

# Equivalence and non-discrimination – A review and critique of the Commission’s intended approach for fibre regulation

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## Executive summary

1. WIK-Consult (“WIK”) has been appointed by Enable Networks and Ultrafast Fibre (“the LFCs”) to prepare a report in response to the Commerce Commission’s draft guidance on equivalence and non-discrimination. This report is prepared to support the LFCs in the regulatory process related to fibre regulation. Nevertheless, this report is brought to the attention of the Commission as an independent expert report.
2. According to the Commission, the LFCs have to meet the equivalence and non-discrimination requirements under different tests which might generate different results. In our view and assessment the non-discrimination obligation for self-supply is identical in effect to the service provider’s equivalence obligation. As a consequence, we conclude when the equivalence test is satisfied, the non-discrimination test for self-supply is automatically satisfied.
3. In the Commission’s view to satisfy equivalence of price, upstream prices have to meet an economic replicability test (ERT). The Commission formulates this guidance unconditionally. In its view ERT should hold and be applied under all economic circumstances. The Guidance holds regardless of the level (and structure) of the wholesale prices. We will show in this report that this proposition of the Commission violates efficiency requirements, discourages investment, distorts entry decisions and in the end harms the long-term interests of end-users.
4. Besides generally applying an ERT the Commission’s Draft Guidance formulates the additional requirement that the upstream price should be the lower of the imputed upstream price calculated using the minimum of the ECPR-based rule and the upstream cost calculated using either the LRIC or BBM methodology. Our report shows that while this additional requirement applies an ERT it is not a rational and efficient dynamic pricing approach. It does not allow LFCs to earn enough revenues over time to recover the UFB investment and to earn a risk-adjusted rate of return.
5. In developing its own ERT methodology the Commission correctly refers to a similar ERT approach defined by the European Commission. The Commission, however, overlooks the context in which the EU introduced the ERT concept and the prerequisite for its application in the EU. By ignoring this context the Commission derives wrong conclusions on the general applicability of the ERT. The dominant application of the ERT among European NRAs is related to competition at the end-user markets for broadband access. The ERT is used to test whether access seekers are able to replicate the end-user prices of the vertically integrated incumbent. The ERT also provides pricing flexibility for wholesale inputs which are not subject to cost-based regulation. European NRAs have predominantly used the ERT to give incumbents price flexibility for L2 and

L3 bitstream access services. NRAs do not use the ERT to derive the L1 unbundling price from a (regulated) L2 or wholesale access price. That would not make sense because the unbundling price is regulated and there is no flexibility for the incumbent to vary it.

6. Using the ERT to determine an upstream wholesale price is efficient only as long as there is price flexibility for the network operator in determining its downstream price. If the network operator faces a price constraint in the downstream market, then the efficiency of the upstream price resulting from applying an ERT depends on the efficiency characteristics of the downstream price following from the constraint. If the constraint generates a cost-based price, then the resulting upstream price would also be a cost-based price. Such a price enables efficient entry in the downstream market by access seekers. In that case there is efficient competition between the network operator and the access seeker in the downstream market. If the constraint generates a downstream price below cost, then the resulting upstream price will also be below cost. This outcome favours access seekers at the expense of network operators and incentivises inefficient entry. The LFCs do not have pricing flexibility in their downstream L2 market. The L2 prices in New Zealand are not the result of economic efficiency considerations.
7. Thus, LFCs will not have pricing flexibility regarding L2 prices until 1.1.2022 and it may need another one to two years before one can interpret the then prevailing L2 prices as market prices resulting from an unconstrained pricing behaviour of LFCs. Only then would it be appropriate to apply an ERT to determine L1 prices.
8. In addition to straight forward requirements for non-discrimination, the Commission also includes in its definition a behaviour which offers the same terms to different access seekers but the offer has a different effect depending on the position of the access seeker purchasing the service. Individual and or subjective characteristics in the latter case thus become a criterion for an objective classification of the conduct of a network operator. This also implies that the characteristics of an access seeker and not objective criteria of the price structure or terms may determine whether or not the access seeker would face discriminatory treatment. This unusual approach makes the concept of discrimination highly arbitrary and subject to adverse selection and moral hazard. We will demonstrate the inefficiency implications of this highly questionable definitional approach in the case at hand.
9. The costs of PONFAS unbundling are not only related to the number of customers connected to an RSP. They also depend on the purchase behaviour of an RSP. Unlike L2 costs, the L1 cost of splitters and feeder fibres become RSP-specific costs and can no longer be shared between RSPs. Pricing according to cost causation and the cost drivers of service generation cannot relate L1 PONFAS prices to the cost driver end-users as in the case of L2, but has to reflect the RSP-

specific drivers. Only component pricing can properly manage this. The relationship between cost causation and cost drivers on the one hand and price or price structure on the other hand can no longer be reflected by a uniform price depending on the number of an RSP's customers. The price structure directly has to address RSP-specific cost components. Component pricing where unbundlers pay a fixed charge for the splitter, feeder fibre and collocation and a variable per customer charge for the distribution fibre reflects the cost structure of providing the PONFAS service.

10. Under the PONFAS service description and service provision access seekers get access to the LFCs' network such that their access is equivalent to the LFCs' own access or usage of the network.
11. Given the architecture of P2MP fibre networks it is obvious that the efficient use of the unbundling option for unbundlers is limited. As network and cost structure suggest, two prerequisites are essential: Firstly, a certain local density of connections and a certain (local) market share. Otherwise, economies of scale at the FFP level (splitter, feeder fibre) and at the CO level (GPON system) cannot be exhausted. Network and cost structure do not support competition for L2 services over the whole footprint of an LFC network.
12. Using an unbundled wholesale input compared to bitstream access means jumping upwards in the ladder of investment. Each step upwards on the ladder changes the cost structure such that the relative proportion of fixed cost increases at the expense of variable cost. To keep the business model viable and profitable jumping up the ladder requires either a larger market share and/or a stronger (local) concentration of demand. As a result the number of players which can viably jump up the ladder may decrease. This is not an abstract consideration. Actual market structure development supports this dynamic. This will also hold for PONFAS unbundling.
13. Component pricing creates incentives to use L1 PONFAS services only if the relevant network elements are equally or similarly efficiently used as the network operator is using them. Access seekers will use PONFAS if and when they can concentrate a relevant number of customers in an FFP area. There is no inefficient duplication and underutilization of resources. Access seekers only use network elements which they can efficiently fill.
14. Vogelsang argues that component pricing violates the Act's prohibition of geographic price discrimination. This argument is incorrect. Component pricing is calculated on the basis of cost averaging between low cost and high cost areas and is therefore consistent with geographic uniform pricing. It does not discriminate geographically. If unbundlers efficiently choose between the L1 and

the L2 services, they face similar or identical cost of wholesale inputs in low and high density areas.

15. Component prices are not discriminatory with regard to individual customer characteristics. They do not vary according to willingness to pay. Component prices also do not involve large up-front payments to adversely select large unbundlers against small unbundlers. They are not volume discounts or a two-part tariff, and do not represent second or third degree price discrimination.
16. There are many similarities between sub-loop unbundling (SLU) and PONFAS/L1 unbundling in a P2MP fibre architecture. Sup-loop unbundling generates a similar cost structure to unbundlers as PONFAS unbundling. When the Commission introduced SLU in New Zealand in 2009, it set different component prices for colocation at the cabinet, for access to the sub-loops and for the fibre backhaul from the cabinet to the CO. This price structure is nearly identical to the pricing model which the LFCs have developed for using their PONFAS unbundling service.

## 1 Introduction and acknowledgements

### 1.1 Introduction

17. WIK-Consult (“WIK”) has been appointed by Enable Networks and Ultrafast Fibre (“the LFCs”) to prepare a report in response to the Commerce Commission’s draft guidance on equivalence and non-discrimination. According to the LFCs’ request, WIK’s report should mainly respond to the following points:

- (1) that to satisfy equivalence of price, the available margin [between L1 and L2 prices] has to satisfy the economic replicability test [3.30], and that if the network’s own downstream operations traded at a loss *“it could be inferred that the network operator’s downstream operations were receiving different and more favourable terms than access seekers”* [3.32];
- (2) that in the economic literature two- (or multi-) part tariff price structures are considered a form of price discrimination (specifically related to the feeder fibre/distribution fibre pricing structures adopted by the LFCs).

Besides these two major points this report covers selected other items of the Commission’s draft guidance.

18. This report is prepared to support the LFCs in the regulatory process related to fibre regulation. Nevertheless, this report is brought to the attention of the Commission as an independent expert report.

### 1.2 Citation

19. To make citation a bit easier we use a few abbreviations. We refer to the Commission’s documents in the following way:

- (a) **Commission’s Draft Guidance** stands for: Commerce Commission, Equivalence and non-discrimination – guidance on the Commission’s approach for telecommunications regulation, draft version, 4 March 2020.
- (b) **Commission’s EVP** stands for: Commerce Commission, Fibre regulation emerging views: Technical Paper, 21 May 2019.
- (c) **Commission’s Response** stands for: Commerce Commission, Equivalence and non-discrimination in New Zealand telecommunications – Ingo Vogelsang report, Response to submissions, 2 April 2020.

- (d) **Commission Fixed Line Regulation** stands for: Commerce Commission, Fixed line telecommunications regulation overview, Context of the regulatory framework, 2 April 2020.
20. In October 2019 the Commission has initiated a consultation on its expert advisor's report by Ingo Vogelsang. We refer to this report and several submissions and cross-submissions in relation to the consultation in the following way:
- (a) **Vogelsang Report:** Ingo Vogelsang, Equivalence and non-discrimination in New Zealand telecommunications markets: The case of Layer 1 unbundled access to fibre networks, October 16, 2019.
  - (b) **LFC Submission:** Enable Networks Limited and Ultrafast Fibre Limited, Submission on application of equivalence and non-discrimination obligations under Part 4AA of the Telecommunications Act 2001, 31 October 2019.
  - (c) **Chorus Submission:** Chorus submission on Professor Ingo Vogelsang's interpretation of the equivalence and non-discrimination obligations imposed on local fibre companies, 18 November 2019.
  - (d) **NERA Report:** NERA, Equivalence and non-discrimination: a review of Ingo Vogelsang's report on behalf of Chorus New Zealand Limited, 18 November 2019
  - (e) **Vocus/Vodafone Submission:** Vocus Group New Zealand and Vodafone New Zealand, Joint submission on expert report from Dr. Ingo Vogelsang on equivalence and non-discrimination, 18 November 2019.
21. We refer to our own report prepared for the LFCs in June 2019 and also submitted in the October 2019 consultation:
- (a) **WIK Report:** WIK-Consult GmbH (authors: Dr Karl-Heinz Neumann, Dr Thomas Plückebaum), EOI pricing for unbundled services of LFCs, non-confidential version, 7 June 2019.
22. All other documents and publications which we cite are fully documented wherever we refer to them.
23. If we reference within this text to a "para xy" it means a paragraph in this report.

### 1.3 Structure of the report

24. This report is structured in four sections. In Section 2 we present the Commission's and our own understanding of equivalence and non-discrimination. In Section 3 we assess the ERT concept in its application by NRAs in general and the Commission in the context of L1 PONFAS pricing<sup>1</sup>, Section 4 reflects and assesses whether a component pricing for L1 services is discriminatory.

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<sup>1</sup> When we refer to L1 pricing it is always related to L1 PONFAS pricing only without explicitly mentioning that in each particular case.

## 2 Equivalence, non-discrimination and pricing

25. According to Section 156 AB of the Telecommunications Act 2001 the LFCs have to satisfy the following equivalence requirement: *“equivalence of supply of the service and access to LFC’s network so that third party access seekers (RSPs) are treated in the same way to LFC’s own business operations, including in relation to pricing, procedures, operational support, supply of information and other relevant matters”*. This equivalence of input (EOI) requirement is the only requirement LFCs have to meet when providing the unbundled services. Agreement on service description and price with RSPs or the Commission is not required by the Act.
26. According to the Commission LFCs also have to meet the non-discrimination requirement as defined in Parts 2A and 4AA of the Act: *“**non-discrimination**, in relation to the supply of a relevant service, means that the service provider must not treat access seekers differently, or, where the service provider supplies itself with a relevant service, must not treat itself differently from other access seekers, except to the extent that a particular difference in treatment is objectively justifiable and does not harm, and is unlikely to harm, competition in any telecommunications market.”*
27. In our view and assessment this non-discrimination obligation for self-supply is identical in effect to the service provider’s equivalence obligation. As a consequence, we would conclude when the equivalence test is satisfied, the non-discrimination test for self-supply is automatically satisfied.
28. We acknowledge that the Commission does not exclude circumstances where the equivalence obligation is satisfied but a network operator may nevertheless breached its non-discrimination obligation.<sup>2</sup> Thus, the Commission insists on a separate test for non-discrimination. In the end that remains a legal question which we and our expertise cannot finally conclude. We conclude in Section 4 that the price structure for the L1 PONFAS service as proposed by the LFCs is not discriminatory as the Commission suggests. At the same time the price structure also exactly meets the equivalence test.
29. In the Commission’s view to satisfy equivalence of price, the margin between the network operator’s upstream and downstream prices has to cover at least the downstream long-run avoidable cost of an equally efficient operator (“EEO”)<sup>3</sup> including a normal return on capital.<sup>4</sup> This includes downstream fixed costs that are avoidable in the long-run. The relevant margin has to satisfy an economic replicability test (ERT). In other words, the access seeker should be able to

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<sup>2</sup> See Commission’s Draft Guidance, para 5.6.

<sup>3</sup> Correctly, it should be the incremental downstream long-run avoidable cost.

<sup>4</sup> See Commission’s Draft Guidance, para. 3.30.

profitably replicate the incumbent's downstream service by using the incumbent's upstream service at the prevailing wholesale price.

30. The Commission formulates this guidance unconditionally. In its view ERT should hold and be applied under all economic circumstances. The Guidance holds regardless of the level (and structure) of the wholesale prices. We will show in Section 3 that this proposition of the Commission violates efficiency requirements, discourages investment, distorts entry decisions and in the end harms the long-term interests of end-users.
31. In para. 3.64 of its Draft Guidance the Commission formulates an additional constraint for L1 prices besides meeting the ERT to be consistent with equivalence: According to this requirement the upstream price should be the lower of the imputed upstream price calculated using the minimum of the ECPR-based rule and the upstream cost calculated using either the LRIC or BBM methodology. We will show in Section 3.2 that while this additional requirement applies an ERT it is not a rational and efficient dynamic pricing approach. It does not allow LFCs to earn enough revenues over time to recover the UFB investment and to earn a risk-adjusted rate of return.

### 3 ERT and L1 PONFAS pricing

#### 3.1 Application of the ERT in the EU

32. In developing its own ERT methodology the Commission states its definition and application of the ERT is consistent with the approach adopted in the EU.<sup>5</sup> While the Commission adopts a similar definition to that used by the European Commission in its Recommendation<sup>6</sup>, it overlooks the context in which the European Commission introduced the ERT concept, and the prerequisite for its application in the EU. By ignoring this context, the Commerce Commission derives wrong conclusions on the general applicability of the ERT. In any case, the Commission cannot conclude that its proposed application of the ERT is the same has been done by European NRAs.
33. The European Commission introduced its ERT concept to foster investment in NGA. Pricing flexibility for network operators was regarded as an important prerequisite for promoting efficient investment.<sup>7</sup> Pricing flexibility at the wholesale level was necessary to allow access seekers and the SMP operator to introduce price differentiation on the retail broadband market to foster penetration. Wholesale prices may be determined by applying an ERT in two cases: if there are either (a) retail price constraints by competition or (b) a cost-based price anchor is in place for wholesale copper access prices. The ERT ensures that the SMP operator does not abuse its pricing flexibility in the downstream market to hinder or exclude access seekers from competition.
34. The dominant application of the ERT among European NRAs is related to competition at the end-user markets for broadband access.<sup>8</sup> The ERT is used to test whether access seekers are able to replicate the end-user prices of the vertically integrated incumbent. The ERT also provides pricing flexibility for wholesale inputs which are not subject to cost-based regulation. European NRAs have predominantly used the ERT to give incumbents price flexibility for L2 and L3 bitstream access services. Only in a few cases has the ERT been used to provide pricing flexibility for unbundled wholesale access products. They are predominantly still regulated cost-based.
35. Major parts of the European Commission's Recommendation are related to a proper costing methodology for cost-based wholesale pricing. According to the

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<sup>5</sup> See Commission Draft Guidance, para. 3.33.1.

<sup>6</sup> European Commission (2013): Commission recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment C (2013) 5761, 11 September 2013.

<sup>7</sup> See Ibit, rec (49 ff.).

<sup>8</sup> See BEREC Guidance on the regulatory accounting approach to the economic replicability test (i.e. ex-ante sector specific margin squeeze tests), BoR (14) 190, 5 December 2014.

European Commission: “*Cost recovery is a key principle in a costing methodology.*”<sup>9</sup> (Only) this principle provides – according to the EU – the appropriate build-or-buy signal, in particular in the context of NGA.

36. Nearly all NRAs in the EU regard the unbundling price as an anchor price, mostly determined cost-based. This follows from the economic logic and the efficiency implications of the ladder of investment concept.<sup>10</sup> We are not aware of any example where the regulated L1 unbundling wholesale price is derived from a L2 bitstream price. Several NRAs (e.g. Germany, UK) test the appropriateness of the price structure between the L2 and the L3 price by means of an ERT. Some NRAs also test whether there is sufficient economic space to replicate the L2 wholesale price based on the regulated LLU price.
37. The only approach which has some similarities to the Commission’s approach is that applied by the Austrian regulator RTR. In principle, RTR has applied an LRIC approach to determine the (copper) local loop unbundling (LLU) price. To provide end-user pricing flexibility for the incumbent and at the same time protecting access seekers against potential margin squeeze behaviour, RTR has applied the following pricing rule since 2007.<sup>11</sup>

$$p_{ULL} = \min \{LRIC_{LLU}, \text{margin squeeze free wholesale price}\}$$

Effectively, from 2007 onwards the LLU price was lower than the LRIC of ULL. The pricing rule enabled pricing flexibility for the incumbent. It had the choice of either increasing its end-user price or lowering its wholesale price. It was effectively the incumbent’s choice to set the ULL price below LRIC to compete against aggressive pricing offers from mobile operators. Thus, applying the ERT pricing rule generated pricing flexibility in the downstream market. In copper-based pricing it is not too difficult for an incumbent to price copper ULL below forward-looking LRIC because its relevant cost was significantly below LRIC. This is a major difference compared to a fibre unbundling price of a wholesale-only LFC in New Zealand.

The European Commission was always critical to the Austrian approach of pricing LLU. In its comments and decision regarding RTR’s notification of the measure “*the Commission stressed that the regulated wholesale access should in principle be cost-oriented and invited RTR to reconsider its hybrid approach and to apply a transparent and appropriate cost model.*”<sup>12</sup> This is consistent with the Recommendation: “*In this respect, the Commission maintains that the proposed price regulation for both market 4 and 5, where the SMP operator would not be*

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<sup>9</sup> Ibid rec. (26).

<sup>10</sup> See Section 4.4 of this report.

<sup>11</sup> See Telecom-Control-Kommission, Bescheid R4/07-49, 20.12.2007.

<sup>12</sup> European Commission: Commission Decision concerning Cases AT/2013/1475-1476, Brussels 23/7/2013, C (2013) 4968 final.

*allowed to earn a return sufficient to replace its assets, would not be in line with Article 13(1) of the Access Directive, which requires NRAs to take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed.”<sup>13</sup>*

38. The ERT as defined and proposed by the European Commission is applied by European NRAs in an economic environment where there is price flexibility for the integrated incumbent operator in the downstream market. The downstream end-user markets, mostly the broadband access market, are competitive. NRAs then test

- Whether the incumbent’s end-user prices can economically be replicated on the basis of regulated wholesale inputs which may be an unbundling or a layer 2 or layer 3 regulated wholesale input.
- Whether a L2 wholesale price can be replicated by an access seeker using a L1 unbundling wholesale access product if the incumbent has price flexibility to set the L2 price.

NRAs do not use the ERT to derive the L1 unbundling price from a (regulated) L2 or wholesale access price. That would not make sense because the unbundling price is regulated and there is no flexibility for the incumbent to vary it.

39. There are two economic elements on the appropriateness of applying the ERT to determine or test the appropriateness (“equivalence”) of the price of an upstream input:

- (1) The operator must have pricing flexibility to determine the downstream price; and.
- (2) Following the ladder of investment concept the LLU (L1) price is cost-based.

On the basis of these prerequisites there is a wide application of the ERT as a regulatory tool in Europe.

### **3.2 ERT and downstream price flexibility**

40. We have shown in the previous subsection that the ERT is applied by European NRAs in a market and regulatory environment where network operators have pricing flexibility in the downstream market(s). This prerequisite of applying the ERT has major efficiency implications.

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<sup>13</sup> European Commission: Commission Recommendation regarding cases AT 2013/1475-1476, Brussels 22/11/2013, C(2013) 8132 final.

41. Using the ERT to determine an upstream wholesale price is efficient only as long as there is price flexibility for the network operator in determining its downstream price. If the network operator faces a price constraint in the downstream market, then the efficiency of the upstream price resulting from applying an ERT depends on the efficiency characteristics of the downstream price following from the constraint. If the constraint generates a cost-based price, then the resulting upstream price would also be a cost-based price. Such a price enables efficient entry in the downstream market by access seekers. In that case there is efficient competition between the network operator and the access seeker in the downstream market. If the constraint generates a downstream price below cost, then the resulting upstream price will also be below cost. This outcome favours access seekers at the expense of network operators and incentivises inefficient entry.
42. The LFCs do not have pricing flexibility in their downstream L2 market. L2 prices are based on a price cap determined by Crown Infrastructure Limited ("CIP"). The price cap for L2 services set out in a deed which the LFCs entered into with CIP in 2011. All (contractually regulated) prices were determined until 1.1.2020 when a new regulatory regime for fibre (including pricing) was expected to replace the CIP contracts. This timing has been extended to 1.1.2022, and the contracted prices remain in place (subject to CPI adjustment) under transitional provisions in the Telecommunications Act until 2022. It is important to note that all LFCs have the same wholesale price caps as determined by CIP regardless of their cost of deploying the fibre networks in their respective coverage areas. The L2 prices in New Zealand are not the result of economic efficiency considerations.
43. Thus, LFCs will not have pricing flexibility regarding L2 prices until 1.1.2022 and it may need another one to two years before one can interpret the then prevailing L2 prices as market prices resulting from an unconstrained pricing behaviour of LFCs. Only then would it be appropriate to apply an ERT to determine L1 prices.
44. If the LFCs had pricing flexibility, would they set the level of L2 prices as they are today? For a variety of reasons that would not be the case. First of all there are indications that the level of L2 charges does not cover the cost at an LRIC or BBM level. In particular prices will probably be too low to compensate LFCs for initial losses during the building phase of the UFB network where take-up was limited. Under the potential rationale for below cost L2 prices of penetration pricing, operators would not charge customers below costs for a period of about 10 years and at take-up rates which have achieved 60% and more nowadays. A third reason why L2 prices under pricing flexibility may look different compared to the current L2 prices follows from price uniformity. CIP has fixed the same price cap for L2 prices for all LFCs. De facto, the price cap regime does not even give pricing flexibility with regard to the L2 price structure. Effectively, CIP determines the price for each individual service. This holds for each LFC. Thus, their L2

prices do not differ. LFCs, however, operate in different regions of New Zealand. Only Chorus` costs of deployment may be representative for New Zealand as a whole because its UFB networks cover close to 70% of all homes passed of the fibre network in New Zealand. Because of their concentrated regional network footprint, the network deployment costs of the other LFCs is much more determined by the regional cost and density characteristics of their UFB area.

45. The Commission interprets and rationalizes the possibility of L2 prices to be below cost as a form of penetration pricing.<sup>14</sup> Under penetration pricing a new product is priced below cost in the phase of launching the product. After a successful launch the price is increased above cost. Over the whole cycle the product then covers total cost and generates a profit.
46. If the Commission would enforce its proposed pricing rule that the equivalent price may not exceed the minimum of a cost-based and an ERT-based price in each moment in time<sup>15</sup> unconditionally<sup>16</sup>, it would de facto not allow penetration pricing. Under the Commission`s rule, operators would be unable to recover initial losses in the first phase of penetration pricing during the second phase.
47. The Commission acknowledges in its Draft Guidance (para. 3.60) *“that the ECPR minimum standard is applied during periods when downstream prices are below costs, it would not be appropriate to move to a cost-based standard for the upstream price in subsequent periods without considering the costs to end-users from the risk of asset stranding.”* The Commission in this passage recognises the risk of asset stranding in a move from below-cost pricing for upstream services to cost-based pricing, but does not consider the effect of the risk of asset stranding from requiring a below-cost upstream price in the first place. Because the Commission de facto does not come to final conclusions, market players de facto get no guidance from the Commission.

### 3.3 ERT and efficient entry

48. Applying the ERT to determine a wholesale price in a vertical relationship leads to efficient pricing only under certain circumstances. If the downstream service price is not efficient, then the resulting upstream price resulting from applying the ERT methodology, would not be efficient either. If the downstream price is not cost-based, then the upstream price would also not be cost-based. If the downstream price is causing a loss to the network operator, then also the resulting upstream price would generate a loss.

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<sup>14</sup> See Commission`s Draft Guidance, para. 3.64.

<sup>15</sup> See Commission`s Draft Guidance, para. 3.64.

<sup>16</sup> The Commission is not concrete whether and under what conditions it would deviate from this rule.

49. A below cost L1 PONFAS price would incentivize more RSPs to acquire unbundling and at parts of the fibre network than would not be efficient. Inefficient entry would increase the total cost of the network at a given demand. The capacity of certain network elements would become unutilized or underutilized and the risk of asset stranding would increase.
50. A below cost L1 price would appear to generate advantages to RSPs/unbundlers. They pay less than they would have to pay under efficient/cost-based pricing. However this does not hold in a mid-term perspective. Below cost L1 access incentivizes them to invest more in unbundling than would be efficient. This situation is, however, not stable. Once the LFCs get pricing flexibility for their L2 services, they will increase L2 prices to become cost covering, which would, applying an ERT, increase the L1 price. Then certain unbundling entry decisions will prove to be unprofitable.
51. The L1 unbundled price will be the universal input service for all LFC services, Therefore, it is essential to get this price right (cost-based) from its first introduction. Otherwise, RSPs would not get the proper signals and incentives for making their buy-or-build decisions whether and where to purchase unbundling efficiently.
52. Below cost L1 prices not only distort entry and investment decisions of RSPs and waste resources for network operators, but RSPs may face the risk of stranded assets of their entry decisions which may not prove viable in the longer term.
53. The Commission – as well as Professor Vogelsang – do not consider the implications of inefficient entry from a below cost L1 price in terms of inefficient cost duplication on the profitability of UFB fibre investment, stranded assets and the impacts on consumers. More important, they do not take it into consideration when proposing the unconditional application of the ERT methodology.

#### **3.4 When can the ERT be applied to determine L1 prices?**

54. The Commission's view is that upstream prices must always meet the ERT test to be consistent with equivalence.<sup>17</sup> This means that in each period of time the L1 unbundling price has to meet the ERT test.
55. The Commission does not consider the impact of a L1 price meeting the ERT but being below a cost-based price. When upstream prices are below cost, applying ECPR results in a L1 price below cost which is more favourable to access seeker's downstream operations than the network operator's downstream operations. At the same time incentives for inefficient entry arise.

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<sup>17</sup> See Commission's Draft Guidance, para. 3.62.

56. We do not agree to the unconditional applicability of the ERT as a tool to determine L1 prices. We have shown that the application of the ERT where the L2 price is below cost can cause inefficient cost duplication, inefficient entry and stranded investment for network operators and access seekers. These implications of an unconditional application of ERT harm the long-term interests of end-users in New Zealand. The ERT cannot therefore be a tool to be applied to determine the L1 price where L2 prices are below cost.
57. Some commentators<sup>18</sup> argue that there are no indications that current UFB prices are below cost, suggesting that there is no economic problem for an LFC to apply ECPR/ERP to determine L1 prices. Whether UFB prices are below cost is a question of fact that can be determined by the Commission. The Commission's guidance must apply to all possible factual situations. The proper conclusion, protecting the interest of access seekers and the network operators, would be the following: The downstream (L1) price may be derived applying ECPR provided it covers at least the relevant L1 cost.
58. Besides our strong reservations and arguments against the general and unconditional application of the ERT as a regulatory tool to determine wholesale prices, we want to bring to the attention of the Commission some reasons why the ERT may be generally inferior to other pricing rules.
59. The Commission requires upstream prices always to meet the ERT test to be consistent with equivalence.<sup>19</sup> This means, in each period of time the L1 unbundling price has to meet the ERT test. This also implies, whenever the price of the portfolio of L2 prices changes, the L1 prices have to also change. The same holds if a single component of the price of an individual L2 price changes, the L1 price has to change.
60. Because there is a broad portfolio of L2 services the mechanics of using an ERT as a general and binding rule to determine L1 prices may lead to sudden and often changes of L1 prices. This may be relevant in particular when there are competing L2 offers in the market from RSPs. Then LFCs can no longer keep L2 prices stable for a long period of time but have to respond to competitive reactions of unbundlers.
61. Cost-based pricing would instead be much more consistent with a policy and strategy of price stability for L1 prices, which was a key objective of the European Commission recommendation. Stable L1 prices give greater support to strategic investment decisions of unbundlers than a price path which is driven by short-term competitive actions and reactions. For this reason European NRAs do not generally apply the ERT tool to determine LLU prices.

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<sup>18</sup> E.g. Vocus/Vodafone, p. 6.

<sup>19</sup> See Commission's Draft Guidance, para. 3.62.

## 4 PONFAS price structure and non-discrimination

### 4.1 The Commission's view on non-discrimination

62. The Commission in para 4.22 of its Draft Guidance correctly identifies discrimination as a conduct which involves a difference in treatment either between different access seekers or between the network operator and other access seekers. In a straight forward interpretation of economic discrimination the Commission regards offering different terms to different access seekers as discriminatory. In addition, the Commission also includes “*offering the same terms if the offer has a different effect depending on the position of the access seeker purchasing the service*” as discriminatory. Individual and or subjective characteristics in the latter case thus become a criterion for an objective classification of the conduct of a network operator. This also implies that the characteristics of an access seeker and not objective criteria of the price structure or terms may determine whether or not he would face discriminatory treatment. This unusual approach makes the concept of discrimination highly arbitrarily and subject to adverse selection and moral hazard. We will demonstrate the inefficiency implications of this highly questionable definitional approach in the case at hand.
63. The Commission does not explicitly develop a conclusion on whether or not component-based pricing for L1 is discriminatory or not. The Commission's advisor Ingo Vogelsang, however, makes the explicit assessment: “*Pricing by element simply is a misinterpretation of equivalence and is discriminatory*”.<sup>20</sup>
64. We will show in the following subsections that component pricing meets the equivalence standard, is non-discriminatory and represents efficient wholesale pricing. For that purpose we describe the structure of the LFCs' fibre network and the resulting cost structure for L1 and L2 services (Subsection 4.2). Subsection 4.3 shows how competition for L2 works under L1 access. Subsection 4.4 brings unbundling into perspective to the concept of competition as described by the ladder of investment concept. Subsection 4.5 addresses whether there is discrimination due to a difference in treatment with regard to component-based pricing. Subsection 4.6 compares PONFAS unbundling with sub-loop unbundling.

### 4.2 Network and cost structure<sup>21</sup>

65. To properly assess the costs of providing L1 and L2 prices and the opportunities and limitations of downstream competition it is essential to have a clear view on

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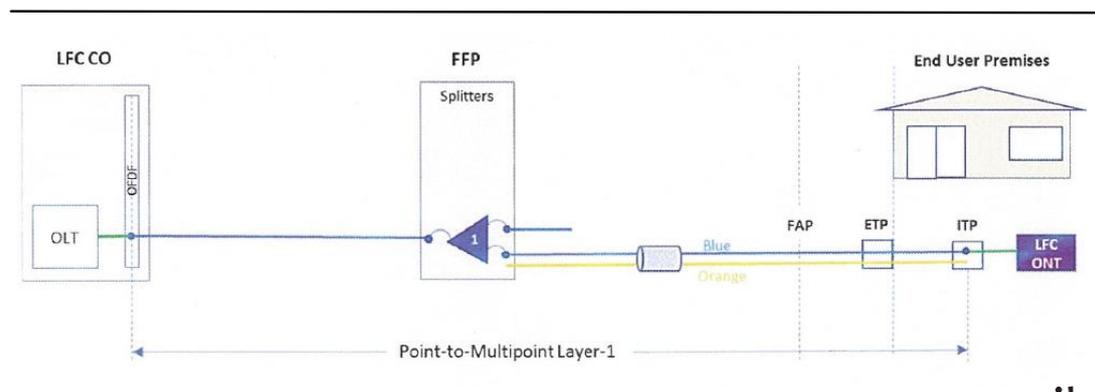
<sup>20</sup> Vogelsang Report, p. 26.

<sup>21</sup> This Subsection relies upon the June 2019 WIK report, in particular Subsection 3.1.

the LFCs’ network architecture. Otherwise, false conclusions like some of Ingo Vogelsang’s may occur.

- 66. Figure 4-1 describes the network elements of the existing networks deployed by each LFC. The Layer 1 service in the represented P2MP architecture extends from the optical fibre distribution frames (“OFDF”) in the Central Office (“CO”) over the fibre feeder cable (from the OFDF) to the FFP (Fibre Flexibility Point). Here the splitters are located which are connected to a feeder fibre in the network sided direction and offer ports for end-customer connections. These ports are connected to a distribution frame where on the other ports side the end premises are connected to. The end-customer fibre cables can be patched onto such splitter customer sided ports with a pigtail according to the splitter of the provider it has contracted.

Figure 4-1: Existing PON Network Architecture – Underground (ALL LFCs)



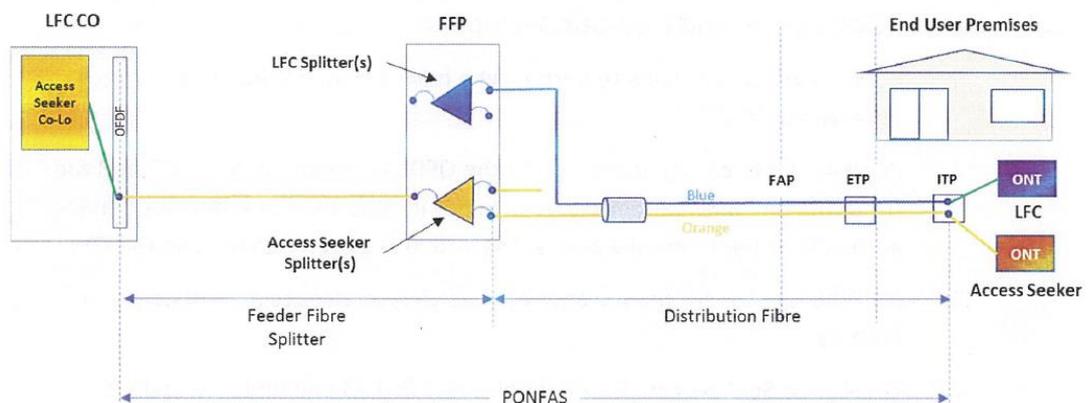
Source: LFCs (2018), p.5

At the splitters in the FFPs the distribution fibre cable for each end-user premise ends and it extends on its other end to the Internal Termination Point (“ITP”). The ITP is the fibre network demarcation and test point within the customer’s building and marks the end of the LFC’s P2MP Layer 1 network. The Fibre Access Point at the border of the property (“FAP”) and the External Termination Point (“ETP”) outside the building are intermediate construction elements used for ending fibre construction when a building is not yet contracted for being connected to the network and using its services. The FAP can be hosted in a handhole or a distribution box at the edge of the street (or on a pole), the ETP usually is mounted on the external wall of residential and most commercial single dwelling units. They are also part of the distribution network. The LFCs’ contracts with CIP required them to install two fibres to each home (blue and orange line). While the blue line is used for providing the bitstream access service by the LFC, the orange line is dedicated for fibre unbundling. By this a building can be served by two

active networks in parallel, one over the LFC's bitstream and one over its unbundling service, thus providing a wider choice of services to the end-customer. The P2P DFAS service uses the same network elements as the P2MP L1 network with the exemption of the splitters. So it is using the blue/orange distribution fibre and a dedicated fibre of the feeder network segment. Both are connected to each other by a patch cord (or direct splice) in the FFP. This network architecture has been requested and approved by CIP in each LFC's respective Network Infrastructure Project Agreement, and approved by the Commission in its EOI review of each LFC.

- 67. To provide the L2 bitstream wholesale services over their P2MP fibre topology, the LFCs have installed two active network elements to the passive L1 network elements: The OLT (Optical Line Terminator) at the Central Office and the ONT (Optical Network Terminator) at the end-user premises. Both elements are required to administer the competing access requirements of the end-users connected to the same splitter and the same single and thus shared feeder fibre line towards the Central Office.
- 68. Figure 4-1 shows that the L1 network and the elements of that network are transparently and separately identifiable as an input to producing the L2 service for the RSPs as well as for producing the L2 service by the LFCs.
- 69. Figure 4-2 shows the structure of the network when an access seeker requires an unbundled Layer 1 PONFAS service. The only network element which has to be duplicated in this case is the access seekers splitter(s) in the FFP to which the distribution fibres of its customers are connected. In addition, RSPs get their own feeder fibres dedicated to connect their dedicated splitters to the CO.

Figure 4-2: Unbundling in the PONFAS Architecture – Underground (All LFCs)



Source: LFCs (2018), p.7

70. When the RSP produces its own bitstream L2 service based on the unbundled L1 service, it has to install its own OLT equipment collocated at the LFC's CO and its own ONT at the end-user premises. Furthermore, a separate splitter is provided which corresponds to the LFC's service specification. The LFCs have to install a splitter for the first customer of an RSP and provide space in the cabinet for the additional splitter(s). Each RSP dedicated splitter uses one feeder fibre independent of how many customers are connected to the particular splitter.
71. To assess costs and the cost structure of the L1 and the L2 services, it is important to identify costs which are shared, those which are RSP-specific and those which are end-customer-specific.
72. When LFCs provide a L2 service to several RSPs, splitters, feeder fibres and the GPON equipment at the CO are shared among RSPs which purchase the L2 service. The distribution fibre and the ONT are "variable" costs which are end-user-specific and therefore also RSP-specific. They are not shared.
73. Cost drivers and cost causation change when the RSPs purchase PONFAS unbundling from the LFCs to produce their own L2 service. The GPON equipment is no longer shared because the unbundlers make their own investment in GPON OLT technology collocated at the CO and the ONTs at the customer premises. The splitters and the feeder fibres are now no longer shared with other RSPs. Instead, each RSP uses its own splitter in the FFP. Each splitter is connected with a separate feeder fibre to the OFDF and over this to the RSPs OLT. Thus, in the case of PONFAS unbundling the splitters, feeder fibres and OLTs (incl. line cards) are no longer shared among RSPs but become RSP-specific costs. The distribution fibres and ONTs remain end-user-specific costs and remain a variable customer-driven cost for each RSP. RSPs as unbundlers get the exclusive use of their splitters and feeder fibres. Those passive assets can (no longer) be used by the LFCs to provide their own L2 service for another RSP.
74. The total cost of an LFC providing a L1 and a L2 service is no longer driven by total end-user demand alone but also by the L1 demand of each RSP at the FFP. Total end-user demand therefore is no longer the only cost driver. Total costs incurred by an RSP which purchases unbundling depend on each RSP's distribution of end-customers at FFPs. Pricing according to cost causation and the cost drivers of service generation cannot relate L1 PONFAS prices to the cost driver end-users as in the case of L2, but has to reflect the RSP-specific drivers. Only component pricing can properly manage this. The relationship between cost causation and cost drivers on the one hand and price or price structure on the other hand can no longer be reflected by a uniform price depending on the number of an RSP's customers. The price structure directly has to address RSP-specific cost components.

75. Component pricing relates prices to customer-specific costs. This makes it different to two-part or multi-part tariffs where the fixed price component is used to recover non-customer-specific fixed costs.

#### 4.3 L1 access and L2 competition

76. Component pricing where unbundlers pay a fixed charge for the splitter, feeder fibre and collocation and a variable per customer charge for the distribution fibre reflects the cost structure of providing the PONFAS service. Two aspects have to be further highlighted: (1) The L1 network and the corresponding L1 unbundled service is an input service to produce the L2 service. (2) Under the architectural model described access seekers who purchase the Layer 1 unbundled service get access to the L1 network in the same way as the LFCs get access to the L1 network to produce their own L2 services. Or to put it into other terms: Under the PONFAS service description and service provision access seekers get access to the LFC's network such that their access is equivalent to the LFCs' own access or usage of the network.<sup>22</sup>
77. From a cost perspective unbundlers can efficiently make use of unbundling if they can concentrate a sufficient number of end-users at the FFP level to utilize the capacity of the splitter and the corresponding feeder fibre, and at the CO level utilize the capacity of a GPON system (if they use GPON technology).
78. [Confidential]
79. These numbers indicate that depending on its local market share an unbundler can potentially efficiently use the fixed costs of a splitter. However, an unbundler needs a certain scale of operation to compete efficiently. Competitiveness does not depend on whether the unbundler is small or large as Professor Vogelsang and the Commission seem to suggest. It is sufficient that the unbundler can concentrate a relevant level of demand locally, which would include small regional RSPs. Unbundlers might even have a cost advantage over an LFC at the FFP level. Due to indivisibility LFCs cannot fully utilize the capacity of the "last" splitter in an FFP. Thus, their average utilization is below the maximum utilization. Because an unbundler does not need to switch all customers to unbundling in an FFP and can still use the L2 service to serve its customers in a specific FFP area, it is in a different position: it has the option of only using a splitter if it can efficiently utilize it. A network operator does not have this option.

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<sup>22</sup> A RSP could also base its bitstream service on DFAS only, i.e. providing a high quality L2 bitstream service for business customers. This also uses the components of the passive LFC infrastructure, including the feeders but without the GPON active network components.

80. Nevertheless, it is obvious that the efficient use of the unbundling option for unbundlers is not unlimited. As network and cost structure suggest, two prerequisites are essential: Firstly, a certain local density of connections and a certain (local) market share. Otherwise, economies of scale at the FFP level (splitter, feeder fibre) and at the CO level (GPON system) cannot be achieved. Network and cost structure do not support competition for L2 services over the whole footprint of an LFC network.
81. The inevitable economic conclusion is that the economic viability of an unbundling business model in a P2MP fibre network topology is limited. These findings are evident in the experience of the copper equivalent of PONFAS, sub-loop unbundling. We transfer our broad experience with this business model in Europe to the PONFAS unbundling case in New Zealand in the next subsection.

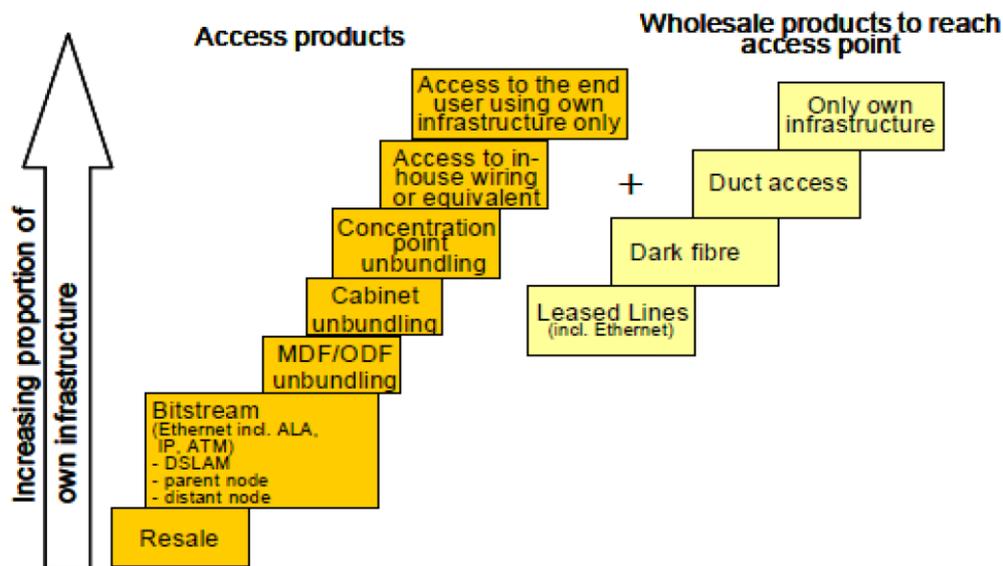
#### **4.4 Unbundling and ladder of investment**

82. The vertical relationship between L1 and L2 wholesale products and the impact on competition is best represented by the ladder of investment concept which has been a guideline for managing and developing competition and regulation in Europe and in other parts of the world.<sup>23</sup> The ladder of investment as represented in Figure 4-3 describes the relationship of business models based on various access products and own infrastructure investment of the access seeker. The left hand side of the ladder displays the different access products linked to access points. The right hand side depicts wholesale products that access seekers may use to reach the access points from their own PoPs.

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<sup>23</sup> See Martin Cave, The ladder of investment in Europe, in retrospect and prospect, Telecommunications Policy, Vol. 38, September 2014, p. 674-683.

Figure 4-3: NGA ladder of investment



Source: BEREC

83. The reference point of each rung of the ladder is a business model based on the sole use of the particular access product. The concept assumes that the intensity of competition increases stepping upwards the ladder. Jumping from one rung to the next requires relatively more infrastructure investment by the access seeker. This has an impact on the cost structure. At the lowest rung of the ladder the alternative operator (nearly) only faces variable and (nearly) no fixed cost. The opposite holds once the final jump has been made. At the upper end of the ladder the alternative operator faces predominantly fixed costs and nearly no variable cost. Each step upwards on the ladder changes the cost structure such that the relative proportion of fixed cost increases at the expense of variable cost. To keep the business model viable and profitable jumping up the ladder requires either a larger market share and/or a stronger (local) concentration of demand. This may imply that the number of players which can viably jump up the ladder may decrease. This is not an abstract consideration. Actual market structure development supports this dynamic.
84. In its stylized form a business model only relies on just one wholesale product of the ladder. The business reality, however, is more complex and different. In Europe and in other parts of the world alternative operators rely on various wholesale inputs and their efficient combination to produce their retail products

and to reach a large (national) addressable market. De facto various combinations of access products and backhaul products are possible depending on the scenario and the network architecture.

85. In providing NGA end-user products, unbundlers in Europe typically rely on a business model which combines bitstream access and unbundling for a nationwide service offering. Given the cost structure of unbundling and own infrastructure investment, unbundling is only viable in high density access areas; in lower density areas operators usually rely on bitstream access. ISPs usually produce and offer the same end-user products based on different wholesale inputs.
86. It is surprising to us that Ingo Vogelsang, who is one of the intellectual fathers of the ladder of investment concept<sup>24</sup>, ignores these elements and characteristics of the concept in the New Zealand context. Instead of accepting the competitive and market structure implications of the ladder of investment concept, he scales down the unbundling business model so that unbundlers face a cost structure similar to resellers or L2 access seekers. He ignores the business model of combining L1 and L2 access which will be the most relevant business model for RSPs in New Zealand as it is in other parts of the world.
87. A market environment where unbundlers face the true cost of resources they use is not discriminatory treatment; it is efficient and consistent with the ladder of investment concept.

#### **4.5 Is there discrimination due to a difference in treatment with regard to price?**

88. Ingo Vogelsang<sup>25</sup> is not entirely correct when arguing that component pricing of the L1 service favours large L1 buyers over small L1 buyers. It is correct that L1 buyers who have a high customer density at a certain FFP have an advantage, but that can be a small or a large access seeker. The rationale of using the L1 service depends on its local concentration (or market share) of demand. This can but must not necessarily correlate to a buyer's size or national market share in the end-user market.
89. Ingo Vogelsang proposes as an alternative to component pricing an aggregated price over all components in the form of a uniform connection charge.<sup>26</sup> He implies that only this single price for the L1 service would satisfy the non-discrimination obligation. At the same time he is proposing to calculate the L1

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<sup>24</sup> See Martin Cave and Ingo Vogelsang, How access pricing and entry interact Telecommunications Policy, Vol. 27, November 2003, p. 717-727.

<sup>25</sup> See Vogelsang Report, p. 17.

<sup>26</sup> See Vogelsang Report, p. 17.

price at a level that would only be accessible for access seekers that expect to reach a certain scale or market share such that small (and potentially inefficient) access seekers might be excluded from the market, but does not explain how such a cost/price calculation approach might work in practice.

90. Vogelsang misunderstands the incentives created for access seekers facing (potentially) different pricing structures for L1. It is not that component pricing would lead to underutilization of facilities – as he assumes.<sup>27</sup> Underutilization follows in the case of uniform pricing. Faced with a uniform price unbundlers have an incentive to buy L1 instead of L2 even if they can only concentrate a few customers in an FFP area. Splitters and feeder cables dedicated to access seekers will not be optimally used. At the margin an access seeker might demand unbundled access for a single end-user served from an FFP. This customer would “consume” one dedicated splitter and one dedicated feeder fibre. It is obvious that such a demand pattern for PONFAS would generate tremendous cost for network operators which would not be compensated by corresponding revenues. It is obvious that a pricing structure which invites such a wholesale demand pattern is highly inefficient.
91. This can be demonstrated by a simple example of two RSPs with a different distribution of customers.<sup>28</sup> RSP A is assumed to have 10 customers at one FFP and RSP B 10 customers at 10 different FFPs. Under unbundling RSP A consumes the resources of one splitter and one feeder fibre. RSP B consumes the resource cost of 10 splitters and 10 feeder fibres. Both RSPs consume the resources of 10 distribution fibres. According to Ingo Vogelsang, RSP B would only be treated in a non-discriminatory way if he paid the same price for the wholesale services as RSP A, despite the fact that RSP B is generating a fixed cost which is ten times higher than that of RSP A. In addition, RSP B receives tenfold the capacity per end-customer than RSP A, because of the sharing structure of the single feeder fibre of RSP A. Such a definition of a discriminatory difference in treatment would result in different resources being consumed for the same number of customers. If access seekers faced a pricing structure based on their resource consumption they would behave efficiently. Under an efficient wholesale price structure RSP A and B would be treated the same if their service demand generates the same resource consumption. Thus, the component pricing structure of the LFCs treats RSP A and RSP B the same, based on their respective resource consumption.
92. Assume the LFC has installed just one splitter in an FFP which serves few customers, which occurs in a relevant number of cases in reality. If five unbundlers each have one customer served from that FFP, the LFC would have

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<sup>27</sup> Ibid, p. 17.

<sup>28</sup> This example was originally formulated by NERA, p. 14.

to install five additional splitters and connect five additional feeder fibres to serve the unbundling demand in that FFP. It is obvious that from an overall economic perspective unbundling would not be efficient in that situation. A uniform pricing approach would, nevertheless, incentivize RSPs to unbundle even when they cannot concentrate demand to a relevant level and demand would more efficiently be served by a L2 service.

93. Imagine a business customer being connected to a splitter as the single user, thus receiving the full capacity up- and downstream of the feeder fibre. However, this access seeker pays just a small proportion of the feeder fibre cost even though it is exclusively dedicated to this single customer. Thus, the proposed pricing would also lead to major distortions between the use of the DFAS and PONFAS wholesale services.
94. Component pricing on the other hand, creates incentives to use L1 PONFAS services only if the relevant network elements are equally or similarly efficiently used as the network operator is using them. Access seekers will use PONFAS if and when they can concentrate a relevant number of customers in an FFP area. There is no longer inefficient duplication and underutilization of resources. Access seekers only use network elements which they can efficiently fill.
95. Vogelsang asserts that component pricing creates the distinct problem “*that it is almost impossible to fit in with a retail-minus approach, because L2 prices are not by element*”.<sup>29</sup> Problems of applying retail-minus under component pricing is not a problem of component pricing, it is a problem of the retail-minus methodology. The ERT – properly applied – is a much more suitable approach to easily deal with different price structures in the downstream and the upstream markets. An ERT calculates a business model and not a single product. In applying the ERT European NRAs have dealt with and solved this issue. An ERT calculation can easily deal with different price structures in the downstream and the upstream markets. It does not require the same price structure for downstream and upstream prices.
96. Vogelsang also argues that component pricing violates the Act’s prohibition of geographic price discrimination.<sup>30</sup> Also this argument is incorrect. Of course, fibre network costs depend on and vary by customer density, as the access line length and its cost depend on the different regional characteristics. A L1 pricing approach which reflects such cost differences would explicitly vary by density or by CO area. This holds for a uniform as well as for a component based price structure for L1 products. That is, however, not the pricing approach of the LFCs. Instead, they have calculated a uniform L1 component price to be valid in high density and in low density parts of their UFB area. Component pricing is

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<sup>29</sup> Vogelsang Report, p. 25.

<sup>30</sup> See Vogelsang Report, p. 25f.

calculated on the basis of cost averaging between low cost and high cost areas and is therefore consistent with geographic uniform pricing. It does not discriminate geographically.

97. It is also not correct that unbundlers – as Vogelsang argues – will pay substantially more per connection in remote than in dense areas. This simply depends on their choice between two wholesale access services. If they efficiently choose between the L1 and the L2 services, they face similar or identical cost of wholesale inputs in low and high density areas.
98. Component pricing is not a customer-specific pricing. The price is neutral between RSPs. It does not vary upon individual characteristics of an RSP. Thus, component prices are not discriminatory with regard to individual customer characteristics.
99. The key economic characteristic of price discrimination is that prices vary according to willingness to pay of the customer (the RSP). This is not the case with component pricing. All RSPs pay the same price. Thus, prices are not discriminatory with regard to willingness to pay. The intention of pricing components separately is not to differentiate according to willingness to pay, it has the rational to incentivise an efficient purchase behaviour.
100. Component pricing also does not involve “large up-front payments”<sup>31</sup> to adversely select large unbundlers against small unbundlers. The scale related to the own active equipment installed by an unbundler are much higher than those related to component prices for a splitter and a feeder fibre.
101. Component pricing is not a volume discount. Access seekers pay the same price per component. The access price does not depend or vary on the volume purchased by the RSP. A small RSP will face the same price and the same price structure as a large RSP. Thus, component pricing does not discriminate with regard to the size of an RSP or the volume of the wholesale product purchased.
102. Component pricing also does not meet the prerequisite of the economic concept of second degree price discrimination. Under second degree price discrimination the firm provides price schedules or options for each user of the respective service to choose. This self-selection mechanism is used to extract consumer surplus. PONFAS component pricing does not provide different pricing options for RSPs to choose. There is only one price structure which applies to all RSPs. Thus, there is no second degree price discrimination included in component pricing.

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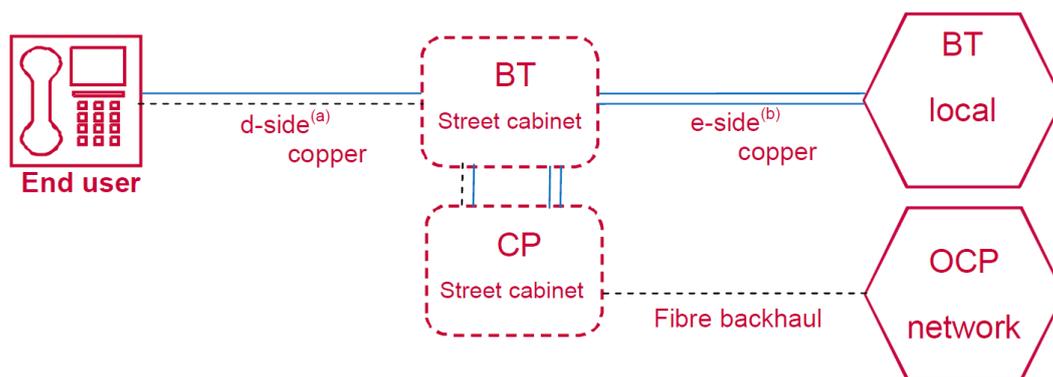
<sup>31</sup> See Commission's Draft Guidance, para. 4.44.

103. Component pricing as applied by LFCs also does not discriminate vertically (third degree of price discrimination). Under 3<sup>rd</sup> degree price discrimination the firm separates the market into different groups and charges different prices to different groups. Component pricing does not differentiate between various RSPs.
104. Component pricing does not exclude inefficient purchase behaviour with regard to cost. If an unbundler generates benefits for his customers besides cost saving component pricing does not hinder him to make use of such benefits. Component pricing therefore does not discriminate with regard to cost-efficient purchase behaviour. Each RSP can combine L2 and L1 services unconstrained.

#### 4.6 PONFAS unbundling and sub-loop unbundling

105. There are many similarities between sub-loop unbundling (SLU) and PONFAS/L1 unbundling in a P2MP fibre architecture. Sub-loop unbundling allows RSPs to physically take over the sub-loops between the street cabinet and the customers premises (see Figure 4-4). This enables an RSP to install equipment at a location close to the incumbent's street cabinet. The RSP will then establish a fibre backhaul connection from the street cabinet to its network node either based on its own physical network infrastructure or leased as a fibre link from the incumbent. It allows the RSP to provide superfast broadband services either to end-users or as a bitstream service to other RSPs.

Figure 4-4: Business model based on sub-loop unbundling



(a) d-side = distribution side

(b) e-side = exchange side

106. Sup-loop unbundling generates a similar cost structure to unbundlers as PONFAS unbundling. The sub-loops leased from the incumbent generate a variable cost to the access seeker depending on the number of customers he can achieve in a street cabinet area. The backhaul connection generates a fixed cost per street cabinet (either infrastructure-based or purchased as a backhaul service) similar to the feeder fibre in the LFCs' PONFAS price structure. The only major difference between the two business models is that in the case of sub-loop unbundling the access seeker installs active equipment at the street cabinet while in the case of PONFAS only a passive network element (the splitter) is used. Furthermore, in the case of PONFAS, collocation occurs at the FFP (splitter, feeder fibre) and at the CO (OLT) and in the case of SLU at the street cabinet (DSLAM/MSAN and feeder fibre) and at the CO (aggregator in case of feeder use).
107. Because both business models generate the same cost structure, it is worthwhile to recognize how the sub-loop unbundling business model has developed. Several studies have concluded that sub-loop unbundling business models have a limited viability.<sup>32</sup> They show that the model is viable in high density areas with a large number of cabinets per km<sup>2</sup> and for large cabinets. Furthermore, viability depends on the (local) market share of an unbundler.
108. Market reality in Europe underlines these model-based findings:
- In several Member States SLU-based business models do not occur at all although SLU is available as a wholesale product.
  - When and where SLU is used, it is usually only used by one alternative operator at a street cabinet besides or instead of the incumbent.
  - If SLU is used, it is used regionally concentrated.
  - To give an example: Although widely used by more than one hundred regional operators, only about 39,000 street cabinets<sup>33</sup> from a total of about 330,000 provide SLU in Germany.<sup>34</sup> SLU increased when vectoring technology was introduced and alternative operators got the chance to use this technology exclusively at one street cabinet.

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<sup>32</sup> See for instance: Analysys, The business case of sub-loop unbundling in the Netherlands, Report for OPTA, 26 January 2007; Stefano Lucidi, Martin Ockenfels, Bernd Sörries, Anhaltspunkte für die Replizierbarkeit von NGA-Anschlüssen im Rahmen des Art. 61 Abs. 3 EKEK, WIK Discussion Paper No. 460, March 2020; BEREC, Case studies on Regulatory Decisions regarding Vectoring in the European Union, BoR (14) 122, 26 September 2014; WIK-Consult study for ECTA: The Economics of Next Generation Access, 10 September 2008.

<sup>33</sup> BNetzA Tätigkeitsbericht Telekommunikation (annual report of telecommunications) 2018/2019, Bonn, December 2019, These are 15% of the cabinets, and its number is no longer increasing. For full LLU 50% of the COs are unbundled, covering more than 80% of the population. The rest of these areas is covered by bitstream access.

<sup>34</sup> The average number of sub-loops connected to a street cabinet in Germany is similar to the number of distribution fibres connected to an FFP in New Zealand (on average).

109. SLU in New Zealand provides insights for the PONFAS unbundling case for both pricing and uptake as a business model. Sub-loop unbundling was introduced in New Zealand in 2009.<sup>35</sup> The Commission decided on the price and non-price terms for Telecom to provide access to 3,600 roadside cabinets throughout its network. The sub-loop service was designed to provide Telecom's competitors with the opportunity to also deliver advanced broadband services, by shortening the copper loop for DSL services. The Commission's decision covered three services: the sub-loop colocation service at the cabinet, the sub-loop unbundled copper local loop service (access to the distribution segment of the copper loop) and the sub-loop backhaul service (connecting the competitors' DSLAM from the cabinet to Telecom's CO via a feeder fibre link). For each component of the SLU service the Commission set separate prices. The charge for access to each sub-loop was \$11.99 per line in urban areas and \$22.14 per line in non-urban areas. The monthly rental for the sub-loop co-location and sub-loop backhaul services were calculated on a cabinet-by-cabinet basis. The average cost of building a roadside cabinet was \$972 per month and allocated to parties based on the proportion of occupied space that each is using. The monthly rental to be paid by each party for the sub-loop backhaul service was calculated based on the proportion of active fibres between the CO and roadside cabinet that it was using, plus the cost of Telecom equipment at the CO. The average cost of these fibre links was \$1,911 per month in urban areas and \$3,197 per month in non-urban areas. The cost of Telecom active equipment at the CO was \$430 per month. This price model led to a combined cost per customer for the SLU service which was approximately 26% higher than the corresponding costs for local loop unbundling.
110. Accordingly, it can be seen that the Commission set up in 2009 a component-based price structure for the SLU service which is nearly identical to the pricing model which the LFCs have developed for using their PONFAS unbundling service. We also note that, consistent with the experience in several Member States, there was no take up of the SLU service by access seekers when it was available as a wholesale product,
111. Given the similarities of the cost structure of the two business models, we can conclude that PONFAS unbundling is likely to be limited to those areas where an access seeker can mobilize a high concentration of customers at an FPP. These consequences do not however flow from non-equivalent and discriminatory L1 PONFAS prices. They simply follow from basic network economics. A regulatory regime which tries to overcome these basic economics will cause major market distortions, higher costs for the whole system and does not support the long-term interest of end-users.

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<sup>35</sup> See "Commerce Commission issues sub-loop decision", Commission Media Release, 18 June 2009.