

**DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE**

Cancels & replaces the same document of 10 June 2014

Working Party No. 2 on Competition and Regulation

FINANCING OF THE ROLL-OUT OF BROADBAND NETWORKS

-- Note by Switzerland --

16 June 2014

This document reproduces a written contribution from Switzerland submitted for Session IV of the 57th meeting of the Working Party No. 2 on Competition and Regulation on 16 June 2014.

*More documents related to this discussion can be found at:
<http://www.oecd.org/daf/competition/>*

Please contact Ms. Cristiana Vitale if you have any questions regarding this document [E-mail: cristiana.vitale@oecd.org].

JT03359164

Complete document available on OLIS in its original format

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.



1. Introduction

1. This contribution focuses on the trade-off between investment and competition when deploying «next generation access» (NGA¹) networks as experienced in Switzerland. The Swiss case is characterised by relatively strong cable-operators and a co-investment strategy of the incumbent telecom operator Swisscom with public utilities for the roll-out of FTTH (Fibre To The Home) infrastructure. Even though Swisscom and the public utilities are partially state-owned, their investments are in principal privately financed.

2. Historically, the development of the Swiss broadband market was shaped by the rivalry between the incumbent telephone operator Swisscom and relatively strong cable operators. This infrastructure-based competition led to high broadband penetration, though complemented by a rather faint price competition. However, in 2007 the legislator refrained from implementing a comprehensive and technologically neutral regulatory framework. Consequently prices for broadband services remained comparatively high.² For lack of effective access regulation (cf. note 0), certain competition problems had to be addressed by competition law: since the liberalization of the Swiss telecom market in 1998, the Swiss Competition Commission and its Secretariat (hereafter: ComCo) have been investigating the Swiss broadband market several times. A major margin squeeze case, for example, resulted 2009 in a fine of 219 million Swiss francs.³

3. This contribution presents two reports by ComCo, which are directly concerned with financing of the roll-out of broadband networks in Switzerland: firstly, in 2010 and 2011 ComCo had to evaluate several cooperation projects between the Swisscom and the public utilities for the roll-out of FTTH networks; secondly, just recently, ComCo gave its evaluation of an adjustment of regulated prices. In those two reports, ComCo had to constantly consider the trade-off between investment and competition: comparatively high prices for broadband access had to be weighed against the prospect of high investments in NGA infrastructure.

2. Starting point: liberalization and regulation in Switzerland

4. The Swiss telecommunication market has been liberalized since 1998. Simultaneously, the newly founded Swisscom bought the Swiss landlines and thus became the incumbent telecom operator in Switzerland, of which the state remains the majority shareholder today.⁴ In 2000, Swisscom started its own ADSL broadband service. For lack of access regulation, until 2007 any telecom operator without own network infrastructure had no choice but to purchase commercial wholesale products from Swisscom.

¹ In this document NGA refers to networks that delivers fibre close or directly to the end. Besides Fibre-to-the-Home (hereafter: FTTH) this includes hybrid (fibre coax) cable networks based and hybrid networks based on twisted copper phone lines and Fibre-to-the-Node.

² Evaluation des schweizerischen Fernmeldemarkts (Bericht des Bundesrates in Erfüllung des Postulats KVF-S vom 13. Januar 2009 [09.3002]), p. 17. Preisüberwacher, Vergleichende Analyse der Preise für den Internetzugang in der Schweiz und ihren Nachbarländern, 2011. All decisions and reports of ComCo are available on <http://www.weko.admin.ch/>.

³ RPW 2010/1, 116 ff., *Preispolitik Swisscom ADSL*; the case is pending before the court of appeal.

⁴ <http://www.bakom.admin.ch/dokumentation/zahlen/00744/00749/00751/>.

5. The main competitors of Swisscom in the Swiss broadband market were various cable network operators which held a geographic monopoly for the provision of cable TV. Today, approximately 90 % of all Swiss households are connected to a cable network.⁵ Especially since cable operators have offered broadband internet access in the late 1990s, the infrastructure-based competition between Swisscom and cable operators has been shaping the Swiss telecom market. In fact until today, the extension of bandwidth for broadband customers has been led by the cable operators. However, this competition did not result in major price adjustments: whereas the bandwidth was constantly extended, prices for the different specific user profiles remained high and basically unchanged.⁶

6. The only major price reduction in the broadband-market resulted from the unbundling of the local loop in 2007 (local loop unbundling hereafter: LLU).⁷ This comparatively late regulatory intervention was accompanied by two particularities of Swiss telecom regulation: firstly, bitstream access was framed in such a way that telecom companies could hardly deploy it. As a result, their choice was to either buy the regulated local loop, which required considerable investments to access Swisscom's local exchanges, or to purchase Swisscom's commercial wholesale product (bitstream) «broadband connectivity service» (BBCS). Secondly, access to the LLU was regulated for the «twisted pair» metallic cable (of Swisscom) only; of which the access regulation is until today not technologically neutral.⁸

7. Since any infrastructure which is to some extent based on fibre or coaxial technology has been explicitly excluded from regulation, NGA investments have been primarily market driven. During the period between the adoption of the new regulatory framework in 2007 and today, some of the major investment decisions have been taken: widespread upgrade of the cable networks and the DSL-networks to NGA-level as well as the roll-out of FTTH networks. Today, more than 80 % of Swiss households have access to an NGA network and in the bigger cities Swisscom and public utilities offer services based on FTTH networks⁹.

8. Currently, three different regions concerning NGA investments can be distinguished: Where public utilities announced the roll-out of an FTTH network, Swisscom enters into a cooperation to build the network; in regions with competing cable operators, Swisscom invests in hybrid VDSL technologies; in other regions without any competing network operator, Swisscom shows basically no investment activity.¹⁰

⁵ <http://www.swisscable.ch/article/article.php3?art=675>.

⁶ Vgl. RPW 2012/2, pp. 209-259, *Glasfaser St. Gallen, Zürich, Bern, Luzern, Basel*.

⁷ BAKOM, Endkundenpreise bei Breitbanddiensten: Vergleich und Entwicklung der preisgünstigsten Produkte 2012-2013.

⁸ Art. 3 let. d^{bis} of the Telecommunications Act (TCA; 784.10) defines the *fully unbundled access to the local loop* as the provision of access to the local loop for another telecommunications service provider for utilisation of the ^{entire} frequency spectrum of the twisted pair metallic line. And Art. 3 let. d^{ter} TCA defines the *fast bitstream access* as the establishment of a high-speed connection to the subscriber from the exchange to the building connection on the twisted pair metallic line.

⁹ Gutachten der Wettbewerbskommission zur vorgeschlagenen Anpassung der Verordnung über Fernmeldedienste (FDV), 2014, note 20; available on <http://www.weko.admin.ch/>.

¹⁰ To identify in which region which kind of broadband access is available please check: <http://map.geo.admin.ch/?topic=nga>.

3. Cooperation between public utilities and Swisscom

9. In 2007, the local publicly owned utility company of Zurich (hereafter: EWZ) announced its plans to enter the telecom market by investing 200 million Swiss francs in a pilot FTTH network.¹¹ Soon other public utilities followed to roll-out FTTH networks in several Swiss cities.¹² Swisscom responded by initiating a parallel FTTH roll-out, while inviting the public utilities to cooperate.¹³ Swisscom promoted a multi-fibre model, which would allow each infrastructure owner to control at least one fibre. Swisscom justified the additional costs¹⁴ with the prospect of effective competition. For lack of regulatory competence, the Swiss telecom regulator, the Communication Commission (hereafter: ComCom), set up a round table in order to coordinate the FTTH roll-out in Switzerland.¹⁵ The participants finally agreed on certain standards, notably to roll-out four fibres for each household.¹⁶

10. In 2010 and 2011 six public utilities and Swisscom notified their cooperation agreement to ComCo for approval. Art. 49a section 3 of the Federal Act on Cartels and other Restraints of Competitions (CartA; SR 251) stipulates that possible sanctions for infringements of cartel law are waived if the undertaking submits notification of potential restraints of competition before it takes effect and that ComCo does not to open an investigation. Within this so called «opposition procedure», ComCo had to examine the cooperation agreements.

11. The cooperation contracts (with little differences) provided for the building of a separate feeder infrastructure and a common drop and in-house infrastructure. Additionally, they settled the usage rights for the four fibres per household and the financial commitment of each partner.¹⁷ In all contracts each party obtained at least one fibre exclusively. Concerning possible infringements of competition law, the parties announced in particular the following clauses to ComCo:

- *Layer-1-Exclusivity*: The clause provided that only public utilities were allowed to commercialize dark fibre (layer 1 in the OSI-model);
- *Protection of Investment*: This clause stipulated that one party could notify to the other party a price discrimination in order to maintain a certain price level;
- *Compensation Mechanism*: If the used capacity of the network by one infrastructure partner exceeds a certain ratio, additional compensation-payments are due.

¹¹ Later in 2012, a second credit of 400 million Swiss francs was granted in a public referendum for the FTTH roll-out in the whole city of Zurich.

¹² The first cities were Zurich, St. Gallen, Basel, Bern, Geneva and Luzern.

¹³ Swisscom press release, December 9th 2008.

¹⁴ WIK-Consult estimated around 22 % additional cost of the four fibre model compared with only one fibre: WIK-Consult, Szenarien einer nationalen Glasfaserausbaustrategie in der Schweiz, Study for OFCOM, 2009, pp.65-69.

¹⁵ <http://www.comcom.admin.ch/aktuell/00429/00457/00560/index.html?lang=de&msg-id=43030>.

¹⁶ RPW 2012/2, p. 259, *Glasfaser St. Gallen, Zürich, Bern, Luzern, Basel*.

¹⁷ The cooperation partners roll-out different areas and grant each other infeasible rights of use.

12. In its analysis ComCo came to the conclusion that the clauses «Layer-1-Exclusivity», «Protection of Investment» and «Compensation Mechanism» would be considered as cartels presumed to lead to the elimination of effective competition in the sense of art. 5 sec. 3 CartA.¹⁸ However, ComCo's report did not forbid those clauses: the ex ante evaluation required by the «opposition procedure» mainly allows for the indication of potential future elimination of competition.

13. In its report ComCo carefully weighed the danger of impeding investment versus the prospect of long lasting restraints of competition. As for the «Layer-1 Exclusivity», it should facilitate the utilities' market entry and secure their investment. However, according to ComCo a long lasting prevention of competition for dark fibre could result in a serious restraint of competition. «Compensation Mechanism» and «Protection of Investment» were designed to prevent aggressive pricing (e.g. below total cost). The cooperation partners argued that without this security they would not risk such investments. ComCo identified in its report various possible outcomes for those clauses capable of restraining competition e.g. they could prevent efficient strategies to gain market shares. Especially where customers are reluctant to take-up a new technology or face high switching costs, the public utilities would be hindered from market development whereas Swisscom could slowly transfer its customers while constantly making profit on the old networks.

14. Finally, ComCo concluded that Swiss Cartel Act did not allow for such far reaching exceptions as presented by the parties' clauses, without any regulatory rule approved by the legislator. After ComCo presented its report to Swisscom and the public utilities, they adopted their cooperation contracts for the most parts according to the objections of ComCo and – most importantly – continued their investment: Today most of the bigger agglomerations in Switzerland have access to an FTTH network, jointly financed by public utilities and Swisscom.¹⁹

4. Adoption of a «modern equivalent asset» for cost calculation

15. The Swiss telecom regulation requires that all cost-oriented pricing is based on a «modern equivalent asset»,²⁰ that is, the technology of a hypothetical new entrant. Today, an entrant undisputedly would roll-out an FTTH infrastructure. The regulatory body ComCom announced in several of its past decisions the imminent transition to FTTH technology²¹ expecting that this change in cost calculation would considerably reduce prices for regulated products such as LLU or leased lines. In order to guarantee predictability of regulatory decisions, ComCom invited the legislator to adjust the implementation rule of the Swiss telecom regulation, the Ordinance on Telecommunications Services (hereafter: OTS).

16. One reason for the ComCom's reservation to adjust the method of cost calculation independently, was the question of how to allocate infrastructure costs to different services. By using the technically feasible performance, most costs would be allocated to the fibre infrastructure, hence prices for regulated (copper) products would drop radically. However, today almost nobody demands such high bandwidth. Alternatively, costs could be allocated equally, which would result in similar wholesale prices for obviously very different products. In the legislative process, the Federal Office of Communications (hereafter: OFCOM) proposed to adjust the cost model with a «performance delta» based on potential revenues for a copper and a fibre access line: As long as the market potential of the old and the new

¹⁸ RPW 2012/2, p. 216, *Glasfaser St. Gallen, Zürich, Bern, Luzern, Basel*.

¹⁹ In few places such as the city of Lausanne, Swisscom cooperates with the local cable operator.

²⁰ Art. 54 Section 2 of the Ordinance on Telecommunications Services (OTS; SR 784.101.1).

²¹ Gutachten der Wettbewerbskommission zur vorgeschlagenen Anpassung der Verordnung über Fernmeldedienste (FDV), 2014, note 20.

technology are still basically the same, cost allocation remains equal; only when demand and revenues of fibre-based services sufficiently increases, prices for copper products will drop.²²

17. The legislation was highly contested as Swisscom and other infrastructure owners (cable operators and public utilities) feared a major drop of access prices, especially LLU. They argued that this adjustment would lead to an overall price cut for broadband products. This would reduce their profit expectation and hence their incentives to invest in NGA infrastructure. The Swiss Federal Council decided to consult the Competition Commission (ComCo) on this matter before taking its decision. The main question which was brought forward to ComCo was if the usage of a «modern equivalent asset» for cost calculation as well as the implementation of the «performance delta» would affect incentives to invest in NGA infrastructure.

18. The question of how the regulation of a telecom infrastructure affects investment incentives is highly disputed among researchers and practitioners.²³ ComCo was well aware of this debate. Rather than attempting to settle this question generally, ComCo approached the matter by first limiting the scope of a potential effects and then assessing the effects on competition for the specific Swiss context. Today, over 80 % of Swiss households already have access to an NGA infrastructure. For these regions, NGA investments are already sunk and any adjustment of cost calculation cannot influence investments. Furthermore, certain (alpine) regions of Switzerland are very sparsely populated. For these regions, the investment in an NGA-infrastructure will not be profitable, which is why a change in cost calculation will also make no difference. As a result, any change of cost calculation may only influence a very limited region of Switzerland, which comprises around 12 % of Swiss households.²⁴

19. For the analysis of a potential impact for these households, ComCo concentrated its analysis on two effects, which it evaluated again not generally, but in the very specific Swiss context.²⁵

- i. The «replacement effect», which is well known in industrial economics, states generally that a historic monopolist has little incentives to invest in a new network infrastructure, which would cannibalize the existing one. OFCOM justified the introduction of a «performance delta» with this effect arguing that an artificially high price for the LLU would prevent investments in NGA infrastructure.²⁶ Indeed Swisscom only started its NGA investments when faced with the upgrading of cable networks and the roll out of FTTH infrastructure by public utilities. There can be little doubt that Swisscom was not the first mover in NGA investment. Only infrastructure-

²² Gutachten der Wettbewerbskommission zur vorgeschlagenen Anpassung der Verordnung über Fernmeldedienste (FDV), 2014, note 14-16.

²³ See e.g. Telecommunications Policy 37, November 2013, in which all articles deal highlight different aspects of the ongoing debate. An overview provides: CARLO CAMBINI/YANAN JIANG, Broadband Investment and Regulation: A Literature Review, 2009, Telecommunications Policy 33, pp. 559–574.

²⁴ Gutachten der Wettbewerbskommission zur vorgeschlagenen Anpassung der Verordnung über Fernmeldedienste (FDV), 2014, notes 21-22.

²⁵ The literature discusses many different effects which depending on set-up and assumption; see CARLO CAMBINI/YANAN JIANG, Broadband Investment and Regulation: A Literature Review, 2009, Telecommunications Policy 33, pp. 559–574. However, the discussion about the specific modelling of cost calculation concentrates mainly on the above mentioned effects: see MARC BOURREAU/CARLO CAMBINI/STEFFEN HOERNIG, Ex ante regulation and co-investment in the transition, 2012, Telecommunication Policy 36 and CHARLES RIVER ASSOCIATES, Costing Methodologies and Incentives to Invest in Fibre, 2012.

²⁶ WIK-CONSULT, Analyse von alternativen Methoden zur Preisregulierung, Studie im Auftrag des BAKOM, 2012. See also: WIK-CONSULT, Wholesale pricing, NGA take-up and competition, Study for ECTA, 2012.

based competition forced Swisscom to react. Significantly, in regions without competing infrastructure, Swisscom requests communes to contribute to the upgrade of their old copper landlines to NGA standard.²⁷ ComCo concluded therefore that a replacement effect could be observed, however, it would only still affect a very small area: regions without infrastructure competition, but where NGA investment would be in principle profitable.

- ii. The opposite effect is initiated by the «migration effect», which basically states that low LLU prices would (negatively) affect prices of all broadband products, even if they require a much higher bandwidth than attainable with LLU. Hence, the infrastructure owners argued that incentives to invest in NGA infrastructure would be seriously impeded by a reduction of the LLU price.²⁸ ComCo had analysed this question extensively when examining the FTTH cooperation.²⁹ Since the introduction of LLU in 2007, the regulator had adjusted its price several times. However, this reduction had only affected prices of copper-based broadband products. Prices for higher bandwidth were unaffected: they stayed the same or even increased over time.³⁰

20. ComCo established therefore in its report for the Swiss Federal Council that in the Swiss context the «replacement effect» might dominate the «migration effect», although any effect would only be relevant for a very small part of Switzerland. The driving force for investments in NGA infrastructure in Switzerland is, undisputedly, strong infrastructure-based competition. However, this competition is mainly concerned with broadband products, which cannot be provided over copper infrastructure, such as triple-play bundles (internet, fix-net telephone and television) and bandwidth higher than 15 Mbits/s. ComCo concluded therefore that an adjustment of cost calculation (without assessing the concrete method) would have hardly any effect at all on investment decisions. If anything, it would stimulate investment in regions without infrastructure competition. And even if a reduction of the access price (assuming a strong «migration effect») would have a negative effect on investments in those areas, the enhancement of service based competition throughout Switzerland would still justify an adjustment of access prices to a «modern equivalent asset» and the introduction of a «performance delta».³¹

5. Discussion

21. The surprising outcome of the particular Swiss «experience» is the widespread market entry of a new infrastructure provider, the public utilities. Their initiative led to the roll-out of FTTH networks in most larger agglomerations of Switzerland. This result was in principle attained without state funding. A more detailed analysis reveals that on the one hand, the infrastructure owners probably anticipate the amortization of infrastructure investments because they expect persisting high prices for broadband access. Hence, there is an intense opposition to any adjustment of LLU-prices. On the other hand only public companies are building FTTH infrastructures, which raises suspicions of not strictly market-based assessment of investment risks.

²⁷ See e.g. <http://www.swisscom.ch/de/privatkunden/festnetz/das-netz/gemeinden-regionen.html>.

²⁸ See e.g. PLUM CONSULTING, Costing methodology and the transition to next generation access, a report for ETNO, 2011.

²⁹ Vgl. RPW 2012/2, pp. 209-259, *Glasfaser St. Gallen, Zürich, Bern, Luzern, Basel*.

³⁰ See also: BAKOM, Endkundenpreise bei Breitbanddiensten: Vergleich und Entwicklung der preisgünstigsten Produkte 2012-2013.

³¹ Gutachten der Wettbewerbskommission zur vorgeschlagenen Anpassung der Verordnung über Fernmeldedienste (FDV), 2014, notes 37-40.

22. At the moment, the telecommunication sector is in a phase of transition: constantly increasing demand for higher bandwidth slowly renders the old copper network obsolete. This development results in a shift of the customer base to hybrid networks, which are not subject to access regulation. The application of the «performance delta» should enable a frictionless transition, without impeding NGA investments.

23. The co-investment strategy of public utilities and Swisscom enables a widespread roll-out of FTTH networks. Despite the higher costs, the multi-fibre model may enable competition on the infrastructure level. Most public utilities committed themselves to an open access strategy, which allows many (smaller) telecom companies to offer their services on the new infrastructure. Moreover, as the utilities do not offer any retail service themselves, there is no margin to be squeezed by them.

24. Effective competition is possible but also fragile. The tight cooperation between Swisscom and public utilities remains a challenge for ComCo. As regulation in Switzerland is not technologically neutral, ComCo has the relevant markets under constant observation. It especially remains to be seen how the cooperation agreements are applied and if the close cooperation on infrastructure level results in the restraint of effective competition. For example, a prohibitive layer-1-price of Swisscom could have the same effect as the «Layer-1-Exclusivity».

25. There are also concerns because the partners have very different starting points for market development. Swisscom owns the old telephone network which has been continually upgraded to NGA bandwidth, and a powerful mobile network of the fourth generation.³² Swisscom can slowly transfer customers to its FTTH infrastructure, whereas the public utilities face strong pressure to develop their customer base. For example in Zurich, Swisscom finances 60 % of the FTTH network and the public utility EWZ 40 %.³³ However, the market share of Swisscom is (on the old infrastructure) about 60 % and switching costs are usually rather high. Swisscom's financial risk is manageable, whereas it needs to be seen if EWZ will manage to gain a market share corresponding to its investment, once the requested bandwidths exceed the capacity of the hybrid copper and cable infrastructures. As EWZ only offers wholesale products its business model faces even more challenges.

26. If the demand for bandwidth further grows, cable networks eventually will lose market shares, similarly to copper technology today. As the cable operators do not yet dispose of an FTTH infrastructure their strategy remains vague. They can either further upgrade their own network or finally shift to the fibre network infrastructure of the public utilities and Swisscom. The latter scenario could lead to a duopolistic market with two network operators working tightly together on one common infrastructure.

27. At the moment, take up rates of FTTH-based products are still rather low. The public utilities have reacted with a push for more and symmetric bandwidth in order to create a unique selling position. However the price level still remains quite high for residential customers, a phenomenon that has been characteristic for the Swiss telecommunications sector since its liberalization. The development of the next few years will show if more competition is possible or if regulation (and the correspondent adaption of the law) will be an adequate response to this constellation. A further challenge will be the provision of NGA infrastructure in remote areas. Eventually, it is not clear whether the closing of the broadband gap can succeed without any kind of state intervention.³⁴ However, due to strong infrastructure-based competition this gap seems at the moment comparatively small.

³² Long Term Evolution (LTE).

³³ <https://www.stadt-zuerich.ch/ewz/de/index/telecom/ewzTelecomPortrait/ewzTelecomAuftrag.html>.

³⁴ In order to formulate strategies for NGA deployment in remote areas and consult communities, OFCOM established a task force; see <http://www.hochbreitband.ch/>.