core network, LKW has sole control over an infrastructure which is not easily duplicated and thus – due to the lack of countervailing buying power – is has significant market power available to it. Hence LKW has an incentive in this way to raise the access prices above the competitive or cost efficient level respectively. Thus the cardinal objective of the regulation must be to correct this market failure and set the access rates at the height of the fictive or cost efficient competition price respectively.

Instead of using an engineering-like bottom-up LRAIC model operated by the Regulatory Authority which in the opinion of the AK seems unreasonable due to the resources and time required for it, the obligation to have the cost oriented provision of the physical access to the infrastructure in the core network (including any annex services related to this) as well as to the access to the civil engineering infrastructure based on historic full cost accounting should occur. The starting point for this is, one the one hand, the valuation of the (historic) passive infrastructure as purchased by LKW in the context of the consolidation agreement from 2007 and, on the other hand, the investments made since

⁶⁶ Cf. Recitals 5 and 6 as well as Art. 4 of the Access Directive 2002/19/EC.

then and/or the ongoing ones by LKW in the core network, which represent the current investments.

When a cost accounting model is used by a regulated undertaking to determine cost oriented prices, there is in principle an incentive to report (too) high prices. Likewise, the undertaking has no incentive to provide the services in line with the efficient use of resources due to the lack of competition pressure. The risk of gold plating and other inefficiencies occurs. In order to identify these as well as any reporting of excessive costs and be able to curb them, the AK must pay attention to this especially when assessing the cost accounting submitted and, if available, it must draw upon comparative values as well for instance from other countries or industries respectively as a supporting methodology (benchmarking) in order to be able to appropriately assess the cost values submitted by LKW and be in a position to correct them if required. This also concerns various parameters for the cost accounting, such as for instance depreciation periods and the weighted average costs of capital. When applying benchmarking, AK will make recourse to the costs prevailing in those countries which are similarly well developed in terms of network development and comparable in topography as Liechtenstein, with additional factors such as wage and price level, the settlement conditions or population density to be appropriately taken into account. Hence any possible striking differences which remain are to be taken into account finally when setting the concrete prices.

LKW is not permitted to give preferential treatment to any wholesale service buyer and it has to provide all of the services at non-discriminatory conditions (equal treatment under the same conditions) – and that also with respect to the prices and costs charged. When granting the access to the civil engineering infrastructure, LKW must grant conditions to third parties for the access and the use which are equivalent to those for itself or its associated undertakings as the case may be. Discounts and rebates may not be granted.

The annex services are to be determined and set accordingly in advance and cost oriented prices or expenditure based costing methods approved by the AK are to be charged or applied in a transparent manner.

7.2.2 Provisional setting of the access price

Until the submission and final approval of a cost accounting model in line with the requirements and of a reference offer from LKW based on this, the prices currently applied by LKW for FOC fibre and fibre pairs (dark fibre) and annex services in the core network should be applied as an upper limit. The price list currently used by LKW will be provided by the AK to the registered operators for the purpose of a comment with respect to this consultation.

In the event that, despite the non-discrimination guaranteed by LKW between the service buyers contained among others in the implementing agreement to the consolidation

agreement, it is seen that specific existing access agreements provide more advantageous conditions than in the price list mentioned above, these more advantageous conditions are to be applied in line with the principle of non-discrimination instead of the other ones until the approval of the reference offer.

7.3 Obligation of non-discrimination and reference offer

Wholesale products for the access to the infrastructure in the core network for high capacity transmission routes are to be offered in a non-discriminatory manner. LKW must grant all of the services, conditions and information related to the physical access in the core network to all of the wholesale service buyers at uniform conditions, quality and price (equal treatment under the same conditions). Discounts and rebates may not be granted.

In order to put this non-discrimination obligation in a concrete form and/or render it operative respectively, the publication of a reference offer is required. The reference offer (including prices) is to be submitted to the Regulatory Authority prior to its publication for assessment and approval. The publication must occur not later than three months after the imposition of the obligation.

Existing access agreements are to be adapted – as required – in line with this at the point in time of the publication of the approved reference offer.

The reference offer has to cover all of the access conditions. It is to be submitted to the AK in advance for approval and to be published by LKW. The reference offer should at least include those wholesale products which LKW currently provides and be extended as required with products which will be demanded regularly in the future. Thus it has to cover all the normal cases required for the access. In this regard, LKW is free to include the present measures of special regulation in already existing reference offers or to expand them. Any further services are to be provided by LKW on a case-by-case basis based on an assessment of the reasonableness of the request, if necessary with the intervention of the AK.

All services are to be offered in a sufficiently unbundled form and thus structurally itemised in such a way that a buyer of access only has to pay for those services which it also actually needs. Potential one-off or up-front charges are to be listed in a cost oriented manner in the reference offer and care must be taken to ensure that these are charged in a non-discriminatory manner.

As the AK can order amendments to the reference offer and impose a transparency obligation to accompany this, the AK is in a position to inspect all documents and papers which are required or useful for assessing the measures imposed (e.g. with regard to the price controls).

In the event that the physical access in the core network is subject to any availability or capacity restrictions, LKW must grant the access on equal terms in line with the given restrictions to all of the access buyers. In there is a lack of resources, reasonable new access products are to be provided where appropriate when demanded by other market players, such as especially the wavelength unbundling access to the fibre optic. LKW is to guarantee the efficient usage of limited capacities by the access buyers by means of appropriate measures and prevent misuse by an access buyer to the detriment of others. Demanding all or part of unused access capacities for instance for the purpose of preventing or restricting the access of another buyer, or measures of a similar effect, represent a misuse.

7.4 Transparency obligation

If an access partner brings the non-compliance with the non-discrimination obligation to the attention of the AK, it can proactively monitor its compliance. Such monitoring can serve for the potential launching of *ex officio* proceedings to remedy discriminatory behaviour. In this regard, the AK can require the following information especially:

- number of processed advance enquiries, offer requests/orders and items provided and the respective length of time need to process each of them;
- list of all unsuccessful advance enquiries, offer requests/orders, unprocessed items requested with a detailed description of the reasons for the hindrance and the action needed as the case may be on the part of the access partner which is required to have positive, successful processing;
- complete list of all existing or ordered access services and collocations at the point in time of the report, including details on their respective current status (ordered, offer submitted, under construction, transferred) together with the date of the last change in the status;
- submission of the detailed invoices in the reporting period of all (realised and transferred) access services and collocations in all forms as they are also provided to the access partner, together with details of the date of the transfer, the kind of collocation, the access partner concerned and the collocation location.

The provision of these data to the AK is regarded as suitable in order to be able to undertake the monitoring of the most fundamental aspects with respect to the compliance with the obligation of non-discrimination.

7.5 Accounting separation

Accounting separation should at least occur and be organised in accordance with the markets as per the Recommendation on Markets. In order to be able to recognise any

unjustified shifting of not directly allocable costs between regulated and unregulated areas, and/or between various regulated areas, it is necessary that the accounting separation also includes unregulated areas and thus the undertaking is reflected in its entirety. In this way the Regulatory Authority for instance is also in a position to recognise and thus prevent costs being charged twice. In the context of rendering the accounting separation operative as required, at a minimum the following information is to be provided in conformity with the requirements of the AK:

- revenues;
- costs (which can be differentiated in accordance with personnel costs, costs for the depreciation of assets, capital outlays and sundry costs);
- a detailed schedule of fixed assets for the undertaking, key figures on personnel, cost drivers such as especially the number of lines and other information necessary to assess the cost accounting.

The details of the concrete structure are to be specified by the AK.

Annex: - Overview of LKW's optical fibre telecommunications network as of January 2013

Übersicht Glasfaser Telekomnetz

