COMMISSION STAFF WORKING DOCUMENT

EXPLANATORY NOTE

Accompanying the document

Commission Recommendation

On the regulatory promotion of Gigabit connectivity

Contents

Glossary

Term or acronym	Meaning or definition
ACM	Authority for Consumers and Markets (Dutch NRA)
ADSL/VDSL	Asymmetric Digital Subscriber Line / Very high-bit-rate Digital Subscriber Line
AGCOM	Autorità per la Garanzie nell Comunicazioni (Italian NRA)
AKOS	Agency for Communication Networks and Services of the Republic of Slovenia
ANACOM	Autoridade Nacional de Comunicações (Portuguese NRA)
ARCEP	Autorité de Régulation des Communications Électroniques, des Postes et de la Distribution de la Presse (French NRA)
BCRD	Broadband Cost Reduction Directive
BEREC	Board of European Regulators for Electronic Communications
BIPT	Institut Belge des Postes et télécommunications (Belgium NRA)
BNetzA	Federal Network Agency (German NRA)
BU LRIC+	Bottom-Up Long-Run Incremental Costs Plus
BU-LRAIC+	Bottom-Up Long-Run Average Incremental Costs Plus
BU-LRIC	Bottom-Up Long-Run Incremental Costs
CCA	Current Cost Accounting
CEI	Civil Engineering Infrastructure

CNMC	Comisión Nacional de los Mercados y la Competencia (Spanish NRA)
ComReg	Commission for Communications Regulation (Irish NRA)
CRC	Communications Regulation Commission (Bulgarian NRA)
DCF	Discount Cash Flow
DAE	2014 Digital agenda for Europe
DESI	Digital Economy and Society Index
DOCSIS	Data Over Cable Service Interface Specification
ECS	Electronic Communication Services
ECTA	European Competitive Telecommunications Association
EECC, Code	European Electronic Communications Code
EoI/EoO	Equivalent of Input/Equivalent of Output
ERT	Economic replicability Test
ETNO	European Telecommunications Network Operators' Association
EU	European Union
FDC	Fully Distributed Costs
FTTH/B	Fibre To the Home/Building
FTTC	Fibre To The Cabinet
FTTLA	Fibre To The Last Amplifier
FWA	Fixed Wireless Access
Gbps	Gigabits per second
GPON	Gigabit passive optical network
HAKOM	Croatian Regulatory Authority for Network industries
HCA	Historic Cost Accounting

HFC	Hybrid Fibre-Coaxial
ILR	Institut Luxembourgeois de Régulation (Luxembourgish NRA)
KPI	Key Performance Indicator
LCA	Life Cycle Assessment
LLU/ULL	Local-Loop Unbundling/Unbundled Local Loop
LTE	Long Term Evolution (*a mobile technology*)
Mbps	Megabits per second
MDF	Main Distribution Frame
MS	Member State
MST	Margin Squeeze Test
MVNO	Mobile Virtual Network Operator
NCA	National Competition Authority
NDCM Recommendation	Recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment
NGA	Next Generation Access
NGA Recommendation	Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks
NRA	National Regulatory Authority
ODF	Optical Distribution Frame
OFCOM	Office of Communications (British NRA)
OPEX	Operating Expenses
PTS	National Post & Telecommunications Agency (Swedish NRA)
P2P	Point to Point
P2MP	Point to Multipoint

QoS	Quality of Service
RAB	Regulated/Regulatory Asset Basis
REO/EEO	Reasonably Efficient Operator/Equally Efficient Operator
RRM	Recommendation on Relevant Markets
RRT	Communications Regulatory Authority (Lithuanian NRA)
RTR	Austria Regulatory Authority for Broadcasting and Telecommunications
SLA(s)	Service Level Agreement(s)
SLG(s)	Service Level Guarantee(s)
SLU	Sub-loop unbundling
SMP	Significant Market Power
SMP Guidelines	2018 Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and
TD-FDC	Top Down- Fully Distributed Costs
TRT	Technical Replicability Test
UKE	Office of Electronic Communications (Polish NRA)
Visionary Analytics Study	Study entitled "Regulatory Incentives for the Deployment of Very High Capacity Networks in the Context of the Revision of the Commission's Access Recommendations" conducted in late 2020 and the first half of 2021 by a team led by Visionary Analytics.
VHCN	Very High Capacity Network
VULA	Virtual Unbundling Local Access
WCA	Wholesale Central Access
WLA	Wholesale Local Access
WLR	Wholesale Line Rental Products

5G	Next generation (5th) of wireless/mobile technologies

1. INTRODUCTION

The Commission issued in the early 2010s two recommendations concerning the application of remedies under the 2009 Regulatory Framework: the recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (hereinafter 'NGA Recommendation')[1] and the recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (hereinafter 'NDCM Recommendation')[2]. These two recommendations cover a broad range of issues related to access regulation. However, the guidance provided in these recommendations need to be updated to take into account the significant market and technologic developments (the main developments and trends are presented in chapter 2) as well as the regulatory changes that have occurred since the previous recommendations were issued (the regulatory framework is presented in chapter 3).

This review should be seen in the context of new Digital Decade[3] Gigabit targets stipulating that by 2030 all end users at a fixed location are covered by a gigabit network up to the network termination point, and all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G, in accordance with the principle of technological neutrality as set out in the Decision (EU) 2022/2481 establishing the Digital Decade Policy Programme 2030[4]. In order to reach these ambitious targets, considerable investments[5] from operators will be necessary in the coming years. It also reflects the overall shift in the European Electronic Communication Code (hereinafter 'the Code' or 'EECC')[6] towards incentivising investment in Very High Capacity Networks (hereinafter 'VHCN(s)')[7] and the new provisions therein. In particular, for the first time, the "*promotion of connectivity and access to, and take-up of*" VHCN is an explicit objective of

[1] Commission Recommendation 2010/572/EU of 20 September 2010 on regulated access to Next Generation Access Networks (NGA) Text with EEA relevance OJ L 251, 25.9.2010, p. 35–48

[2] Commission Recommendation 2013/466/EU of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, OJ L 251, 21.9.2013, p. 13–32

[3] The European Commission, on 9 March 2021, presented a vision and avenues for Europe's digital transformation by 2030. More on: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en#next-steps

[4] Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030, OJ L 323, 19.12.2022, p. 4–26.

[5] The SWD accompanying the Digital Decade proposal refers to a total investment gap of about EUR 250 billion to reach the 2025 Gigabit Society targets (Ferrandis et al, mentioned in footnote 52). Further investments would be required to reach the 2030 targets

[6] Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (the Code), OJ L 321, 17.12.2018, p. 36

[7] The types of networks taken into account for the calculation of the DESI indicator for "fixed Very High Capacity Networks (VHCN)" are: "Fibre to the Home" (FTTH), Fibre to the building ("FTTB") and Cable "Docsis 3.1", which are generally capable to deliver at least a 1Gbps downlink. VHCN therefore constitutes a good proxy for the notion of Gigabit networks used in recent initiatives, such as the Communication "2030 Digital Compass: the European way for the Digital Decade". While the Code refers to VHCNs and not to "gigabit networks" as such, a fixed VHCN is an FttH or FttB network, or other networks which are capable to delivering at least 1 gigabit/second with more balanced distribution of traffic between uplink and downlink speeds.

the regulatory framework alongside the promotion of competition, the development of the internal market and the interests of the citizens of the Union.

While coverage of VHCNs has significantly progressed since the adoption of the NDCM Recommendation in 2013, considerable private investments in VHCNs will be required to meet the ambitions set by the Decision (EU) 2022/481 (see below, chapter 2).

The new guidance will complement other sources of guidance on the Code (e.g. 2018 Commission SMP Guidelines[8] and 2020 Relevant Market Recommendation (hereinafter '2020 RRM')), guidelines that have been issued by BEREC in particular on co-investment[9], symmetric regulation[10] and VHCN[11]. In particular, taking into account the strong competitive dynamics shown in electronic communications markets in the past years, the 2020 RRM limits the list of markets recommended for ex ante regulation to two - the local wholesale access market and the dedicated business capacity market.

The new recommendation will also complement other, parallel initiatives. In particular, the ongoing revision of Broadband Cost Reduction Directive[12] (Commission's proposal for a "Connectivity Infrastructure Act") will contribute to VHCN deployments, in particular by further facilitating the re-use of existing physical infrastructures, enhancing the coordination of civil works, and simplifying permit granting procedures. Moreover, the new Broadband Guidelines, a successor of the EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks, were adopted on 12 December 2022.[13].

Scope of the new guidance

The principles of the 2013 NDCM Recommendation were applicable to the market for wholesale network infrastructure access and to the wholesale broadband access market (respectively markets 4 and 5 of the 2007 Recommendation on Relevant Markets[14],

[8] Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services (2018/C 159/01).

[9] BEREC Guidelines to foster the consistent application of the conditions and criteria for assessing new very high capacity network elements (Article 76 (1) and Annex IV EECC), BoR (20) 232, 11.12.2020

[10] BEREC Guidelines on the Criteria for a Consistent Application of Article 61 (3) EECC, BoR (20) 225, 10.12.2020

[11] BEREC Guidelines on Very High Capacity Networks, BoR (20) 165, 01.10.2020

[12] Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks Text with EEA relevance
OJ L 155, 23.5.2014, p. 1–14

[13] Communication From The Commission Guidelines on State aid for broadband networks 2023/C 36/01 C/2022/9343 *OJ C 36, 31.1.2023, p. 1–42*

[14] Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (notified under document number C(2007) 5406) (Text with EEA relevance), OJ L 344, 28.12.2007, p. 65–69

corresponding to Market 3a and 3b of the 2014 Recommendation)[15]. In light of the latest Recommendation on Relevant Markets, adopted in 2020[16], the guidance contained in the new Recommendation will primarily be applicable to the wholesale local access market (Market 1). However, the principles set out in this Recommendation also apply to other wholesale markets, not included in the Recommendation (EU) 2020/2245, that are upstream or downstream of the market 1, that are nonetheless subject to SMP regulation. This can concern for instance the wholesale central access market (ex-market 3b listed in the 2014 RRM) and the upstream civil engineering infrastructure market, if these markets are defined by the NRA and are found to justify the imposition of regulatory obligations in accordance with Article 67(1).

As was the case with the 2010 and 2013 recommendations, the new Recommendation is not directly applicable to the high quality market (market 2 of the 2020 RRM), given the specific characteristics of the demand by large and/or technologically advanced businesses, and the heterogeneity and specificity of the retail and wholesale products, and associated processes, on this market. However, the guidance provided in this Recommendation with respect to access to civil engineering infrastructure should be applicable irrespective of whether this access is imposed under the regulation of the market for wholesale local access provided at a fixed location (market 1), or of any other market, including the wholesale dedicated capacity market (market 2) or as part of the regulation of a separate upstream market for access to civil engineering infrastructure. Moreover, the measures issued by NRAs with respect in particular to the migration to VHC networks may have an impact on market 2. Where such impact exists, it should be duly taken into account by NRAs.

2. MARKET DEVELOPMENTS

The landscape of fixed electronic communications networks has considerably changed between the end of the 2000s - when the NGA Recommendation was issued - and today. The Digital Economy and Society Index (DESI) is a composite index published annually by the European Commission since 2014[17]. It shows an important increase of VHCN[18] coverage and

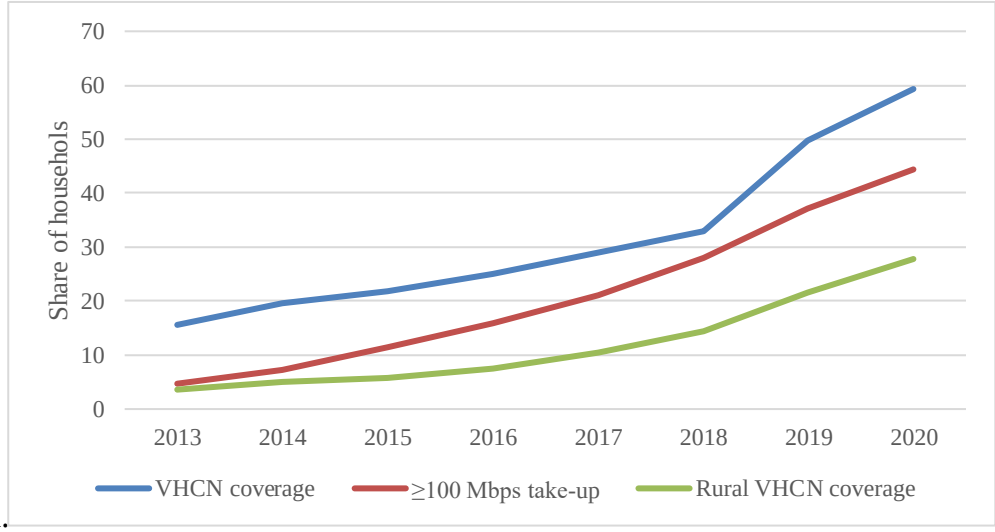
[15] Commission Recommendation 2014/710/EU of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive) (2014 Recommendation on Relevant Markets) (OJ L 295, 11.10.2014, p. 79).

[16] Commission Recommendation (EU) 2020/2245 of 18 December 2020 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with the Code (2020 Recommendation on Relevant Markets) (OJ L 439, 29.12.2020, p. 23-31)

[17] It measures the progress made by EU Member States towards a digital economy and society, bringing together a set of relevant indicators. DESI 2020 was composed of five principal policy areas, which group 37 indicators overall: 1 Connectivity (Fixed broadband take-up, fixed broadband coverage, mobile broadband and broadband prices), 2 Human capital (Internet user skills and advanced skills), 3 Use of internet (Citizens' use of internet services and online transactions), 4 Integration of digital technology (Business digitisation and e-commerce), 5 Digital public services (e-Government). DESI 2021 has been adjusted to reflect the two major policy initiatives set to have an impact on the digital transformation in the EU in the coming years: the Recovery and Resilience Facility (RRF) and the Digital Decade Compass.

take-up by end users. In 2013, only 15% of EU households were covered by a VHCN. The DESI 2021 data on connectivity shows an improvement in VHCN, particularly that it is available in 59% of the households in the EU, up from 50% a year ago, but still far from universal coverage of Gigabit networks (the digital decade target for 2030). The rural VHCN coverage went up from 22% in 2019 to 28% in 2020.[19]

Table 1: EU VHCN coverage (global (EU wide) and rural) and take-up of very high-speed broadband.



Source: DESI

This growth was the consequence of end users' rising demand for higher speeds products, driven among other things by increased use of teleworking and consumption of higher quality media content. VHCN coverage almost doubled after 2018, as the upgrade of cable networks to DOCSIS 3.1 started in several Member States and FTTH deployments also accelerated.

Based on these DESI figures, it appears that while FTTH/B coverage was high in several countries including Spain, Portugal, Scandinavian countries and much of Eastern Europe, including Latvia, Bulgaria and Lithuania, full fibre coverage remained limited in Germany, Italy and Belgium, and is fragmented in France and the Netherlands. In the case of Germany, Italy and Belgium the initial focus for the incumbent was on FttC/VDSL, supplemented with

[18] Under Article 2(2) of the Code, "'*very high capacity network' means either an electronic communications network which consists wholly of optical fibre elements at least up to the distribution point at the serving location, or an electronic communications network which is capable of delivering, under usual peak-time conditions, similar network performance in terms of available downlink and uplink bandwidth, resilience, error-related parameters, and latency and its variation; network performance can be considered similar regardless of whether the end-user experience varies due to the inherently different characteristics of the medium by which the network ultimately connects with the network termination point*". In accordance with Article 82, BEREC issued in October 2020 guidelines on the criteria that a network is to fulfil in order to be considered a very high capacity network.

[19] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_5481

vectoring in Germany. However, there is a clear trend towards FttH deployment in all Member States from both incumbents and alternative operators, at least at regional level[20].

DESI figures show that demand for fixed broadband has steadily increased over the last decade[21], including for subscription above 100 Mbps[22]. Nonetheless, the demand for gigabit speeds remain currently very limited, as only 1.3% of households have subscribed to offers of at least 1 Gbps (well below the VHCN coverage).

The Covid-19 pandemic has led to an increase of the demand for bandwidth both downstream and upstream and raised awareness regarding new patterns of working, healthcare, education, provision of public services and entertainment. This trend should continue in the years to come, fuelled by new usages in the business and residential markets such as the development of the Internet of Things (IoT) or virtual reality.

This substantial increase in coverage has however left a significant gap between urban and rural regions. In rural areas, growth was slower, but still substantial, from 4% to 28% over the same time period. This gap is due to higher costs of deployment and lower economies of scale in these regions that are more isolated and less densely populated. The business case of VHCN deployment is therefore less evident for private investors and can even be clearly unprofitable in some cases. The large gap between total and rural VHCN coverage shows the regional disparities in digital opportunities and confirms that, in order to meet the Digital Decade connectivity targets, more investment is needed in rural areas in order to catch up[23]. It is expected that deployment in rural areas will gain importance in the future years as urban areas approach ubiquitous coverage. However, parallel deployment of new VHCN infrastructure in rural areas would in general remain relatively limited.

At the same time, the importance and relevance of copper networks is progressively decreasing. In several Member States[24], the incumbent has already announced or even started plans to decommission such network.

The second main phenomenon is the multiplication of operators that are involved in the deployment of networks. In most Member States, incumbents still play an important role in the deployment of VHCNs, but a number of alternative operators have achieved a significant share of the VHCN coverage. This includes alternative operators having deployed FTTH/FTTB, with the help in some Member States of regulated access to the incumbent's

[20] The Explanatory Note accompanying the 2020 Recommendation on Relevant Markets

[21] Over three quarter of EU households (77%) had a fixed broadband subscription in 2020, following a steady growth (an annual growth rate of 2.1%) over the last 8 year (2021 DESI Report).

[22] In 2020, more than one third of EU households subscribed to such a service (34%), up from 2% eight years ago (idem). However, there are strong contrasts across Europe, with some countries well 60 % take up (for instance Sweden, Spain and Portugal) and other where take up is less than 10 % (Greece, Cyprus, Croatia).

[23] Digital Economy and Society Index 2021 Digital infrastructures

[24] According to the BEREC Draft Report on migration and copper switch-off (BoR (21) 171), the SMP operator had already closed copper-based network elements in 10 Member States (BE, EE, ES, FI, LU, MT, PL, PT, SE and SI). The SMP operator had announced its plans to switch off its legacy copper access network in 16 MS (BE, EE, ES, FI, FR, EL, HU, IE, IT, LU, MT, PL, PT, SE, SI and SK).

civil engineering infrastructure. This also includes many cable operators that have gradually improved their network to the latest standards (DOCSIS 3.1)[25]. However, unlike legacy copper networks, fibre or cable, VHCNs are not yet ubiquitous. Privately funded networks are mostly deployed in the urban areas (where sometimes multiple networks overlap), while rural areas, where business cases are less attractive due to higher rollout costs and lower population density, suffer from lower coverage rates and are therefore covered by networks that are often at least partly publicly funded.

In most EU Member States, the telecommunication landscape has therefore drastically evolved from a single copper network, with mostly service-based competition, to multiple networks deployed by various operators, with various technologies and geographic coverage, with increasing infrastructure-based competition where these networks overlap. This has important consequences in terms of regulation. When making their regulatory/deregulatory decisions, NRAs have to take into account these new emerging competitive landscapes and in particular existing and emerging infrastructure competition. They have to deal with markets that are geographically more fragmented and with a delicate migration from copper to VHC networks, including a transition period where VHCNs are rolled out but the copper network is not phased out yet.

[25] The Explanatory Note accompanying the 2020 Recommendation on Relevant Markets (SWD(2020) 337) highlights that cable operators, which are present across the whole of Belgium, the Netherlands and Malta, and in some regions of other countries including Germany, Spain, France, Poland, Portugal and Ireland, have mainly pursued incremental investment strategies relying on the upgrade of existing networks with DOCSIS 3.1.

3. REGULATORY FRAMEWORK

In view of these market developments and of new policy objectives, the regulatory framework for electronic communications has been substantially modernized with the 2018 European Electronic Communications Code (the "Code"). The Code provides for a revamped and modernized framework for the electronic communications sector and aims at creating a pro-competitive and investment-friendly regulatory environment. In particular, under the new objective by the Code, NRAs, BEREC and the Commission should promote connectivity and access to, and take up of VHCN, needs to be a guiding principle for this review.

The Significant Market Power (SMP) regime remains the key instrument for ex ante regulation, even if regulatory intervention can be envisaged outside of the SMP regime under the specific conditions set in Article 61 of the Code through symmetric regulation[26]. Under the SMP regime, regulatory intervention on a specific product and geographic market can be justified if proven that these markets are characterised by high barriers to entry and do not tend towards effective competition, and that competition law instruments are insufficient to tackle the identified competition problems. An undertaking is deemed to have SMP, if, either individually or jointly with others, it enjoys a position equivalent to dominance, i.e. a position of economic strength, which gives it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers. Guidance on the market definition and SMP assessment has been provided in the SMP Guidelines and in the 2020 RRM.

When the EECC became fully applicable on 21 December 2020, it introduced the promotion of connectivity, access to and take-up of VHCN as a new objective of the regulatory framework, alongside the promotion of competition, the development of the internal market and the interests of Union citizens. This additional objective requires reconsidering both the 2010 NGA Recommendation and the 2013 NDCM Recommendation to ensure that these rules remain applicable in a dynamic policy and market environment; and incentivise VHCN investments while also promoting competition. The market environment has also changed dramatically as a consequence of huge amounts of investments required to replace the copper local loop by fibre and the emergence of players other than the historic telecom incumbents that are deploying FTTH loops in certain geographic areas. As a consequence of these evolutions, a revision of the recommendations[27] adopted under the 2009 Regulatory Framework is required.

[26] In particular, Article 61(3) provides that access obligations can be imposed with respect to wiring and associated facilities inside buildings or up to the first concentration or distribution point where the replication of these network elements would be economically inefficient or physically impracticable; under strict conditions such obligations can be extended up to a point beyond. These provisions are applicable outside of the context of a market analysis, and irrespective of whether the undertaking concerned has been designated as having significant market power.

[27] 2010 NGA Recommendation and the 2013 NDCM Recommendation

As highlighted in the previous recommendations, consistency of regulatory approaches taken by NRAs is of fundamental importance to avoiding distortions of the single market and to creating legal certainty for all investing undertakings[28]. While the guidance provided in the existing recommendations has certainly contributed to more consistent regulatory approaches, in relation for instance to costing methodology where the guidance of the NDCM Recommendation was largely followed by NRAs (see chapter 7 of this document), inconsistent practices can still be observed including in relation to aspects covered by existing recommendations such as pricing flexibility which was applied as such in a limited number of Member States[29].

Emphasis on self-regulation and co-regulation

The Code puts a strong emphasis on the importance for NRAs to be open to, and take into account, the initiatives emerging from the market that can foster the deployment of VHCNs while supporting sustainable competition. It also supports the development of innovative investment models based on cooperative arrangements between operators, in particular co-investment and/ or new business models such as the wholesale only model. It also adds an emphasis on effective access to civil engineering infrastructures as a way to foster efficient, infrastructure-based competition. NRAs should encourage and explore market initiatives that allow parties to diversify the investment risk while enabling sustainable competition on the downstream markets.

In this regard, and as mentioned in the Explanatory Note accompanying the 2020 Recommendation on Relevant Markets[30], commercial agreements, including agreements on wholesale access, co-investment agreements and reciprocal access agreements between operators, are likely to become more common in the near future and should be taken into account by NRAs when assessing the competitive dynamic of a particular wholesale market. If such agreements have been entered on a lasting basis, are sustainable and improve competitive dynamics, they can contribute to the conclusion that a particular wholesale market does not warrant ex ante regulation. These market developments should therefore be duly considered by the NRA when analysing the market, in particular when assessing whether a market is susceptible of ex ante regulation[31], and whether one (or several) operator has SMP on the market[32]. In that regard, the recent case DK/2021/2346 illustrates that in situation with a high degree of overlap between fibre and coaxial networks, and where at least one of these networks is open at wholesale level on a commercial basis, the NRA should assess the commercial wholesale conditions, and duly take such commercial offers into consideration when assessing whether an operator has significant market power in the market.

[28] Recital 3 of the NGA Recommendation.
[29] Visionary Analytic Study, p. 74-75. The reasons for this limited application of pricing flexibility are discussed in chapter 7 of this document.
[30] SWD(2020) 337 final
[31] Article 67(1)
[32] Article 63(2)

Where a market is found not to be competitive and undertaking(s) have been designated as having SMP, the Code foresees multiple situations where self-regulation or co-regulation tools should be preferred over regulatory obligations, in particular intrusive obligations such as price control.

First, where the SMP operator opens a new VHCN to co-investment under Article 76 of the Code, in accordance with the conditions and procedure set in Articles 76 and 79 of the Code[33], the commitment shall be made binding and no additional obligation shall, in principle, be imposed with respect to the VHCN elements subject to the commitments[34].

Second, where the SMP operator has the characteristics of a wholesale-only undertakings (provided in Article 80, paragraph 1), the Code calls for a less intrusive regulatory response, that takes into account that competition risks would be lower than for vertically integrated undertakings. In that regard, wholesale-only operators will in particular have no incentive to conduct practices excluding access seekers from the retail market. In particular, while the Code provides that NRAs impose obligations "*relative to fair and reasonable pricing*", this possibility is limited to the case where this remedy would be "*justified on the basis of a market analysis including a prospective assessment of the likely behaviour of the undertaking designated as having significant market power*". In a recent case[35] where the NRA had proposed to impose on wholesale-only operators the obligation to charge fair and reasonable prices, the Commission commented on NRAs duty to duly analyse the current level of prices charged by these operators, as well as other relevant elements that could impact their incentive and ability to charge excessive prices in the future[36].

Third, and more generally, the existence of commercial agreements and cooperative arrangements (including those to which the SMP operator is not a party) should adequately be taken into account by the NRA where considering possible regulatory obligations.

This is the case in particular, but not only, where the SMP operator offers a commitments regarding conditions for access, including cooperative arrangements. In such a case, the NRA

[33] These conditions are defined in Article 76(1) and Annex IV of the Code. In particular, the co-investment offer should include fair, reasonable and non-discriminatory terms allowing access to the full capacity of the network for co-investors ; and the possibility for access seekers not participating in the co-investment to benefit from the same quality, speed, conditions and end-user reach as were available before the deployment, accompanied by a mechanism of adaptation. In accordance with Article 76(4), BEREC has published in December 2020 guidelines to foster the consistent application by NRAs of the conditions set out in paragraph 1, and the criteria set out in Annex IV (BoR (20) 232).

[34] Article 76(2); a derogation is foreseen in the case where remedies are necessary to address significant competition problems on specific markets that cannot otherwise be addressed.

[35] DK/2021/2346

[36] In that case, the Commission observed in particular that in light of the relatively low take-up, wholesale-only operators would need to attract service providers in order to maximise the use of their network, especially in the presence of a competing cable network. The Commission also noticed that the characteristics of the undertakings involved (utility companies owned by energy consumers) and the possible existence of countervailing buying power in cases where there is only one wholesale customer on the network, could also limit the operator's ability or incentive to raise their prices in the future.

should in principle perform a market test and assess such commitments[37]. Article 79(2) of the Code lists different elements that NRA should have regard to when assessing the commitments and their possible regulatory consequences:

"(a) evidence regarding the fair and reasonable character of the commitments offered;

(b) the openness of the commitments to all market participants;

(c) the timely availability of access under fair, reasonable and non-discriminatory conditions, including to very high capacity networks, before the launch of related retail services; and

(d) the overall adequacy of the commitments offered to enable sustainable competition on downstream markets and to facilitate cooperative deployment and take-up of very high capacity networks in the interest of end-users".

In the application of Article 79, NRAs should generally foster a constructive dialogue with the SMP operator and between market players with a view to encourage initiatives that can contribute to VHCN deployments while preserving competition.

Irrespective of whether commitments have been offered by the SMP operator under Article 79, the existence of commercial access agreements and other cooperative arrangements in a given market, or in an area within this market, can constitute a significant market development which may lead the NRA to consider reviewing the obligations imposed on the SMP operator pursuant to Article 68(6). Where these developments influence the competitive dynamics in a previously defined market, or in an area within this market, they may require a new market analysis. In areas where multiple network are being deployed, and where access to at least one VHC network is provided – either by the SMP operator or by its competitor(s) – on reasonable commercial terms permitting sustainable competition at retail level, where the NRA nonetheless finds that an undertaking has SMP, it should carefully consider whether the imposition of intrusive regulatory obligations (in particular price control obligations and access obligations under Article 73) would be necessary and proportionate. NRAs should monitor the impact of these agreements.

4. MAIN STEPS OF THE PROJECT

The European Commission services started to work on the revision of the current Access Recommendations in early 2020.

A targeted consultation[38] took place in the period between 16 July 2020 and 7 October 2020. 24 respondents (in particular: BEREC, ETNO, ECTA, FttH Council and individual operators) presented their experience with the current recommendations and expressed their views on

[37] Except where such commitments clearly do not fulfil one or more relevant conditions or criteria.
[38] See **ANNEX I – SUMMARY OF THE CONSULTATION ACTIVITIES**

their revision. See Annex I for the summary of main results and references to the views of the stakeholders in the following chapters.

A study[39] was commissioned to support the Commission services in the revision of the existing recommendations. The consultant (Visionary Analytics with the assistance of experts with experience in telecom/regulatory matters) started its work in September 2020 (hereinafter 'Visionary Analytics Study'). A workshop with NRAs and BEREC was held on 15 April 2021 and a second workshop, with stakeholders, took place on 9 June 2021.

The final version of the Visionary Analytics Study was published in September 2021. See Annex II for the summary of the main findings of the Visionary Analytics Study and references to the views of the stakeholders in the following chapters.

A workshop with NRAs and BEREC was held on 17 March 2022 and has been followed by several small meetings to discuss specific points of the future recommendations. On … the Commission submitted draft Recommendation accompanied by the SWD for BEREC opinion in accordance with Article 34 of the Code. BEREC opinion was delivered on … and is summarized in the Annex III of this SWD and referred to in the following chapters. <TO BE ADDED>

[39] See **ANNEX II – SUMMARY OF THE VISIONARY ANALYTICS STUDY**

5. NON-DISCRIMINATION

In line with the Recital 184 EECC, the principle of non-discrimination ensures that undertakings with SMP do not distort competition, in particular where they are vertically integrated and supply services to undertakings with whom they compete on downstream markets. As such the non-discrimination principle remains one of the most important rules of ex ante regulation.

5.1 Provisions of the EECC relating to non-discrimination and means to achieve it

In relation to interconnection and access, the obligation of non-discrimination, under Article 70 of the EECC, is one of the key remedies that can be imposed on undertakings with significant market power (SMP) in order to promote effective competition on a relevant market. It also serves as a safeguard mechanism in those cases in which the SMP still exists but competition is developing and hence pricing flexibility is mandated instead of price control. One of the measures that can be imposed under Article 70 EECC is the obligation for the SMP undertaking to ensure equivalence of access, namely that the SMP undertaking applies equivalent conditions in equivalent circumstances to all access seekers. Moreover, it has the obligation to provide the same service and information to others, under same conditions and of the same quality, as it provides for its own downstream services (or those of its subsidiaries or partners).

Equivalence of access could be achieved by two main ways, each leading to specific outcomes: Equivalence of Inputs and Equivalence of Output.

Equivalence of Inputs (EoI) means the provision of services and information to internal and third-party access seekers on the same terms and conditions, including price and quality of service levels, within the same time scales using the same systems and processes, and with the same degree of reliability and performance.

Equivalence of Output (EoO) means the provision to access seekers of wholesale inputs comparable, in terms of functionality and price, to those the SMP operator provides internally to its own downstream businesses albeit using potentially different systems and processes.

Compared with the previous framework[40] Article 70(2) of the EECC is implicitly, but clearly, referring to the possibility to impose EoI, thereby incorporating a key element of the NDCM Recommendation. Article 70(2) of the EECC provides: *"(...) National regulatory authorities may impose on that undertaking obligations to supply access products and services to all undertakings, including to itself, on the same timescales, terms and conditions, including those relating to price and service levels, and by means of the same systems and processes, in order to ensure equivalence of access*".

[40] Article 10 of Directive 2002/19/EC of the European Parliament and of the Council of 7 march 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive).

Article 70 of the EECC does not specify where it may be appropriate to impose EoI or other forms of non-discrimination obligations. However, Recital 185 EECC builds upon the NDCM Recommendation by recognising that "*[i]n order to address and prevent non-price related discriminatory behaviour, equivalence of inputs (EoI) is in principle the surest way of achieving effective protection from discrimination*". However this recital also highlights that EoI is likely to trigger higher implementation and compliance costs than other forms of non-discrimination of access, and calls for a cost-benefit analysis of imposing such obligations. The recital also points out that EoI is more likely to be proportionate when imposed in relation to new systems, and further mentions other factors that may be relevant in conducting the cost-benefit analysis. In other words, the virtues of EoI are confirmed, but it is also recognised that it may be more appropriate to impose other solutions in some cases in particular when in a Member State a high number of small-scale undertakings are designated as having SMP, the imposition of EoI on each of those undertakings can be disproportionate.

5.2 Current Guidance under NDCM Recommendation

5.2.1 Equivalence of access

The NDCM Recommendation contains important guidance to NRAs to foster a consistent and effective application of this remedy.

In particular, the recommendation seeks to ensure an effective equivalence of access to the regulated network elements and associated facilities. To that end, the recommendation highlights that the surest way to achieve effective non-discrimination is by the application of EoI, which ensures a level playing field between the SMP operator's downstream businesses, for example its retail arm, and third-party access seekers, and promotes competition.

EoI is defined in point 6(g) of the NDCM Recommendation as meaning "*the provision of services and information to internal and third-party access seekers on the same terms and conditions, including price and quality of service levels, within the same time scales using the same systems and processes, and with the same degree of reliability and performance* […]". The NRAs should therefore assess whether it would be proportionate to impose EoI, by considering in particular whether the compliance costs are outweighed by the expected competition benefits. Where EoI is disproportionate, NRAs should ensure that the SMP operator provides the wholesale inputs to access seekers on an 'equivalence of output' (EoO) basis.

Point 6(h) of NDCM Recommendation defined 'Equivalence of Output (EoO)' as the *provision to access seekers of wholesale inputs comparable, in terms of functionality and price, to those that the SMP operator provides internally to its own downstream businesses albeit using potentially different systems and processes.*

The general principle of NDCM Recommendation is that where NRAs consider imposing non-discrimination obligations on SMP operators, they should examine whether it would be proportionate to impose EoI, meaning that the SMP operator would be required to provide

network access to external and internal service providers on 'the same' terms and conditions and using 'the same' systems and processes. Furthermore, Recital 16 of NDCM Recommendation indicates that "*EoI should, in principle, be introduced at the deepest possible network level at which competition will be effective and sustainable in the long term*".

Where EoI is used, including the economic terms, price control obligations may no longer be needed – provided that the other conditions for pricing flexibility are met (see section 7.1.5.2 of this document). The SMP operator may itself commit to following the EoI approach voluntarily (possibly with the expectation that this commitment would lead to lighter regulatory obligations, in particular in relation to price control).

In any case, the NRA should assess "*whether it would be proportionate to require SMP operators to provide relevant wholesale inputs on an EoI basis*" (Point 7 of the NDCM Recommendation). The decisive factor in this regard is whether the competition benefits of EoI outweigh its costs[41] or not[42]. When carrying out this proportionality assessment, the NRA must take into account the fact that (Point 7 of the NDCM Recommendation) compliance costs are often lower for NGA networks than for existing copper networks. Where EoI is disproportionate, NRAs should opt for EoO (Point 9 of the NDCM Recommendation). Moreover, when carrying such proportionality assessment NRAs should not stop short by assessing only one side (e.g. by concluding that EoI costs would be very significant), but must also assess any potential benefits (e.g. lessening of regulatory burden, withdrawal of some remedies, etc.).

5.2.2 Technical replicability of the new SMP's retail offers

Whenever a SMP operator is subject to a non-discrimination obligation (regardless whether is to be accomplished by way of EoI or EoO) access seekers should have network access to the extent that they can 'technically replicate' the SMP operator's new retail product (i.e. they can offer retail products in a comparable form). To achieve this end the NRA (or exceptionally the SMP operator) must test the technical replicability demonstrating that alternative operators would be able to technically replicate the retail offer of the SMP operator on the basis of the regulated wholesale input they receive, in particular where EoI has not yet been fully implemented (Point 11 of the NDCM Recommendation). In particular:

[41] Point 7 of the NDCM Recommendation refers to 'compliance costs' which refer to the costs of the SMP operator. However, this does not mean that under the NDCM Recommendation, NRAs should disregard the costs borne by access seekers (who may often have to adapt their own processes in case the SMP operator changes its internal processes) when performing their proportionality assessment.

[42] Point 7 of the NDCM Recommendation states in doing so, the NRA should take into account in the proportionality assessment, inter alia, the following considerations: (i) incremental costs of compliance with EoI are likely to be low when new systems are being designed; (ii) the potentially linked non-imposition of regulated wholesale access prices on NGA networks as recommended in points 48 and 49; (iii) the potentially positive effect the application of EoI might have on innovation and competition; (iv) any voluntary commitment by the SMP operator to provide wholesale inputs to access seekers on an EoI basis, as long as such a voluntary offer meets the conditions set out in this Recommendation; and (v) the number and size of the SMP operator(s).

- Where the NRA conducts the test, it must require the SMP operator to provide details on the new retail products 'with sufficient notice' prior to their launch.
- Where the operator itself conducts the test, the NRA should 'validate' the test results (Points 14 to 16 of the NDCM Recommendation).

In case the technical replicability test fails, the NRA must oblige the SMP operator (Points17 and 18 of the NDCM Recommendation) to amend the network access product in a way that ensures its technical replicability and, in the meantime, cease or delay the provision of the retail product pending compliance with the requirement of technical replicability.

Provided that EoI is fully implemented or technical and economic replicability of retail products is ensured in case EoI has not been fully implemented, the NDCM Recommendation requires NRAs to apply pricing flexibility (i.e. not to impose or maintain cost-orientation obligations on SMP operator if specific requirements are also met).

The NDCM Recommendation acknowledges that price control for NGA wholesale products may not be warranted also in other situations. In particular, NRAs can also remove price controls on NGA access products where there is 'effective equivalence' of access and 'effective infrastructure-based competition' (Point 58).

When NRA has already lifted previously imposed obligation, in reliance on the implementation of the EoI, in case of failure by the SMP operator the NRA can at any time reintroduce such obligations and may impose penalties if the SMP operator fails to fully implement an agreed EoI (Point 54). Along with the removal of price controls, the NRA should (Point 55):

- monitor the investment and competitive environment for NGA networks and
- obtain information from network operators about their NGA rollout plans.

The NDCM Recommendation considers that the two-pronged approach above (i.e. stricter application of non-discrimination and costing methodology) will ensure that:

- on the one hand, those seeking access to NGA access products under the flexibility regime have equal access to the incumbent operators' networks through tougher non-discrimination rules;
- on the other hand, investment incentives for NGA are in place (i.e. pricing flexibility for NGA wholesale access).

5.2.3 Monitoring of the non-discrimination obligations

Moreover, to monitor the application of non-discrimination obligations and reinforce transparency, the NRAs should require the SMP operators to measure Key Performance

Indicators (KPI)[43] in relation to the provision of the wholesale access products, and to define corresponding Service Level Agreements (SLAs) and Service Level Guarantees (SLGs).

In this regard, recital 23 of the NDCM Recommendation states that: *"(...) KPIs are the most appropriate tools to detect potential discriminatory behaviour and enhance transparency with respect to the delivery and quality of the SMP operator's regulated wholesale access products in the relevant markets. In order to enhance transparency and foster market confidence, NRAs may facilitate through appropriate industry forums the agreement between the SMP operator and third-party access seekers on the detailed KPIs and ensure that such KPIs are audited and published in a manner that allows for the early detection of potential discriminatory behaviour. The KPIs should be related to the key activities in the provisioning cycle, covering all its stages, i.e. the ordering process, the delivery or provision of the service, the quality of service including faults and fault repair times, and migration by access seekers between different regulated wholesale inputs."*

5.3 Non-discrimination under the SMP regime – current practice

The equivalence regime in place for different products in the WLA and WCA markets, as reported by NRAs in the online survey and BEREC's 2020 Regulatory Accounting Report, are presented in the table below. EoI is imposed by several NRAs on SMP operators but the number of regulated access products subject to EoI varies among Member States. NRAs that decided not to impose EoI but instead to implement strict non-discrimination in the form of EoO generally did so after a proportionality assessment[44]. However, this assessment was in most cases not based on precise estimates of the costs that EoI and/or EoO imposes (or would prospectively impose) on the SMP operators and on access seekers. Some NRAs have proceeded to a cost estimation for one or more access products. The justifications given for imposing EoO instead of EoI are therefore in most cases based primarily on qualitative justifications, and NRA rarely assessed the benefits of its introduction. Some NRAs e.g. the Polish[45] and the Danish[46] abstained from imposing obligations of EoI, based only on cost assessment (i.e. disregarding an assessment of potential benefits). However, in these markets, different degrees of separation were voluntarily implemented by the SMP operator. Also, lack of demand for duct access is sometimes invoked as a reason not to impose access on EoI[47] basis.

[43] The definition of KPIs, point 6(j) of the NDCM Recommendation: *"Key Performance Indicators (KPIs)' are indicators that measure the level of performance in the provision of the relevant wholesale services."*

[44] E.g. BE/2018/2073 and FI/2018/2073. For example, the Polish NRA (UKE), in its agreement of 22 October 2009 with the incumbent (later implemented into regulatory measures) found EoI not to be a proportionate tool to ensure non-discrimination. In turn it implemented the EoO principle in the form of voluntary commitments including the introduction of the Chinese Walls, along with KPIs.

[45] The Polish NRA (UKE) found EoI not to be a proportionate tool to ensure non-discrimination. In turn it implemented the EoO principle in the form of voluntary commitments including the introduction of the Chinese Walls along with KPIs (case PL/2011/1184).

[46] DK/2021/2346

[47] This is the case in Ireland and Cyprus.

Table 2 : Non-discrimination obligations.

Country	Equivalence regime	Products concerned
ES	EoI	EoI for NEBA local, NEBA fibre and civil engineering
LU	EoI	EoI for all regulated products in markets 3a and 3b
PT	EoI	EoI for duct access (no other NGA access products)
SI	EoI	EoI for all access products
SK	EoI[48]	EoI for VULA and bitstream products, however, for processes where costs are high, EoO can be justified
CY	EoI and EoO[49]	EoI imposed for "products via GPON optical fibre topology network and Vectoring technique in the copper network". Other products subject to EoO
FR	EoI and EoO[50]	EoI is imposed on wholesale access to ducts and civil engineering, EoO is imposed for access to legacy and FTTH networks on WLA market; EoO is also imposed on WCA market
IE	EoI and EoO	Market 3a: VULA FTTC & FTTH - EoI; Civil Engineering Infrastructure (Duct & Pole Access) - EoI; Other legacy products - EoO. Market 3b: Next Generation Bitstream FTTC & FTTH - EoI; Current Generation Bitstream - EoI.
IT	EoI and EoO	EoI for LLU, SLU and VULA FTTH/B, Enhanced EoO for other access services (VULA FTTC and bitstream services).
SE	EoI and EoO	EoI is used on local access to fibre-based infrastructure. EoO is used on backhaul and co-location (and before the deregulation on civil engineering).
AT	EoO	EoO for all access products
BE	EoO	EoO for all forms of NGA access
DE	EoO	EoO for all access products
EE	EoO	EoO for all products
EL	EoO	EoO for all wholesale products.
FI	EoO	EoO for LLU and bitstream
HU	EoO	EoO for all access products
MT	EoO	EoO on VULA FTTH (the only regulated access product)
PL	EoO	EoO for all access products

[48] Case SK/2016/1906-1908.

[49] Market 3a Decision 91/2017 stipulates that *"[CYTA must provide] in the context of access equivalence, products via GPON optical fibre topology network and Vectoring technique in the copper network, based on the input equivalence principle (EOI)*."

[50] Commission Comments of 25.11.2020 concerning Cases FR/2020/2277-2278-2279-2280. In the context of the symmetric framework that applies to the terminating segment of the FttH network, the NRA considers that the EoO obligations imposed is sufficiently detailed to result in an approach similar to EoI (FR/2020/2281).

Country	Equivalence regime	Products concerned
HR	EoO[51]	EoO for all access products
NL	None	Decision currently annulled
RO	None	Deregulated
BG	None	Deregulated
CZ	Other	Obligation was not imposed in last market review (due to the voluntary structural separation of the SMP operator).
DK	Other	EoO or EoI[52] imposed on all access products (legacy and fibre),
LT	Other[53]	Effectively EoO for all access products, although there are no references to either EoO or EoI in the decisions.
LV	Other[54]	KPIs, SLAs and SLGs have been imposed on wholesale access products, and NRA requires the provision of access services and information to other undertakings under the same conditions and with the same quality as the SMP operator provides to itself. This includes access to online information, online service ordering and maintenance and fault repair systems, but it was considered that full EoI would be disproportionate, access seekers use an online tool (a web page called SPRINTT).

Source: NRA responses to the online survey and BEREC's 2020 & 2021 Regulatory Accounting Reports, unless stated otherwise in footnotes.

In general, the Commission, in its comments letters addressed to NRAs was encouraging NRAs to impose strict forms of non-discrimination. The Commission called on detailed proportionality assessment supporting the conclusion that the imposition of EoI would be disproportionate[55]. The NRAs were invited to consider implementing EoI, alongside other competitive safeguards (most notably a technical and economic replicability test), instead of maintaining strict cost control obligations for fibre based broadband access products[56]. The Commission also highlighted that requiring the SMP operator to provide NGA wholesale inputs on an EoI basis is likely to create sufficient net benefits, and thus be proportionate,

[51] Case HR/2019/2164-2165

[52] In the recent market review (case DK/2021/2346), those regional SMP operators which proposed commitments, decided to apply EoI.

[53] LT NRA response to the online survey: "*Non-discrimination monitoring is carried out through the technical and qualitative parameters of the access services offered, in order for the access operator to be able to provide competitive retail services. NRA supervises ordering process, provision of service; quality of service, fault repair times, etc.*"

[54] Commission Decision of 19.07.2018 concerning Case LV/2018/20197-2098; Notification of a Draft Measure pursuant to Article 7, para.3, of the Framework Directive 2002/21/EC, Summary of SPRK Draft Decision concerning Markets 3a and 3b.

[55] E.g. case HR/2015/1739-1741

[56] E.g. case EE/2017/1981-1982

given that the incremental costs of complying with EoI are lower in case of newly built systems[57].

5.4 Stakeholders' views

There is a broad agreement among respondents to the targeted consultation conducted by the Commission in 2020 that the non-discrimination obligation is an essential tool of *ex ante* regulation.

BEREC, in its reply, indicates that EoI - which is imposed to some degree by the majority of NRAs regarding NGA wholesale local access products - is essential to create a level playing field between operators. Although, according to BEREC, in individual cases and depending on the circumstances, EoO could be more appropriate and proportional. BEREC expects that importance of the obligation of non-discrimination will continue to grow in the coming years once competition in the markets subject to ex ante regulation further consolidates, and consumers continue to pay growing attention to issues that go beyond the mere availability of access and pricing terms and conditions. In this context, different regulatory instruments are necessary to ensure that access to the regulated inputs is equivalent between the retail arm of the SMP operator and alternative operators, and between alternative operators themselves. In this vein, BEREC indicates that Key Performance Indicators, Service Level Agreements and Service Level Guarantees play a key part to monitor the application of that obligation. Furthermore, with respect to CEI access, BEREC indicated that "*There seems to be a relatively high consensus on the appropriateness of EoI as the norm for the wholesale access to civil engineering, however the proportionality assessment of EoI by NRAs might differ in a given situation*". On that point BEREC also insisted that it should be up to the NRA to decide on the most appropriate set of obligations. According to ETNO[58] their experience shows that the principles from the NDCM Recommendation on EoI and on economic replicability tests in many instances are difficult to implement. This can sometimes lead to disproportional regulatory constraints in the given circumstances. In their opinion, EoO can be effective in dealing with discriminatory practices.

On the other hand, ECTA and some alternative operators claim that further progress is needed to ensure non-discrimination on a solid ex-ante basis, based on Article 70 of the EECC and related articles. ECTA is of the view are that EoO has demonstrated its inability to prevent discrimination; therefore EoI should be the preferred solution for non-discrimination obligation. There is also a needed to ensure that NRAs explicitly impose strict internal-external non-discrimination on SMP operators.

[57] E.g. case FR/2017/2030-2032

[58] More in: Frontier Economics: "Shaping Policies to Support Investment in Very High Capacity Networks", Final Report for ETNO, 21 January 2021, https://www.etno.eu/library/reports/103-investment-vhcn-2022.html.

5.5 Evidence gathered in the Visionary Analytics Study

According to Visionary Analytics (VA) Study, there is substantial variation between the non-discrimination obligations (EoI and EoO) imposed by NRAs. When deciding on whether to impose EoI or EoO for specific access products, NRAs seldom proceed to a quantitative cost/benefit analysis, but often rather rely on a qualitative estimation of the need to ensure 'stricter' non-discrimination for the wholesale access products at stake.

Several comments received from stakeholders acknowledge that any requirement to set up EoI will have a substantial cost. Calls from operators to move from EoO to EoI are sometimes motivated by (potential) information sharing between wholesale and retail arms of the SMP operator. Beyond that specific issue, these calls seem to reflect problems related to the enforcement or the functioning of EoO rather than to the current guidance. Similar monitoring and enforcement problems are in some cases raised even when EoI is imposed.

According to the findings, very few NRAs perceive causal links between strict non-discrimination and incentives to invest in VHCN deployment. In fact, no NRA acknowledged that such obligations may decrease SMP operators' incentives to invest in VHCN deployment.

The Visionary Analytics analysis shows that all NRAs foresee a technical replicability test or at least mandate KPIs ensuring non-discriminatory replicability of the retail services of the SMP operator by alternative operators. However, comments received suggest there is some room for improvement. The manner in which KPIs are monitored varies substantially across the EU. Several comments by access seekers relate to alleged weaknesses in the monitoring and enforcement. In some Member States, there appears to be a lack of transparency as to how the NRA monitors KPIs, and what happens if they are not adhered to. In fact, comments received sometimes go beyond the non-discrimination issue. Some operators seem concerned with also QoS issues, stressing that KPIs set by NRAs are sometimes not ambitious enough.

Finally, Visionary Analytics Study found that SLAs and in many cases also SLGs on the provision of wholesale broadband access products are provided by SMP operators across the EU. However, access seekers' comments suggest that in some cases the billing procedure and the level of the SLG payments foreseen would not be sufficiently dissuasive to ensure that the SMP operator complies with its delivery obligations.

Visionary Analytics Study includes the following recommendations regarding the regulatory treatment of non-discrimination obligation:

- The successor recommendation should continue to call for a case by case proportionality assessment of EoI versus EoO, in line with current practice. Both costs and benefits should be considered not only from the perspective of the SMP operator, but also from the perspectives of alternative operators and of the NRA;
- In general, NRAs should duly justify their choices between EoO and EoI on a wholesale product by product basis, taking Member State characteristics and market

characteristics into account. If however a single wholesale input is used in multiple wholesale products, then the decision should be made on an input by input basis;

- The successor recommendation could encourage NRAs to consider enabling the SMP operator to offer comprehensive commitments in order to implement effective non-discrimination, subject to a consultation and approval process designed to seek consensus with alternative operators and overseen by the NRA. The potential advantages of such a multi-stakeholder process are obvious;
- The frequency with which KPIs are updated (and SLAs and SLGs where appropriate) should be set by means of the multi-stakeholder process. A cycle shorter than the market review cycle is likely to be appropriate;
- When designing or refining the non-discrimination framework, the NRA should consider utilising the same consensus-based multi stakeholder process to establish KPIs, SLAs and SLGs to ensure that the Quality of Service of wholesale products is in line with competitive market needs in the Member State.
- It is important that the process of monitoring KPIs is fully transparent;
- Penalties related to KPIs must be proportional, but should be large enough to be dissuasive. In Member States where it is feasible to do so, the NRA should encourage the SMP operator and the alternative operators to establish in advance a level of SLG penalties that are likewise proportional but dissuasive. In assessing whether the level of wholesale penalties is sufficiently dissuasive, the NRA should bear in mind that a breach of wholesale obligations on the part of the SMP operator may cause the alternative operator that uses the wholesale access product to be subject to indemnities imposed by the same NRA for problems at the retail level – the wholesale penalty should be large enough to cover the retail indemnity;
- If the NRA identifies a pattern of repetitive breaches of non-discrimination obligations (as demonstrated for instance by means of monitoring of KPIs) on the part of the SMP operator, the NRA should consider imposing periodic penalty payments in order to motivate the SMP operator to refrain from repeating the breaches. Penalties that progressively increase in response to a pattern of repeated infractions could be appropriate in some circumstances;
- The successor recommendation could urge the NRA, for payment of penalties that are largely under its control (such as repeated discrimination as identified by KPIs), to strive to ensure that dissuasive payments are made without undue delay through a pre-established process for payment and billing. It could also require the NRA to report on the level of penalties that it has imposed and on the delay, where relevant, from complaint to payment of the penalty. The NRA should consider the promotion of alternative dispute resolution provisions (e.g. in the reference offer) that seek to accelerate the dispute resolution process;
- The monitoring of any delays in payment of penalties is encouraged so as to ensure that their dissuasive effect is not lost;
- The TRT should serve to ensure that alternative access seekers can technically replicate the retail offer of the SMP operator on the basis of the regulated wholesale

input they receive. In the interest of proportionality, it need not be required for minimal changes to an existing retail offer of the SMP operator that prima facie do not imply a risk to technical replicability (such as for instance changes to price or to contract duration). Where a flagship retail product is a bundle that includes both regulated and unregulated elements, the TRT should be applied only to the regulated elements.

- The TRT should continue to be implemented in advance, wherever feasible, of the SMP operator launching a new retail offer that depends on a new relevant wholesale input being available. If the TRT is conducted in advance of the launch of the SMP operator's new retail offering, it is desirable (but not required) that the ERT be conducted at the same time.
- Commercial agreements between the SMP operator and alternative operators to offer additional wholesale access services with QoS beyond that covered by existing Reference Offers should not be prohibited. The SMP operator should be encouraged to meet reasonable requests for such services.
- In crafting non-discrimination plans, NRAs should be sensitive to the need to ensure that the SMP operator does not use information about the deployment plans of alternative operators for its own competitive advantage. In particular, NRAs should ensure that the retail arm of a vertically integrated SMP operator is not informed in advance of network deployments and/or the evolution of competitors in cases where this knowledge might provide the SMP operator with a competitive advantage. We recommend that the successor recommendation oblige SMP operators (except for those where the risk of abuse of information is low, such as wholesale-only operators) to provide an annual report documenting its practices in this regard, any known allegations of violation, and any corrective actions that it has taken. Beyond this, NRAs must have both the authority and the responsibility to investigate any allegations that the SMP operator has improperly used information about the plans of competitors for its own competitive advantage, and to impose dissuasive penalties if and as appropriate.

5.6 Updated guidance

In line with the EECC and the inputs received, the Recommendation continues to emphasize the need to ensure effective non-discrimination. Based on the regulatory practice and input received, overall current guidance (under the NDCM Recommendation) continues to be relevant and requires not substantial changes, rather adjustments to the refined thinking in the EECC.

5.6.1 EoI vs EoO

"Strict" non-discrimination ensures equivalence of access if it is efficiently implemented, taking into account proportionality analysis involving the costs to be paid not only by SMP operators but also by access seekers. In line with the EECC, Equivalence of inputs (EoI) is in principle the surest way of achieving effective protection from discrimination; in practice,

however, its advantages over EoO will vary considerably from one wholesale access product to the next. In this regard, the new Recommendation builds on the NDCM Recommendation and the Recital 185 EECC to indicate situations and circumstances where the cost-benefit for EoI is more likely to be positive, or *a contrario* cases where EoI would often not be proportionate.

Further guidance remains necessary, in particular regarding the relevant factors and considerations to be taken into account in the context of the cost-benefit analysis. NRAs, in particular, should conduct a quantitative cost/benefit analysis, including implementation costs both for the SMP operator and the access seeker as well as qualitative estimation of the need to ensure 'stricter' non-discrimination for the wholesale access products at stake. As explained above, NRAs have chosen different approaches when it comes to non-discrimination, even in relation to new products. In result, significant divergences in how the cost benefits analysis were conducted in practice by NRAs were observed, leading often to different approaches under similar circumstances.

Moreover, building on the Recital 16 of the NDCM Recommendation, new Recommendation will emphasize that when considering the application of EoI, NRAs should first consider introducing it at the deepest network level at which competition will be effective and sustainable in the long term. In particular, in line with the emphasis on access to CEI in the EECC and the New Recommendation (cf. Chapter 6 of this document), where CEI access is imposed and has the ability to foster infrastructure competition, NRAs should carefully consider the benefits and costs of implementing EoI for CEI.

Where the NRA finds that EoI would not proportionate for a given product or process, a well-crafted EoO regime, with good enforcement and suitable KPIs/SLAs/SLGs, can in many cases be appropriate to contribute to the further development of competition. For both EoO and EoI, effectiveness is heavily dependent on (1) the quality of the Reference Offer, (2) the degree to which KPIs, SLAs and SLGs are comprehensive, effective, and reflect the real needs of alternative operators; and (3) the effectiveness of monitoring and enforcement of non-discrimination obligations on the part of the NRA[59].

However, EoI provisions are largely self-enforcing, whereas EoO can be challenging to enforce in cases where the SMP operator does not itself consume the same wholesale access product that it offers to competitors. The cost-benefit analysis of EoI vs. EoO should also factor in long term monitoring costs of NRAs, which might be higher for EoO and in some instances outweigh the implementation costs in the long term[60]. A case by case proportionality assessment of EoI versus EoO, should therefore be undertaken. In practice, NRAs need to take into account a number of factors (e.g. a quantitative cost/benefit analysis

[59] The Visionary Analytics Study page 303.

[60] NRAs that decided not to impose EoI but instead to implement strict non-discrimination in the form of EoO generally did so after a proportionality assessment. However, this assessment was in most cases not based on precise estimates of the costs that EoI and/or EoO imposes (or would prospectively impose) on the SMP operators and on access seekers.

for SMP operators and access seekers, as well as a qualitative estimation of the need to ensure 'stricter' non-discrimination for the wholesale access products at stake) when determining if the obligation of EoI is likely to be implemented in practice as it depends on the wholesale products. BEREC observes that, in practice, the boundary between EoI and EoO at a product level[61] will not be clear-cut and that EoI is unlikely to be implemented across all of the inputs to wholesale products.

Finally, as BEREC stated in its contribution to the targeted consultation, market developments must also be taken into account when choosing a non-discrimination approach. An increasing number of alternative operators are now deploying fibre alongside the former market incumbents in several countries. From a forward looking perspective this could lead to several SMP operators in different sub-national markets being regulated in the same country.[62] In line with the EECC, the imposition of EoI on each of those undertakings can be disproportionate in such cases. Furthermore, in some markets developments are also tending towards fewer vertically integrated operators.

Nonetheless, where the SMP operator is a wholesale-only operator meeting the conditions prescribed in Article 80(1) of the Code, it would in principle have no incentives to discriminate between downstream providers. As a consequence, NRAs should refrain from imposing non-discrimination obligations on wholesale-only operators, unless they establish that there are specific circumstances that justify imposing such obligation e.g. if wholesale-only operators had longstanding exclusive arrangements with one service provider or were vertically integrated and would able to dictate their commercial terms to other retail service providers.

5.6.2 Technical Replicability Test (TRT)

The TRT should serve to ensure that alternative access seekers can technically replicate the retail offer of the SMP operator on the basis of the regulated wholesale input they receive. In the interest of proportionality, it need not be required for minimal changes to an existing retail offer of the SMP operator that prima facie do not imply a risk to technical replicability (such as for instance changes to price or to contract duration).

Currently NRAs have different approaches on the timing of the TRT:

[61] It is assumed that a wholesale product is built up from various inputs (such as assets, IT processes etc.).
[62] See for example BoR (18) 24, Assessment of the need to review the BEREC Common Positions on Markets 3a, 3b and 4. Mar. 08.2018, p. 13-14.

Table 3: Approaches to implementing the TRT.

Approaches	No. of NRAs
The SMP operator must submit a report before the launch of any new resale offers	9
The SMP operator must be able to demonstrate technical replicability upon request	9
Other	8
Not applicable (because not regulated, or no obligation)	6

Source: Visionary Analytics Study, page 155

For the avoidance of doubt, it should be noted that, as part of the TRT, NRAs should ensure that access seekers are technically able to replicate the retail offer of the SMP operator on the basis of the regulated wholesale input they receive; however the TRT as such does not require that the SMP operator should provide access to inputs that are not subject to an access obligation pursuant to Article 72 or 73 of the EECC, even where the SMP operator provides retail offers including this non-regulated input.

TRT is not only applicable in EoO situations, but should generally be imposed as part of non-discrimination obligations. In the interest of proportionality, it need not be required for minimal changes to an existing retail offer of the SMP operator that prima facie do not imply a risk to technical replicability (such as for instance changes to price or to contract duration). Where a retail product is a bundle that includes both regulated and unregulated elements, the TRT should be applied only to the regulated elements. The TRT should continue to be implemented in advance, wherever feasible, of the SMP operator launching a new retail offer that depends on a new relevant wholesale input being available. If the TRT is conducted in advance of the launch of the SMP operator's new retail offering, it is desirable (but not required) that the ERT be conducted at the same time.

The required technical replicability test can be carried out by either the SMP operator or the NRA. If the SMP operator conducts the technical replicability test itself, the NRA should require the SMP operator to provide it with the results of the test including all information needed to demonstrate that technical replicability is fully ensured, with sufficient notice for NRA to validate the results of the test and for access seekers to replicate the relevant retail offer. Alternatively, if the NRA conducts the technical replicability test, it should require the SMP operator to notify to the NRA the details of the new retail offers that consume a relevant regulated wholesale input together with all information needed for the NRA to assess replicability, with sufficient notice prior to the launch of such retail offers. Such notice should be sufficient for NRA to conduct the technical replicability test and for access seekers to replicate the relevant retail offer.

5.6.3 Monitoring

KPIs play a key role in ensuring effective monitoring of non-discrimination. The manner in which KPIs are monitored varies substantially across the EU. Several comments by access seekers relate to alleged weaknesses in the monitoring and enforcement. In some Member States, there appears to be a lack of transparency as to how the NRA monitors KPIs, and what happens if they are not adhered to. In fact, comments received sometimes go beyond the non-discrimination issue. Operators seem concerned with QoS issues, stressing that KPIs set by NRAs are sometimes not ambitious enough[63].KPIs are set and monitored by the NRA. Where infractions are noted, the NRA plays the key role in imposing penalties. The NRA is thus in a substantially different role than is the case for SLAs and SLGs, which typically are agreements between two undertakings, two private firms. Therefore, it is important to include in the reference offers quality standards, that parties must meet when fulfilling their contractual obligations[64].

KPIs should be sufficient to ensure effective non-discrimination, but nonetheless proportionate[65]. They should not be so numerous or so complex as to be needlessly burdensome.

The frequency with which KPIs are updated (and SLAs and SLGs where appropriate) should be set by means of the same multi-stakeholder process. As already stressed in the NDCM Recommendation, the potential advantages of such a multi-stakeholder process should enhance transparency and foster market confidence.

The process of monitoring KPIs should be fully transparent. NRA should make public any reports and/or decisions to remedy non-compliance. Indeed, almost all NRAs mandate KPIs to be available to all authorised operators (systematically or on request)[66]. In particular, aggregated values should be available so individual operators can compare their KPIs to the industry average. Also penalties related to KPIs must be proportional, but should be large enough to be dissuasive. In assessing whether the level of wholesale penalties is sufficiently dissuasive, the NRA should bear in mind that a breach of wholesale obligations on the part of the SMP operator may cause the alternative operator that uses the wholesale access product to

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[63] Visionary Analytics Study, page 136

[64] Visionary Analitics Study page. 304, and the BEREC 2019 Guidelines on the minimum criteria of the reference offer (BoR (19) 238) page 8.

[65] BEREC 2019 Guidelines: "*SLAs should be available for ordering, delivery, service (availability) and maintenance (repair), including specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, for provision of support services (such as fault handling and repair). Reference offers should also include the quality standards that each party must meet when performing its contractual obligations, including the specification of KPIs with respect to SLAs, as well as SLGs for ordering, delivery, service (availability) and maintenance (repair). In the Guidelines KPIs, SLAs and SLGs – applied in both equivalence of access concepts (EoO or EoI) – are addressed adequately to remain further on effective tools to enforce and monitor the non-discrimination obligation*."

[66] In one Member State only aggregated values are available and operators can compare KPIs to the industry average, BEREC BOR (16) 219, p.42.

be subject to indemnities imposed by the same NRA for problems at the retail level – the wholesale penalty should be large enough to cover the retail indemnity.

Finally, NRAs should be open to consider enabling the SMP operator to offer comprehensive commitments in order to implement effective non-discrimination, subject to a consultation and approval process designed to seek consensus with alternative operators and overseen by the NRA.

6. ACCESS TO CEI AND OTHER ACCESS OBLIGATIONS (ARTICLES 72 & 73)

This chapter will discuss in turn issues linked to the access to civil engineering infrastructure (Article 72), and other access obligations (Article 73).

6.1 Access to civil engineering infrastructure

Civil engineering infrastructure (CEI) encompasses physical infrastructure assets and other facilities that could host electronic communications networks. According to Article 72 of the Code, civil engineering includes, but is not limited to, buildings or entries to buildings, building cables, including wiring, antennae, towers and other supporting constructions, poles, masts, ducts, conduits, inspection chambers, manholes, and cabinets. Up to 80% of the total cost of deploying an electronic communications network can consist of civil works[67]. Given that, access to the SMP's CEI (where widely available) plays, or can play, an instrumental role in the large scale roll-out of VHCNs. This is reflected in the regulatory framework established by the Code.

6.1.1 Legal framework

The Code

Article 72 of the Code establish the regulatory framework of access to the civil engineering infrastructure of the operator identified as holding SMP. Article 44 of the Code refers to the co-location and sharing of network elements and associated facilities for providers of electronic communications networks, in a context which is not dependent on identifying a SMP operator. Article 44 of the Code is not the subject of the Recommendation.

Article 72 of the Code allow NRAs to impose obligations on SMP operators to meet reasonable requests for access to, and use of, CEI whenever NRAs conclude, following a market analysis, that denial of access or unreasonable terms and conditions having a similar effect would hinder the emergence of a sustainable competitive market at retail level and would not be in the end-user's interest. In terms of scope, Article 72 of the Code refers explicitly to civil engineering. CEI is not defined in the Code but Article 72 provides a list of examples: *"buildings or entries to buildings, building cables, including wiring, antennae, towers and other supporting constructions, poles, masts, ducts, conduits, inspection chambers, manholes, and cabinets*"[68].

Article 72 of the Code allows NRAs to impose access to civil engineering infrastructure even if CEI is not part of the relevant market in accordance with the market analysis, provided that the obligation is necessary and proportionate.

[67] SWD (2020) 337 final, page 62.

[68] Article 72 of the Code does not cover the access to cables and wiring (except in-building cables). Access to cables and wiring is covered by Article 73 of the Code.

Article 73 of the Code refers to access to "*specific network elements and associated facilities*". The latter category of associated facilities[69] is a wider concept which includes CEI.

Article 73 of the Code obliges NRAs to assess before imposing any other access obligation (i.e. access to specific network elements, like, for instance, physical or virtual access to fibre, copper or coax lines, and associated facilities) whether the imposition of access to CEI under Article 72 alone would be a proportionate means by which to promote competition and the end-user's interest. Consequently, in such a case, access to CEI could be the only access obligation imposed.

Recital 172 of the Code recalls that the impact of the Broadband Cost Reduction Directive[70] (hereinafter 'BCRD') should be taken into account before considering SMP-based obligations[71].

As it will be referred to in the BCRD section, the BCRD aims to facilitate and incentivise the rollout of high-speed electronic communications networks by promoting the joint use of existing physical infrastructure and by enabling a more efficient deployment of new physical infrastructure so that such networks can be rolled out at lower cost. It follows that addressing a competition problem is not a specific objective of the BCRD, although competition might benefit from its application. On the other hand, obligations imposed based on a finding of SMP are specifically designed to address the competition problem(s) identified in the market analysis. It can therefore be assumed that SMP-based regulation is more appropriate to tackle a competition issue. Against this background, recital 187 of the Code implies that where civil engineering assets are owned by an SMP operator, SMP-based regulation will be necessary, independently of the application of the BCRD.

According to recital 187 of the Code, civil engineering assets that can host an electronic communications network are crucial for the successful roll-out of new networks because of the high cost of duplicating them, and the significant savings that can be made when they can be reused. Therefore, in addition to the rules on physical infrastructure laid down in Directive 2014/61/EU, a specific remedy is necessary in those circumstances where civil engineering assets are owned by an undertaking designated as having significant market power.

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[69] According to Article 2 of the Code, "*associated facilities*" means associated services, physical infrastructures and other facilities or elements associated with an electronic communications network or an electronic communications service which enable or support the provision of services via that network or service, or have the potential to do so, and include buildings or entries to buildings, building wiring, antennae, towers and other supporting constructions, ducts, conduits, masts, manholes, and cabinets.

[70] Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks, currently under review.

[71] This is in line with the Modified Greenfield Approach that NRAs should follow in conducting their market analysis, as emphasised in the SMP Guidelines (point 17): "[…] the *analysis should take into account the effects of other types of (sector-specific) regulation, decisions or legislation applicable to the relevant retail and related wholesale market(s) during the relevant period*." (Communication from the Commission Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services, 2018/C 159/01).

Recital 187 of the Code also indicates that it is necessary to ensure that regulated access to CEI can be used as a self-standing remedy for the improvement of competitive and deployment dynamics in any downstream market.

Finally recital 187 of the Code provides guidelines to NRAs on how the reusable legacy CEI should be valued. This is relevant when NRAs set access prices to CEI, but also to other regulated wholesale access products. According to recital 187 of the Code reusable legacy CEI should be valued on the basis of the regulatory accounting value net of the accumulated depreciation at the time of calculation, indexed by an appropriate price index, such as the retail price index, and excluding those assets which are fully depreciated, over a period of not less than 40 years, but still in use.

2010 NGA Recommendation

Point 11 of the 2010 NGA Recommendation provides a definition for civil engineering infrastructure[72]. This definition is narrower than the scope of Article 72 of the Code as it does not comprise, for instance, buildings, building wiring or antennae. Point 11 of the 2010 NGA Recommendation also provides definitions for some CEI assets, namely ducts[73] and manholes[74].

Points 13 – 17 of the 2010 NGA Recommendation provide guidelines to NRAs on how to regulate access to CEI of the SMP operator. Where duct capacity is available, access to CEI should be provided in accordance with the principle of equivalence. Access to existing CEI should be provided at cost oriented prices. NRAs should mandate for a reference offer for access to CEI, provided there is a request for such offer, in which case the reference offer should be in place not later than 6 months after the request for it has been made. According to point 16, NRAs should, in accordance with market demand, encourage, or, where legally possible under national law, oblige the SMP operator, when building CEI, to install sufficient capacity for other operators. Point 17 of the recommendation indicates that NRAs should work with other authorities to establish a data-base containing information on geographical location, available capacity and other physical characteristics of all CEI which could be used for the deployment of optical fibre networks. Such data-base should be accessible to all operators.

Point 2 of Annex I of the 2010 NGA Recommendation provides general guidelines to NRAs on pricing the access to CEI. The costing methodology for setting the prices for access to CEI

[72] According to the NGA Recommendation, '*civil engineering infrastructure*' means physical local loop facilities deployed by an electronic communications operator to host local loop cables such as copper wires, optical fibre and co-axial cables. It typically refers, but is not limited to, subterranean or above-ground assets such as sub-ducts, ducts, manholes and poles.

[73] According to the NGA Recommendation, '*duct*' means an underground pipe or conduit used to house (fibre, copper or coax) cables of either core or access networks.

[74] According to the NGA Recommendation, '*manholes*' means holes, usually with a cover, through which a person may enter an underground utility vault used to house an access point for making cross- connections or performing maintenance on underground electronic communications cables.

should be consistent with the one used for setting the prices for access to the unbundled local copper loop. Furthermore, CEI access prices should be based on the costs effectively borne by SMP operator and should capture the proper valuation of assets, including their depreciation. The risk profile of the CEI should not be considered by NRAs different from that of copper infrastructure except where the SMP operator incurs specific and extra CEI costs to deploy an NGA network.

Annex II of the 2010 NGA Recommendation further explains the principle of equivalence for access to CEI of the SMP operator. The SMP operator should provide access on a strictly equivalent basis, in particular through the sharing of all necessary information as is available internally on, for example, the organization of the CEI, the geographical location of these elements and the available space in ducts. The SMP operator should provide the tools for ensuring proper access to updated information. The same intervention rules and technical conditions should apply to both third-party access seekers and internal access seekers.

Annex II of the 2010 NGA Recommendation also provides guidance regarding other aspects that are key to ensure an effective and non-discriminatory access to CEI, including the ordering and provisioning of access, the definition of service level indicators, the publication of a reference offer, regular monitoring by the NRA and addresses the asymmetry of information.

2013 NDCM Recommendation

Point 6 of the 2013 Non-discrimination and costing methodologies Recommendation provides definitions for non-reusable and reusable CEI. Both are legacy CEI used for the copper network. The attribute of reusable or non-reusable depends on whether the CEI can or cannot be used to accommodate an NGA network.

According to point 30 of the 2013 NDCM Recommendation, NRAs should adopt BU-LRIC+ as the costing methodology for the purposes of setting copper and NGA wholesale access prices where cost orientation is imposed by NRAs as a remedy. Points 31 and 32 of the 2013 NDCM Recommendation indicate that the BU LRIC + costing methodology should estimate the current cost that a hypothetical efficient operator would incur to build a modern efficient network, which is an NGA network capable of delivering the Digital Agenda for Europe[75] (DAE) targets. However, NRAs should not assume the construction of an entirely new CEI network for deploying an NGA network. NRAs should rather include any existing legacy CEI also capable of hosting an NGA network, as well as CEI to be newly constructed to host the NGA network.

Points 33 – 36 of the 2013 NDCM Recommendation provide guidelines to NRAs on how to valuate CEI assets for the purpose of setting wholesale access prices, drawing a distinction between reusable legacy CEI and new CEI. NRAs should set the Regulated Asset Base (RAB)

[75] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – "A Digital Agenda for Europe" (COM/2010/0245 final)

for reusable legacy CEI at the regulatory accounting value net of the accumulated depreciation at the time of calculation, indexed by an appropriate price index, such as the retail price index. At the same time NRAs should exclude from computation reusable legacy CEI which are fully depreciated (normally over a period of not less than 40 years in case of ducts), but still in use. On the contrary, new CEI should be valued on the basis of replacement costs. The 2013 NDCM Recommendation rules for valuation of reusable legacy CEI are the same as provided nowadays by recital 187 of the Code.

BCRD

The BCRD aims to facilitate and incentivise the rollout of high-speed electronic communications networks by promoting the joint use of existing physical infrastructure and by enabling a more efficient deployment of new physical infrastructure so that such networks can be rolled out at lower cost[76]. Access through the BCRD is based on a dispute-resolution intervention, and not on an *ex ante* intervention by the regulatory authority nor on the position of given operator in the market[77].

Article 2(2) of the BCRD provides a definition of physical infrastructure[78]. This definition is broader than the definition of CEI provided in Point 11 of the 2010 NGA Recommendation, as it includes, for instance, buildings and antenna installations. At the same time, the physical infrastructure definition in the BCRD excludes cables (including dark fibre) and is therefore narrower than the civil engineering definition of Article 72 of the Code that includes in-building cables, including wiring. Access to cables and wiring other than in-building ones is covered by Article 73 of the Code.

Article 3 of the BCRD mandates that any network operator (not only from the electronic communications sector but also from other utilities sectors such as energy, transport and water) meet all reasonable requests for access to its physical infrastructure under fair terms and conditions, including price. Access may only be refused for objective, transparent and proportionate reasons. In addition, where access is refused or the parties cannot reach an agreement on specific terms and conditions, a dispute resolution mechanism is available.

Article 4 deals with obligations concerning access to information regarding the existing physical infrastructure (i.e. transparency), in order to enable access to physical infrastructure in accordance with Article 3.

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[76] Article 1(1) of the BCRD.

[77] The review of the BCRD is included in the 2020 Commission Work Programme as a REFIT initiative and is part of the actions announced in the Commission's Communication 'Shaping Europe's Digital Future' (COM(2020)67 final).

[78] According to Article 2(2) of the BCRD, 'physical infrastructure' means any element of a network which is intended to host other elements of a network without becoming itself an active element of the network, such as pipes, masts, ducts, inspection chambers, manholes, cabinets, buildings or entries to buildings, antenna installations, towers and poles; cables, including dark fibre, as well as elements of networks used for the provision of water intended for human consumption, as defined in point 1 of Article 2 of Council Directive 98/83/EC (1) are not physical infrastructure within the meaning of this Directive.

The BCRD is currently under revision[79]. The [proposal reviewing the Broadband Cost Reduction Directive] aims to bring a qualitative improvement to the current framework. It would also aim to further clarify its status as *lex generalis* in relation with the SMP regulation under the Code, when it comes to the access obligation. The [proposal reviewing the Broadband Cost Reduction Directive] becomes more specific by providing additional rules and guidance on, for instance, the application of "*fair and reasonable terms*" or the meaning of "*alternative means of access*". The [proposal reviewing the Broadband Cost Reduction Directive] provides some rules on in-building (fibre) wiring, domain not covered by the current BCRD. Finally, the [proposal reviewing the Broadband Cost Reduction Directive] prescribes a set of rules dedicated to improving the amount and quality of available information about the actual CEI.

2020 RRM

In its 2020 Recommendation on Relevant Markets the Commission did not consider appropriate to include, in the list of markets susceptible to *ex ante* regulation, a separate upstream market for physical infrastructure access (PIA). The notion of physical infrastructure access used in the Explanatory Note accompanying the 2020 RRM is equivalent to the notion of access to civil engineering used in the Code and in this SWD. For simplicity, we will use the term CEI even where we are referring to the Explanatory Note accompanying the 2020 RRM.

The Explanatory Note accompanying the 2020 RRM highlights the increasing importance of CEI, in particular in those Member States where ubiquitous physical infrastructure is available. According to the Explanatory Note accompanying the 2020 RRM, NRAs might consider delineating a separate CEI access market (as opposed to imposing access to CEI on the basis of Article 72 of the Code) where:

- SMP-based CEI is (or becomes in future) the only SMP remedy required to ensure effective competition in electronic communication markets;

- Civil engineering infrastructure is effective in stimulating deployment by alternative operators, and the reliance on CEI as a remedy could lead to a mismatch in the geographic scope of CEI obligations and the geographic scope of downstream markets, due to emergence of infrastructure competition in some areas (warranting no SMP designation) and/or the deployment of VHC infrastructure by an operator other than the incumbent, which may warrant an SMP finding (e.g. in other areas where only one VHC network is economically viable).

The Commission further observed that in such cases, a separate CEI market would have the benefit of allowing the use of CEI for multiple purposes, including providing local access, central access, backhaul, and potential future/new emergent services. In this sense, CEI could

[79] REF to be added when available

be a "cross-market" wholesale remedy that can be used to facilitate the deployment of fixed access infrastructure to consumers as well as businesses and (if applied in the relevant network segments) for fixed and mobile access and backhaul.

6.1.2 Regulatory practices

SMP regulation vs. BCRD

Contrary to the BCRD provisions which apply to the physical infrastructure assets of all network operators and irrespective of their market position (i.e. symmetric rules), the CEI access obligations discussed in this SWD apply to the operator holding Significant Market Power. Therefore, such access obligations are based on a market analysis and an SMP finding[80], and are imposed when considered appropriate and proportionate to address the competition problems identified. NRAs often prescribe specific ex ante financial and technical conditions and require these to be transparent for all access seekers. As discussed in the Legal Framework section, BCRD and SMP regulation have different objectives. Therefore, obligations imposed under the SMP regime are generally much more detailed than under the BCRD.

In most Member States[81], access to CEI is mandated under the SMP regulation – although the scope and actual use of this remedy significantly varies between Member States, as reported in the Visionary Analytics Study[82] and in a Report on access to physical infrastructure by BEREC[83]. The BEREC report indicates that remedies imposed to the SMP operator related to the access to its physical infrastructure apply in most countries to the local access and backhaul segments.

In several Member States[84], access to CEI under SMP regulation has never been imposed or has been lifted at some point. Depending on the Member State, this may be explained by the deregulation of the fixed wholesale access market[85], by limited market demand[86] and/or

[80] Although it is not required that access to CEI assets belongs to the relevant product market definition as clarified in Article 72 of the Code.
[81] Currently, some form of CEI access obligation under the SMP regime is imposed in 18 out of 27 Member States. The 9 Member States with no SMP CEI access obligations imposed are: Austria, Bulgaria, Denmark, Finland, Luxembourg, the Netherlands, Poland, Romania and Sweden. In the case of Bulgaria, the Netherlands and Romania the local and central access markets are currently fully deregulated.
[82] Pages 177-179.
[83] The 2019 BEREC Report on access to physical infrastructure in the context of market analyses reported that 19 NRAs imposed SMP access obligations in relation to ducts/pipes, 12 in relation to chambers and manholes and 10 in relation to poles.
[84] Austria, Bulgaria, Denmark, Finland, Luxembourg, the Netherlands, Poland, Romania and Sweden.
[85] As is currently the case in Bulgaria, the Netherlands and Romania.
[86] As seems to be the case in, for instance, Luxembourg (case LU/2019/2137), Sweden (according to NRA's reply to Visionary Analytics' survey) or Finland (case FI/2012/1328).

because the NRA considered that national provisions implementing the BCRD measures were sufficient to ensure access to CEI[87].

In fixed wholesale access markets with persistent competition problems, the Commission has in several cases raised concerns with respect to draft measures where the BCRD provisions were considered sufficient by NRAs which therefore proposed to withdraw regulated access to CEI based on SMP[88]. BCRD rules apply to all electronic communications and other utilities network operators. The BCRD refers to "*fair and reasonable terms and conditions, including prices*". The Commission indicated that it is typically insufficient to subject an operator that has SMP, and which can thus act independently of its customers and consumers, to the same sets of minimum standards that apply to all operators[89]. Moreover, in such cases, the Commission questioned whether access to CEI of the SMP operator on reasonable terms to be negotiated case by case, without a requirement of a clear reference offer, would be sufficient to promote infrastructure competition, wherever economically efficient, through access to passive infrastructure[90].

In recent deregulatory case (BG/2019/2155), the Bulgarian NRA (CRC) had found the wholesale local access market in Bulgaria to be competitive. While access to CEI had contributed to the development of infrastructure-based competition, CRC underlined in this case that the national law transposing the BCRD significantly reinforces its provisions by including obligations for access, non-discrimination, transparency - including the publication of a reference offer - and price control equivalent to a significant extent to the set of obligations imposed on Bulgarian Telecommunications Company EAD (BTC) due to its SMP status. In its comments, the Commission has called CRC to closely monitor the market developments to ensure that the application of the BCRD rules was effective and sufficient.

The results of access to CEI under SMP regulation

In some Member States[91], the "legacy" CEI allows ubiquitous or near ubiquitous coverage of the territory, while in other Member States[92], legacy ducts and poles are limited or inexistent, or are not reusable. Likewise, in some Member States[93] several CEI assets (ducts, pipes,

[87] For instance, in Denmark (case DK/2017/1993), Czechia (case CZ/2018/2067) or Bulgaria (case BG/2019/2155).
[88] In case of Denmark (case DK/2017/1993) and Czechia (case CZ/2018/2067).
[89] Case CZ/2018/2067
[90] Case DK/2017/1993
[91] For instance, in Luxembourg, Malta, Cyprus, Ireland, Lithuania, Estonia, Portugal, Spain or France, according to Visionary Analytics Study, page 190.
[92] For instance, in Austria, Germany, Czechia, Greece or Belgium, according to Visionary Analytics Study, page 190, and the 2020 RRM SWD page 64.
[93] For instance, in Ireland, Greece, Spain, France, Italy, Latvia, Hungary, Portugal or Slovenia, according to Visionary Analytics Study, page 180.

chambers, manholes, and poles) are subject to access obligation while in other Member States[94] access is mandated to ducts and pipes only.

In some Member States[95], access to CEI under SMP regulation has been instrumental in fostering VHCN deployments and infrastructure-based competition, but in other Member States, there has been limited take up for this wholesale product. In general, access to CEI has taken up slowly when the obligation was introduced for the first time, but then at greater speed, in an ever increasing pace. In those Member States where the take up of this product had picked up, access to CEI has also led to progressive and still ongoing fibre deregulation.

According to WIK, SMP-based regulated access to civil engineering has been effective in supporting infrastructure competition in dense urban areas of France, Spain and Portugal (~10-30% HH). Key to effectiveness are strict cost-orientation and attention to processes, terms and conditions in the regulated Reference Offers[96]. Such access relies on high-quality ubiquitous incumbent CEI.

The most relevant cases (Spanish, French and Portuguese) in this context are described below.

In 2008[97], following its second review of the broadband markets, the Spanish NRA (then CMT, currently CNMC) imposed for the first time regulated access to Telefonica's CEI on the basis of SMP. In 2021 CNMC reviewed the regulated access prices to CEI. According to CNMC's notification[98], in 2011 access to CEI, as a wholesale service, started to gain relevance, and demand is expected to be mostly met by 2030. The demand at the end of 2015 was roughly 16 500 km of sub-ducts, in the first quarter of 2021 it amounted to more than 40 000 km, and by 2030 it should reach 63 000 km, according to CNMC estimates.

In the most recent review of the Spanish broadband markets[99], CNMC imposed access to Telefonica's CEI at national level based on Telefonica's SMP in market 1/2020[100]. CEI backhaul for FTTH deployment is included in CNMC reference offer for CEI (from the ODF to the Point of Presence). CNMC did not impose fibre regulation in 696 municipalities, corresponding to 70% of the Spanish population and 76% of the total FTTH access installed by Telefonica. This represents a significant de-regulation compared to the previous market review[101], where CNMC did not regulated fibre in 66 municipalities corresponding to roughly 34% of the Spanish population.

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[94] For instance, in Belgium, Germany, Estonia, Croatia, Lithuania or Slovakia, according to Visionary Analytics Study, page 180.
[95] In particular in Portugal, Spain and France.
[96] WIK-Consult (2017), Best practice for passive infrastructure access, 19 April 2017, commissioned by Vodafone.
[97] Case ES/2008/0804
[98] Case ES/2021/2316
[99] Case ES/2021/2330-2331
[100] CNMC also imposed regulated access to Telefonica's CEI at national level based on Telefonica's SMP in market 2/2020 (case ES/2022/2361).
[101] Case ES/2015/1818-1820

Also in 2008[102], following its second review of the broadband markets, the French regulator (ARCEP) regulated for the first time access to CEI (although only for underground ducts) on the basis of SMP. In its final decision[103] ARCEP noted that the SMP operator's underground infrastructure had around 350 000 km. The third market review was carried out in 2011[104], ARCEP extended the access obligation to above-ground CEI and settled the prices for access to CEI. The forth market review took place in 2014[105]. In this final decision[106] ARCEP underlined that access to SMP operator's civil engineering had increasingly been used by alternative operators (the underground infrastructure of the SMP operator had still 350 000 km). By the end of first quarter of 2014 alternative operators leased around 14 146 km of SMP operator's civil engineering (mainly underground infrastructure) to deploy FTTH networks which was an increase of 43% year on year (9 924 km leased by 31 March 2013). From this point on the alternative operators' demand for the SMP operator's civil engineering to deploy FTTH only increased with double digit percentage year on year (28 760 km leased by 31 December, 36 716 km leased by 30 June 2016, 49 876 km leased by 31 December 2016)[107].

In 2020 ARCEP carried out its most recent market review[108]. This time ARCEP defined a separate market for civil engineering. The product market definition includes CEI for the deployment of both access and backhaul networks. The geographic scope of the market is national. In its final decision[109] ARCEP noted that the SMP operator's underground infrastructure had around 560 000 km, while 13 million poles made up for the aboveground infrastructure. By the end of first quarter of 2020 alternative operators leased around 250 000 km of SMP operator's civil engineering to deploy FTTH or FTTLA[110] networks which was an increase of 65% year on year (150 000 km leased by 31 March 2019).

In Portugal, in 2006, around 12 000 km of the total 24 000 km of ducts of the former incumbent had already been made available to alternative operators[111]. In 2016 the Portuguese NRA (ANACOM) established that from a forward looking perspective 56% of the Portuguese households were located in a competitive area for the provision of retail broadband services[112]. The competitive areas were defined as parishes (the third level of administrative subdivision of Portugal) where there were at least two alternative operators to the former incumbent, each with NGA coverage higher than 50% in the parish, or there was one

[102] Case FR/2008/0780
[103] ARCEP Decision n° 2008-0835
[104] Case FR/2011/1213
[105] Case FR/2014/1602
[106] ARCEP Decision n° 2014-0733
[107] https://archives.arcep.fr/index.php?id=13515&L=0&l=408&cHash=76efdd7eea4b88df8d4ebed653002cea
[108] Case FR/2020/2277
[109] ARCEP Decision n° 2020-1445
[110] FTTLA – Fibre to the last amplifier. In contrast with FTTH, the last mile of FTTLA is served by coax cables instead of optical fibre.
[111] WIK-Consult (2017), Best practice for passive infrastructure access, 19 April 2017, page 64.
[112] Case PT/2016/1888

alternative operator to the former incumbent with NGA coverage higher than 50% in the parish and the former incumbent's retail market share in the parish was below 50%.

Circumstances which limit the take up of access to CEI

As underlined before, in some Member States there has been a limited take up of CEI under SMP regulation, which can be explained by a number of factors.

Obstacles to the effectiveness of the SMP CEI access remedy where imposed

According to Visionary Analytics Study[113], the main obstacles to wider usage of CEI – excluding situations where there is no or limited demand from alternative operators – can be grouped into the following categories:

- Limited availability of ducts (the availability of legacy ducts differs strongly between Member States, and might also differ between urban and rural areas);
- Mismatch between the access seekers' needs and the available CEI (for example in terms of inacceptable infrastructure quality, lack of space to deploy, or where the processes in place are unsuitable for mass deployments);
- High access prices and other access conditions (including the duration of procedures, or burdensome operational requirements regarding access to ducts);
- Lack of information about existing and or built infrastructures;[114]
- Lack of enforceable QoS;
- Excessive ancillary obligations that artificially increase deployment costs for alternative operators;
- Discriminatory practices for access to CEI (for instance, better access terms for the retail arm of the SMP operator or misuse of information provided by alternative operators).

Overall, Visionary Analytics Study concludes that proper design and enforcement of the access obligations are crucial for the effectiveness of the access remedy.

Access to the information (transparency)

Visionary Analytics Study[115] also finds that the usefulness of the information regarding CEI (in particular of the location and ducts' spare capacity) made available by SMP operators is an issue in some Member States.

[113] Page 188-193

[114] According to the Visionary Analytics Study (page 190) there is an increasing demand for poles for deployment of VHCNs. The study provides examples of agreements with electricity providers for access to poles in several Member States. However, it appears to be even more difficult to ensure access to information on available civil engineering, especially when it comes to available space. For example, even in the cases of Spain and Portugal, which have some of the most elaborate and well-developed information systems on the available civil engineering of the SMP operator, information on the available space of poles is not stored in the system.

[115] Page 195

The experience of Member States where the CEI access has been the most effective shows that the access to geo-referenced information on the location of CEI and on the state of occupation, have been of prime importance. For instance, in Portugal, operators have access to an online system containing up-to-date information on the location and occupation of ducts, and the location of poles, of the SMP operator. Following the changes to the reference offer for ducts imposed by the NRA in 2010, the database now provides information in particular on the occupation level of each duct segment, based on a system differentiating at least four levels of occupation (no free space/ high occupancy/ moderate occupancy/ low occupancy). Likewise, in Spain, operators have access to an online system containing up-to-date information about the infrastructure of the SMP operator (location of ducts and poles, as well as the spare capacity on ducts)[116]. The NRA has approved a SLAs' general standard applicable for the services provided by the information system of the SMP operator[117].

Access to electronic, geo-referenced information on existing and planned CEI, alongside reliable and updated information on the occupancy level (state of occupation) of the CEI has also been identified by the Member States as a best practice in the context of the Connectivity Toolbox[118].

Reparation, renovation and de-congestion of existing CEI, in particular ducts

In different situations, reusing existing ducts, may require to conduct reparation or de-congestion works. As explained by WIK in a 2017 report commissioned by Vodafone[119]: "*A common problem when duct access is requested is that space could be available, but requires the reorganization of cables or removal of unused cables. A key question in this context is who is permitted to conduct the decongestion work, and who is responsible for covering the costs.*"

According to BEREC[120], when a duct or a sub-duct is damaged or is currently not in use, it can be rehabilitated in order to be useable for the deployment of new and enhanced networks, in particular VHCN. When a duct or sub-duct is saturated, a solution can be the removal of unused cables (e.g. inactive copper cables) or the bundling of active cables. This solution should permit the liberation of more space, and can be coupled with efficient engineering rules to occupy the available space in ducts. In the same way, it might be not possible to use existing poles to deploy new and enhanced network, in particular VHCN elements, whether

[116] WIK-Consult (2017), Best practice for passive infrastructure access, 19 April 2017, page 37-38, as well as the information provided within "Oferta Mayorista de Acceso a Registros y Conductos (MARCo)": https://www.cnmc.es/ambitos-de-actuacion/telecomunicaciones/concrecion-desarrollo-obligaciones#ofertas-mayoristas-vigentes
[117] https://blog.cnmc.es/2011/01/26/mejorando-el-acceso-a-las-ofertas-mayoristas/
[118] Commission Recommendation (EU) 2020/1307 of 18 September 2020 on a common Union toolbox for reducing the cost of deploying very high capacity networks and ensuring timely and investment-friendly access to 5G radio spectrum, to foster connectivity in support of economic recovery from the COVID-19 crisis in the Union (OJ L 305, 21.9.2020, p. 33–41)
[119] WIK-Consult (2017), Best practice for passive infrastructure access, 19 April 2017, page 39-40.
[120] BoR (20) 169, reply to Q.23 of the targeted consultation

because they are damaged, incorrectly installed, or because their capacity to support physical efforts is no longer sufficient. In this case, reparations, replacements or reinforcements can be foreseen in order to enhance the capacity of hosting new and enhanced network, in particular VHCN elements.

The experience from different Member States shows that the approaches on this issue differ. In some Member States, alternative operators are allowed to undertake decongestion work themselves. The WIK study reports that in Spain, alternative operators must first request the incumbent to re-organize cables, but can proceed to undertake the work itself if the incumbent has not carried out the decongestion within 12 days.

Access to CEI: separate market or remedy?

In 2020 RRM SWD the Commission pointed out the conditions under which NRAs might consider defining a separate market for physical infrastructure. These conditions rely on the access to SMP operator's physical infrastructure to be or to become the only SMP remedy required to ensure effective competition, as well as to be an effective mean in stimulating deployment by alternative operators. Such conditions could be met in particular in Member States where a single operator owns a physical infrastructure network which is ubiquitous (it has national coverage and allows reaching all households in the national territory) and is suitable for the deployment of alternative fibre networks.

In the same document, the Commission also explained that access to CEI as a remedy on the basis of Article 72 may prove to be a practical and efficient alternative to the delineation of a separate CEI market: (i) in the short term in Member States where infrastructure-based competition is emerging and/or where it is unclear if CEI will play a significant role in driving infrastructure-based competition and new market entry; (ii) in the longer term, in Member States where a ubiquitous physical infrastructure network owned by a single operator is not present (ex. Germany) or demand for CEI is absent or very limited (ex. Sweden), and therefore a separate CEI market cannot be clearly defined or distinguished; (iii) where SMP-based PIA is not or might not be the trigger for deployments.

Currently, several NRAs regulate access to CEI, in particular to ducts and poles, as part of the regulation of market 1 and/or market 2 of the 2020 RRM– or market 3b of the 2014 RRM, where this market is still regulated. In 2019, the British NRA (OFCOM), while the United Kingdom was still an EU Member State, defined for the first time in the EU a separate CEI market[121]. Nowadays the French NRA (ARCEP) is the only one in the EU which has defined a separate CEI market[122].

[121] Case UK/2019/2170-2171. OFCOM had defined product market for the supply of wholesale access to telecoms physical infrastructure for deploying a telecoms network. Its scope was limited to infrastructure that can be used to host fixed elements of telecoms networks, such as ducts, poles and chambers, regardless of whether they were used for access or backhaul. Non-telecoms infrastructure was excluded from the market.
[122] Case FR/2020/2277

In 2020 ARCEP defined a separate market for wholesale access to physical infrastructure for fibre deployment in electronic communications networks.[123] ARCEP finds that both underground telecoms ducts and aerial poles are part of the market. It considers them as substitutes but remarks that in large areas only one of those infrastructures is available. ARCEP concludes that overall, those infrastructures are substitutable, because large-scale deployment of a new fibre network requires using both underground and aerial physical infrastructure.[124] The geographic scope of the market is national and includes French overseas departments, regions, and communities.

ARCEP conducts the three criteria test, and finds that the three criteria are cumulatively met. The market is characterized by high and non-transitory barriers to entry due to the very large size of the network and the correspondingly large investment to replicate it. The current network was largely deployed by Orange (previously France Télécom) at the time when it was a public monopoly. The market is found not to tend towards effective competition, as there is no alternative to the existing CEI and there are no technological advancements that would allow rapid deployment or optimised use of alternative physical infrastructures. Finally, ARCEP concludes that competition law will not be sufficient to address the market failures identified.

ARCEP designates Orange as having SMP on the physical infrastructure market based on a quantitative[125] and qualitative[126] analysis. Orange is the only player that has a continuous and ubiquitous physical infrastructure network suitable for fibre roll out. Enedis and local authorities' networks offer only a local, complementary solution to Orange's network. Overall, there is no viable alternative to Orange's physical infrastructure network because it would be technically difficult, economically unviable and very time consuming to replicate it.

ARCEP proposes to impose the following obligations on Orange: (i) access, (ii) non-discrimination, (iii) transparency, (iv) accounting separation, (v) cost accounting and (vi) price control[127].

In its recent comments on the last review of the Spanish wholesale local access market[128], the Commission observed that physical infrastructure access is the key remedy in market 1 of the

[123] In its response to the Commission's RFI, ARCEP clarifies that despite the denomination of the market as being related only to fibre deployments, actually the market definition is not formally restricted only to fibre network deployments. It is intended to serve only for information and practical use purposes, as ARCEP is not aware of and considers unlikely any demand for deployment of new networks other than fibre networks in the future.

[124] Other types of underground infrastructure such as sewers, heating, water and gas networks as well as rail and motorways are not considered substitutes and, therefore, are not part of the relevant market.

[125] Orange controls more than 560 000 km of underground ducts, its closest competitor only few 10 000 km. Moreover, Orange owns 13 million aerial poles and manages an additional 5 million aerial poles, owned by Enedis, the French electricity provider. For a large majority of areas, Orange is the only provider of physical infrastructure.

[126] The size and capillarity of Orange's physical infrastructure that can be mobilised for the deployment of optical local loops and fibre collection networks, correspond to extremely high levels of investment, in the order of tens of billions of euros, whose profitability can only be expected over a period of several decades.

[127] Cost orientation, Regulatory Asset Base (RAB) on the basis of the indexation method.

2020 RRM which contributes to the development of infrastructure-based competition. In the future, with further development of competition in wholesale markets in Spain, this obligation may be identified as the only bottleneck at least in some areas. In the Commission's view the regulation of a physical infrastructure market could be justified given the significant deployment of NGA/VHCN networks relaying on ubiquitous regulated access to physical infrastructure. A separate market for physical infrastructure would provide operators with regulatory predictability, which is necessary to further incentivise deployment of VHCNs, while limiting access regulation to what is necessary and proportionate. In line with the 2020 RRM SWD approach, the Commission encouraged the Spanish NRA (CNMC) to consider at the next market review whether a separate market for physical infrastructure would be the most appropriate to address remaining competition concerns.

In its final measure CNMC noted that the 2020 RRM did not identify a separate market for access to CEI as a relevant market subject to ex-ante regulation and that very few NRAs had defined such a market so far. At the same time, CNMC committed in its final measure to assess in 3 year time the convenience of limiting regulation to access to CEI, and therefore of fully deregulating fibre in Spain.

How to incentivize the deployments of new CEI assets

In Italy, at least between 2013 and 2017, the access prices to ducts of local installation (mini-tubes) varied depending on whether the assets were new or reused[129]. The access prices were at first based on a fully distributed bottom-up costing methodology, taking into account the real costs for digging, laying of the mini-tubes, cost of work, etc. Such costs were fully distributed on the volumes considered (e.g. number of mini-tubes). Volumes were evaluated considering the expected demand of services in a discounted cash flow (DCF) 15 year period[130]. In 2018, the Italian NRA (AGCOM), now applying the BU-LRIC + methodology, considered maintaining the access price differentiation between the new and reused ducts of local installation. However, following the public consultation AGCOM deemed appropriate to change the approach, eliminating the distinction between the new and reused ducts of local installation and setting a single access price. AGCOM took into account the importance of access to CEI for fostering investments in full fibre access networks, seeking at the same time to simplify and to make more efficient the process of access to CEI[131].

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[128] Case ES/2021/2330

[129] https://www.agcom.it/documents/10179/3160100/Delibera+623-15-CONS/e546afa6-5b15-436d-b651-cf93ee5919c5?version=1.0 (table 22, page 182)

[130] Case IT/2014/1586

[131] https://www.agcom.it/documents/10179/15564025/Allegato+8-8-2019+1565257726463/80ee0437-e3fb-4077-8d51-624658fe9445?version=1.0 (points 75 – 79, page 23-24)

6.1.3 Views expressed by stakeholders

SMP regulation vs. BCRD

In its input to the targeted consultation, BEREC[132] highlighted that the BCRD and the Code pursue different objectives, and that the BCRD case-by-case approach to dispute resolution may not be sufficient to remedy important competition problems identified under SMP regulation, which rather requires a frequent and more general regulatory intervention. BEREC also referred to the finding of its previous report on access to physical infrastructure in the context of market analyses[133] that identified potential drawbacks stemming from the exclusive application of the BCRD[134]. BEREC also indicated certain circumstances where BCRD could be sufficient[135], although noting that this assessment should be undertaken by NRAs on a case-by-case basis.

According to Visionary Analytics Study[136] most NRAs consider that BCRD alone, as it stands today, is not sufficient to ensure effective access to CEI of the SMP operator for access seekers. The interviewed NRAs underlined the reasons for which BCRD it is not suited to address competition problems, as follows:

- BCRD solutions are more complex and more costly to negotiate as compared with SMP remedies;
- BCRD solutions being based on "*fair and reasonable terms*" are less likely to be scaled up as compared with, in particular, ex ante SMP price regulation;
- BCRD does not specify any SLAs, SLGs and KPIs as compared with SMP remedies;
- BCRD regime does not provide mandatory information on the availability of CEI as compared to SMP regulation;
- The host network under the BCRD might have additional technical requirements (such as safety in power grids) and network topology variation.

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[132] BoR (20) 169, reply to Q.26 of the targeted consultation.
[133] BoR (19) 94
[134] "*The Report refers in particular to the fact that the BCRD may not be as well suited as ex ante regulation to deal with problems linked to the vertical integration of incumbent fixed operators, which are both managers of the physical infrastructure and electronic communications network operators. The lack of prescriptiveness of the BCRD on issues such as the potential approaches with regard to access, or on prices (which may have to be determined on a case-by-case basis, via dispute resolution) are mentioned as additional factors that may be worth considering when deciding whether reliance on the BCRD alone is sufficient to ensure adequate access to the physical infrastructure of the SMP operator*" (reply to question 26 of the targeted consultation).
[135] According to BEREC,"[…]*depending on the conditions prevailing in each Member State, the BCRD may be sufficient in instances where physical infrastructure (in particular ducts and poles) is not widely available or is not widely used, as well as in instances where other economic agents besides the SMP operator have the means and incentives to grant access to their physical infrastructure, on the basis of economic and technical terms and conditions which are similar to those that may be available from the SMP operator. As noted, this is in any event an issue that will have to be evaluated by NRAs on a case-by-case basis, when undertaking their market reviews.*" (reply to question 26 of the targeted consultation)
[136] Page195-200 of Visionary Analytics Study.

At the same time, the BCRD regime does not depend on the outcome of periodic market reviews. Therefore, it might be more predictable and reliable for access seekers. Furthermore, the BCRD does not require a proportionality assessment, contrary to SMP regulation.

It is worth noting that BCRD is not intended primarily to address competition problems but to lower the cost of deploying electronic communications networks, thereby addressing persistent bottlenecks to network deployment. Nevertheless, the revision of the BCRD is expected to address some of the shortcomings of the current directive which could lead to potential improvements in access to CEI.

In its reply to the targeted consultation[137] ETNO considered that SMP and BCRD obligations should be coherent, potentially mutualized, and well-balanced between the telecom operator and the other physical infrastructure owners.

In its reply to the targeted consultation[138] ECTA considered that SMP operators' access obligations to CEI should under no circumstances be replaced by obligations under the BCRD. In support of its standpoint ECTA underlined that, unlike SMP-specific obligations, BCRD does not provide mandatory access, does not require non-discrimination nor mentions EoI, provides only a fair and reasonable standard in particular on pricing, and does not mandate for a reference offer which would limit the transparency and predictability for access seekers. According to ECTA, replacing SMP obligations to grant access to civil engineering infrastructure with obligations under the BCRD would fundamentally fail to address the nexus between the operator's SMP in a given market and its control over the infrastructure assets. Therefore, it would likely only reinforce the SMP operator's ability to behave independently of competitors in the market(s) concerned.

Visionary Analytics Study proposes[139] the new recommendation to reinforce the principle that CEI subject to an SMP access obligation should not simultaneously be subject to the national transposition of the BCRD and its successor, to avoid inconsistencies, inefficiency and access seekers to engage in "forum shopping".

Practice where access to CEI should be the only access remedy

As BEREC points out in its reply to the targeted consultation[140], NRAs should in any event carry out a case-by-case assessment to determine whether access to CEI alone is a proportionate means by which to promote competition and the end user's interest. Also as BEREC further explains, there are characteristics of the physical infrastructure access that should be taken into account in the assessment, namely ubiquity as well as effective and non-discriminatory access:

[137] ETNO's reply to Q.26 of the targeted consultation
[138] ECTA's reply to Q.26 of the targeted consultation
[139] Visionary Analytics Study, page 322.
[140] BoR (20) 169, reply to Q.27 of the targeted consultation

- Ubiquity of the civil engineering infrastructure: the SMP operator's civil engineering infrastructure has to be ubiquitous so that alternative operators can reach any end-user by accessing this infrastructure. Should alternative operators in a given area have to heavily invest into network deployment (including physical infrastructure) to reach end users' premises, further SMP-based access obligations would be needed;

- Effectiveness of the access to civil engineering infrastructure: the regulated civil engineering infrastructure has to be actually usable and exhibit sufficient space to effectively host multiple independent networks.

A number of stakeholders[141] who contributed to the targeted consultation consider that access to CEI should be a stand-alone obligation when CEI is the last bottleneck and infrastructure-based competition emerged or it is likely to emerge grounded on access to CEI, notably with the roll out of FTTH. Moreover, some stakeholders[142] argue that in areas where infrastructure-based competition has developed, remedies in the upstream market should progressively be relieved. Other stakeholders[143] would rather have NRAs to do a more detailed assessment of legal or administrative area constraints to deploy telecommunications infrastructure or a cost analysis of areas to decide which are more prone to infrastructure-based competition.

During the NRA workshop on Visionary Analytics Study, hold on 15 April 2021, it was concluded that the criteria used to determine whether access to CEI could be used as a stand-alone remedy should be country-specific, as CEI varies from one Member State to another[144].

Circumstances which limit take up of access to CEI

Obstacles to the effectiveness of the SMP CEI access remedy where imposed

The majority of stakeholders who contributed to the targeted consultation consider that the principles of the NGA Recommendation regarding effective access to CEI, in particular of Annex II, remain generally relevant looking forward. ETNO and Orange[145] do not disagree with this but consider that the gap between the requirements stemming from the BCRD and those imposed under SMP regulation is too large and that a more harmonized approach would be necessary. On the other hand, Vodafone and Iliad[146] consider that access to CEI obligations should be strengthened in particular with regard to the principle of non-discrimination and cost orientation. The need to adjust the guidance on CEI in light of the BCRD provisions (current or as reviewed) has also been highlighted in the targeted consultation[147]. BEREC[148]

[141] KPN N.V., Orange, ETNO, Open Fibre.
[142] Telefonica, Deutsche Telekom AG.
[143] FTTH Council Europe ASBL, Vodafone, Tim spa.
[144] Visionary Analytics Study, page 348.
[145] Reply to Q.24 of the targeted consultation.
[146] Reply to Q.24 of the targeted consultation.
[147] FTTH Council Europe ASBL, reply to Q.24 of the targeted consultation.
[148] BoR (20) 169, reply to Q.24 of the targeted consultation.

considers that there is no need to modify the general principles laid down in the NGA Recommendation.

Visionary Analytics Study proposes[149] to consider the following changes in the Recommendation:

(i) The Recommendation should urge NRAs to assess whether mandating SMP operators to provide access to all sections of their civil engineering that may be needed in order for alternative operators to deploy their fibre network between their ODFs and their end-users would be proportionate to address the market power of the SMP operator, taking into account the feasibility for alternative operators to use alternative civil engineering infrastructure such as ducts. Where relevant, NRAs should also identify different points of delivery at which the physical infrastructure could be accessed. Such an access obligation could where appropriate and proportionate also encompass ducts of the backhaul networks, and shelters susceptible to host operators' passive and active equipment, to the extent that such related facilities have enough capacity. Where the conditions are met, the NRA might find it appropriate to define a separate market for access to physical infrastructure as envisioned in the 2020 RRM rather than attempting to impose the access remedy under Article 72/73 EECC.

(ii) To expand the technologies for which alternative operators could use SMP CEI access. In line with the principle of technological neutrality, the SMP operator should not be allowed to refuse access solely because the access seeker intends to use the access to deploy VHC networks based on technologies other than FTTH unless such access would objectively lead to exhaustion of available space for future fibre deployments on that specific route. The burden of proof should be on the SMP operator.

(iii) In Member States where there is history of unsatisfactory responses by the SMP operator (a) to reasonable requests for renovation, repair or bypass of SMP CEI, or (b) to reasonable requests to expand the capacity of a duct, pole, or other similar element of CEI; and to the extent that it is deemed to be proportionate, the Recommendation should encourage NRAs to require SMP operators (1) to establish procedures for the certification of qualified workers or subcontractors authorised to make such interventions; and (2) to define the procedure to be followed for such interventions. At a minimum, the SMP operator must be informed of all work undertaken in this way. Where work is undertaken on behalf of an alternative operator, the NRA will need to set rules on who pays for such work, and who owns the resultant infrastructure (typically the SMP operator), in instances where the SMP operator or a contractor approved by the SMP operator makes improvements to the SMP operator's infrastructure at the request of an alternative operator.

(iv) NRAs should be vigilant against unreasonable SMP operator labour practices that require SMP staff to be present, and paid for, even where their presence is superfluous. In this respect, NRAs should not only estimate the cost of "*provisioning of access to civil*

[149]Visionary Analytics Study, page 316 – 320.

engineering infrastructure", but also limit these costs to those of indispensable interventions. Moreover, NRAs should assess the opportunity of interventions by the SMP operator on the occasion of the review of the reference offer.

Principle of equivalence for access to the civil engineering infrastructure of the SMP operator and access to information

In its input to the targeted consultation[150], BEREC indicated that imposing EoI for CEI access requires the SMP operator to implement, for its own retail arm and for all other access seekers, (i) the same wholesale inputs in terms of products and services; (ii) the same operational and technical processes (including access to the same prior information, the commands' platforms of products and services, as well as the steps organizing the access and the roll out actions); the same engineering rules (technical prescriptions to be respected by any undertaking deploying new and enhanced networks, in particular VHC networks in the CEI of the SMP operator), and the same internal transfer protocols. BEREC considers that the principles laid down in Annex II of the NGA Recommendation can be transferred to the Recommendation.

Furthermore, BEREC observed that "*For the deployment of new and enhanced networks, in particular VHC networks, EoI being a strict form of non-discrimination is consistent with the promotion of competition, whether it concerns infrastructures, technologies or innovation. However, the proportionality of EoI needs to be assessed*". With respect to the cost-benefit analysis to be conducted by the NRA, BEREC considers that if "*the conclusion of such an analysis is that EoI would imply disproportionate financial costs or costs in terms of implementation time compared to outcomes on market competition, NRAs should impose on the SMP operator an obligation with terms as close as possible to the EoI obligation, but at least guaranteeing EoO*". BEREC adds that *"The EoO obligation gives the possibility to the SMP operator, to foresee different commands or transfer protocols for alternative undertakings than the ones that the SMP operator uses. Yet, the tools that are meant to be used by alternative undertakings should permit the same performance level that is observed for the SMP divisions. This equivalence should avoid that the differences put the alternative operators using the SMP operator's physical infrastructure at a disadvantage in terms of costs and pace of roll out operations, compared to the protocols the SMP operator follows internally."*

BEREC also noted that[151] *"The SMP operator may need to repair or renovate its own civil engineering infrastructure, or may need to release more space or capacity in this infrastructure for its own VHCN rollouts, a corollary of the non-discrimination obligation is to guarantee the same possibility of any infrastructure user deploying VHCNs, including the*

[150] BoR (20) 169, reply to Q.5 of the targeted consultation.
[151] BoR (20) 169, reply to Q.23 of the targeted consultation.

SMP operator. This can be fulfilled appropriately if a non-discrimination obligation (primarily EoI) is imposed. When the SMP operator has the obligation of granting reasonable access requests to physical infrastructure, the NRA can also impose on the SMP operator an obligation to grant reasonable requests of renovation of infrastructure elements necessary to deploy new and enhanced networks, in particular VHCN. Therefore, a reasonable request of renovation of regulated civil engineering infrastructure has to be assessed in terms of its technical and financial complexity, proportionality and of its expected outcome for the concerned undertakings. In order to ensure transparency and non-discrimination and pursuant to the adopted principle of EoI or EoO, the modalities of renovations' requests, processes and appreciation, should be clear and should apply to all undertakings deploying new and enhanced networks, in particular VHCNs, including the SMP operator itself. Otherwise, the SMP operator may have the incentive of prioritizing the available capacities for its own needs, and thus unduly restrict alternative undertakings' access to the existing physical infrastructure. Finally, it is important to recall that regulation should take into account future needs as well as the efficiency of new investments in constructing new physical infrastructure elements, by providing a framework that foresees both rapid and sustainable solutions. This can be done by pooling parts of networks or their hosting infrastructures, and by providing efficient, non-discriminatory and optimal engineering rules".

In its reply to the targeted consultation[152], ETNO underlined that, as in other situations, also for civil infrastructure different systems of equivalence and non-discrimination can guarantee effective equal treatment. The choice should be based on proportionality considerations. If EoI is to be imposed on civil engineering, it should be decided and imposed before the internal process definition for new network deployment.

In its reply to the targeted consultation[153], ECTA supports EoI as the default position on non-discrimination obligations. In ECTA's view even in the Member States with the most developed regulation in terms of access to CEI there is a persistent discrimination against the alternative operators due to the lack of EoI or lack of EoI enforcement. ECTA is particularly concerned about information asymmetries between the SMP operators and alternative operators. ECTA suggests that the mechanisms to prevent the wholesale arm of the SMP operator to share information with its retail arm regarding deployment plans of alternative operators should be included in the new recommendation.

Visionary Analytics Study proposes[154] the Recommendation:

(i) To strengthen the provisions on the quality of databases and ordering processes of the NGA Recommendation (point 17) so as to substantially increase the likelihood that the database of SMP CEI is fully current and up to date. The NRA should however consider the causes of any defects in the current database (taking into account the number of orders for

[152] Reply to Q.5 of the targeted consultation.
[153] Replies to Q.3 and Q.23 of the targeted consultation.
[154] Visionary Analytics Study, page 320 – 322.

SMP CEI currently placed, and the number that could be expected if the database were improved) in order to assess whether more effort invested would be proportionate and warranted.

(ii) To provide principles-based guidance as to which elements of the database of the SMP operator's CEI should be publicly visible.

(iii) To reinforce the importance of providing end-to-end ordering of CEI, such as ducts, where proportionate, as a complement to any point-to-point ordering processes that may already exist.

How to incentivize the deployments of new CEI assets

In its reply to the targeted consultation, BEREC suggests that "*For civil engineering infrastructure that has been built or will be built specifically for full fibre network deployment (i.e. FttH/FttB), potential investment risks that are associated with such deployments by the SMP operator might differ from the risks associated with the maintenance of legacy civil engineering infrastructure or the deployment of such infrastructure for FTTC networks*"[155].

Also, in its reply to the targeted consultation[156] ETNO argued that the new assets of CEI should be treated with care for a period of at least 5 years to avoid disincentives for such investments. In ETNO's standpoint, given the multiple possibilities to either co-invest or at least coordinate the civil works, the regulatory intervention on the new CEI assets should be light (only obligations to ensure non-discrimination), while leaving the parties to negotiate in good faith the terms and conditions for access.

In the view of FTTH Council Europe ASBL any access regime must be careful what signals it sends to investors about access conditions once that investment is sunk. If investors believe that an access regime will not allow an adequate return on investment then that investment will not happen. Infrastructure that has already been built and is fully amortised should be treated differently than new infrastructure built provided that such investments are efficient[157].

Vodafone considered that different costing and pricing regimes could be justified to incentivise building of new CEI, but this should not be the rule in case of markets where a single operator holds SMP[158]. Open Fiber reflected that setting incremental prices for access to newly built CEI could deter investments in such assets[159].

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[155] BoR (20) 169, reply to Q.25 of the targeted consultation. BEREC further indicates that these associated risks must be represented accurately in order to quantify a possible risk premium but acknowledges that this may be difficult due to uncertainties and imperfect information. Taking into account the impact that cost-oriented access to these CEI assets could have on overall incentives to invest, BEREC calls for sufficient flexibility to be granted to NRAs to deal adequately for these issues

[156] Reply to Q.25 of the targeted consultation.

[157] Reply to Q.25 of the targeted consultation.

[158] Reply to Q.25 of the targeted consultation.

[159] Reply to Q.25 of the targeted consultation.

6.1.4 Future guidance

Overall the 2010 NGA Recommendation and the 2013 NDCM Recommendation served their purposes regarding access to CEI and effectiveness of the SMP-based regulation. Therefore, the principles enshrined in these two recommendations broadly remain valid from a forward looking perspective. Nevertheless, given the new regulatory framework in this area resulting from the Code, the [proposal reviewing the Broadband Cost Reduction Directive], the observed regulatory practices of NRAs and the views expressed by stakeholders, some further guidance is needed as follows:

a) Clarifying the scope of the rules and guidance on CEI

As previously highlighted the current understanding of CEI provided by point 11 of the 2010 NGA Recommendation is narrower than the scope of Article 72 of the Code, as it does not comprise, for instance, buildings, building wiring or antennae. For the purpose of the Recommendation, CEI should be understood as encompassing physical infrastructure assets and other facilities that could host electronic communications networks. According to Article 72 of the Code, civil engineering includes, but is not limited to, buildings or entries to buildings, building cables, including wiring, antennae, towers and other supporting constructions, poles, masts, ducts, conduits, inspection chambers, manholes, and cabinets. A particular emphasis will be put in some parts of the guidance on access to ducts and poles.

b) The relationship between SMP regulation and the [proposal reviewing the Broadband Cost Reduction Directive]

BCRD and SMP regulation set out regulatory regimes which are closely related, as both require some form of access to CEI under certain conditions, and complementary. Nevertheless BCRD and SMP regulation have different areas of application and scope, purposes and levels of ambition. On the one hand, BCRD has a broader area of application (i.e. to all electronic communications and other utilities network operators), and seeks to address technical or economic persisting bottlenecks which can reduce the cost of deploying broadband networks based on fair and reasonable terms. On the other hand, Article 72 of the Code only concerns the civil engineering infrastructure owned or controlled by the SMP operator and seeks to address competition problems in relevant market(s) based on detailed and specific access terms.

In line with the Modified Greenfield Approach that NRAs should follow in conducting their market analysis, NRAs are required to take into account the impact of the BCRD on the market before imposing CEI access obligations under Article 72 of the Code.

Based on the difference of nature and scope between the two regulatory regimes, confirmed by the [proposal reviewing the Broadband Cost Reduction Directive], the Recommendation clarifies that, in general, regulated access to CEI under SMP is likely to be more effective to

address competition issues stemming from the SMP's control of key CEI assets. As a consequence, except in specific circumstances[160], the mere application of the provisions of the BCRD/ [proposal reviewing the Broadband Cost Reduction Directive] would generally not be adequate to effectively address these specific competition problems. This is particularly the case in situations where there is demand for large scale deployments, over multiple areas, given that the BCRD/ [proposal reviewing the Broadband Cost Reduction Directive] tools are based on a case by case approach and do not prescribe rules of general applicability.

In some (relatively limited) cases, it appears that CEI assets have been subject to both BCRD and SMP regulation, which could raise the issue of overlapping rules and consequently of obligations[161]. The Recommendation and the [proposal reviewing the Broadband Cost Reduction Directive] clarify that whenever an asset is subject to an access obligation under the Code, in particular SMP regulation, these obligations prevail over the access obligations under the horizontal provisions of the BCRD/ [proposal reviewing the Broadband Cost Reduction Directive]. This means in particular that an SMP operator should in principle not be subject to the access obligations under the provisions implementing the BCRD/ [proposal reviewing the Broadband Cost Reduction Directive] for CEI assets for which it is subject to access obligations under the SMP regime. BCRD/ [proposal reviewing the Broadband Cost Reduction Directive] access provisions can apply to other CEI assets of the SMP operator that are not covered by access obligations under the Code[162] or for other purposes not foreseen by the SMP regulation (e.g., for mobile backhaul).

The fundamentals of the interplay between BCRD and SMP regulation remain unaffected by the former's revision. Nonetheless the Recommendation should ensure the consistency and complementarity between the two regimes, in particular with respect to the transparency requirements (including the provision of all necessary information to obtain access to CEI). As such, further guidance should be provided to NRAs to help them to find out the most appropriate solutions on transparency measures given that the Single Information Points (SIPs), set up according to the BCRD, are also expected to collect some information about the location of CEI assets, controlled by electronic communications operators and by other network operators, like companies providing utilities. In some Member States the SIPs already collect quite extensive information, including from SMP operators, and provide public interfaces, free of charge, for data access. Moreover, following the same logic, the [proposal reviewing the Broadband Cost Reduction Directive] increases the collaboration between the SIPs and NRAs.

c) The scope of access to CEI

[160] Such as: absence of significant market demand for or limited availability of SMP CEI.
[161] The Polish NRA (UKE), see pages 195 and 196 of the Visionary Analytics Study. This was also highlighted by several stakeholders in the public consultation on the review of the BCRD organised by the Commission from December 2020 to March 2021.
[162] See page 195 of Visionary Analytics Study.

As previously mentioned, Article 72(2) of the Code empowers the NRAs to impose CEI access obligations, even if the CEI is not included as a stand-alone product in the relevant market in accordance with the market analysis. This is particularly relevant as it can be imposed as a stand-alone remedy in different regulated markets, when needed[163]. As such, even if CEI does not need to belong to the relevant market, the imposition of access to CEI as a regulatory obligation still needs to be based on a SMP finding in one or more related downstream markets. Moreover, NRAs may impose such obligation provided that it is necessary and proportionate to meet the objectives of Article 3 of the Code.

In areas of wholesale local access markets that constitute separate geographic markets and that are found to be effectively competitive, access to CEI cannot be imposed or maintained as part of the regulation of this wholesale local access market[164]. In line with the 2020 RRM SWD, as infrastructure-based competition increases, while competition problems related to access to CEI remain, the definition of a CEI separate market could be required to maintain the access to CEI remedy.

Nevertheless, when there are grounds to impose access to CEI as a regulatory remedy NRAs should not necessary seek to limit the scope of access to CEI to the corresponding downstream product market. Rather NRAs should assess to which extent access to CEI is able to address the identified competition problems on the relevant market. In some cases access to backhaul ducts might be necessary to address the competition problems on the wholesale local access markets, in particular where the access seekers need backhaul ducts to properly reach the access points where local loops are provided. Article 72 of the Code, by mentioning in plain words that CEI is not required to belong to the relevant market to become an access remedy, supports an extensive approach on the scope of the access to CEI as remedy, if the national circumstances give reasons for NRAs to go beyond the CEI assets corresponding the downstream product market. Moreover, far reaching access obligations to CEI could also become a ground for not imposing or for the removal of network access specific obligations. According to Article 72(2), NRAs may impose such obligation provided that it is necessary and proportionate to meet the objectives of Article 3 of the Code.

d) Circumstances under which access to CEI should be imposed as the only access remedy (Article 73(2), last subparagraph)

NRAs should choose the least intrusive regulatory intervention that would effectively address the retail competition problem identified. In this respect, the Code gives particular

[163] This will be in particular significant for business providers, which in order to design their offer use both products from mass-market connectivity and from dedicated capacity, and can therefore have a similar remedy for access to CEI in both markets. Thanks to this design they will be able to design their offer more independently and with greater flexibility. Worth recalling that recital 187 of the Code indicates that regulated access to CEI "*can be used as a self-standing remedy for the improvement of competitive and deployment dynamics in any downstream market*".

[164] This applies equally to other wholesale broadband markets, such as the market 3b of the 2014 RRM, where regulated.

prominence to the principle of regulating civil engineering first, as the privileged SMP-based access remedy.

Therefore, when considering possible remedies, NRAs should start by considering remedies for access to CEI[165]. Moreover, Article (73)(2) of the Code establishes that where a NRA considers imposing obligations on the basis of Article 72 or of Article 73, it shall examine whether the imposition of obligations in accordance with Article 72 alone would be a proportionate means by which to promote competition and the end-user's interest. Should regulated access to civil engineering alone be enough to effectively address the retail competition problem identified, the SMP operator should not be subject to access obligations under Article 73 – i.e. access to specific network elements (e.g. passive or virtual or active access to fibre, copper or coax lines) and associated facilities – in the relevant downstream market(s) .

The Recommendation clarifies that access to CEI should be envisaged as the only access remedy where the following conditions are met at the same time:

- First, the CEI controlled by the SMP operator is ubiquitous, or at least sufficiently widespread, within a given geographic market or area;
- Second, the CEI of the SMP operator is able to effectively host multiple independent electronic communications networks allowing alternative operators to deploy their own VHC network up to the end users premises (without prejudice to the sharing of the in-house wiring pursuant to Article 61(3) of the Code);
- Third, CEI as the only access remedy can be adequate in a market, or in a given area, where a certain degree of end-to-end infrastructure based competition has emerged or where there is a viable and realistic prospect that such competition will emerge within the review period.

However, where infrastructure-based competition has not yet materialized but where its development, based on CEI access, constitutes a viable and realistic prospect within the review period, removing immediately all other access obligations could deprive access seekers from any possibility to reach the end users, therefore raising significantly the barriers to market entry. In such a case, it may be necessary to maintain, on a transitory basis[166], other access obligations in addition to CEI access, except where access to the network elements is available on a commercial basis under fair and reasonable terms and conditions.

e) Increasing the level of transparency

A clear pre-requisite for an effective CEI access is to ensure that all operators that intend to roll out fibre networks have access to accurate and up-to-date information on CEI, such as the location and available capacity of the ducts. Where the SMP operator uses tools for its own purpose (i.e. for its retail arm), such as databases, these shall also be made available to other

[165] Recital 171 of the Code.
[166] The time to allow an efficient operator to duplicate the access network.

operators[167]. Where the database contains confidential information, the SMP should find adequate solutions to deal with this issue. If constrained to protect the commercial confidentiality it has the responsibility to remove this information. For instance, the SMP operator could remove the confidential information from the database or could require access seekers to observe the same level of reasonable confidentiality protection. If the removal solution was chosen, the SMP operator should act swiftly without causing any discrimination between access seekers or between access seekers and its own retail arm.

Article 4 of BCRD states that Member States may require every public sector body holding, in electronic format, by reason of its tasks information about: (i) location and route, (ii) type and current use of the infrastructure, and (iii) a contact point concerning the physical infrastructure of network operators to make it available and to update it afterwards via the single information points (SIPs) by electronic means. Where the said information is not available via SIPs, network operators shall provide it upon written request. Such information sent to SIPs shall be accessible promptly in electronic format, and under proportionate, non-discriminatory and transparent terms.

The [proposal reviewing the Broadband Cost Reduction Directive] render mandatory the provision of information concerning the physical infrastructure of network operators and of other public sector bodies via SIPs, require network operators to make available the information via SIPs, and demand the provision of geo-referenced information. All information sent to SIPs is expected to be accessible electronically.

Consequently, it is recommended the SMP operator to provide geo-referenced information regarding its CEI by way of a digitised platform. This platform could be either set up by the SMP operator or the SIP platform set up following the transposition of the BCRD/ [proposal reviewing the Broadband Cost Reduction Directive]. NRAs in collaboration with SIPs and after consultation with the market players (SMP operator(s) and access seekers) should find the most appropriate solution.

f) Ensuring re-use of existing CEI

While the Recommendation does not aim to address operational issues in detail, the establishment of appropriate and non-discriminatory processes to allow the re-use of existing CEI, where feasible, seems to be an important element of a well-functioning access to CEI remedy. The Recommendation seeks to address in this way the situations when the ducts are clogged either by cables which ceased to be used or by other debris.

g) Preparing the processes and tools for large scale deployments

[167] See case EE/2021/2310 where the Commission commented that, in areas where the incumbent would be found to have SMP, ensuring an effective, non-discriminatory and transparent access to these facilities can play an important role in the further development of infrastructure competition in Estonia. This includes the obligation for the SMP operator to share all necessary information pertaining to infrastructure characteristics.

In order to achieve the connectivity targets set by the Digital Decade Policy Programme 2030, CEI access conditions should enable large scale deployment across the territory by all access seekers that deploy VHCNs. It is therefore an aspect that requires NRAs' attention, at least in Member States where CEI access can be expected to play an important role. SMP operators should provide pre-set forms for the access requests to their CEI, should ask from access seekers, when necessary, documents and information in standard format, and should use automated tools to deal with the access requests to their CEI. Likewise SMP operators should allow access requests for multiple locations at once, should respond to these requests in short notice and should enable the full exchange of data with the access seekers via electronic means.

h) Incentivizing the deployments of new CEI assets

When the SMP operator is deploying VHC networks, the decision whether or not to build new CEI for this purpose may not be primarily influenced by regulatory considerations. The SMP operator would be the first user, and in many cases the main user, of these assets for its own fibre deployments. As such, in particular deploying fibre in ducts will allow the operators to intervene on its network and maintain it more efficiently[168].

However, the conditions under which the alternative operators would be able to use the newly built CEI ducts, for the purpose of deploying their own VHC networks, could to some extent have an impact on the SMP operator's incentive to build new CEI with sufficient capacity to host alternative networks.

Moreover, building significant new CEI could mean for the SMP operator, depending on the circumstances of the market, both in terms of induced costs and expected revenues, a risk profile of investment higher than the risk profile associated with legacy CEI. The price control obligations imposed regarding access to CEI should adequately reward the investment made in these new CEI assets with sufficient capacity.

The Recommendation, following the line already set by 2010 NGA Recommendation, provides further clarity for the NRAs by indicating the most likely situations when the promotion of new CEI deployment is needed and how to proceed in such situations. When the SMP operator incurs additional and quantifiable risks associated with significant investments in CEI applying a risk premium should be considered (see section 7.2.2 of this document). Furthermore, in the Member States where legacy CEI co-exists with newly built CEI in the SMP operator's network, the pricing between the two type of assets should be de-averaged. The prices for access to the newly built CEI should reflect the current market economic conditions and should be based on the full actual costs incurred by the SMP operator, as long as strict non-discrimination is ensured in terms and conditions of access to such infrastructures. Such an approach would provide the right incentives on the market for the setting up of new civil engineering infrastructures.

[168] Footnote 588, page 185, of Visionary Analytics Study.

6.2 Network specific access obligations under Article 73

In line with the previous section, the network specific access obligations under Article 73 of the Code should only be imposed if regulated access to civil engineering alone would not be sufficient to effectively address the retail competition problems identified.

Where the NRA finds that it is necessary and proportionate to impose access obligations under Article 73 of the Code, it should ensure that access to the network is effective. In particular, access obligations with respect copper networks should in principle be maintained where the copper access network continues to be regulated on the basis of SMP, without prejudice to progressive lifting of remedies pursuant to Article 81 of the Code where the conditions are met (see chapter 8 of this document).

Under market 1 of 2020 RRM, where technically and economically feasible, physical unbundling should in principle be imposed, as it continues to be widely seen as an access means that guarantees access seekers' independence and even a possibility to outperform the access provider, as highlighted in the Explanatory Note accompanying the 2020 RRM[169]. However, the same source also emphasizes that given the migration trends from passive access products towards VULA, a properly specified VULA product could become the main wholesale access product in the future.

In that regard, nearly all NRAs consider that wholesale local access is not limited to physical access but includes also virtual unbundled local access (VULA)[170].

Experience under the Article 7/Article 32 procedure has shown that many NRAs regulate virtual access products that functionally replicate the key features of physical unbundling. Such virtual access products should be included in the WLA market. VULA characteristics should be applied not only in case of FTTC/VDSL and G.fast, but also in the case of xPON based networks, unless these allow for wavelength unbundling.

VULA should as far as possible be functionally equivalent to physical unbundling. In technical terms this means that access should, (i) in principle occur locally; (ii) be generic and provide access seekers with a service-agnostic transmission capacity which is uncontended in practice; and (iii) provide access seekers with sufficient control over the transmission network to allow for product differentiation and innovation similar to LLU. In addition, effective migration processes towards VULA from physical unbundling should be implemented to foster take-up, and ensure that competition is preserved where technological solutions force a migration from unbundled access to VULA. Virtual access products may be designed in a way that they display similar or equal product features, regardless of the location of the handover point for access. Therefore, it could be technically possible to provide wholesale broadband access at central or local level with comparable quality of service from both the

[169] See for instance (SWD(2020) 337 final), page 45

[170] WIK Report: Future electronic communications product and service markets subject to ex ante regulation Recommendation on relevant markets, Table 5-4, page 140.

access seeker and the end-user perspectives. In particular, the characteristics of high quality virtual access products provided at central level could be set equivalent to those of VULA, allowing access seekers to provide similar retail services based on either product. The location of the hand over point would have direct implications on (i) access seekers' incentives to invest and (ii) the price charged for local or more central product of the same functionality.

7. RECOMMENDED APPROACH TOWARDS PRICE REGULATION

7.1 Situations where price regulation for VHCN is not appropriate

7.1.1 Legal framework

Price control obligations, and accompanying cost accounting obligations, can be imposed by NRAs on SMP operators pursuant to Article 74 of the Code.

This provision states that such remedies can be imposed "*in situations where a market analysis indicates that a lack of effective competition means that the undertaking concerned may sustain prices at an excessively high level, or may apply a price squeeze, to the detriment of end-users*"[171]. NRAs are required to assess whether imposing such obligations would be appropriate, by taking "*into account the need to promote competition and long-term end-user interests related to the deployment and take-up of next-generation networks, and in particular of very high capacity networks. In particular, to encourage investments by the undertaking, including in next-generation networks, national regulatory authorities shall take into account the investment made by the undertaking.*"

In relation to this provision, Recital 180 indicates that *"When considering whether to impose remedies to control prices, and if so in what form, national regulatory authorities should seek to allow <u>a fair return for the investor on a particular new investment project</u>. In particular, there are risks associated with investment projects specific to new access networks which support products for which demand is uncertain at the time the investment is made."*

NRAs should therefore carefully assess the need and proportionality for price regulation and the impact that the envisaged price regulation could have on the market and on the incentives of the different market players, in order to determine whether the measure is necessary and proportionate to address the competition problems identified in the market analysis, and whether it contributes to promote the deployment of next-generation network, in particular VHC networks, and their take up.

In particular, Article 74 foresees that the decision to impose or maintain price control obligations should be subject to particular scrutiny where sufficient competitive safeguards are present, as it provides that NRAs "*shall consider not imposing or maintaining obligations pursuant to this Article, where they establish that a demonstrable retail price constraint is present and that any obligations imposed in accordance with Articles 69 to 73, including, in particular, any economic replicability test imposed in accordance with Article 70, ensures effective and non-discriminatory access*".

[171] Corresponding Recital 192 indicates in that regard: "*Price control may be necessary when market analysis in a particular market reveals inefficient competition. In particular, undertakings designated as having significant market power should avoid a price squeeze whereby the difference between their retail prices and the interconnection or access prices charged to competitors who provide similar retail services is not adequate to ensure sustainable competition. [...*]"

Recital 193 indicates in that regard: "*Due to uncertainty regarding the rate of materialisation of demand for the provision of next-generation broadband services, it is important in order to promote efficient investment and innovation to allow those operators investing in new or upgraded networks a certain degree of pricing flexibility. National regulatory authorities should be able to decide to maintain or not to impose regulated wholesale access prices on next-generation networks if sufficient competition safeguards are present. More specifically, to prevent excessive prices in markets where there are undertakings designated as having significant market power, pricing flexibility should be accompanied by additional safeguards to protect competition and end-user interests, such as strict non-discrimination obligations, measures to ensure technical and economic replicability of downstream products, and a demonstrable retail price constraint resulting from infrastructure competition or a price anchor stemming from other regulated access products, or both.* […]".

However, as Recital 193 further clarifies, in addition to this scenario of pricing flexibility, there may be other situations, where the imposition of price control obligations may not be appropriate[172]. Furthermore, in line with Recital 192, in some cases imposition of price control may be necessary when market analysis in a particular market reveals inefficient competition.

7.1.2 Current guidance

At the time of the adoption of the NGA Recommendation, imposing pricing remedies was seen as generally the most appropriate way to deal with a finding of SMP[173]. The NDCM Recommendation, advocated a more nuanced approach: in certain circumstances, pricing flexibility should be viewed as the default option. Specifically, the NDCM Recommendation provided an alternative to the cost-orientation pricing remedy. According to the NDCM Recommendation, NRAs should introduce pricing flexibility when they enforce strict non-discrimination remedies and in the presence of competitive constraints described in the Recommendation.

It is apparent from the above provisions of the Code that the principles promoted by the NDCM Recommendation with regard to pricing flexibility remain relevant as a mean to promote VHCN connectivity while safeguarding competition.

The guidance provided in the NDCM Recommendation promotes the use of pricing flexibility regarding NGA wholesale products where certain competitive safeguards are present. As

[172] Recital 193 mentions in that regard : "*Those competitive safeguards do not prejudice the identification by national regulatory authorities of other circumstances under which it would be appropriate not to impose regulated access prices for certain wholesale inputs, such as where high price elasticity of end-user demand makes it unprofitable for the undertaking designated as having significant market power to charge prices appreciably above the competitive level or where lower population density reduces the incentives for the development of very high capacity networks and the national regulatory authority establishes that effective and non-discriminatory access is ensured through obligations imposed in accordance with this Directive.*"

[173] In particular, the NGA Recommendation indicated that access to existing civil engineering, to the terminating segment of NGA networks, to the unbundled fibre loop should be provided at cost-oriented prices.

indicated in Recital 49 of the NDCM Recommendation, a certain degree of pricing flexibility would allow operators investing in NGA networks "[…] *to test price points and conduct appropriate penetration pricing. This would allow SMP operators and access seekers to share some of the investment risk by differentiating wholesale access prices according to the access seekers' level of commitment. This could result in lower prices for long-term agreements with volume guarantees, which could reflect access seekers taking on some of the risks associated with uncertain demand. In addition, pricing flexibility at wholesale level is necessary to allow both the access seeker and the SMP operator's retail business to introduce price differentiation on the retail broadband market in order to better address consumer preferences and foster penetration of very high-speed broadband services.*" The rationale of such pricing flexibility is to avoid an unnecessary overregulated market environment in terms of wholesale price that deprives end-users of the benefits of competitively driven sustainable investments in VHCN.

According to the NDCM Recommendation, pricing flexibility should be imposed by NRAs where the following conditions are met:

(i) there is a demonstrable retail price constraint resulting from the infrastructure competition or a price anchor stemming from cost-oriented wholesale copper access prices, and
(ii) the *ex ante* economic replicability test is in place in those cases where wholesale price regulation should not be imposed, and
(iii) there is an obligation of providing wholesale access services on the basis of EoI[174].

7.1.3 Regulatory practices and reflection

As a preliminary remark, it is important to observe that regulatory approaches when it comes to NGA/VHCN products have largely varied across the EU. Access to NGA/VHCNs has historically not been regulated in some case[175], or has more recently been deregulated in other Member States[176], or in some geographic markets within Member States[177].

Moreover, without necessarily applying the pricing flexibility as described in the NDCM Recommendation, multiple NRAs have aimed to preserve and foster incentives to invest in

[174] Point 48 and 49 of the NDCM Recommendation indicate that when EoI "*is not yet fully implemented*", "*obligations relating to technical replicability under the conditions set out in points 11 to 18*" should also be imposed as a condition for pricing flexibility.
[175] Fibre networks have historically not been subject to access obligations in Portugal (see for instance case PT/2016/1889).
[176] In particular in Romania and Bulgaria.
[177] See for instance the case ES/2021-2330-2331 where part of market 3b (2014 RRM) was found to be competitive and subsequently deregulated. Moreover, with respect to market 1, while CNMC found Telefonica to have SMP in the entire territory, CNMC did not impose access obligations regarding fibre networks in the more competitive municipalities, representing 68% of the Spanish population.

NGA/VHCNs through light touch price control obligations, sometimes inspired by the principles set in the NDCM Recommendation[178].

Pricing flexibility as such has been applied in a relatively limited number of Member States, as confirmed by the Visionary Analytics Study[179].

ERT (without price control obligations) is currently applied for NGA and/or VHCN access products in Spain, Luxembourg, Ireland, Sweden, Slovenia and Austria[180] (more details can be found in the table in chapter 7.1.5.1.1 Demonstrable retail price constraint stemming from). This figure of a half-dozen Member States applying pricing flexibility should be compared with the number of Member States that actually impose price control obligations for NGA and/or VHCNs, which according to BEREC is situated between 11 and 15, depending on the type of access product concerned[181].

In these countries, the demonstrable price constraint has stemmed from the existence of a regulated copper anchor, rather than due to the presence of alternative infrastructures.

While the presence of alternative infrastructures does not seem to have been taken into account for the purpose of pricing flexibility as such (i.e., ERT and no price control obligations), emerging infrastructure competition is a driving factor for the geographical segmentation of markets and/or remedies.

For instance, in case IT/2019/2181, the Italian NRA AGCOM found the geographic market corresponding to the municipality of Milan to be competitive (and as a consequence, withdrew all obligations in that geographic market). With respect to the rest of the territory, AGCOM applied a geographic differentiation of remedies. In the more competitive areas of the market, characterized in particular by the presence of at least two alternative networks[182], AGCOM allowed more flexibility to the SMP operator with respect to the VULA and bitstream wholesale pricing although maintaining some form of price control[183]. In its

[178] For instance, the Belgian NRA indicated that "*Although the BIPT did not explicitly follow the NDCM (no strict cost orientation), it followed the main principles in its approach to cost modelling for cable & FTTH*" (reply to Visionary Analytics' survey).
[179] See page 74 of Visionary Analytics Study.
[180] Pricing flexibility on the basis of a regulated anchor has also been applied in the UK, a Member State at that time.
[181] The BEREC's 2021 Regulatory Accounting Report (BoR (21) 161) indicates that in 2021, 13 NRAs apply some form of price control for VULA FttC (which in BEREC reports includes those NRAs that apply ERT). For VULA FttH, 15 NRAs apply some form of price control; and for fibre LLU the number is 11 NRAs (figure 18, page 30).
[182] In addition to the presence of at least two alternative infrastructure with sufficient coverage, AGCOM also defined criteria based on the SMP's market share at retail and wholesale level. In total, a list of 26 more competitive municipalities was drawn on this basis. However, flexibility for VULA access products would only be introduced once VHCN take up reaches 25% nationally.
[183] With respect to VULA products in the more competitive areas of the market, the SMP operator is still subject to cost-orientation, but AGCOM introduced the possibility to differentiate its wholesale prices provided that

comments on the case, the Commission pointed out that the current regulation in Italy could already at this stage fulfil almost all the conditions set out in the NDCM Recommendation, for lifting the cost orientation on fibre access products nationally. With respect to the more competitive areas, the Commission observed in particular that the criteria were rigorous and that the requirement that VHCN take up reaches 25% nationally as a pre-condition for pricing flexibility may not necessarily be appropriate to assess the competitive conditions in the more competitive municipalities. The Commission therefore called not to postpone the implementation of flexibility on VULA prices and in any case not beyond 2021. Other NRAs have applied remedies differentiation and lifted price control obligations in the more competitive parts of the market[184].

While the number of NRAs imposing EoI and ERT obligations has increased to some extent over the past years[185], the conditions required for the application of pricing flexibility are often not met. In its Regulatory Accounting Report published in December 2021 (hereinafter 'BEREC's 2021 Regulatory Accounting Report')[186], BEREC observed that "*ERT price control methodology is still mainly used complementarily to cost orientation, albeit a slightly increased use of the ERT at least for NGA/VHCN wholesale products as a price control method can be observed, suggesting it is a substitute with respect to cost orientation, in line with the Commission NDCM Recommendation (2013/466/EU) and the price flexibility tool according to the Code*".

In some instances, the Commission called on NRAs to consider a more flexible approach to price regulation for VHCN products. In particular, in case EE/2017/1980-1981, the Commission asked the Estonian NRA to consider implementing EoI and other competitive safeguards, and to apply pricing flexibility for fibre-based products in order to allow the SMP operator to test appropriate price points and potentially improve Estonia's relatively low ultrafast broadband household penetration.

Furthermore, the Visionary Analytics Study identifies different explanations for the diverse application of the NDCM Recommendation guidance in that respect. In particular, Visionary Analytics Study refers to BEREC's 2019 Regulatory Accounting Report, which indicates that, in the Member States where both FttP coverage and penetration are relatively high (including ES, SE, PT, DK and LU), "*the most common approach is to not regulate (or allow flexibility for) the FTTP product*", which BEREC considers to be in line with the NDCM Recommendation.

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variations in prices are justified; for bitstream products, AGCOM withdrew cost-orientation but nonetheless required prices to be fair and reasonable.

[184] See for instance SI/2021/2356

[185] Such increase can in particular be seen with regard to the imposition of EoI for fibre-based products. For instance, for VULA FTTH, 7 NRAs (including CY, CZ, ES, IT, LU, SI and SK) impose EoI while 6 impose EoO (BEREC Report, Regulatory Accounting in Practice 2021 (BoR (21) 161), page 42).

[186] BEREC Report, Regulatory Accounting in Practice 2021 (BoR (21) 161)

In that regard, the Commission services observe that, according to some of these NRAs' assessments, the application of the approach foreseen in the NDCM Recommendation has largely contributed to preserve competition and to foster investment incentives, in particular for the SMP operator.

For instance, in its reply to Visionary Analytics' survey asking to what extent the pricing flexibility approach has contributed to the achievement of regulatory objectives, the Spanish NRA (CNMC) replied that "*The ERT is one of the main factors that have contributed to the development of a rich competitive environment in Spain, characterized by high level of investment and, in consequence, the development of high-quality NGA networks (the most common speeds in Spain are above 600Mbps). In this context, the availability of the MARCo offer and the symmetric obligation to provide access to in-house wiring are also important factors to be considered*". Similarly, the Luxembourg NRA (ILR) indicates that pricing flexibility has effectively protected competition and contributed to investments from the SMP operator (and from its competitors in their own backbone network). RTR (Austria) considers that while pricing flexibility has contributed to promoting efficient investment in NGA/VHCNs and maintained the pre-existing level of competition, investment from alternative operators have remained limited due to high costs of rollout and limited economies of scales. Other NRAs, such as PTS (Sweden) and Comreg (Ireland) did not provide an assessment of the impact of the application of pricing flexibility in the context of Visionary Analytics' survey, in the former case due to the case that the NRA was still in the process of conducting a new market analysis.

Moreover, the Visionary Analytics Study points to anecdotal evidence suggesting that "*some NRAs consider the flexibility option as more resource intensive than cost orientation*", in particular due to the resources needed to design and conduct the ERT. Visionary Analytics Study also reports that some NRAs consider that that a cost orientation obligation provides a greater price certainty for market participants compared to a lower price certainty under ERT.

Looking forward, Visionary Analytics Study suggests, based on the evidence collected in relation to non-discrimination aspects, "*that the successor recommendation require effective non-discrimination, rather than requiring equivalence of input (EoI) as a prerequisite in all cases*"[187]. Visionary Analytics Study also suggests that "*the "copper anchor" should be updated to provide constructive guidance and criteria as to how a suitable anchor product should be identified. The ideal anchor product would be (1) an entry level product that is used, or amenable to being used, by alternative operators to provide their own retail products and (2) with a price that is either price regulated or else constrained in such a way that regulation is not necessary*". The report further contains some reflections on the ERT, which are discussed in the corresponding section (cf. section 7.1.5.3.).

[187] Page 267

7.1.4 Views expressed by the stakeholders

In its response to the Targeted consultation, BEREC *"agrees with the usefulness of allowing pricing flexibility to promote investment in new technologies, however BEREC wants to repeat that sufficient safeguards must be in place to ensure a quick reaction in case the SMP operator misuses the pricing flexibility for anti-competitive behavior. In general, NRAs must have the powers and the discretion to react swiftly on market developments to avoid unintended consequences. BEREC also wants to point out that pricing flexibility is an important factor for investing in new technologies, but other conditions must be met too to make a business case for the operator/investor, namely the willingness to pay of users (demand side) as well as a general environment conducive to investment, i.e. the general economic conditions and competitive pressure (supply side). Pricing flexibility alone is not enough."*

During the workshop organized by Visionary Analytics with NRAs on 15 April 2021, some NRAs indicated that the copper anchor identified in the NDCM Recommendation (copper unbundling) was becoming progressively irrelevant and that an update was necessary. Another NRA considered that the link between pricing flexibility and EoI was creating difficulties in the application of the NDCM Recommendation.

The views expressed by stakeholders during the targeted consultation on pricing flexibility are split.

In particular, ETNO and some of its members (for instance Deutsch Telekom and TIM) support the current guidance principles from the NDCM Recommendation under which price flexibility may be imposed. Additionally, ETNO and its members consider that before applying a price control, NRAs should analyse the impact of the intended regulatory intervention in terms of network investments. They also ask for more support for co-investment schemes. Liberty Global also expressed its support for the guidance already provided by the Commission with respect to pricing flexibility.

A contrario, ECTA is of the opinion that the introduction of wholesale pricing flexibility for SMP operators has enabled the dominant telecom companies to limit competition. It also claims that effective non-discrimination obligations do not justify the lifting of price control obligations. Furthermore, ECTA considers that the recommendation should not limit the discretion of NRAs to consider when to apply, or not apply, pricing flexibility. Iliad (a member of ECTA) and Vodafone are also of the view that the application of pricing flexibility should be subject to a case-by-case analysis to determine if some form of price control may still be needed. Furthermore, Vodafone considers that cost-orientation should be imposed where only one network is present in a given area.

7.1.5 Future guidance on pricing flexibility

As explained in chapter 3, the Code puts a strong emphasis on the importance for NRAs to be open to, and take into account, the initiatives emerging from the market that can foster the deployment of VHCNs while supporting sustainable competition. In particular, where market players envisage proposing co-investment or access offers on a voluntary basis, the NRA should explore these solutions with the market. The Code provides for deregulation or partial deregulation under the conditions respectively foreseen in Article 74 (co-investment) and Article 80 (wholesale only). However, there are also other situations where market-driven solutions can play an important role, for example commercial agreements or other cooperative arrangements, proposed by the SMP operator pursuant to Article 76 or Article 79, or both of the Code, that foster VHCN deployments while preserving competition.

NRAs should be open to and accompany market initiatives (see chapter 3 of this document) that allow parties to diversify the investment risk while enabling sustainable competition on the downstream markets. In addition to the situation where the conditions set out in Article 76 are met, in area where commercial agreements/commitments under which access to a VHCN is available to third parties under reasonable terms, thereby improving the competition dynamics, that price regulation may not be warranted.

In the context of the Code, and given the important uncertainty that continues to exist with respect to the rate of materialisation of demand for the provision of next-generation broadband services, pricing flexibility (and the possibilities it offers to test price points and encourage the developments of agreements between the SMP and access seekers based on long-term or volume commitments) is expected to be an important tool to promote both the deployment of VHCNs and their take-up, while preserving competition. In a context where competition, and in particular infrastructure competition, is developing in many areas across Europe, and where investments in VHCN need, more than ever, to be encouraged, it is appropriate to apply pricing flexibility on a significantly larger scale than has been the case until now.

While the main principles of the NDCM Recommendation regarding pricing flexibility are now recognised in the Code[188], and remain relevant to stimulate investments and take up of VHCNs in particular, it is necessary in the context of the new recommendation to consider whether the specific conditions listed in the NDCM Recommendation for the application of pricing flexibility should be adjusted/updated in light of the Code and relevant technological and market developments. We will discuss in turn the different safeguards, i.e. the presence of a demonstrable retail price constraint resulting from the infrastructure competition or a price anchor stemming from cost oriented wholesale copper access prices; the ERT and effective non-discrimination.

[188] Article 74(1)

7.1.5.1 Presence of a demonstrable retail price constraint

The demonstrable retail price constraint constitutes an essential safeguard. Such demonstrable retail price constraint would not be sufficiently strong to conclude that the relevant wholesale market is effectively competitive and therefore that no operator has SMP. This retail price constraint, however, should prevent the operator that has SMP at the wholesale level from setting excessive retail prices.

7.1.5.1.1 Demonstrable retail price constraint stemming from infrastructure competition

The NDCM Recommendation indicates that the demonstrable price constraint can come from the competition exerted by one or more alternative infrastructures. In this context, alternative infrastructures are infrastructures that are not controlled by the SMP operator[189].

Recital 193 of the Code refers, more broadly, to "*a demonstrable retail price constraint resulting from infrastructure competition*".

In many areas across Europe, in particular in densely populated areas, an increasing level of infrastructure competition can be observed. Where, despite this development, an operator still has SMP on the relevant market, the competitive pressure resulting from competing networks should be duly taken into account by the NRA for the assessment of appropriate remedies. In that regard, Recital 54 of the NDCM Recommendation indicates: "*Such demonstrable retail price constraint would not be sufficiently strong to conclude that the relevant wholesale market is effectively competitive and therefore that no operator has SMP. This retail price constraint, however, should prevent the operator that has SMP at the wholesale level from setting excessive retail prices.*"

While so far, pricing flexibility has been applied mostly on the basis of regulated anchors (see below, section 7.1.5.1.2 of this document), it can be expected with the development of infrastructure competition that pricing flexibility on the basis of infrastructure competition will be more frequent looking forward.

An infrastructure present in a given area can in principle be deemed to exert demonstrable price constraint on the SMP where there is substitutability at retail level between the services provided over the SMP's network, on the one hand, and the services provided over the alternative infrastructure, on the other hand. An alternative infrastructure can exert demonstrable price constraint even where it is not directly included in the relevant wholesale market.

In that respect, the strong presence of cable networks has led different NRAs to partially deregulate their market[190]. In areas where competing fibre networks are deployed in parallel

[189] Point 49 of the NDCM Recommendation.
[190] Partial deregulation was observed in e.g. Italy and Poland.

but this emerging infrastructure competition does not (yet) lead to effective competition, the alternative fibre network can generally be expected to exert demonstrable price constraint on the SMP's network.

Depending on the market conditions that can be observed by the NRA, other technologies that are found to be part of the same retail market could also exert a demonstrable price constraint, including fixed wireless access in certain cases.

The demonstrable retail price constraint can result from the presence of alternative infrastructure and the services provided over this infrastructure. Moreover, the Recommendation recognises that in the context of increasing VHCN coverage and more granular geographic analysis, the emerging or prospective infrastructure competition could in some cases be found to sufficiently constrain the SMP's operators' ability to raise its prices. Where VHCN deployment has not yet started within the area, NRAs should assess the likelihood and viability of future VHCN deployment. In order to assess the likelihood of future deployments within a given area, the NRA should, inter alia, be able to refer to the information collected for the purpose of Article 22 of the Code, provided that planned deployment are considered sufficiently credible. The existence of effective access to CEI can contribute to make infrastructure competition a viable and realistic prospect within the review period.

7.1.5.1.2 Demonstrable retail price constraint stemming from a regulated anchor

In the absence of an alternative infrastructure, the demonstrable price constraint could also stem from a regulated anchor. Where the retail price is sufficiently constrained by an alternative infrastructure, the regulation of an anchor product will not be necessary for the purpose of applying pricing flexibility.

The Code confirms the relevance of the concept of a regulated anchor which is explicitly mentioned in the Code recitals along with retail price constraints resulting from infrastructure competition[191].

Under the NDCM Recommendation, the anchor is a regulated copper wholesale access product (unbundling or bitstream) subject to cost orientation in accordance with the recommended cost methodology, which sufficiently constrains NGA prices[192]. Based on national circumstances, similar anchoring effect could have a regulated access product to the civil engineering infrastructure of the SMP operator.

The NDCM Recommendation already foresaw that a copper anchor could no longer exercise a demonstrable retail price constraint on NGA products in the medium/long term and could be

[191] Recital 193

[192] "*This retail price constraint, however, should prevent the operator that has SMP at the wholesale level from setting excessive retail prices*" (recital 54 NDCM Recommendation)

replaced by an NGA-based product that is tailored to have the same product features. It was expected that this would not be required before 2020[193].

As seen above, pricing flexibility has been applied in half a dozen Member States on the basis of the presence of a regulated anchor[194].

Table 4: Application of pricing flexibility for NGA / VHCN wholesale products

Member State	Case	Regulated anchor subject to cost orientation	Wholesale products subject to pricing flexibility (ERT and no price control)
Spain	ES/2015/1818-1919, confirmed in ES/2021/2330-2331	LLU (price caps based on a LRIC model)	Local and central NEBA services
Sweden	SE/2015/1687-1688	Copper access (LLU and virtual access)	Fibre access (pricing flexibility as of November 2016)
Luxembourg	LU/2019/2137	Copper services (BULRIC+)	Fibre services (previously pricing flexibility for NGA products under case LU/2014/1633)
Austria	AT/2017/1987	LLU/SLU (Bottom-Up FL-LRAIC)	VULA
Slovenia	SI/2017/2004-2005[195]	Copper services (BU LRIC +)	VULA on upgraded copper networks ; fibre access
Ireland	IE/2018/2090	Copper (including FttC-based bitsream)	FttH based products
UK[196]	UK/2018/2063	lower bandwidth VULA services (VULA 40/10)[197]	Other VULA products

Source: NRA's notifications to the Commission

[193] Recital 56 of the NDCM Recommendation.
[194] ES, LU, IE, AT, SI, SE and UK (a Member State at the time).
[195] In the recent notification SI/2021/2356, this approach is confirmed for NGA products in market 1/2020, except in the more competitive parts of the market where all price control regulation is removed.
[196] A Member State at that time.
[197] This product was subject to an LRIC+ cost based charge control following a CPI-X model, with X set to align charges to forecast efficient costs by the penultimate year of the charge control.

In the two last examples (IE and UK), the NRAs have considered that the former copper LLU anchor did no longer sufficiently constrain the products offering higher bandwidths, which led to "upgrading" of the anchor by introducing price regulation for some or all FttC based products. In that regard, the Commission commented in the Irish case on the introduction of cost orientation for FttC based virtual and central access services, by indicating that NGA based access products should be controlled in principle by means of a more flexible form of price control, such as an economic replicability test. The Commission therefore asked "*ComReg to explain in detail, in the specific circumstances of the Irish market, the difference in approach to FTTH products and FTTC products as regards forms of prices control. In this regard, ComReg may want to pay particular attention to the role FTTC based access products play as an anchor product for FTTH based access products, in light of the decline in market demand for copper-based CG retail services, and monitor price developments on relevant retail and wholesale markets accordingly*". In the UK case, OFCOM considered in 2018 that the pricing constraint previously exercised by LLU access ('the copper anchor') was no longer sufficiently strong to constrain the VULA 40/10 pricing in a way that would avoid a negative knock-on effect for retail superfast broadband prices. Ofcom argued that this approach was in line with the NDCM Recommendation, which – in its recital (56) – acknowledges that the copper anchor could, in principle be, replaced by a basic NGA-based product where the access product offered by the SMP operator on the legacy (copper) access network is no longer able to exercise a demonstrable retail price constraint on the NGA product. The Commission did not comment on OFCOM's proposal to identify the VULA 40/10 as the new anchor.

The cases in the table above illustrate that the traditional copper anchor (LLU) is still considered as relevant in a number of Member States. However, increasingly, copper LLU will no longer be able to sufficiently constrain NGA/VHCN prices, in particular in situations where (i) wholesale copper products are being progressively phased out due to copper switch-off or the upgrade of the copper network with vectoring that leads to a phase out of copper unbundling[198]; and/or (ii) where copper and VHCN products are no longer substitutes on the retail and wholesale markets[199].

In some markets, at least in the short term, a copper-based anchor (LLU or VULA depending on the national market conditions and remedies in place) subject to cost orientation could continue to exert such price constraint. However, in the absence of retail price constraint stemming from an alternative infrastructure or from regulated access to civil engineering infrastructures, if an NRA finds on a forward looking basis that a copper based anchor is not, or no longer exerting sufficient competitive pressure on VHCN products, the NRA should define an entry level product provided over VHCN, and apply pricing flexibility for other products provided over VHCN, provided that the other conditions for pricing flexibility are

[198] See for instance case EE/2021/2310-2311

[199] See for instance case SE/2019/2217 and DK/2021/2346, where the copper and fibre networks have been found to belong to separate product markets at retail and wholesale levels.

met. In order to preserve genuine flexibility with respect to VHCN, the technical performances of this regulated product should be limited to what is required to exert demonstrable retail price constraint.

Given the differences in VHCN coverage and take up across Europe, and their evolution in the years to come, respondents to the targeted consultation generally agreed that it would be difficult to define in absolute terms the characteristics of the updated anchor. The new recommendation therefore aims to lay down guiding principles to help the NRAs define the regulated anchor taking into account their national market specificities.

In particular, based on the inputs received in preparation of the new recommendation, the following considerations and principles could be useful to guide NRAs in setting this updated anchor:

- As it is currently the case with the NDCM Recommendation, the anchor product should be subject to cost orientation, based on the costing methodology recommended in the new recommendation;

- Based on the findings of the market analysis, NRAs should define the characteristics of the regulated anchor. Where copper-based products (including VULA products provided over an upgraded copper network) are still able to exert a demonstrable retail price constraint over VHCN on a forward looking basis, the NRA should in principle not define VHCN-based anchor. However, the NRAs could define a technologically neutral anchor (by defining the performance of the wholesale product rather than refer to a specific product) and allow the SMP operator to provide this (cost oriented) anchor on the copper network or on the VHCN. Based on national circumstances, similar anchoring effect to an active product could have a passive product based on regulated access to the civil engineering infrastructure of the SMP operator. NRAs should consider such a possibility.

- Where the NRA concludes that a copper based anchor would no longer exercise a demonstrable retail price constraint, and in the absence of a demonstrable price constraint stemming from alternative infrastructures or from regulated access to civil engineering infrastructures, the NRA should define an entry level product provided over VHCN in the relevant wholesale market. The technical performances of this regulated product should be limited to what is required to exert demonstrable retail price constraint. As such, this anchor product would be a virtual, or an active, regulated product. This product should in principle be subject to cost orientation, while pricing flexibility is ensured for all other products provided over VHCN. Similarly, where a migration plan has been enacted under which the SMP operator plans, the commercial and/or technical closure of its copper network, it can be necessary for the NRA to define a VHCN based regulated anchor, following the same principles.

7.1.5.2 Effective non discrimination

The elements gathered by the Commission (see chapter 5 of this document) show that while EoI continues to be the safest way to ensure non-discrimination, there are situations where the NRA will conclude, after a cost-benefit analysis, that it would not be proportionate to impose this standard, or that it would only be proportionate to do so with regard to specific wholesale products or processes. Where this is the case, NRA should nonetheless ensure effective non-discrimination by imposing appropriate monitoring mechanisms and technical replicability tests.

The circumstance that effective non-discrimination would be ensured through other means than imposing EoI with regard to a given VHCN wholesale product should not, in itself, exclude the application of pricing flexibility for this VHCN wholesale product where the conditions are met.

Based on the above, pricing flexibility for VHCN wholesale products should be applied – provided that the other competitive safeguards are present – where effective non-discrimination is ensured through the implementation of EoI for the VHCN wholesale product that would be subject to pricing flexibility, and/or for a particularly relevant upstream wholesale product (in particular for access to CEI where this product can significantly contribute to the development of infrastructure competition).

However, where the NRA has established that EoI obligations (for the corresponding VHCN wholesale product or for a relevant upstream wholesale product) would be disproportionate, the NRA should assess whether effective non-discrimination can be ensured through the implementation of EoO, in combination with appropriate monitoring mechanisms and technical replicability tests. If so, pricing flexibility for VHCN wholesale products should be applied – provided that the other competitive safeguards are present.

7.1.5.3 Economic replicability test

Provisions of the EECC relating to the Economic Replicability Test (ERT)

In order to prevent, price based, exclusionary practices, the EECC requires an ex ante economic replicability test (ERT) is in place as a condition, among other competitive safeguards, to apply pricing flexibility[200]. Article 74 of the Code confirms this link between the non-imposition of price control obligations and the imposition of an ERT imposed in accordance with Article 70 (non-discrimination obligations).

[200] The ERT can be considered as a specific type of *ex-ante* margin squeeze test that can be used by the NRAs to implement pricing flexibility as an alternative to the strict price control obligations. Specifically, the test assesses whether the margin between the retail price of the relevant retail products and the price of the relevant VHCN-based regulated wholesale access inputs covers the incremental downstream costs and a reasonable percentage of common costs.

Hence, the notion of ERT continues to be highly relevant as an enabler for pricing flexibility, and thus as an alternative to cost orientation for the provision of access to VHCN, in a similar way as this was defined in the NDCM Recommendation for NGA access. The definition of the ERT is provided in recital 64 of the NDCM Recommendation as follows: *"a lack of economic replicability can be demonstrated by showing that the SMP operator's own downstream retail arm could not trade profitably on the basis of the upstream price charged to its competitors by the upstream operating arm of the SMP operator ('equally efficient operator' (EEO) test)."*[201]

The NDCM Recommendation provides methodological guidance on the ERT to be used in the context of that recommendation. Specifically, the NDCM Recommendation sets the principles and the parameters that the implementation of the economic replicability test should follow in order for the NRA to be able to ensure that the margin between wholesale and retail is sufficient. In particular, the NDCM Recommendation stresses that the economic replicability test should ensure that *"the margin between the retail price of the SMP operator and the price of the NGA wholesale input covers the incremental downstream costs and a reasonable percentage of common costs"*.[202] Finally, the NDCM Recommendation defines the relevant parameters to design the economic replicability test methodology: relevant downstream costs, cost standard, relevant regulated wholesale and retail products and relevant time period to run the test.[203]

Current regulatory practice

As explained above, the purpose of the ERT is to serve as an additional safeguard to avoid excessive pricing in a situation where there is no price regulation remedy in place. This can be achieved, according to the NDCM Recommendation, by ensuring that access seekers remain able to economically replicate the downstream offers of the SMP operator with the wholesale input they receive, despite the ability of the SMP operator to price this input more flexibly.

Although, the ERT has been identified in the NDCM Recommendation as an enabler for pricing flexibility its use has been relatively limited in practice. BEREC acknowledges in its 2021 Regulatory Accounting Report by stating that "*Up to now, the statement of the NDCM Recommendation on the ERT for NGA products as the alternative for ex ante price control has not been fully applied*".[204] This is because, based on the BEREC's 2021 Regulatory Accounting Report, the "*ERT price control methodology is still mainly used complementarily to cost orientation"* by most of the NRAs. However, a slightly increased use of the ERT at least for NGA/VHCN wholesale products as a price control method can be observed, suggesting it is becoming a substitute with respect to cost orientation, in line with the

[201] The Equally efficient operator (EEO) margin squeeze test stands for an efficient operator in the downstream market with the scale of the SMP operator, so the costs can be taken from the SMP operator's regulated accounts.
[202] NDCM Recommendation, recital 64
[203] NDCM Recommendation, Annex II
[204] BEREC Report: Regulatory Accounting in Practice 2021, BoR (21) 161)

Commission NDCM Recommendation and the price flexibility tool according to Article 74(1) of the EECC.

Table 5 presents the main Member States in which an *ex ante* Margin Squeeze Test (MST) methodology has been used as a complementary regulatory tool in parallel with cost-oriented wholesale price regulation.

Table 5: Use of MST as a complement to cost orientation.

Methodology	ULL	VULA FTTC	VULA FTTH	Fibre unbundling	Dark fibre in the access segment	Duct in the access segment	Bitstream FTTC	Bitstream FTTH
Ex ante MST	CZ, DE, EL, IT	CZ, DE, EL, EI, IT	CZ, EI, IT	CZ, DE	DE, EL	DE, EL	AT, DE, EL, IT, LT, PL	AT, IE, IT, LT, PL
Ex post MST	DK, EE, LT	LT	LT	LT, EE, DK	LT	LT, EE	EE	EE

Source: Visionary Analytics Study, Table 14, page 11

Table 6 below presents the main Member States and the respective cases in which the ERT methodology has been used in the context of pricing flexibility.

Table 6: Main cases in which ERT has been used in the context of pricing flexibility.

Member State	Case	Wholesale products subject to pricing flexibility (ERT and no price control)
Spain	ES/2015/1818-1919, confirmed in ES/2021/2330-2331	Local and central NEBA services
Sweden	SE/2015/1687-1688	Fibre access (pricing flexibility as of November 2016)
Luxembourg	LU/2019/2137	Fibre services (previously pricing flexibility for NGA products under case LU/2014/1633)
Austria	AT/2017/1987	VULA
Slovenia	SI/2017/2004-2005[205]	VULA on upgraded copper networks ; fibre access
Ireland	IE/2018/2090	FTTH based products

[205] In the recent notification SI/2021/2356, this approach is confirmed for NGA products in market 1/2020, except in the more competitive parts of the market where all price control regulation is removed.

Member State	Case	Wholesale products subject to pricing flexibility (ERT and no price control)
UK[206]	UK/2018/2063	Other VULA products

Source: article 7/32 notifications

It is difficult to identify why the use of ERT as pricing flexibility tool (as envisaged in the NDCM Recommendation) has not sparked a greater interest with the NRAs, although both BEREC and the other stakeholders, such as access providers and their associations, expressed a clear preference towards a more flexible pricing environment with the use of the ERT, its implementation is rather limited. However, while the relevance of the ERT as one of the safeguards for pricing flexibility is established by the EECC and confirmed by the elements gathered by the Visionary Analytics Study and the responses to the targeted consultation, designing and implementing this test has proven to be a complex challenge for both the NRAs and operators.[207]

This is because the deployment of the ERT and the results that this deployment may have in a market are highly dependent on the precise design and the parameters applied in the general methodology described in the NDCM Recommendation. Examples of such difficulties based on the Visionary Analytics Study and replies to the targeted consultation are:

a) the treatment of retail bundles combining both regulated and non-regulated inputs (such as for instance audio-visual premium content)[208];
b) the conditions where it can be justified for the NRA to apply scale adjustments to the SMP's costs ("adjusted Equally Efficient Operator") and how to define the reasonably efficient scale[209].

Targeted consultation – Inputs from stakeholders:

Based on the replies of the various stakeholders to the targeted consultation, the majority of stakeholders, with some exceptions, are in favour of the ERT methodology as a regulatory tool in markets were a price control obligation is considered inappropriate.

BEREC considers that the ERT plays a key role for the development of NGA infrastructures and the use of wholesale NGA offers. Due to this, BEREC is of the view that the existing guidance is sufficient in principle thus there is no need for more. Although BEREC is of the

[206] A Member State at that time
[207] Visionary Analytics Study, section on the Economic Replicability Test, page 265: "*The ERT has also proven to be complex to implement in practice, and there are many questions as to how best to apply it*"
[208] Although premium content such as football is not a service regulated by NRAs, its relevance in certain markets entails that the upcoming recommendation should consider some guidance on its inclusion in for instance in the ERT. This is because in markets where bundled products including premium content are key for end-users, not ensuring access seekers possibility to compete with similar bundled products can have large impact on the retail market. The relevant question is how to proportion the cost of unregulated services, to ensure that access seekers are able to compete with the full bundle offered by the regulated SMP operator. This issue has come up in particular in case UK/2015/1692 and, very recently, in case ES/2021/2330.
[209] On this issue, see for instance LU/2019/2141.

view that current guidance is sufficient, in the same time calls for two procedural issues which the upcoming recommendation could explore. The first is related to the treatment of Bundles and especially in respect to the data gathering powers of the NRAs regarding the non-regulated parts of bundled products. The second procedural issue is related to the time limits that are set in para. 56(c) of the NDCM Recommendation. Specifically, BEREC is of the view that these limits should be compatible with any required follow-up activity to update the list of flagship products, following their evolution, and revise the result of the replicability analysis.

ETNO and its members, as well as Liberty Global, believe that the ERT is still a valid tool, and that it remains important to preserve the flexibility to adapt the application of the ERT to national or regional circumstances. On top of that, ETNO members proposed to incorporate risk and demand sharing models in the ERT, which generally should not be imposed in areas where the price control obligation is imposed.

Instead, according to ECTA and BREKO, the ERT has had limited success in ensuring effective access. ECTA members mention concrete problems they are facing with the ERT. Specifically, ECTA is of the opinion that the ERT is ineffective, in particular due to the fact that SMP operators are left to decide how to implement the test. ECTA also complains that the SMP operators' high prices at both wholesale and retail level cannot be prevented by margin squeeze based tool such as the ERT. ECTA generally does not support the use of the ERT as it "*neither provides for adequate control of potentially excessive pricing, nor does it sufficiently comprise considerations of economic efficiency and innovation based on a combination of technology and pricing*". Due to this it suggests as a minimum, the use the Reasonably Efficient Operator (REO)[210] standard or at least EEO with scale adjustment.[211]

The FTTH Council considers that the concept of ERT should be reviewed in order to reflect the evolution of market conditions and the new regulatory landscape stemming from the EECC. In particular they stress the development of new operators deploying FTTH networks, and the increasing shift towards infrastructure competition.

Further, during the workshop organised and conducted on 15 April 2021 by Visionary Analytics, NRAs expressed their support on the ERT as a competitive safeguard in the context of pricing flexibility. However, it was raised that incorporating long-term pricing into the ERT may create challenges for smaller operators and new entrants, because it is mostly large operators that have volume discounts or long-term pricing. Moreover, in respect to portfolio versus product-by-product approach, it was noted that the portfolio seems to have some advantages, such as leaving market participants more flexibility in setting prices. In respect to

[210] The Reasonably Efficient Operator (REO) stands for the margin squeeze test for an efficient operator in the downstream market, where the costs are based on a generic (alternative) operator which does not (yet) have the scale of the SMP operator.

[211] The Adjusted Equally Efficient operator (adjusted EEO) margin squeeze test starts with the SMP operator's cost and adjusts it to the scale of the generic (alternative) opera-tor for which the margin squeeze test is conducted.

these two approaches, it was also noted that national circumstances might dictate whether a product-by-product or a portfolio approach is more appropriate. Specifically, based on the NRAs' views, it seems that when competition is higher, the portfolio approach may be more suitable, while the existence of a strong incumbent could favour the product-by-product approach.

In the workshop organised and conducted on 9 June 2021 by Visionary Analytics with market operators only, stakeholders expressed the view that the ERT plays a fundamental role in ensuring effective and non-discriminatory access. However, some of them were on the opinion that there is need for new guidelines to assist the NRAs to achieve a more consistent approach on the application of the ERT. It appears, based on specific stakeholder's view, that different NRAs have applied ERT with a very wide range of application methods, sometimes alongside cost-orientation. Hence, it appears that the current guidance leaves too much margin for discretion for NRAs on the implementation of the ERT.

Evidence gathered in the Visionary Analytics Study

Visionary Analytics Study confirms the findings of the above-mentioned BEREC's 2021 Regulatory Accounting Report in respect to the use of the ERT in the context of pricing flexibility. Specifically, it confirms that NRAs make extensive use of ex ante MSTs, but only a few use the ERT as an alternative to price control in the sense meant by the NDCM Recommendation since only a few have implemented pricing flexibility. However, based on the findings of the Visionary Analytics Study, where NRAs apply flexibility, they tend to follow the guidance provided for the ERT and consider that the guidance provided in the NDCM Recommendation will likely continue to be adequate to deal with future technological and market evolutions. Specifically, in the respective online survey which was conducted in the context of the study, 8 NRAs responded that the guidance on the implementation of ERT provided in the NDCM Recommendation is likely to continue to be adequate to deal with future technological and market evolution, while only 3 disagreed (11 others could not answer the question).

In respect to the effects of the application of ERT, Visionary Analytics Study states that there is indication that in countries that applied the recommended pricing flexibility or those which previously applied only a margin squeeze test, NRAs consider that the approach has contributed to promoting efficient investment in NGA/VHCN, leading to an increase in NGA/ VHCNs and better quality of service for end-users.

In respect to possible gaps in the current guidance, the Visionary Analytics Study founded some in respect to the following points:

(1) Dealing with retail product bundles
(2) Level of aggregation of retail products to run the ERT (i.e. individual products versus a portfolio of products)
(3) Scale economies and scale adjustments
(4) Treatment of possible long term and volume discounts at the wholesale price

(5) Time frame in which the ERT should be conducted
(6) Use of a replicability test at the wholesale level (i.e. economic space between the various related wholesale products)
(7) Transparency of the process of designing the ERT

In reference to the above points, the Visionary Analytics Study provides the following recommendations:

In respect to the retail product bundles and the level of aggregation of retail products to run the ERT, the recommendation given by the Visionary Analytics Study is that in the flagship's product identification exercise, NRAs should take into consideration the national circumstances. In this context, the NRAs should take into consideration parameters such as the degree of market power of the SMP operator, and the prevalence and nature of bundled offerings. In addition, in respect to the treatment of unregulated services within a bundled flagship, the Visionary Analytics Study identifies three possible approaches to conduct the ERT on bundles:

- Impute a price for just the regulated elements of the bundle. The stand-alone price of the unregulated elements of the bundle is subtracted from the total. This approach might not be satisfactory if for instance the stand-alone offers are not much taken up. Also, the price of the bundle will often be considerably less than the sum of the stand-alone prices of its components;
- Apportion the price of the bundle to the different components of the bundle. This may be difficult to do in practice. Further, it is not clear how to deal with possible cross-subsidisation of some elements of the bundle by other elements;
- Conduct the ERT for the bundle as a whole. The challenge in this case is that it is necessary to estimate the cost of all of the regulated and unregulated components.

In respect to the above approaches, Visionary Analytics Study identifies the apportion the retail price to the different elements of the bundle as the most promising approach in general. However, it notes that it is not clear if this can fit for all Member States or in all circumstances. For this reason, Visionary Analytics Study suggests that each NRA should conduct this assessment on a case-by-case basis.

Further, in respect to the information gathering on the unregulated components, Visionary Analytics Study recommends that the successor recommendation should clarify that information needed to allocate the price of a flagship retail bundle across regulated elements and any non-regulated elements of the retail bundle for purposes of the ERT falls within the scope of Art. 20(1) EECC. Hence, the SMP operator must respond to these information requests, even where they involve non-regulated services.

In respect to possible scale adjustments, Visionary Analytics Study notes that a scale adjustment will not necessarily required in every Member State. However, in cases in which a scale adjustment is required, this should reflect the overall level of competition for broadband and for VHCN in the Member State.

In respect to the treatment of possible long term and volume discounts at the wholesale price, Visionary Analytics Study concluded that this requires a case-by-case analysis. However, it stresses that in most cases, long term discounts and volume discounts to wholesale prices should be ignored when conducting the ERT.

In respect to the time frame in which the ERT should be conducted, Visionary Analytics Study states that it appears to be a trade-off here between providing the NRAs with time that they might occasionally need (but not always), versus possibly introducing delay into an already lengthy process. Due to this, permitting the NRA to initiate the ERT up to three months after the launch of the relevant retail product and completed within four months thereafter, as this is set in point 56(b) of the NDCM Recommendation, continues to be appropriate.

As regards to the use of a replicability test at the wholesale level, Visionary Analytics Study points out that this was probably never a major issue for the EU overall. However, there is still some possibility going forward that the price of SMP offers for VULA and unregulated bitstream might not leave enough economic space for competitors to offer bitstream service in certain Member States. However, it concludes that the existing guidance (recital 63 of the NDCM Recommendation) remains generally fir for purpose.

Finally, as regards the transparency of the process of designing the ERT, Visionary Analytics Study suggests that the successor recommendation should expand the list provided in point 56(a) of the NDCM Recommendation. The new aspects include, where applicable: how flagship products will be determined, whether flagship products are intended to be individual versus portfolio products, and what approach will be taken to any unregulated products that are part of the flagship bundle.

Updated guidance on ERT

Based on the replies to the targeted consultation and the Visionary Analytics Study, the Recommendation confirms the approach advocated in the NDCM Recommendation (now also incorporated in the EECC) and, if feasible, provides further, targeted guidance on the main issues faced by NRAs since then.

The areas where clarifications are required include:

(1) whether the flagship products assessed under the ERT should be individual products versus a portfolio of products;[212]
(2) if a bundle includes unregulated services (for example, video content), then how to reflect this in the ERT;

[212] An individual product is considered both a bundled product or a stand-alone product. A portfolio of products can include a range of products, including stand-alone and/or bundled products. As an example, a portfolio consisting of three products can include one “internet-only” product, one “bundle with internet+TV” product and one “bundle with internet+TV+mobile” product.

(3) in dealing with scale economies;
(4) how to deal with volume discounts and long term pricing in the ERT; and
(5) the process to be followed in order to ensure transparency and stakeholder engagement;
(6) timeframe for conducting the ERT and possible adjustments.

We consider each of these in turn.

1) Flagship products assessed under the ERT - individual versus a portfolio of products

The NDCM Recommendation calls on NRAs to implement the ERT only for "flagship" products. Specifically, in recitals (66) and (67) of the NDCM Recommendation mentions: *"The NRA need not to run the test for each and every new retail offer but only in relation to flagship products to be identified by the NRA. ... NRAs should ... assess the margin earned between the most relevant retail products including broadband services (flagship products) and the regulated NGA access input most used ... as the most relevant for delivering the retail products for the market review period in question."*

However, the NDCM Recommendation leaves NRA some margin of discretion to define what the relevant "flagship" products can be. Specifically, it does not provide any guidance on the applicability of ERT to individual products versus a portfolio of products. The trade-offs between portfolio versus product-by-product approaches are clear enough in principle. A portfolio approach provides the SMP operator with more flexibility, makes it easier for the SMP operator to implement welfare-enhancing Ramsey-Boiteux pricing principles[213] and in some Member States may better reflect market realities; however, it potentially permits a selective price squeeze on some products and may reflect market realities less well in some other Member States.

In respect to the principles for the selection of the ERT flagship products, the Recommendation continues to provide the same level of flexibility to the NRAs as in the NDCM Recommendation. However, it stresses clearly that NRAs should take into account the national circumstances such as the degree of market power of the SMP operator, and the prevalence and nature of bundled offerings.

Furthermore, factors that the NRA should take into account include:

(1) how the SMP operator packages its most popular offerings in practice (e.g. whether as individual connectivity offerings, versus, for instance, bundles that include unregulated elements such as content); and

[213] With Ramsey-Boiteux pricing, mark-ups on different offerings reflect demand elasticity for those offerings. Note that the SMP operator will in general be just as strongly motivated as the NRA to impose Ramsey pricing in order to maximise producer surplus (and total welfare), and is better able to do so because it has a better understanding of retail demand elasticities. Cf. Laffont and Tirole (2000), *Competition in Telecommunications*.

(2) whether the selection of a portfolio as an ERT flagship would provide an SMP operator, which has a high degree of market power in comparison to its competitors in the market, with too much scope to abusively price individual narrower offerings.

Another point that might also come into play is the geographic differentiation of wholesale products. The NDCM Recommendation considers this possibility by mentioning: *"Should national competitive circumstances show a difference between geographic areas in terms of the NGA access input used (for example in rural and densely populated areas) NRAs should vary the test based on specific inputs identified as the most relevant."*[214]

In respect to the issue of geographic differentiation, the Recommendation calls the NRAs to follow, while conducting the ERT, the same principles that are used in the case of geographically differentiated markets segmentation. In this case the ERT should reflect the geographic delineation based on the geographic differentiation of wholesale products. Following these principles, if a NRA identifies geographic differentiation of wholesale products, it will be appropriate to consider wholesale costs and retail prices separately for each one of the geographic areas in which SMP is present in which the wholesale products differ regionally. The ERT should seek to ensure that the prices for the flagship retail services leave enough economic space for competitors relative to the price or prices of the main SMP wholesale access products that could be used to produce them in each geographically differentiated area.

2) Treatment of unregulated components of a bundle in the ERT

Recital 283 of the Code highlights, in relation to the Code's end-users protection provisions[215], that "*Bundles comprising at least either an internet access service or a publicly available number-based interpersonal communications service, as well as other services, such as publicly available number-independent interpersonal communications services, linear broadcasting and machine-to-machine services, or terminal equipment, have become increasingly widespread and are an important element of competition*". As such, the NRA may find it necessary to designate as flagship product, bundles that include non-regulated inputs (including services and sometimes goods which are not electronic communication services).

Consideration of unregulated components

Conducting the ERT on bundled services that include unregulated components can become complex, both because the NRA must obtain information about many components of the bundle, and because non-replicability might be caused by unregulated components, in case for example a cross-subsidisation exists between the regulated and the non–regulated components of the bundle. Indeed, the regulated components might represent a small fraction of the cost

[214] NDCM Recommendation, recital 67
[215] Article 107 on bundled offers.

and price of a large bundle. Further, determining whether the costs of the unregulated components are efficiently incurred can also be challenging.

In respect to the approaches proposed by Visionary Analytics Study for conducting the ERT, the Recommendation calls NRAs to follow a case-by-case basis by taking into consideration the various specificities of the bundle products that are available in the respective Member State. Examples of these specificities is the penetration of the bundled services and the identification of the most important elements included in the broadband bundles. After this analysis, the respective NRA has to conclude to a specific methodology to estimate the cost of these most important elements. Examples of such elements that can be included in broadband bundles is the mobile services and the pay-tv components.

Table 7 demonstrates some key differences between the ERT models in Spain and the UK.[216]

Table 7: The ERT models in Spain and the UK.

CNMC's approach (ES/2021/2330)	**Ofcom approach (UK/2015/1692)**
The ERT applies a **joint replicability test** for analysing bundles. Hence, all the incomes and costs related to all the services included in the bundle are considered as a whole. The most important elements included in the broadband bundles are the mobile services and the pay-tv components. The **analysis of the mobile component** is based on a cost-model that takes the average prices for voice traffic and mobile broadband from Telefónica's existing MVNO contracts. In line with the EEO standard, CNMC applies these average prices to the different customers' consumptions of each broadband bundles. The **analysis of the *pay-TV* component** content differs depending on the ownership of content and channels: • For determining the cost of third-party channels (Discovery, Fox, etc.), CNMC calculates a monthly average cost per subscriber for	Ofcom proposes to require BT to set its charge for the VULA product in a way that ensures that a 'minimum VULA margin' (between the wholesale VULA price and retail prices for services that use VULA as an input) is maintained. Ofcom applied an 'adjusted EEO' conceptual approach for assessing costs and revenues. BT's own costs and revenues form the basis for the ERT, with two adjustments to reflect i) the lower average customer lifetimes of alternative operators and ii) lower bandwidth costs of alternative operators. LRIC+ standard was used to assess BT's costs. In deviation from the 'flagship approach' which is recommended in the Commission's 2013 Recommendation, Ofcom adopted a portfolio approach, which would take into account BT's entire portfolio of fibre-based packages in the analysis, rather than

[216] EC analysis on the basis of the relevant notifications

each of them based on current distribution contracts. • The cost of own non-premium channels and VoD Platform are proxied using total payments for content/editing from the previous semester. CNMC analyses the costs reported by Telefónica and verifies the distribution rights contracts to ensure that valuations are correct. As a result of this analysis, CNMC determines a monthly cost per subscriber and channel. • In the case of those channels that are subject to the NCA's wholesale offering obligation (currently 5 channels), the costs are equal to the wholesale price that alternative operators pay Telefónica for access. According to the commitments of the Telefónica/DTS merger operation, Telefónica must meet three different economic replicability tests linked to the wholesale offering obligation of premium channels without prejudice of the existence of other mechanisms the NCA applies to survey the commitments and effective competition in the Spanish pay-TV markets. The treatment of these channels in CNMC's ERT is exactly the same as the one in the NCA replicability tests in Telefónica / DTS commitments. The aim is to ensure a consistent approach to replicability from CNMC as an integrated body. Besides the ERT, CNMC considers the	individual products or bundles. ERT assess the existence of a minimum margin between the wholesale VULA price and retail prices for services that use VULA as an input. In this respect, although broadband may be sold as a stand-alone product, the reality is that it is typically sold bundled with other services. In the specific UK scenario, Ofcom considered it appropriate to include the costs related to premium content (in particular of BT Sports rights) in the assessment of the VULA margin. In Ofcom's view, excluding BT Sport from the ERT would leave a 'gap' in the test which would allow BT to set a margin that is insufficient for an (adjusted) EEO to compete profitably against BT's superfast broadband packages, where these are bundled with (free) access to BT Sport. Ofcom's assessment of the VULA margin was based on historical data provided by BT, in order to consider whether the net present value of the ongoing monthly margin is sufficient to cover the upfront net costs, which would be amortised over the average customer lifetime of 5 years.

network costs generated by pay-TV as follows: (i) the costs of the Ethernet network are generated by the BU-LRIC cost model; (ii) the cost of all other elements is based on Telefónica's regulatory account.	

Source: Commission analysis based on the relevant article 7/32 notifications

Cost information regarding unregulated components

One important issue for the cost analysis of these complex bundles that incorporate unregulated components seems to be the lack of reliable information in relation to the cost of the unregulated components. This is mainly because SMP operators sometimes refuse or delay to provide or provide incomplete or misleading information about the distribution of costs or revenues for the different components of a bundle that includes both regulated and non-regulated elements. In particular, SMP operators dispute in practice whether they are obliged to provide information about otherwise non-regulated products, and there is a risk that NRAs will be unable to properly implement the ERT in consequence.

In that regard, it should be noted, that Article 20(1) of the EECC is addressing this issue by clearly mentioning that *"Member States shall ensure that undertakings providing electronic communications networks and services, associated facilities, or associated services, provide all the information, including financial information, necessary for national regulatory authorities, other competent authorities and BEREC to ensure conformity with the provisions of, or decisions or opinions adopted in accordance with, this Directive and Regulation (EU) 2018/1971 of the European Parliament and of the Council.(...) Where the information collected in accordance with the first subparagraph is insufficient for national regulatory authorities, other competent authorities and BEREC to carry out their regulatory tasks under Union law, such information may be inquired from other relevant undertakings active in the electronic communications or closely related sectors. Undertakings designated as having significant market power on wholesale markets may also be required to submit accounting data on the retail markets that are associated with those wholesale markets."*

In light of these provisions, the Recommendation clarifies that where an NRA designate a bundle product comprising non-regulated inputs (including goods and services which are not electronic communication services), it should be able to request from the SMP operator and other electronic communication services (ECS) operators the information needed to allocate the price of a flagship retail bundle across regulated elements and any non-regulated elements of the retail bundle for purposes of the ERT constitutes *"information, necessary for national regulatory authorities, other competent authorities and BEREC to ensure conformity with the provisions of ..."* falls within the scope of Art. 20(1) of the EECC. In specific circumstances where the NRA has tried to collect the information from ECS operators but has not been able

to obtain, it may consider inquiring this information from undertakings active in closely related sectors, such as content providers[217] where necessary to exercise their tasks.

3) Dealing with scale economies - Equally Efficient Operator (EEO) versus a scale-adjusted Equally Efficient Operator

The implementation of an ERT, as it is the case with any other similar MST, involves a certain number of key methodological choices, including in regard of the choice between the EEO, the REO or the adjusted EEO tests.

In respect to this issue, although the NDCM Recommendation suggests the equally efficient operator (EEO) test, it also provides for the possibility of scale adjustments (i.e. adjusted EEO). Specifically it is mentioned: *"Where specific market circumstances apply, such as where market entry or expansion has been frustrated in the past, NRAs may make adjustments for scale to the SMP operator's costs, in order to ensure that economic replicability is a realistic prospect. In such cases, the reasonably efficient scale identified by the NRA should not go beyond that of a market structure with a sufficient number of qualifying operators to ensure effective competition."*[218]

Taking into consideration the maturity level in the broadband access markets that has been achieved in the meantime, the Recommendation calls the NRAs to follow the same principles set in the NDCM Recommendation (i.e. EEO or scale-adjusted EEO tests). In particular, the Recommendation maintains the possibility to apply a scale adjustment, where justified by specific market circumstances. This could be the case in particular where significant imbalances in terms of economies of scale and scope exist between the SMP operators and its competitors.[219] Also in these cases, it should be stressed that the estimation of the scaling factor is not a straightforward exercise, and in order to be efficient should be adjusted to the market circumstances (i.e. size of competitors). In addition, the value chosen potentially has an important impact on prospects for competitive entry. Due to this, the scale factor must be chosen with care. If, on the one hand, it is set too high, it limits the number of competitors that can be expected to successfully enter or maintain themselves in the market. If, on the other hand, the scale adjustment is set too low, it might possibly lead to inefficient competitive

[217] See Recital 57 of the Code.
[218] NDCM Recommendation, recitals 64 and 65
[219] An example of such an imbalance can be seen in Luxemburg, were the SMP operator enjoys a market share of above 60% while all other competitors have very low market shares. In this case, the NRA proposed, in the context of the ERT, to model the replicability of retail flagship products for an access seeker with an assumed market share of 15% while no alternative operator currently reaches this threshold. Furthermore, according to NPA's own assessment, only one company might reach that market share by the end of the regulatory period while other access seekers represent only 2-3% of the retail market. Based on this, the Commission commented in its decision that it is unlikely that, during the review period, these operators will reach the economies of scale comparable to that used for the purpose of ERT assessment. Therefore, the Commission urges the NRA to revisit the assumptions of the proposed ERT in the light of current market conditions in order to ensure that alternative operators are actually able to recreate the SMP's flagship products and to effectively compete and gain market share vis-à-vis the incumbent on the basis of regulated wholesale products. (case LU/2019/2141)

entry. Further, if it were to be set so low as to result in setting the price of wholesale products below the SMP operator's costs, it can be expected to lead to economic distortions.

Based on the above, it becomes evident that the scale adjustment should reflect the overall level of competition for VHCN in the respective Member State. For this assessment, the Recommendation proposes several factors that should be taken into account, as appropriate, which for instance might include:

- the number of competitors that are likely to be sustainable at each level of the value chain,
- the current HHI[220] at each level of the value chain and its expected evolution over time,
- the size of the largest competitors relative to that of the SMP operator, and
- the size of the VHCN market in the Member State (which might influence the number of competitors that can be economically sustainable).

4) Volume discounts and long term pricing in the ERT

The use for purposes of calculating the ERT of long term discounts, volume discounts and commercial agreements that have been negotiated between the SMP operator and one or more alternative operators would tend to imply a lower wholesale price for analysis, and thus once again implies that some flagship products would pass the ERT that otherwise might fail. In effect, smaller alternative operators might not have enough economic space to operate profitably.

For this reason, NRAs should in principle base the ERT on the non-discounted price of wholesale services, and to use the scale adjustment to the EEO test to ensure that the market is sufficiently open to competition. Therefore, in most cases, long term discounts and volume discounts to wholesale prices should be disregarded when conducting the ERT. If, however, the market is such that a significant part of access seekers actually receiving wholesale services at discounted prices, then it will typically be appropriate to reflect them in the ERT. This is because, in such markets, the NRA may need to explicitly reflect discounts in order to accurately reflect market realities in conducting the analysis. Based on the above, it becomes evident that the handling of long term discounts and volume discounts in the ERT requires a case by case analysis by the NRA.

5) Ensuring transparency and stakeholder engagement

The ERT is an important procedure for which transparency and stakeholder engagement are important. Recitals (66) and (67) of the NDCM Recommendation provide basic guidance: *"The NRA should set out and make public in advance in its adopted measure following a*

[220] The Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration. It is calculated by squaring the market share of each firm competing in a market and then summing the resulting numbers. It can range from close to zero to 10,000.

market analysis the procedure and parameters it will apply when running the ex ante economic replicability test. … The economic replicability test set out by the NRA in advance should be adequately detailed and should include as a minimum a set of relevant parameters in order to ensure predictability and the necessary transparency for operators."

Point 56(a) and Annex II of the NDCM Recommendation identify a number of aspects of the ERT that must be subject to public consultation in advance: (1) the relevant downstream costs taken into account; (2) the relevant cost standard; (3) the relevant regulated wholesale inputs concerned and the relevant reference prices; (4) the relevant retail products; and (5) the relevant time period for running the test.

To enhance the predictability and the necessary transparency for the operators, the Recommendation expands the list to include, where applicable: (6) how flagship products will be determined, (7) whether flagship products are intended to be individual versus portfolio products, and (8) what approach will be taken to any unregulated products that are part of the flagship bundle.

6) Timeframe for conducting the ERT and possible adjustments

In the context of the targeted consultation, BEREC indicated that there might be a need to revise the time limits for conducting the ERT by NRAs.[221] Specifically, BEREC is of the view that these limits should be compatible with any required follow-up activity to update the list of flagship products, following their evolution, and revise the result of the replicability analysis.[222] In case relevant changes are detected, NRAs can update the list of flagship products or revise the result of replicability analysis according to updated information more rapidly.

In practice, the NRA's choice of timing for conducting an ERT (if one is needed at all) is likely to depend on many factors, including the degree to which the retail product is entirely new versus being a minor adaptation of an existing retail product. The fact that the NRAs have the option to apply the test *ex post* appears to be positive to the extent that this provides useful flexibility to the SMP operator to avoid needlessly delaying product introduction. However, even so, the time frame could easily be problematic if for example a product fails the ERT months after it has been released.

For this reason, the timing constraints as these are defined in Para. 56(c) of the NDCM Recommendation continue to be appropriate. However, in cases where the NRA has to follow up the evolution of flagship products or revise the result of replicability analysis according to updated information, the time constraint of four months that is mentioned in Para. 56(c) of the

[221] Para. 56(c) of the NDCM Recommendation states that: "*the procedure that the NRA will follow to conduct an ex-ante economic replicability test, specifying that the NRA can start the procedure on its own initiative or at the request of third parties, at any time but no later than three months after the launch of the relevant retail product, and will conclude it as soon as possible and in any case within four months from starting the procedure*"

[222] This follow up of the evolution of existing flagship products it may be related for example to price modifications, temporary discounts, incorporation of new bundled services and others

NDCM Recommendation can be extended to five months. In this case the NRA should provide the proper justification regarding the necessity of this extension. Furthermore, if a Technical Replicability Test (TRT) is also required, the timing of the two tests (i.e. TRT and ERT) should be aligned as much as possible.

7.1.6 Other situations where price control obligations may not be appropriate

As indicated above, pricing flexibility as foreseen in the Code is not the only circumstance where price control obligations may not be appropriate – provided that effective and non-discriminatory access is ensured. This is confirmed in the new Recommendation.

In particular, following Recital 193, this may be the case in particular in situations characterized by high elasticity of demand, or in situations where the business case of deploying a VHCN would be marginally viable even absent regulation, for instance in lower population density areas.

Moreover, commercial agreements or voluntary commitments under Article 79 should also be taken into account when considering the appropriateness of imposing remedies. In particular, where such initiatives would contribute to VHCN deployment while ensuring that access is provided under fair and reasonable terms conditions (including financial conditions), imposing intrusive price control obligations could not be proportionate.

7.2 Pro-investment approaches to price control obligations

7.2.1 Costing methodology

<u>Costing methodology</u>

Cost recovery is a key principle in any costing methodology. This includes an appropriate return on invested capital. A costing methodology should provide a 'build-or-buy' signal to strike an appropriate balance between ensuring efficient entry and sufficient incentives to invest in infrastructure.

Main cost allocation methodology are *Long-run (average) incremental cost (LR(A)IC)*[223]and *Fully distributed costs (FDC)*[224]. LRAIC can refer to two types of modelling approaches used for estimating the cost of the services, which are Bottom Up Long Run Incremental Cost Plus

[223] The LRIC approach calculates the incremental costs (including a reasonable rate of return) which the SMP undertaking incurs when providing an additional wholesale access service to independent retail undertakings (including its own retail arm). In the long term, all costs are considered to be variable because the production capacity is not a constraint (as it is the case in the short term). Therefore, LRIC includes capital and the volume-sensitive costs resulting from a substantial change in production.

[224] Under FDC, all costs, including joint and common costs, are fully allocated to all the operator's services/products according to a specified distribution/allocation key. Therefore, the costs of a given service/product are composed of direct volume-sensitive costs, direct fixed costs and a share of joint and common costs.

(BU LRIC+)[225] and Top Down Long Run Incremental Cost plus (TD LR(A)IC+)[226]. In contrary, FDC refers to the fact that the cost of the services has been determined taking into account the results of the regulatory accounting system of incumbent operators.

A NRA can evaluate a cost either by the actual cost incurred by the investor (historic cost) or by the estimated "current cost" or "replacement cost" (the hypothetical cost faced by a (hypothetical) entrant). Under a historic approach, the relevant asset value is determined at the time of the investment and is never reappraised: the relevant cost measure in each period is always based on the actual investment cost. Under a current cost appraisal approach, the asset value is reappraised each period to reflect the current cost of building the asset. Therefore, with falling deployment costs, the asset value can fall below the value of investment made by the incumbent. Such a valuation aims to reflect the market value (rather than just historic value) of the asset. Typically, such an approach would rely on a detailed 'bottom-up' engineering model to estimate the cost of deploying the modern efficient network.[227]

<u>The Code</u>

Article 74 of the European Electronic Communications Code provides in particular that: "*In determining whether price control obligations would be appropriate, national regulatory authorities shall take into account the need to promote competition and long-term end-user interests related to the deployment and take-up of very high capacity networks. (...)".* The Code establishes general principles for cost accounting, stating in particular that it falls on the SMP operator subject to a cost orientation obligation to demonstrate that the charges derive from the costs and that NRAs may use other cost accounting methodologies than those used by the undertaking. NRAs shall make public a description of any cost accounting system that is used to support price control. In particular, Article 71 of the Code states that: *A national regulatory authority may, in accordance with Article 68, impose obligations for accounting separation in relation to specified activities related to interconnection or access. In particular, a national regulatory authority may require a vertically integrated undertaking to make transparent its wholesale prices and its internal transfer prices, inter alia to ensure compliance where there is an obligation of non-discrimination under Article 70 or, where necessary, to prevent unfair cross-subsidy. National regulatory authorities may specify the format and accounting methodology to be used.* Hence, in order to enforce cost-orientation obligations, NRA should impose accounting separation pursuant to Article 71 of the Code.

<u>2010 NGA Recommendation</u>

[225] The bottom-up (BU) approach develops the cost model on the basis of the expected demand in terms of subscribers and traffic and sets the network design and estimates the related costs on the basis of a network engineering model.

[226] Top-down approach allocates costs using existing accounting data. It takes the existing cost structure of a group of services, and allocates the direct costs incurred in producing each product. The remaining common costs are allocated to each product using various cost-causation methods such as input coefficients.

[227] A taxonomy of costing methodology choices is presented in the study "Costing methodologies and incentives to invest in fibre" by Charles Rivers Associate for the Commission (April 2012).

The 2010 NGA Recommendation[228] indicated that NRAs should consider whether duplication of the relevant NGA access infrastructure is economically feasible and efficient. The purpose was to create a genuine level playing field between the downstream arm of the SMP operator and alternative network operators. This may therefore imply that NRAs use different cost bases for the calculation of cost-oriented prices for replicable and non-replicable assets, or at least adjust the parameters underpinning their cost methodologies in the latter case.

In line with the regulatory framework at the time (and also now with Article 71 of the Code), the NGA Recommendation provided that, to enforce cost-orientation obligations, NRAs should impose accounting separation on the SMP operator. Separated accounts for the NGA infrastructure and/or service elements to which access is mandated should be set up in such a manner that the NRA can:

(i) identify the cost of all relevant assets for the determination of access prices (including depreciation and changes in the evaluation) and

(ii) monitor effectively whether the SMP operator grants access under the same conditions and prices to other market participants as to its own downstream arm. Such monitoring should include the possibility to carry out margin-squeeze tests. To avoid double counting, costs should be allocated on the basis of objective criteria amongst the various wholesale and retail products that rely on such inputs.

NRAs should estimate the incremental costs required to provide access to the facilities concerned. Such costs relate to the ordering and provisioning of access to civil engineering infrastructure or fibre; operating and maintenance costs for IT systems; and operating costs associated with wholesale product management. These costs should be allocated on a proportionate basis between all undertakings enjoying access, including the downstream arm of the SMP operator.

On CEI, the NGA Recommendation provides that NRAs should regulate access prices to CEI consistently with the methodology used for pricing access to the copper ULL.

<u>2013 NDCM Recommendation</u>

The NDCM Recommendation explicitly suggests using a (BU LRIC+), based on an efficient NGA network, consisting wholly or partly of fibre. Point 25 of the Recommendation emphasises that a costing methodology should lead to access prices replicating as much as possible those expected in an effectively competitive market. This *"... costing methodology should be based on a modern efficient network, reflect the need for stable and predictable wholesale copper access prices over time, which avoid significant fluctuations and shocks, in order to provide a clear framework for investment and be capable of generating cost-oriented wholesale copper access prices serving as an anchor for NGA services, and deal*

[228] See in particular Annex I

appropriately and consistently with the impact of declining volumes caused by the transition from copper to NGA network,…"

The NDCM Recommendation recommends NRAs to define a hypothetical efficient NGA network when modelling an NGA network and include any existing civil engineering assets that are generally also capable of hosting an NGA network as well as civil engineering assets that will have to be newly constructed to host an NGA network. Therefore, when building the BU LRIC + model, NRAs should not assume the construction of an entirely new civil infrastructure network for deploying an NGA network.

Valuation of the assets of such an NGA network at current costs best reflects the underlying competitive process and, in particular, the replicability of the assets.

As regards SMP operators' CEI, the guidance in the NDCM Recommendation examines different possibilities. For new CEIs, the NDCM Recommendation calls for the "*valuation of the assets of such an NGA network at current costs*" (Point 33). For reusable existing SMP CEIs, however, the NDCM Recommendation says: "*In the recommended costing methodology the Regulatory Asset Base (RAB)*[229] *corresponding to the reusable legacy civil engineering assets is valued at current costs, taking account of the assets' elapsed economic life and thus of the costs already recovered by the regulated SMP operator. Therefore, the initial RAB corresponding to the reusable legacy civil engineering assets would be set at the regulatory accounting value, net of the accumulated depreciation at the time of calculation and indexed by an appropriate price index, such as the retail price index*." (Points 35 and 37 NDCM Recommendation)

As mentioned in the Visionary Analytics Study[230], the NDCM Recommendation recognises that the balance between the regulated wholesale access prices for copper ULL and for fibre unbundling is a crucial element in defining the speed with which SMP operators would phase out their legacy infrastructure. The price of copper as a metal was increasing at the time, which implied possibly higher LRIC costs. There were also calls for a lower LRIC copper cost in order to accelerate the deployment of fibre.

The recommended approach was expected to "*lead to stable copper access prices and a Union average monthly rental access price for the full unbundled copper local loop within a band between EUR 8 and EUR 10 (net of all taxes) expressed in 2012 prices (the price band)* (Point 38).

Pursuant to point 40 of the recommendation, NRAs may continue applying other costing methodologies as long as these methodologies:

(i) where used at the time when the NDCM Recommendation was adopted;

[229] Regulatory Asset Base (RAB) means the total capital value of the assets used to calculate the costs of the regulated services.
[230] See Visionary Analytics Study p. 61

(ii) meet the objectives of BU LRIC+ (particularly the creation of incentives for investment in NGA networks);
(iii) reflect the shift from a copper to an NGA network if the cost methodology is not modelling an NGA network;
(iv) take into account that certain civil engineering assets will probably not be replicated and;
(v) guarantee stable, transparent and foreseeable copper network access prices.

Regulatory Practices by NRAs

BEREC's 2021 Regulatory Accounting Report confirmed the trend towards a consistent application of regulatory accounting frameworks by NRAs. This also reflects convergence in the application of the 2013 NDCM Recommendation. Most NRAs apply the whole set of remedies when SMP regulation is imposed on a specific product/market, where access obligation in combination with non-discrimination are the most frequently applied remedies.

As regards the cost methodology applied, BEREC's 2021 Regulatory Accounting Report[231] found that at least 14 NRAs in 2020 applied NDCM Recommendation paragraphs 30-37 (on BU LRIC+ cost orientation) against only 7 NRAs in 2016. 5 NRAs made use of the transitional regime established by paragraph 40 of the NDCM Recommendation.

According to BEREC's 2021 Regulatory Accounting Report[232], with regard to the cost base, current cost accounting (CCA) is by far the most commonly used methodology for all markets, with the exception of wholesale line rental products (WLR), where historic cost accounting (HCA) is more frequently used. Brief overview can be seen in table 8 on certain markets.

[231] BEREC Report: Regulatory accounting in practice 2021 (p.55)
[232] BEREC Report: Regulatory accounting in practice 2021 (p.45)

Table 8: Cost base per Member State and market.

	ULL	VULA FTTC	VULA FTTH	Fibre ULL	Dark fibre in the access segment	Duct in the access segment	Bitstream FTTC	Bitstream FTTH
HCA	LI, LT, MT				LT	LT		LT
CCA	AT, BE, CY, DE, DK, EL, ES, FI, FR, HU, IE, IT, LU, LV, PL, SE, SI	BE, CY, DE, EL, HR, HU, IE, IT, LV	BE, CY, EL, ES, HR, HU, IT, LV	BE, DK, FI, HR, HU, LV, PL	CZ, DE, DK, EL HR, HU, IE, IT, LV PL, SI	BE, DE, EL, FR, HR, HU, IT, IE, LV, PL, SK, ES	BE, CY, DE EL HR, HU IE IT, LV PL	BE, DK, ES[233], HR, HU, IT, LV PL

Source: NRA responses to the online survey and BEREC's 2020 & 2021 Regulatory AccountingReports, unless stated otherwise in footnotes.

The most frequent cost allocation approach remains LRIC/LR(A)IC for almost all products/markets. In the access market (market 3a) a preference for LRIC/LR(A)IC can be found. In general, when LR(A)IC/LRIC is chosen as the main category, the most common approach is Bottom-up. With respect to the BEREC's 2020 Regulatory Accounting Report a reduction in the use of FDC can be detected also for Market 3b for legacy products and NGA products. BEREC's 2021 Regulatory Accounting Report found that within the copper network, ULL is still the most regulated product.

[233] Change of input in relation to the BEREC RA 2021 report. EC's letter on ES/2021/2316: "*In its reply to the RFI, CNMC explains that civil engineering assets are not valued at full replacement costs, as is the case for the other assets in the BU-LRIC model (e.g. equipment, cables), but at current costs that take into account their level of depreciation.*"

Table 9: Cost allocation methods.

Methodology	ULL	VULA FTTC	VULA FTTH	Fibre ULL	Dark fibre in the access segment [234]	Duct in the access segment	Bitstream FTTC	Bitstream FTTH
LRIC	CY, ES, LU, SE, SI	CY	CY, ES,		CZ, SI	SI	CY	ES
LR(A)IC	AT, BE, DE, DK, EL, FR, HU, IE, IT, PL	BE, DE, EL, HR, HU IE, IT	BE, EL, HR, HU, IT	BE, DK, HR, HU, PL	DE, DK, EL HR, HU, IT, PL	BE, DE, EL, HU, IT, PL, SK, ES[235]	BE DE EL HR, HU IE IT PL	BE, DK HR, HU, IT PL
FDC	FI, LT, LV, MT	LV	LV	LT, LV, FI	LT, LV	FR, HR, LV	LV	LT, LV

Source: NRA responses to the online survey and BEREC's 2020 & 2021 Regulatory Accounting Reports, unless stated otherwise in footnotes.

[234] The category 'dark fibre in the access segment' refers to ancillary services mandated to the SMP operator consisting in the provision of access to dark fibre, often as an alternative to access to ducts (e.g. for backhaul to reach street cabinets in the case of sub-loop unbundling).

[235] Deviation from BEREC's 2021 Regulatory Accounting Report. EC's letter on ES/2021/2316: "This is the first time that CNMC will price access to civil engineering infrastructure based on a bottom-up model (BU-LRIC+)"

Table 10: Allocation methods.

	ULL	VULA FTTC	VULA FTTH	Fibre ULL	Dark fibre in the access segment	Duct in the access segment	Bitstream FTTC	Bitstream FTTH
TD LR(A)IC+	DE, PL	DE		PL	DE, PL	DE, PL	DE, PL	PL
BU LR(A)IC+	AT, BE, DK, EL, FR, HR, HU, IE, IT,	BE, EL, HR, HU, IT	BE, EL, HR, HU, IT	BE, DK, , HR, HU	DK, EL HR, HU, IT	BE, EL, HU, IT, SK, ES	BE, EL, HR, HU, IT	BE, DK, HU, IT
TD LRIC					SI			
BU LRIC	CY, ES, LU, SE, SI	CY	CY, ES		CZ	SI	CY	ES

Source: NRA responses to the online survey and BEREC's 2020 & 2021 Regulatory Accounting Reports, unless stated otherwise in footnotes.

As a general rule as soon as a BU-LRIC+ model has been developed and its results have been delivered, the access prices, including for CEI, are regulated accordingly. Nonetheless the (full) application of BU-LRIC+ results has, sometimes, been postponed.

For instance, in case ES/2013/1465, the Spanish NRA (at that time CMT) declared that it had developed a BU-LRIC+ model. However, instead of setting the price by using the results of the BU-LRIC+ cost model, CMT made adjustments to this price by taking into account the SMP operator's cost accounting results and prices in a number of other Member States (France, United Kingdom, Italy and Germany). CMT believed these adjustments were necessary because the BU-LRIC+ model was being used for the first time, and relying only on the model would be risky and would counter the principles of regulatory security and price stability. Eventually, in 2021, the Spanish NRA (now CNMC) decided to rely solely on BU-LRIC+ model to regulate the access prices for, inter alia, CEI.

Also, as a general rule, the development of a BU-LRIC+ by the NRA leads to the removal of any other unnecessary price regulatory obligation on SMP operator. However, there is an exception:

In case LV/2021/2347, it became apparent that the Latvian NRA (SPRK) developed a BU-LRIC+ model. Notwithstanding the existing model, the SMP operator is still obliged to compute access prices, including for CEI, based on a fully distributed costs (FDC) model, as established by SPRK in its latest market review (which took place in 2018). This is happening although BU-LRIC+ results are used as inputs into an ERT which, according to SPRK, has precedence over the price calculations done by SMP operator.

In another case in Lithuania, the NRA (RRT, case LT/2015/1821) considered the application of the BU-LIRC+ model as disproportionate and instead proposed to impose a full set of obligations on the SMP operator TEO, including the price control obligation consisting of a price cap calculated by FDC cost model applying HCA. RRT considered it disproportionate at that stage to adopt a BU LRIC cost model using CCA, when (i) the transition from copper to NGA has already largely taken place in Lithuania; (ii) civil engineering assets, which are crucial for the deployment of alternative infrastructure, will not be replicated and should therefore not be valued at current costs.

The Commission noted that RRT's greatest concern when setting access prices is to ensure stability in the pricing of access to civil engineering, which enables the rollout of alternative next generation infrastructures and which has remained stable since 2011. The Commission agreed with the emphasis on stability to ensure that operators' investment plans could be carried out and could benefit end users as soon as possible. However, the Commission considered that the methodology chosen by RRT could compromise this stability in the long term. Indeed, in particular the choice of HCA for all assets in the cost model could potentially lead to very low access prices. The Commission argued that a FDC HCA model is unlikely to send the appropriate build or buy signals, in particular when pricing access to legacy assets that may have been substantially depreciated, but which could be replicated in the competitive process, such as technical equipment or the transmission medium. The more common BU LRIC+ CCA model used by other NRAs and recommended was likely to meet that objective. In the NDCM Recommendation, it is indicated that civil engineering assets are unlikely to be replicated in the competitive process, and for those assets it is therefore appropriate to take into account the assets' elapsed economic lifetime and the costs already recovered by the SMP operator. The Commission noted RRT's explanation that in its view its HCA valuation of civil engineering reflects this reasoning, although the Commission's recommended methodology applies the indexation method to determine the cost of civil engineering rather than a pure HCA standard.

Further, RRT in case LT/2019/2183 continued to apply the FDC costing methodology using HCA to set access prices. The main reasons, put forward by RRT for not relying on the NDCM Recommendation (point 40) were:

- The situation in the market shows that there is infrastructure competition in Lithuania, therefore according to RRT the results of BU LRIC+ model would lead to increase of retail prices. Moreover RRT carried out cost and benefit analysis of BU LRIC + model in 2017 and received negative results. As well, margin squeeze cases will be prevented by non-discrimination obligation, therefore RRT believes that FDC methodology has more advantages than BU-LRIC+,
- SMP and alternative operators invest into next generation networks (NGN) showing an appropriate “build or buy” decision signal, and
- RRT annually initiates an independent audit of Telia's FDC methodology and publishes audit findings. As well, Telia is obliged to publish information on cost calculation methodology, therefore RRT believes that current methodology is fair and transparent.

The Commission noted the reasoning provided by RRT to continue applying the FDC costing methodology using HCA to set wholesale access prices. The Commission noted in particular RRT’s indications that access prices have remained stable in the previous period of review and are expected to remain stable in the next one, that competition in the Lithuanian market is based on infrastructure, and that both the SMP operator and alternative operators are investing in NGN networks. However, for the next period of review the Commission calls on RRT to analyse closely the evolution of wholesale access prices and their impact on the market, and to be prepared to review its price control remedy, particularly for those areas where on the basis of current remedies infrastructure competition does not deliver an acceptable level of competition to end users.

In cases BE/2018/2073-2074-2075 the Belgian NRA (CRC) proposed to impose on the SMP operators the obligation to charge “fair” prices, to be set using a BU-LRIC model to be developed to a later stage, for fibre based products on WLA and WBA markets and for cable based bitstream. By "fair", CRC meant a price which allowed a reasonable margin between the cost of the product and the wholesale price. CRC argued that SMP operators' investments in risky assets, such as fibre and cable, justify a looser price control obligation for fibre and cable based access products compared to copper based access products, which the obligation to observe cost oriented prices was proposed. The ultimate aim of CRC was to encourage NGA deployment. CRC envisaged the price control to be complemented by a margin squeeze test. The Commission suggested, in view of the need to promote efficient investment in new and enhanced infrastructures, as required by Article 8(5) of the Framework Directive, that it might be more appropriate for CRC to take account of the investment risk in its calculation of the cost of capital, instead of an additional mark-up to the cost oriented prices resulting from the cost model. The Commission reiterated its comments in case BE/2021/2301 when the federal arm of Belgian NRA (IBPT) notified the results of its BU-LRIC model for fibre based products. The Commission also urged IBPT to regularly assess the impact of the proposed measure on the investment efforts actually made by the SMP operator and whether the margin resulting from the regulated prices remains aligned with the “fair” price obligation

application, in particular in the light of the evolution of take-up of FTTH services in the years to come.

On Regulatory Accounting in general, accounting separation is often imposed together with the cost accounting obligation. Some NRAs consider it necessary to impose both obligations in order to ensure that robust regulatory accounting information is available for each product. This rationale is related to the fact that accounting separation is useful for vertically integrated undertakings by using cost models to supplement price control measures in order to prevent unfair cross-subsidies (e.g. if the result of the cost model is higher than the cost derived from the accounts of the SMP operator), and when the regulatory framework, in perspective, can become less intrusive.

Pricing the access to CEI

As shown in the below table, the cost orientation principle set out in 2010 NGA Recommendation and 2013 NDCM Recommendation is largely followed by the NRAs that regulate access to CEI on the basis of SMP provisions. The table also shows that BU-LRIC+ is used as the costing methodology in most Member States where access to CEI is subject to cost orientation. This method has increasingly been used over the time[236]. Finally, when it comes to valuation of reusable CEI not yet fully depreciated the Regulatory Asset Base (RAB) approach, as provided by 2013 NDCM Recommendation and, more recently, by recital 187 of the Code is dominant. Some NRAs proposed equivalent solutions to RAB.

[236] For instance, the Italian NRA switched from other costing methodology to BU-LRIC+ in 2015 (case IT/2015/1778), the Hungarian NRA in 2017 (case HU/2017/2021) and the Greek NRA in 2020 (case EL/2020/2237). In 2021 the Spanish NRA decided to regulate fully access prices to CEI based on BU-LRIC+ (case ES/2021/2316). Also in 2021 the Belgian NRA completed the development of a BU-LRIC+ model although its results are used just to assess whether the prices charged by SMP operator are fair and reasonable.

Table 11: Price control obligations with respect to CEI.

Country code	SMP access to CEI in force? (Y/N)	Cost orientation	Costing methodology	Valuation of reusable CEI not yet fully depreciated
BE	**Y**	**Fair and reasonable**		
BG	**N**			
CZ	**Y**			
DK	**N**			
DE	**Y**	**Y**	**BU-LRIC+**	**Equivalent RAB***
EE	**Y**	**Y**	**TD-FDC**	**HCA**
IE	**Y**	**Y**	**Mixed (BU-LRIC+ and TD-FDC)**	**HCA**
EL	**Y**	**Y**	**BU-LRIC+**	**RAB****
ES	**Y**	**Y**	**BU-LRIC+**	**Equivalent RAB**
FR	**Y**	**Y**	**TD-FDC**	**CCA**
HR	**Y**	**Y**	**BU-LRIC+**	**N/A**
IT	**Y**	**Y**	**BU-LRIC+**	**RAB**
CY	**Y**	**Y**	**BU-LRIC+**	**N/A**
LV	**Y**	**Y**	**TD-FDC**	**CCA**
LT	**Y**	**Y**	**TD-FDC**	**HCA**
LU	**N**			
HU	**Y**	**Y**	**BU-LRIC+**	**RAB***
MT	**Y**			
NL	**N**			
AT	**N**			
PL	**N**			
PT	**Y**	**Y**	**TD-FDC**	**HCA**
RO	**N**			
SI	**Y**	**Y**	**BU-LRIC+**	**RAB**
SK	**Y**	**Y**	**BU-LRIC+**	**RAB**
FI	**N**			
SE	**N**			

Source: Information provided by NRAs in their notifications under Article 7/7a of Framework Directive or under Article 32/33 of EECC.

*Equivalent RAB – reusable CEI assets not yet fully depreciated are valued at current costs that take into account their level of depreciation over the lifetime of the assets

**RAB - use of construction & construction and machinery price index instead of retail price index

In the regulatory practice the issue of the valuation of the reusable CEI not yet fully depreciated has been raised in several cases. In 2011[237] and once again in 2013[238] the Commission reminded the German NRA (BNetzA) that the choice of a current cost valuation for assets such as ducts, even if within a BU-LRIC+ costing methodology, may lead to unduly high wholesale input costs. In 2016[239] BNetzA changed its previous view and identified non-replicable assets (cable ducts, pipes, poles), which could be reused for the purpose of NGA-network deployment. Notwithstanding, for the non-replicable, reusable infrastructure elements, which were not fully depreciated, BNetzA decided to calculate the amortized value on the basis of current costs and depreciation over the lifetime of the assets. More recently, in 2021[240], the Spanish NRA (CNMC), also opted to value reusable CEI assets not yet fully depreciated at current costs that take into account their level of depreciation over the lifetime of the assets. The Commission did not comment against such an approach.

In 2020[241] the Belgian NRA (CRC) also proposed to use replacement costs for reusable CEI. In this context, it is important to underline that the case was about setting the access prices to cable networks. The CRC underlined that: "*Historically, the coax distribution cables were deployed on the façades of the buildings or poles or, if underground, directly buried (without ducts).There is therefore only a part of these assets that are reusable in the sense of the Recommendation 2013/466/EU*." However, finally CRC estimated that relying on replacement costs rather than RAB approach for the reusable assets (ducts, poles and trenches) only has a limited impact on the total costs, where the impact generally is below 1% and does not exceed 3% of the total costs of the network[242].
[243].

In one instance[244] the Commission underlined that fair and reasonable prices for access to CEI run the risk to be inefficient for two main reason. The first reason, where regulated prices did not accurately reflect the underlying cost of CEI of the SMP operator, they would distort investment signals. Second reason, if regulated prices for access to CEI were not cost-oriented but set at a higher level, efficient fibre investment would be replaced by other wholesale access possibilities and would delay investments.

Targeted consultation

BEREC replied to the targeted consultation that the BU LRIC+ cost modelling of a modern efficient network at current costs as recommended in the NDCM Recommendation is still relevant state-of-the art as it provides the appropriate build or buy signals that can promote

[237] Case DE/2011/1254
[238] Case DE/2013/1464
[239] Case DE/2016/1870
[240] Case ES/2021/2316
[241] Case BE/2020/2242
[242] Case BE/2020/2242
[243] Case BE/2021/2301
[244] Case IT/2009/0988

efficient entry and maintain incentives to invest in new and enhanced networks, in particular VHCNs.

BEREC further commented that the BU LRIC+ methodology should be applied irrespective of the technology of the new and enhanced network deployed/ to be deployed. As long as cost models take into account the costs and asset lives associated with a particular new technology then the appropriate economic signals will be sent and SMP operators will be adequately compensated. Hence, there is no requirement for differentiating between new technologies in cost methodologies. Also, NRAs should not distort investment decisions into different new technologies by applying different cost methodologies.

In response to the targeted consultation, ETNO said that the costing methodology described in the NDCM Recommendation has been established by all NRAs and has led to stability and predictability. Changes in the respective methodology would therefore not be required. Furthermore, ETNO believes that NRAs will increasingly need guidance on dealing with utility networks potentially cross-subsidising the construction of new VHCN networks services with their earnings from the utility market.

Deutsche Telekom also believes that the costing methodology has led to harmonized calculation methods and overall stable prices. The overarching goal should be to further support this stability. Amendments in the current costing methodology could lead to changes in the resulting prices and work against the goal of stability.

ECTA agrees that the costing methodology for access to legacy civil engineering assets of the SMP operator, relying on a Regulated Asset Base (RAB) and valued at current cost (points 34 to 38 of the European Commission's 2013 Recommendation), remains the appropriate one with regard to access to civil engineering infrastructure of the SMP operators. It is also appropriate to apply this methodology for setting the wholesale charges for unbundled access to the copper loop. A costing methodology should not provide particular deployment incentives specific network technologies, as long as these meet the required VHCN performance standards.

ECTA mentions that wholesale charges for unbundled access to the copper network of SMP operators have trended upwards in several Member States (Germany, France, Spain) since 2013. In some cases (Germany and France), several successive increases occurred.

Visionary Analytics Study

A majority of NRAs and stakeholders confirmed in their replies to Visionary Analytics' questionnaire that the current methodology works well. Several NRAs consider that the entry of alternative operators was facilitated and/or their market shares have increased thanks to cost orientation.

Visionary Analytics confirmed that the price band for copper ULL has ensured stability but also noted a growing divergence in the regulated maximum rates for ULL set across the EU.

Recital 41 of NDCM Recommendation states that a FTTH, a FTTC network or a combination of both can be considered a modern efficient NGA network. Visionary Analytics finds that NRAs could update their models to better meet the most recent policy targets. BEREC's 2021 Regulatory Accounting Report understands that DEA targets (The coverage at least of 30 Mbps to 100% and take-up of the population at 50% at 100 Mbps) are explicitly implemented in the BULRIC model by 8 NRAs[245]. Some NRAs use models that progressively evolve to full FTTH coverage. Visionary Analytics argues that NRAs should continue estimating cost difference between an access product based on FTTC/FTTH and on an access product entirely based on copper by replacing the optical elements with efficiently priced copper elements where appropriate in their VHCN engineering model.

Visionary Analytics mentions that some stakeholders ask for the new recommendation to update the guidance on the valuation of re-usable assets on a regulatory asset basis (RAB) as the cost models do not properly reflect the decreasing value of the access products.

Also, Visionary Analytics Study analyses the effectiveness of using long term access pricing and the use of volume discounts. In particular, Annex I, Point 7 of the NGA Recommendation specifies how to assess pricing in cases of long term contracts with upfront commitments. In addition, Annex I, Point 8 of the NGA Recommendation foresees a possibility for volume discounts. Pursuant to that, recital 188 EECC provides that "*in the event that price controls are considered to be appropriate, such terms and conditions can include pricing arrangements which depend on volumes or length of contract in accordance with Union law and provided they have no discriminatory effect*".

According to Visionary Analytics Study[246] ten NRAs report that long term access pricing is applied by the SMP operator for the pricing of regulated offers, while only five report volume discounts. Hence, the views on the impact of volume discounts on the deployment of NGA networks are divided, with some convinced of their usefulness to promote fibre deployment and some expressing strong doubts. The latter view corresponds to BEREC's Opinion on the original Draft NGA Recommendation, where BEREC stated that "*volume discounts are rather an instrument to foster penetration ("penetration pricing"), so reducing costs leads to the fact that scale is reached more quickly and gains are shared with access seekers"*. On the

[245] BEREC Report: Regulatory accounting in practice 2021 (p. 55)
[246] Page 101 and 102

other hand, a significant number of NRAs report the use of long-term pricing agreements in their respective Member States. Some say that these long-term commitments have supported NGA deployment.

Regarding the price regulation, Visionary Analytics Study concludes with the following recommendations:

- A successor recommendation should no longer provide a price band for wholesale access products;

- The guidance on costing methodology in Points 25 to 42 of the NDCM Recommendation continues to be relevant for new SMP CEI. This implies valuation based on the use of BU-LRIC modelling and current costs;

- In the future, NRAs should take into account the application of the 2030 Digital Decade targets, namely to ensure Gigabit coverage for all households in Europe[247]. As it is argued within the 2030 Digital Compass Communication (p.6): "As the decade progresses, households will increase the take up of such network technologies reflecting their rising needs for very high capacity connectivity. By the end of this decade, new digital communications features and capabilities such as high-precision, holographic media, and digital-senses over the networks, are expected to provide a whole new perspective to a digitally enabled society underpinning the need for gigabit connectivity. Well before the end of the decade, businesses will need dedicated Gigabit connections and data infrastructures for cloud computing and data processing, in the same way as schools and hospitals will need this for eEducation and eHealth. High performance computing (HPC) will require terabit connections to allow real-time data processing." Therefore, it is necessary to maintain consistency in the framework and to build on the objectives set out before in the DEA targets.

<u>Future guidance</u>

The NDCM Recommendation has led to the wide use and acceptance of the BU LRIC+ model by the NRAs. Therefore, the conclusion is to include the same cost model allocation in this Recommendation due to its continuing relevance. As stated in the NDCM Recommendation: *"The bottom-up long-run incremental costs plus (BU LRIC +) costing methodology best meets these objectives for setting prices of the regulated wholesale access services. This methodology models the incremental capital (including sunk) and operating costs borne by a hypothetically efficient operator in providing all access services and adds a mark-up for strict recovery of common costs. Therefore, the BU LRIC + methodology allows for recovery of the total efficiently incurred costs."* In addition, the NDCM Recommendation explains that *"The BU LRIC + methodology calculates the current costs on a forward-looking basis (i.e. based on up-to-date technologies, expected demand, etc.) that an efficient network*

[247] 2030 Digital Compass: the European way for the Digital Decade; COM(2021) 118

operator would incur to build a modern network today, one able to provide all required services. Therefore, BU LRIC + provides correct and efficient signals for entry." These reflections are still relevant in the current and foreseeable future settings.

In the past, the Commission has also pointed at the risks of diverging from this framework and has taken the view that HC/FDC methodology can have potentially negative effects, in particular with regard to the promotion and deployment of VHCN. Therefore the new recommendation insists on a more consistent application of a BULRIC + model.

The current framework and the guidance provided in the NDCM Recommendation, have brought increased stability and predictability of prices. NRAs and stakeholders acknowledge this and largely support the NDCM Recommendation approach. Overall, while the main principles underlying the NDCM Recommendation remain relevant, it is necessary to update its guidance in light of the Code and the Digital Decade connectivity targets for 2030 whilst continue promoting price stability[248]. Therefore, the modern efficient network to be modelled in line with the recommended methodology should be capable of delivering the targets of the Digital decade set out in terms of bandwidth and coverage. The modern efficient network to be modelled should therefore be a VHCN.

NRAs should adopt a BU LRIC+ costing methodology that estimates the current cost that a hypothetical efficient operator would incur to build a modern efficient network. The assets should be valued on the basis of replacement cost (except for reusable civil engineering assets where Regulated Asset Base continues to be recommended), so as to send the appropriate "build-or-buy" signal. This means, the cost base does not equal the book value (historic cost – depreciation) of the network but the cost of a new network. In most/all cases the cost base will be higher than the book value of the legacy network.

In addition, RAB is used for reusable civil engineering assets that are unlikely to be replicable. Alternative operators are not expected to be able to build parallel civil engineering infrastructure, at least not in cases where legacy civil engineering infrastructure can be used to deploy a VHCN. RAB corresponding to the reusable legacy civil engineering assets would not be valued at the cost of replacing them with new civil engineering infrastructure but at the regulatory accounting value, net of the accumulated depreciation at the time of calculation, which would take account for their elapsed useful life and thus the costs already recovered by the regulated SMP operator. As long as it is based on replacement costs this approach sends efficient market entry signals for build or buy decision but avoid the risk of a cost over-recovery for reusable legacy civil infrastructure that would not be justified to ensure efficient entry and preserve the incentives to invest because the build option is not economically feasible for this asset category.

[248] According to these targets, "all end users at a fixed location are covered by a gigabit network up to the network termination point, and all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G, in accordance with the principle of technological neutrality"

NRAs needs to regularly update the models to ensure consistency of the BU LRIC+ model and accuracy of the data within the model. In relation to the update of the model, according to NDCM Recommendation: *"When implementing the recommended costing methodology or alternative costing methodologies that comply with points 40 and 44, and the NRA maintains the methodology in line with point 46, NRAs should only update the data input into the costing methodology when conducting a new market review, in principle after three years. When updating the model, the NRAs should in principle, and provided that market conditions have remained stable, only adjust such data in line with the real evolution of individual input prices and should in any case ensure the full recovery over time of the costs incurred to provide the regulated wholesale access services. NRAs should publish the updated outcome of the costing methodology and resulting access prices over the relevant three-year period."* The new recommendation should not deviate from the previous recommended timeframe for updating the input data, given that a certain price predictability is maintained within the three-year period. The new recommendation should therefore include a provision pointing to an update of the cost model input data in principle twice during every market review period.

On the other hand, Member States should maintain the established methodology within two review periods in order to promote regulatory stability and predictability. It is therefore recommended that Member States monitor the situation and react as necessary by changing the methodology if there are significant changes in a particular market.[249]

When implementing the recommended costing methodology, NRAs should ensure that inflation is adequately taken into account. This can be done in several ways, for example, through the indexation of assets within the cost model itself or through a nominal rate of return on capital employed when determining regulated prices. In this regard, it is important to point out that inflation should be taken into account in only one way in order to avoid double counting. Consequently, double counting would lead to erroneous determination of final prices.

In addition, the new recommendation should retain Point 7 and 8 of Annex 1 of the 2010 NGA Recommendation concerning criteria to assess long term access pricing and volume discounts, in particular for FTTH deployments[250]. Namely, these provisions are in accordance with Recital 188 of the Code which states "*in the event that price controls are considered to be appropriate, such terms and conditions can include pricing arrangements which depend on volumes or length of contract in accordance with Union law and provided they have no discriminatory effect".*

[249] For instance, the Croatian NRA (HAKOM) adopted BU LRIC+ methodology in 2013 with an update in 2016 (See case HR/2016/1856). In 2021, HAKOM decided to update the methodology given the significant changes in HT's fixed network (complete transition to the so-called "all-IP network" and the abolition of TDM technology, construction of fiber optic network, etc.) the existing fixed network cost model no longer allowed the calculation of actual fixed network costs HT and determination of cost-oriented prices of wholesale fixed network access services.

[250] Annex 1 of the 2010 NGA Recommendation

The new recommendation no longer provides a price band for wholesale access products. The price band mentioned in point 41 of the NDCM Recommendation was used in the context of a transitory mechanism, which recognised the possibility for NRAs applying a costing methodology different than the one recommended in paragraphs 30 to 37 (or alternative methodologies pursuing the same objectives pursuant to paragraph 40), to continue to do so until the end of 2016 provided that the monthly rental price fell within the price band. This price band is therefore no longer used, and it is unclear what purpose a new price band would have.

7.2.2 Adequately rewarding the investment risk

Under cost orientation, the regulated price depends on the cost base and the appropriate cost of capital (measured by Weighted Average Cost of Capital – WACC). As indicated in the chapter above, under the recommended costing methodology, NRAs should apply a BU LRIC+ costing methodology that estimates the current cost that a hypothetical efficient operator would incur to build a modern efficient network. The assets should be valued on the basis of replacement cost (except for reusable civil engineering assets), so as to send the appropriate "build-or-buy" signal. This means, the cost base is not the book value (historic cost – depreciation) of the network but the cost of building a new network. In almost all cases the cost base will be higher than the book value of the legacy network.

In the past decade, most NRAs who implemented a separate WACC for NGA infrastructure did so by adding a risk premium on top of the general WACC, i.e. the WACC typically applied for the copper network wholesale prices. NRAs should be able to continue to apply this generally accepted method for setting the WACC in the framework of Very High Capacity Networks. This is, however, without prejudice to NRAs using other methods to set the WACC eligible for VHCN infrastructure, which do not involve determining separately the additional risk premium.[251]

As for cost of capital, the Commission's WACC Notice[252] (the Notice) has since 2019 provided detailed guidance on the methodology for estimating the regulatory WACC for legacy networks. The Notice is limited to the WACC calculation for legacy infrastructure which means infrastructure not subject to a Next Generation Access (NGA) premium of an SMP operator. The Notice does not address the applicability or the calculation of NGA risk premiums and excludes any consideration of the appropriateness of price control obligations for new VHCN. At the time of drafting the Notice, it proved difficult to estimate the systematic risk specific to each regulated service given the absence of listed companies only providing the regulated services in question. NRAs therefore often assume that the systematic

[251] As for instance seen in Belgium where the national regulator calculated a different WACC for each of the four services offered by the SMP operator – including a separate WACC for FttH. The approach for FttH WACC did not contain an explicit additional premium but rather estimated the overall cost of capital for such products (BE/2019/2185). Such practice would not be discouraged by this recommendation.

[252] Commission Notice on the calculation of the cost of capital for legacy infrastructure in the context of the Commission's review of national notifications in the EU electronic communications sector (2019/C 375/01)

risk for regulated services can be approximated by reference to the estimated systematic risks for a benchmark group of telecoms operators or the domestic SMP operator.

Since the implementation of the methodology from the Notice, we have seen a significant change in the economic landscape which the Notice could not foresee. As a result, the Notice may not adequately reflect current and future economic conditions (in particular inflation), which could lead to situations where investment in VHCNs is not adequately rewarded. As a result, the Notice may need to be revisited in the near future and the principles outlined in the current version, especially as regards inflation forecasts; NRAs may therefore decide not to use these principles as the basis when determining the cost of capital for VHCNs. In this regard and for the basis for any premium when rewarding investments into VHCNs, this staff working document refers to the applicable WACC, such as the WACC set in accordance with the methodology established in the Notice.

The Code provides for recognition in price control obligations of specific risk in particular for new investment network projects. According to Article 74 EECC, *"Where the national regulatory authorities consider price control obligations to be appropriate, they shall allow the undertaking a reasonable rate of return on adequate capital employed, taking into account* ***any risks specific to a particular new investment network project****."* Recital 180 indicates in that regard: "*When considering whether to impose remedies to control prices, and if so in what form, national regulatory authorities should seek to allow a fair return for the investor on a particular new investment project. In particular, there are risks associated with investment projects specific to new access networks which support products for which demand is uncertain at the time the investment is made.*"

There are reasons to consider that in many cases of VHCN investments, the applicable WACC may not reflect the full risks faced by investors[253]. For instance, in its latest study commissioned by OFCOM[254], the Brattle Group suggested that a fibre network could have a higher asset beta[255] than a copper-based network, because: a) demand for fibre may be more sensitive to changes in economic performance and household income; and b) the high investment requirements of fibre magnify the risk of the value of future assets onto the existing asset base. Moreover, risks may vary also between different fibre networks depending on the areas for which deployment is considered, for instance sparsely populated areas facing not only higher costs, but potentially also higher risks compared to densely populated areas.

[253] This is in line with the views of BEREC and the majority of stakeholders expressed in the context of preparation of Visionary Analytics Study. By contrast, ECTA considers that fibre is no longer riskier than copper as the uncertainties listed in the 2010 Recommendation have all been lifted by now and general uncertainty as regards demand and technology is rather limited today.

[254] Cost of Capital: Beta and Gearing for Wholesale Fixed Telecoms Market Review 2021 (https://www.ofcom.org.uk/__data/assets/pdf_file/0011/216002/wftmr-statement-brattle-report.pdf)

[255] As indicated in the WACC Notice (point 48), asset betas reflect companies' systematic risk, free of financial risk (i.e. risk associated with the level of financial leverage).

Although investments into fibre *very likely* come at a higher risk, not all fibre assets subject to price control should be compensated by a higher return. In some cases, the specific fibre investment was not found to be more risky than other investments as the risk of parallel deployment was rather limited whereas in other cases the reduced risk over time resulted in the removal of the imposed risk premium. [256]

As visible from the table below, most NRAs have adopted the methodology outlined in the Notice with eight of the ten notifications received following its application fully align the method for setting the applicable WACC for copper and parameters with those of the Notice and the relevant BEREC Report on WACC parameter calculations according to the European Commission's WACC Notice of 5 November 2019[257].

Table 12: Applicable WACCs notified after application of the WACC Notice.

	Case #	Fully implementing the Notice	Nominal value implemented	Comments on WACC issued by the Commission
Portugal	2022/2357	Yes	6.26%	No Comments
France	2020/2269	Yes	4.80%	No Comments
Spain	2021/2340	Yes	4.82%	No Comments
Germany	Notified 2021/2339	No	4.82%	RFR based on 10 year average rather than 5
	Updated 2021/2354			
Ireland	Notified 2020/2250	No	5.56%	General deviation from the Notice
	Updated 2021/2345			
Czechia	2021/2338	Yes	4.84% for legacy 5.78% for NGA	No Comments on legacy or NGA WACC
Luxembourg	2021/2315	Yes	4.45%	No Comments
Poland	2021/2314	Yes	7.56% for legacy 9.61% for FttH	No Comments on legacy or NGA WACC
Sweden	2021/2313	Yes	4.44%	No Comments
Slovenia	2021/2326	Yes	4.82% for legacy 6.32% for NGA	No Comments on legacy or NGA WACC

Source: Commission letters following the notification of each case

[256] See description of the Danish or Spanish risk premium below in the section named "Further detail on the application of risk premiums in practice – article 7/32 cases".

[257] BEREC annually publishes a report, estimating the relevant parameters for the NRAs to use when estimating the WACC for legacy networks in correspondence with the method outlined in the WACC Notice. Latest report available here.

However, based on the introduction above, the applicable WACC will likely not sufficiently compensate investors from the project specific risk of deploying a new network, but the applicable WACC may serve as a basis if also taking into account current economic situations and ensuring that investors obtain the return required to construct VHCNs.

From the empirical evidence, NRAs setting a specific WACC for NGA products generally estimate a WACC for legacy networks and subsequently add a premium on top to compensate for the additional risk in accordance with the principles outlined in the NGA Recommendation[258]. The following section presents first the principles of this Recommendation, followed by the practical implementation of risk premium by the choosing such cost-oriented remedy.

NGA Recommendation and overview of NGA risk premiums applied by NRAs

A risk premium as described in this section refers to a percentage value on top of the applicable WACC. It is therefore a separate value calculated/implemented to account for (some of) the factors outlined below meaning that NRAs relying on a NGA risk premium would have at least two WACC values: one for copper and one for NGA unless decided to apply the same WACC in both cases.

According to the NGA Recommendation, Annex 1 (6), NRAs should through a risk premium account for the following factors:

(i) uncertainty relating to retail and wholesale demand;
(ii) uncertainty relating to the costs of deployment, civil engineering works and managerial execution;
(iii) uncertainty relating to technological progress;
(iv) uncertainty relating to market dynamics and the evolving competitive situation; such as the degree of infrastructure-based and/or cable competition;
(v) macroeconomic uncertainty.

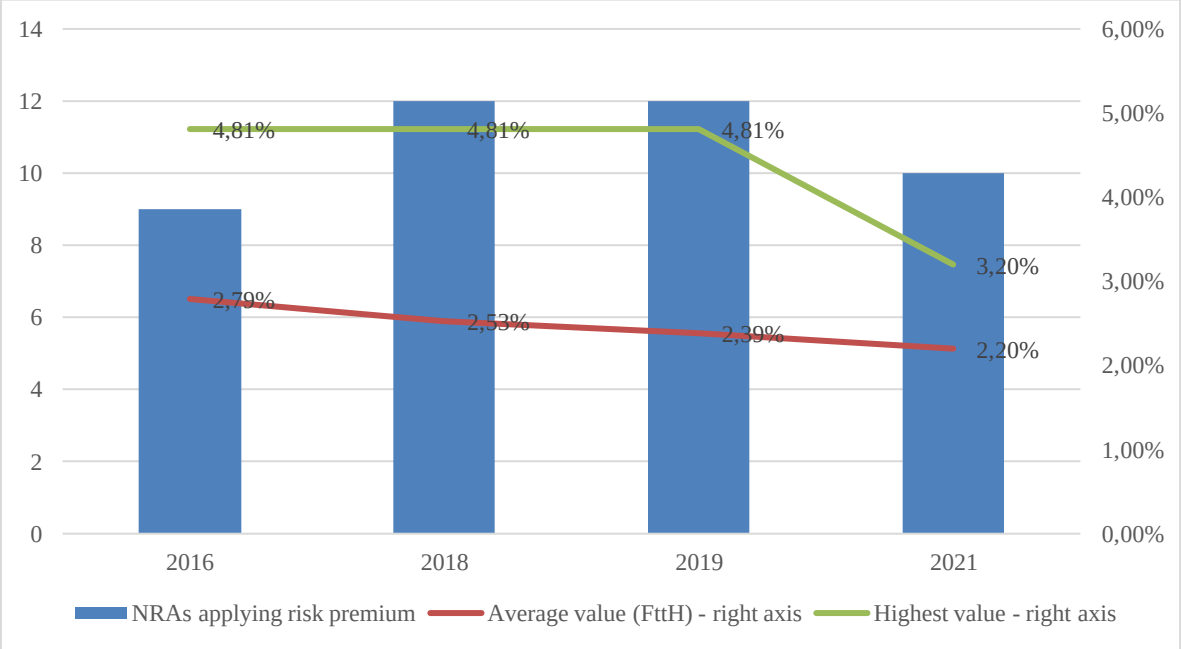
Based on the above principles such premium applied by the NRAs reflects any additional uncertainty of investing into new NGA projects as compared to maintaining and operating infrastructure already deployed.

In 2016, BEREC included for the first time in its annually published Regulatory Accounting (RA) report an overview of risk premiums applied by the NRAs to take into account the specificity of the NGA access products. Nine NRAs informed in 2016 of applying such premium, with the highest premium applied at 4.81% and an average observed of 2.79%. In

[258] Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA), available here.

2021, the latest RA report informs of 10 NRAs using NGA risk premium, the highest applied at 3.2% and an average of 2.2%.[259]

Table 13: NGA risk premiums as informed by BEREC Regulatory Accounting Reports.



Note: These are the values as reported in the BEREC Regulatory Accounting Report from the relevant year. The values were not included in the 2017 and 2020 reports and therefore those two years are missing. Some NRAs may not have used the NGA risk premium in practice in some of the years.

As can be seen from the above graph and the table below, there is an overall decrease of the actual NGA value applied, whereas the number of NRAs applying a risk premium has increased by one over the period. The decreasing average mostly comes from Spain not applying a NGA risk premium in practice as of 2021 (the maximum risk premium of 4.81% applied in 2016-2019 according to the RA report)[260] and that a few NRAs have slightly decreased the NGA risk premium imposed. From 2018 – 2021, only Poland and Slovenia saw increases in the applied NGA risk premium.

Since 2016, the number of NRAs applying a risk premium has been relatively stable. Those who have stopped applying it are Netherlands and Spain. In both cases the discontinuing of the risk premium resulted from the NGA infrastructure not being subject to strict cost regulation anymore, although for different reasons. Where the Spanish regulator actively decided to move away from strict price regulation of fibre, the application of a risk-premium

[259] BEREC did not include in its Regulatory Accounting Reports of 2017 and 2020 an overview of NGA risk premiums.
[260] In fact, Spain had the risk-premium set but did not use it in practice after 2016.

in the Netherlands ceased following a court decision[261] reversing ACMs market review and remedies.

In the opposite end, Poland and Belgium[262] started to apply a risk premium in 2019 and 2020 respectively. Czechia, Croatia, Denmark, Italy, Luxembourg and Slovenia have had risk premiums in place at least since 2018 and until today. Denmark (2%), Italy (3.2%) and Luxembourg (2.5%) have had the same risk premium in place over the period from 2018-2021.

Table 14: Risk premiums applied, according to the BEREC Regulatory Accounting Reports.

	2018	2019	2021
Belgium			1.59%
Czechia	3.31%	1.41%	1.41%
Denmark	2.00%	2.00%	2.00%
Spain	4.81%	4.81%	
Croatia	3.30%	3.30%	1.97%
Italy	3.20%	3.20%	3.20%
Luxembourg	2.50%	2.50%	2.50%
Netherlands	2.00%	2.00%	
Poland		1.25%	2.05%
Slovenia	0.61%	2.50%	2.50%
United Kingdom	1.03%	0.90%	

Note: These are the values as reported in the BEREC Regulatory Accounting Report from the relevant year. The values were not included in the 2017 and 2020 reports and therefore those two years are missing. Some NRAs may not have used the NGA risk premium in practice in some of the years.

NRAs typically estimate a NGA risk premium based on the factors outlined above or rely on a benchmark of the premia applied in other Member States. According to the BEREC's 2021 Regulatory Accounting Report[263], ten NRAs estimate a risk premium for FTTH, in accordance with the table above. In the same Report, BEREC states:

[261] https://www.acm.nl/en/publications/highest-administrative-law-court-netherlands-has-reversed-acms-decision-open-networks-kpn-and-vodafoneziggo

[262] One may argue that the Belgian regulator Institut belge des services postaux et des télécommunications (IBPT), does not apply a risk-premium as such, but separate WACC values exist for copper and fibre. In its most recent WACC notification (BE/2019/2185), four different WACC values calculated by relying on separate a common parameter values. From this approach, it derived a WACC for copper (6.86%), FttH (8.45%), cable (7.12%) and mobile (7.98%) with identical values for tax rate, risk-free rate and equity risk premium whereas the company specific parameters such as debt premium and the respective beta-values differed by infrastructure. IBPT further allows an additional margin on top of the specific WACC for fibre, which increases with the speed offered to incentivise the operators to roll out high-speed capable infrastructures.

[263] BoR (21) 161.

In general it is not possible to obtain a clear view of the corresponding systematic or non-systematic risk taken into account in this NGA risk premium. Uncertainty of demand is the main source of risk […]. The risk is generally applied to all the kinds of infrastructure, both active and passive.

From the article 7/32 case practice, the Commission noted that NRAs argue differently when applying the risk premium with the following section outlining the notifications received and comments provided.

Further detail on the application of risk premiums in practice – article 7/32 cases

Based on the insights obtained from notifications received under art. 7/32 in combination with the analysis performed by Virtual Analytics in its study, it appears that NRAs applying a NGA risk-premium rely on one of the following two approaches:

1. The approach recommended by the NGA Recommendation which is "*to include (...) a supplement reflecting the risk of the investment in the WACC calculation currently performed for setting the price of access to the unbundled copper loop*;

2. Any other additional margin added on top of the legacy WACC to encourage NGA/VHCN investments, e.g. based on international benchmarks.

For the purpose of the first approach, i.e. NGA Recommendation approach, it is necessary to develop a detailed methodology covering all uncertainties identified earlier in the text and to regularly update the supporting criteria. As stated in Annex 1 (6) of the NGA Recommendation: "*Criteria such as the existence of economies of scale (especially if the investment is undertaken in urban areas only), high retail market shares, control of essential infrastructures, OPEX savings, proceeds from the sale of real estate as well as privileged access to equity and debt markets are likely to mitigate the risk of NGA investment for the SMP operator. These aspects should also be periodically reassessed by NRAs when reviewing the risk premium."*

Below, different methods applied and the values derived from them by NRAs are described in more detail based on selection of cases.

Spain[264], for instance, had the highest risk premium added which, according to the RA report, was in place until 2019. CNMC introduced the premium of 4.81% in 2013 and was the result of a detailed model, assessing the risk of deploying fiber in Spain. In the years after its application, CNMC moved to a pricing flexibility (ERT and no price control) approach for wholesale fiber prices. In practice, the risk premium was no longer used since 2016.[265]

[264] Resolution n. MTZ 2012/2155

[265] In bilateral discussions with CNMC, it informed that incumbent Telefonica refrained from using it in its regulatory accounting in 2017 and that 2016 was its last year of application. CNMC agrees, that technically the

The Italian NRA (AGCOM), as stated in BEREC's 2021 Regulatory Accounting Report, evaluated its risk premium through an option pricing model, estimating the level of risk premium in a way to include two main risk factors. The first encompasses the "option value of waiting" and hence covers the risk of investing today versus postponing the investment to a time where new information about demand/cost will be available. The second risk factor is the risk faced by opening the network to third parties without having any first mover advantage. According to the Visionary Analytics Study (p.98): *"To price both options, the NRA has used standard financial techniques, such as the Black-Scholes model, the Cox model, and the Market Asset Disclaimer (MAD) technique, which allow for simulating the value of an asset that has not yet been realized yet and therefore cannot be exchanged on the market."*

Some NRAs, such as ARCEP in France, use a methodology mainly based on the outcome of a discounted cash flow (DCF) valuation. In the context of symmetric regulation, ARCEP calculated the risk premium in a DCF framework, as an add-on to the discount rate resulting in the net present value (NPV) of a fiber based network project being zero. As described in the 2016 Brattle group report[266], ARCEP recognised a risk premium to reward investments in FTTx networks due to higher demand uncertainty compared to legacy networks. The premium defined by ARCEP is equal to the difference between the regulated WACC used for fixed legacy networks and the expected project internal rate of return (IRR) of a broadband network. To evaluate the project IRR, ARCEP uses the DCF model and considers a 25-year economic and financial plan, whose length may vary according to the specific nature of the project considered. The risk premium is not defined ex-ante and it is evaluated on a case by case basis, due to the specificities of each broadband technology regarding costs, and the different kind of services provided.

On the other hand, the Czech NRA[267] applies the NGA risk premium as a risk difference between the risk of investing in a NGA and legacy networks. This method consists of breaking overall risk down into individual risks, which are then evaluated separately. The risk of NGA networks is not performed in an absolute manner, but rather relative to the standard risks e.g. of maintaining the copper network. Risks evaluated when determining the risk premium for NGA includes the dynamic nature of the sector, overall service innovation and the price of services provided by the infrastructure. Further, the level of dependency on general macro-economic developments, intensity of competition, entry barriers to the sector and overall competitiveness were included and defined as *significant risks*. Regulatory risks and market size, capacity and expansion options were defined as *low risks*. Based on this segmentation, the Czech regulator estimated an overall risk coefficient and subsequently multiplied this with the already defined rate of return on invested capital to define a NGA risk

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risk premium of 4.81% is still there but in practice it has not had any impact since 2016, following CNMC's 2016 analysis of former market 3.b finding that NGA products should not be cost regulated but rather subject to ERT.

[266] Brattle group (2016): Review of approaches to estimate a reasonable rate of return for investments in telecoms in regulatory proceedings and options for EU harmonization

[267] See case CZ/2019/2135

premium.

The Danish NRA applies a 2% NGA risk-premium to fibre-infrastructure deployed outside the so-called "DONG-area", a geographic area north of the Danish capital where a substantial fiber network was already deployed prior to the introduction of the general risk-premium. With a presence of NGA infrastructure in that area already, a risk-premium reflecting overall uncertainty of parallel deployment was limited in the DONG-area. For the rest, and majority, of Denmark, the 2% NGA risk-premium applies to fiber.

HAKOM has set the NGA risk premium in previous WACC decisions using the benchmarking method based on the available data on the NGA risk premium defined in other Member States. At the time, according to the available data collected within BEREC, the average NGA risk premium was set to 1.97%. Although the resulting value for the NGA risk premium is lower than the previously determined value, HAKOM considered it justified to apply a lower value of the NGA risk premium in view of market developments.

A similar approach as the one seen in Croatia is used by Slovenia, Poland and Luxembourg. This is mainly due to NRAs not being familiar with a methodology to determine the specific risk premium. The use of a benchmark method may be inconsistent, as it does not reflect the country specific situation neither the project-specific risk that should reflect the conditions for new investments in specific context/set up.

In this regard, Slovenia in its 2021 WACC decision[268] also determines the risk premium based on international benchmark. However, AKOS is using as an input the data of Belgium and Netherlands, which are not in line with Slovenian situation. In particular, Netherlands is not applying the risk premium anymore and Belgium having a separate WACC calculated for FTTH, as a result not having risk premium as an add-on to the legacy WACC.

Determination of a risk premium for VHCNs

For VHCN for which a price control obligation is considered necessary, the applicable WACC might not reflect all risks faced by investors and the estimation of a project specific cost of capital will be required. This does not exclude that in some cases where the risks of investing in VHCN have significantly diminished, the application of a risk premium would no longer be found to be justified by the NRA (for example Danish and Spanish cases described above). In any case, the largest investment gap to persist in the future years will most likely be in rural areas where overall risk of deployment is likely to remain high for still some time, as explained in chapter 2. Especially in such areas, the use of a risk premium in cases of price-control application could prove useful to reduce this investment gap and generally reduce the digital divide between rural and urban areas.

[268] See case SI/2021/2326

The Code provides that when setting the rate of return on capital employed, NRAs should take "*into account any risks specific to a particular new investment network project*". This suggests that the investment risk can differ between areas and over time. What constitutes a specific project would be best defined by the NRA and an analysis of whether an investment is more risky than another would certainly be best conducted by the NRA. In cases where no clear differences of risk between separate areas/projects can be defined, the NRA may consider that all areas are equally risky and, accordingly, apply the project specific risk in a relatively large geographic area. Such approach could lead to one, single risk premium covering all VHCNs investments in the Member State and is typically what we see for the practical implementation of the risk premium today. However, separate risks in differing areas have also been observed, leading to differentiated regulated fibre access prices where the risk premium applies in one area of the Member State and not in another.[269]

Investment risk could be rewarded by means of a risk premium incorporated in the cost of capital. The return on capital allowed ex ante for investment into VHCNs should promote allocative efficiency, sustainable competition and maximum consumer benefits (implying a rate of return that is not excessive); however, without undermining the incentives for undertakings to invest (implying a sufficiently high expected rate of return).

In this respect, in response to the targeted consultation, ETNO argues that the imposition of price control on NGA/VHCN services should be avoided in the presence of a retail constraint and effective non-discrimination, and that therefore the issue of risk premium should in principle concern only the less competitive areas. ECTA rejects the notion that project-specific risk premiums over and above the regulated weighted average cost of capital (WACC) of SMP operators should be applied and projected onto the wholesale tariffs that alternative operators are charged with. The WACC represents the value for which the investor needs to be compensated for an investment. In the context of telecoms regulation, the WACC is calculated by the relevant national regulatory authority and added to the maximum allowed wholesale price that the regulated operator can charge for access to its infrastructure.

The targeted consultation confirmed the relevance of the principles of risk outlined in the NGA Recommendation when setting a risk premium on top of the WACC also for the purposes of VHCN deployment. BEREC and some operators (in particular Vodafone and Liberty Global), argued that the guidance provided in the NGA Recommendation regarding the factors of uncertainty, such as uncertainty relating to retail and wholesale demand, to the costs of deployment, civil engineering works and managerial execution, etc. are still relevant.

Deployment of new networks involves commitments for significant capital investments, and with expected payoffs extending far into the future, thereby increasing exposure to economic downturns and for a longer period. Demand for advanced services, such as those enabled by

[269] Such differentiated premium for the same infrastructure is for instance present in Denmark, where fiber in one area (DONG) is not subject to the 2% NGA risk premium. Accordingly, investments into fiber in the rest of Denmark could be seen subject to a project specific risk premium of 2%.

very high capacity networks, is also likely to be more sensitive to changes affecting household income. As a result, investments in very high capacity networks are likely to expose operators to considerably higher risk compared to activities in legacy infrastructures.

The factors of uncertainty are likely to vary considerably between network deployments using different VHCN technologies and covering different geographic areas. NRAs should therefore assess investment risk with a sufficient level of granularity, taking as much as possible into account the specific characteristics of the investments.

Where an NRA considers it necessary to impose cost-based price controls on very high capacity networks, it should estimate the cost of capital that corresponds to the (systematic) risk of investment in the specific network, supplementing the WACC estimated for legacy infrastructure [with an appropriate risk premium]. To do so, the NRA may, inter alia, rely on detailed financial models allowing for the comparison of volatility of returns of VHCN and legacy networks, or where sufficient information is available, for instance from financial markets, on quantitative estimation techniques allowing for a decomposition of betas of the different assets.

In Italy, the NRA[270] has conducted an analysis to take into account the risk of investing today versus postponing the investment to a time where new information about demand/cost will be available. The balance from the investor perspective is obvious as any uncertainty about future demand and/or technology in year t will be smaller in year t+1. Uncertainty is measured in risk and accordingly, one may argue that with the risk being higher today than tomorrow, the investor should be rewarded for the risk of investing today vs tomorrow. In other words, an investor may hold back investments into VHCN while waiting for more clarity brought by the future. This does not only concern demand but also general technology developments as investors may fear that commitments into a specific technology proves outdated in case a new, faster, cheaper and more efficient technology emerges just after the investments are conducted.

Investors faced with such uncertainty without the adequate reflection in the expected return (for instance with the WACC capped at a too low level) will hold off the investments, leading in the longer run to an under-developed infrastructure. Such behaviour and risk, termed “the option value of waiting”, may be addressed by the NRA as done for instance in Italy, but rewarding the investor for such risk should be done with caution.

Where the NRA believes that an investor holds back investments for the reason outlined above, the NRA should consider allowing an additional return for the SMP.

In such case, the NRA may consider rewarding the investor through the risk premium with an explicit reference to “the option value of waiting”. The Commission in general considers, that

[270] See AGCOM (2015),”The calculation of the Risk Premium for investments in NGA, FTTH and FTTC”, Annex E to resolution No 623/15/CONS.

the otherwise mentioned factors of uncertainty could also encompass the option value of waiting, with demand uncertainty and technological progress being factors likely to be smaller in the future than today. Therefore, an explicit reference to "the option value of waiting" would in general not be expected of the NRAs setting a risk premium, but may be appropriate in situations where competition is extremely unlikely to materialize. Therefore, it is expected that NRAs in general, if found relevant, encompass and incorporates any regards of the Option value of waiting into the risk premium, since the main elements of the Option value of waiting it is already covered by elements of risk to consider therein. However, this Staff Working Document does not exclude that some NRAs may find better use of more complex methods, which would always be evaluated on a case-by-case basis.

In exceptional cases (due to for instance unforeseen time-constraints and/or issues with obtaining reliable data) the NRA may decide to rely on a benchmark for setting the risk premium. From the above section outlining the received article 7/32 notification, it emerges that some clarifications on the benchmark method could be beneficial. Specifically, some NRAs seems in the past to have looked solely at the NGA risk premiums from the BEREC Regulatory Accounting report when using these to set the risk premium in their Member State. For example, in 2016 HAKOM used the latest available data to calculate the WACC and set the WACC by 1 January 2020. The benchmark relied on the values published, including the-risk premium of 4.81 % used in Spain which, as we saw above, was actually not in use after 2016.[271] Further, in its 2019 WACC decision[272], HAKOM in its benchmark used the value from the Netherlands', where a risk premium is indeed in place (of 2%) but this has actually not been used in practice since the market was fully deregulated.

It would therefore seem relevant, that in case a NRA opts for a benchmark when setting a risk premium, the NRA should ensure that the values feeding into the benchmark are first of all used in the relevant market and secondly that the premium serves a similar purposes as the regulated entity in the Member State for which it will apply. However, one must distinguish between the purpose of the risk premium as defined in the NGA Recommendation and any risk premium stemming from the provisions of the Code, since the latter clearly defines a *project specific risk*. In the abstract, it seems at odds with the overall principle of the *project specific risk* to simply rely on a benchmark of all risk premiums estimated in other Member States. While a sufficient similarity between projects across Member States cannot be excluded, relying on a benchmark for the project specific risk premium should be done with the utmost care to ensure that the benchmark value derived is representative for the specific project for which it is intended.

To summarise, when an NRA relies on cost regulation and finds that the applicable WACC does not sufficiently compensate the incumbent/investor for the additional risk connected with the specific project under consideration, the NRA should apply a risk premium on top of the

[271] See case HR/2016/1857
[272] See case HR/2019/2197

legacy WACC applicable at the time of investment. Such premium should take into account the elements outlined above and hereby encompass the added risk of investing into this new infrastructure as compared to the risk of maintaining the legacy network. Therefore, the project specific risk premium should reflect the additional risk of investing in VHCN projects. In exceptional cases, the NRA may choose to rely on a benchmark. Based on the above, such approach should carefully evaluate the risk premiums on which the benchmark is based, to ensure that the values feeding into the calculation are relevant for the specific risk premium in the Member State for which it is intended.

Application of a risk premium for the deployment of new VHCN investments

The premium added should be explicitly distinct from the WACC, to ensure transparency in its application, meaning that any VHCN risk premium is clearly distinguished from any applicable WACC, which by definition is not subject to this premium. While this section describes in detail how the risk premium may be applied on top of the applicable WACC, it does not exclude different ways of rewarding risk of investing into new VHCNs as for instance seen in Belgium, calculating a full WACC for fibre separately.

The NRAs applying a specific risk premium should add such value explicitly on top of the applicable WACC. It would be inconsistent to set a different (separate) non-VHCN WACC only to form the basis on which the VHCN risk premium would be added. This it to say, that it would be inconsistent for the NRA to have one general WACC value for copper (for instance calculated in accordance with the Notice) and then for the purpose of VHCN WACC to set a different "base-WACC" on top of which the VHCN risk premium is applied. If, for instance, an NRA has in place a general 5% WACC in the year when the project specific WACC for a VHCN project is defined and finds that a 3% risk premium for investments into VHCNs is relevant, such value should be added on top of the general WACC in place resulting in a VHCN WACC of 5% + 3% = 8%. This is not to say, that the NRA must have in place a general WACC, for instance in Member States without cost regulation of legacy networks. In such a situation, the NRA may not have a general WACC in place and must calculate it solely for setting the foundation.

In light of the need to revisit the WACC Notice, the NRA should carefully consider whether the value derived under the WACC Notice sufficiently reflects current and future economic conditions, and adequately reward investment, or if it should indeed be updated together with the updated/implemented risk premium. By doing so, the NRA ensures that current the economic situation is sufficiently taken into account when setting maximum prices for VHCNs. One thing particularly relevant, is to ensure that inflation forecasts in the cost model and/or WACC estimation sufficiently reflects the reality observed to avoid a real-return below the intended.

In this respect, the inflation is of particular importance. In the current economic environment, inflation has reached even double digits in some Member States and average inflation in the

euro area of March 2022 stood at 7.4%.[273] In this current climate, the NRAs should carefully evaluate the impact inflation has on incentives and the estimated WACC. While the WACC Notice proposes the ECB forecast for five years, how NRAs implement this in practice is left open. Furthermore, the WACC parameter feeds into cost models, either as a real or nominal value (i.e. including or excluding inflation). In some Member States, the Commission services observe how the nominal WACC value feeds into the model, after which the NRA adds the individual level of expected inflation *over the next five years separately*, meaning that in cases where ECB forecasts inflation for the next five years to be 7%, 6%, 4%, 3% and 2%, these values would individually feed into the cost model.

It is clear, that the current inflation is high, with a significant chance of making the real return within the very near future negative. However, as regulated prices are typically set for two, three or even five years ahead, a very high inflation today should not inflate the WACC artificially for the next five years. In this regard, it would appear wise for NRAs to acknowledge the relative high inflation seen today, whilst making sure that the inflation parameter can be adjusted in the very near future, in case inflation drops. For NRAs using inflation only as part of the WACC, this means carefully evaluating the inflation expectations for the time in which the WACC value is intended to be applicable. For NRAs relying on a nominal WACC and with cost models allowing for a more individual assessment of inflation, i.e. with possibility of adding expected inflation per year in the cost model, the yearly inflation as best forecasted by ECB would appear fit for purpose.

Taking the above into account, the NRA applying a risk premium arrives at two values which, when combined, results in a WACC for VHCNs. This WACC in essence should correspond to the expected return any reasonable investor would expect when deciding whether to place its capital in VHCN infrastructure or elsewhere. For this purpose, the NRA may consider conducting a sensitivity analysis of the WACC for VHCNs, in which the NRA relies for instance on surveys or other relevant materials, to ensure that the derived value indeed matches the expectations of a reasonable investor, especially in light of macroeconomic uncertainties. While any such concern should already be accounted for by the NRA when estimating the risk premium, conducting a sensitivity analysis of the derived WACC for VHCNs ensures that the total value indeed fulfils it purposes: adequately compensating the investor, with an interest of incentivising the roll out of VHCNs. In case the derived value falls short of the reasonable expectation, the NRA should consider revisiting the elements making up the risk premium and carefully assess whether the risk premium should be adjusted upwards or downwards, to the extent that the total value (WACC applicable + premium) indeed provides the optimal incentive for investors.

It would therefore seem reasonable that

1) The applicable WACC forms the foundation for a project specific VHCN WACC;

[273] Data from Eurostat, available here.

2) The NRA carefully considers whether the current applicable WACC is fit for purpose in the current economic climate to act as foundation for the project specific WACC; and
3) Any premium added on top of the applicable WACC is added explicitly and separately on top of the applicable WACC at the time of investment.
4) After completing 1-3 above, the NRA should conduct a sensitivity analysis, by which it analyses if the total derived WACC for VHCNs aligns with the expectations of a reasonable investor. In case the value is to high/low, the NRA should revisit the derived risk premium and adjust accordingly to ensure that the WACC for VHCNs adequately rewards investors to incentivise the construction of the specific project.

NRAs implementing the VHCN risk premium in accordance with the above four principles ensures transparency, consistency and predictability in the setting of any premium for investments into VHCN which promotes VHCN deployment and compensates the SMP operator for the extra risk(s) it incurs in deploying VHCN.

Reassessing risks and the balance between stability and consumer welfare

Once an NRA has implemented a WACC for the project specific VHCN investment, the question is what comes next: should this value remain constant, should it be updated and, of so, how often and finally how should it be removed if the risk is no longer present. The NGA Recommendation makes an explicit reference to the fact that risks may change over time, especially when retail and wholesale demands are met. Investments made at times with a certain VHCN risk premium should arguably be subject to a risk premium reflecting the risk at the time of investment, rather than the risk present some years down the line where the actual risk may not have materialized. However, the NRA should also have the option the remove or reduce the risk premium at some point in the future, meaning that a balance between predictability from the time the investment is made and the future need to reflect conditions at the time must be found. Investors rarely invest all at once and projects evolve, making it very difficult for the NRA to fully evaluate exactly when one projects ends and another begins. Investments into VHCN may not be all made at once but spread out over many years.

In general, the factors of uncertainty may change over time, in particular due to the progressive increase of retail and wholesale demand met. NRAs should therefore in principle review the situation at regular intervals and adjust the risk premium that would apply to new investments, considering time variations in the above factors. However, even in the case where the risk today *has* diminished compared to the risk at the time of the investment into VHCN, the NRA should also carefully consider the VHCN WACC applicable at the time of the investment and that the investor had a reasonable expectation that the expected return (maximum access prices allowed) would result from the WACC at applicable at the time.

Given the need for predictability underlined in the Code, NRAs may also consider freezing the premium granted at the time of the investment. In a case where the investor makes the investment with the expectation to obtain the VHCN WACC for a long period but the

regulator reduces the premium once the risk is no longer present, the investing SMP may alter its ability to recoup its investment.

Any risk taken should be adequately reflected and for investments into new VHCN infrastructure, it would not seem correct to assume the investment repaid within one year or even in the time between two price-updates of the NRA. On the contrary, the expected life for a network (as assumed in cost-models) is around 25-30 years and an investment made into new infrastructure is likely to have a similar business plan for the investor. At the time of investing, the risk premium should reflect the risk present at that particularly time.

The applicable WACC, however, takes into account the general macroeconomic situation in both the Member State and in Europe. For instance, we see in current notifications under article 32, that given the decrease of interest rates over the last couple of years, the legacy WACC values have also decreased.

Against the backdrop of the elements discussed above, it would seem relevant that the risk-premium could be frozen for some time into the future. Freezing the premium, allows a certain amount of stability in the expected return for investment into new VHCN projects as the additional return allowed (i.e. the premium) is constant over some time, whereas the applicable WACC of the value is allowed to adjust with the financial fluctuations.

Hence, when setting the additional risk premium, the NRA should consider freezing this for at least one review period, i.e. five years. NRAs may also consider freezing the premium for longer if found relevant, but to adequately reflect the fact that the risk premium compensates for the risk as evaluated at the time of the investment, the risk premium should not be removed at least within a review period.

Within the last 10 years, it is observed how NRAs have both introduced and removed the risk premium, meaning that while an investment done today could be considered risky, when reassessing this risk in for instance five years' time, the risk may be significantly reduced. However, the investor who committed at the time of investment and with the given risk at the time, may not be fully rewarding for the risk taken five years ago if the risk premium is removed completely because the same level of risk for the specific project is no longer present. Therefore, even when NRAs freeze the risk premium for at least one review period, the question that arises it what to do when the review period is over and the risk is to be reassessed.

The NDCM Recommendation established the foundation of a BULRIC + model which by definition takes into account both historic costs and forward looking expectations of demand from the view of an efficient operator. Into this cost-calculation feeds the WACC (and for VHCN associated risk premium) which acts as a single forward-looking estimate at the time of investment, assuming the cost of constructing the modern equivalent network. Adding together costs of the network and a VHCN WACC results in a single price for each wholesale product offered by the SMP operator. So far, this has been the practice and therefore prices calculated have not only applied for newly constructed wholesale access products, but also for

products already provided under existing contracts, and that price will take effect and remain in effect nationwide until the next review. At any given point in time, prices typically reflect one WACC and one NGA/VHCN risk premium that are both in effect nationwide.

VHCN are made not all at once, but may be potentially spread out over a period of many years. In such situation, and considering the *project specific* description of the VHCN WACC of the Code, this implies the consideration of an approach reflecting the need to strike a balance between the risk profile at the time investments were undertaken (both upside and downside), and the risks that are currently present. Under such considerations, the risk may be assessed taking into account that the risk that was relevant when the investments were made should continue to have some influence on the price that the SMP operator is permitted to charge, but that influence should gradually decline over time.

Visionary Analytics pointed in their study to the above considerations, arguing that the net effect would be to provide some "stickiness" in the VHCN risk premium. The understanding of both upside and downside probabilities at the time of the initial investment would continue to influence the VHCN risk profile indefinitely, but it would play a declining role over time.

In practice, the NRA could consider applying such considerations to the risk premium. Given also the discussions above, such potential evening out of the premium should apply only to the VHCN risk premium. Notably, the WACC is already designed to provide compensation for overall systematic risk and there is a risk of "double counting" if investors are provided with a second level of protection. Furthermore, the applicable WACC takes into account the current economic situation adjusting, among other things, for the levels of interest rates. As the risk premium captures exactly this isolated, additional risk of new investment, any freezing or smoothening consideration(s) should only apply to the risk premium.

Fair bet approach – a potential middle ground between pricing flexibility and strict price control

Where a general emphasis of the Code points towards pricing flexibility (where constraints allow for such), the above section discussed the other end of the spectrum, namely price control in cases with no or very limited competition. One concept, initially introduced by Ofcom, attempts to bring the best of both approaches into one, dubbed "the fair bet". In abstract, this approach allows the investor to charge above a "strict price-control" price, but introduces some safeguards and requirement as to when this additional charge is allowed. The fair-bet thus gives both clarity to the investor and provides a certain amount of flexibility in the price setting whilst defining, to ensure conditions for the access seeker perspective, a regulated limit on the possible maximum charge/return allowed. In abstract such approach has many admirable features but in practice its application is limited. The fair-bet approach also requires a significant amount of negotiations and agreement(s) between the regulator and the SMP in order to draw up the scope of the specific expectations for the fair bet.

The principles of the fair bet entails, that the investing party should be allowed a certain upside above the cost of capital for an agreed period of time – even after the risk present at the time of investment have diminished – while still maintaining a certain control or cap over potential profit for the SMP. For these reasons, the fair bet sits between strict price control and flexibility and also underlines that such approach should only be used in this interplay between the two other options.

8. MIGRATION FROM COPPER TO FIBRE

8.1. Regulatory framework and objectives.

The terms "migration", "copper switch-off" and "copper decommissioning" are used in the literature with meanings that vary or are sometimes considered as interchangeable. In the interest of clarity and precision, it is therefore necessary to provide the definitions of these concepts as will be used in the context of this Recommendation. "Migration" refers to the process by which end-users cancel their subscription to services provided on legacy services in order to subscribe to services provided on a VHC network, with therefore the same process taking place in parallel at wholesale level. "Copper decommissioning" "and copper switch-off" will both be used to refer to the moment when all services are terminated on the copper network.

While take-up of products with a download speed over 1 Gbps is still at an early stage and varies across the EU, facilitating the migration from legacy networks to VHC networks is in the interest of end-users[274], as it allows them to benefit from products of higher quality and reliability[275]. A swift migration process can accelerate the take-up of demand for products provided over VHCN and subsequently support a faster VHCN rollout. On the opposite, delaying migration would increase the time during which the legacy network will continue to run in parallel of the VHCN, thereby reducing the incentive to roll out VHCN in the first place. Ensuring a smooth migration process is therefore an enabling factor to reach the objectives of the Digital Decade communication and the Digital Decade Policy Program.

Several factors influence the speed of migration to VHC networks. Regulation is one of these factors, via its impact on respective access conditions to legacy and VHC networks as well as on the conditions of legacy networks switch-off. The NGA Recommendation and the NDCM Recommendation both touch upon the topic of migration and decommissioning. The NGA Recommendation provided guidance with regard to SMP obligations during the migration and decommissioning process, the notice period to be respected by the decommissioning operator, as well as the necessary transparency from the SMP operator during the process. In the NDCM Recommendation, the recommended costing methodology addresses the risk of

[274] Recital 209 of the EECC.
[275] See the country chapters of the 2021 DESI Report.

inflationary volume effect of migration on legacy products prices by modelling a single efficient NGA network for copper and NGA access products.

The Code has introduced for the first time into the legal framework a provision concerning migration, in article 81[276] that specifically addresses how NRAs should manage the situation where an operator intends to decommission or replace parts of a network subject to SMP regulation, including therefore situations where an operator intends to decommission0 its copper networks and have customers migrate to a VHCN. The main elements of this provision are the following:

- Article 81(1): Operators subject to SMP regulation should notify in advance the NRA about their plans to decommission or replace part of their regulated network.
- First subparagraph of article 81(2): NRAs should ensure that such plans are transparent, reasonable, provide for an appropriate notice period, and ensure the availability of alternative products of at least comparable quality if necessary to safeguard competition and end-users rights;
- Second subparagraph of article 81(2): if these conditions are met and the notified plans are respected by the SMP operators, remedies – in particular access obligations under article 73 - may be lifted, thereby allowing the decommissioning of the concerned network.

The evolution of the electronic communications markets, the implementation of the Code, in particular article 81, and the new 2030 Digital Decade connectivity targets, have made some of the guidance in the NGA and NDCM Recommendations regarding migration and decommissioning insufficient or obsolete. It is therefore necessary to update such guidance, in order to ensure that the migration and decommissioning processes take place in accordance with the most recent legislative framework and policy ambition. The scope of this guidance is limited to cases where end-consumers migrate to an alternative VHCN and the copper network, including the terminal segment, is eventually fully decommissioned. In particular, it does not address incremental upgrades of the copper network not leading to VHCN deployment.

As reflected in article 81 of the Code, the decommissioning of the legacy infrastructure is closely related to migration to VHCN. When it takes place, it induces either a migration of end-users and access seekers still relying on legacy products or a discontinuation of service. Conversely, migration increases the incentive to decommission the copper network as demand for products supplied over this network diminishes. Therefore, on one hand, a slow migration can delay the decommissioning and increase its operational complexity, as a large number of customers remains to be migrated when it occurs. On the other hand, an overly long and burdensome decommissioning process will slow the migration process down as the migration

[276] See also the corresponding recital 209.

will only be fully complete when all remaining copper customers are migrated at the moment of the decommissioning. It would also generate economic inefficiencies if a network that is to be decommissioned were operated for a significant period in parallel of the VHCN.

Literature has also shown that fibre networks are significantly more energy efficient than both HFC networks and copper networks to transport the same amount of data[277]. While fixed networks only contribute to a modest part of the electronic communications sector's emissions of GHG[278] and parts of these energy savings could be offset by a knock-on effect (caused by an increase of data consumption), fully switching to fibre would still contribute to a reduction of the sector's footprint[279]. Moreover, besides the strict scope of the network's energy consumption, the spill-over effects of VHCN coverage on the implementation of various energy saving technologies would increase its contribution to the reduction of GHG emissions. Migration to VHCN and copper decommissioning would therefore have a positive impact on the achievement of the Green Deal objectives.

From all that precedes, migration and copper decommissioning are closely tied together and should both be promoted. At the same time, the decommissioning process must ensure that the benefits of competition and the rights of access seekers and end-users are preserved during the transition. This is why, to ensure a balance between these rights, the protection of competition, and a fast migration, article 81 of the Code establishes that the migration and switch-off process should include appropriate safeguards. These are:

(i) A transparent timetable and conditions, including an appropriate notice period for transition, as well as

(ii) The availability of alternative products of at least comparable quality providing access to the upgraded network infrastructure substituting the replaced elements and enabling the access seekers to reach the same end-users, if necessary to safeguard competition and the rights of end-users.

[277] WiK study for BCRD, part 7.5.1 of the IA.

[278] Evaluation de l'impact environnemental du numérique en France et analyse prospective - Note de synthèse réalisée par l'ADEME et l'Arcep (19 janvier 2022)

[279] According to a study led by Wik Consult for Stokab (Neutral fibre and the European Green Deal), "*a complete migration from the current fixed broadband technology mix in the EU to all fibre would result in emissions from the use of broadband access falling from 15.5 Mio t CO2 to 3.2 Mio t (fibre technology mix) and to 1.1 Mio t of CO2 (only point to point (PtP) connections) per year, if the existing power sources remained unchanged. This represents a reduction in emissions of more than 90% if all broadband connections in the EU moved to PtP FTTH.* "

8.2. State of play of migration and copper decommissioning.

According to BEREC's draft report on migration and copper switch-off, the advancement of copper switch-off in the EU varies across Member States. In 9 MSs[280], the NRA is still not aware of any decommissioning plan from the incumbent. On the opposite, the SMP operator has announced plans concerning the switch-off of its copper network in 16 MSs[281] and has already started to close copper-based network elements, such as MDFs, in 10 MSs[282]. Even within these Member States, the progress of decommissioning varies significantly[283]:

[280] AT, BG, CY, CZ, DE, DK, HR, LT, LV.
[281] BE, EE, EL, ES, FI, FR, HU, IE, IT, LU, MT, PL, PT, SE, SI, SK.
[282] BE, EE, ES, FI, LU, MT, PL, PT, SE, SI.
[283] See also BEREC summary of the 2019 workshop on migration and switch off

Table 15: Advancement of copper switch-off

Member State[284]	Share of copper exchanges closed (as of August 2021, unless mentioned otherwise)
Estonia[285]	70%
Sweden	60%
Spain	9%[286]
Belgium	5%
Slovenia	3%
Portugal	0.5%

Source: BEREC draft report on migration and copper switch-off.

8.3. Public consultation

Both for ECTA and BEREC, non-discrimination during the migration process is an important aspect, pointing among other things to the risk that the timetable of the switch-off could be used strategically by the SMP.

ECTA also expressed its wish that the differences in contracts timeframe for market 1 and market 2 products should be taken into account when setting the duration of the notice period. BEREC and ETNO consider that the current recommendation for the duration by default of the notice period (5 years) is too long.

On the assessment of comparability of new and legacy products, ETNO suggests that this assessment should be based on the retail offers of the SMP operator.

ECTA and BEREC mention that factors at wholesale level should also be taken into account (for instance KPIs/SLA/SLGs). BEREC mentions that some parameters might be market-specific (e.g. for the market for wholesale high-quality access provided at a fixed location).

In cases where the NGA/VHCN network is not rolled out by the SMP, BEREC points out that this could have an impact on the SMP assessment. In case the VHCN is rolled out by alternative operators, ETNO calls for relaxed obligations on the copper decommissioning (for

[284] In Finland and Poland, the SMPO(s) already closed MDFs, however, no information is available how many MDFs have already been closed. The SMPO has not yet closed MDFs but street cabinets in LU and MT and other copper-based network elements in LU.
[285]. Source: WIK Study "Copper switch-off – A European benchmark", March 2019, (The NRA does not collect this data).
[286] It should be noted that according to CNMC's reply to the Commission's request for information in case ES/2021/2316, by 2020 only 11.5% of the broadband market remained served by copper pairs, due to the high VHCN penetration.

instance regarding the notice period for transition), while ECTA insists that obligations should be fully maintained.

FTTH Europe is of the opinion that too restrictive conditions for copper decommissioning might hamper migration. There is a consensus that pricing incentive is a good way to foster migration, but divergent views on which direction to go (in particular ETNO considers copper prices should go up, while ECTA supports the opposite).

On the impact of migration on copper prices, ETNO suggests to signal in the new recommendation that ULL prices should be expected to increase at least in nominal terms. ETNO argued that as more customers will be migrating to FTTH and other VHCN access networks, the more expensive it will be to maintain existing copper-based access lines and setting artificially low access prices for legacy network could have negative effects. ETNO considers that the price band should be abolished. Spreading network costs that remain largely fixed, primarily asset costs, and to a lesser extent, operating costs, over a shrinking number of accesses in service automatically leads to an increase in the cost per access in service. The NRA cannot envisage making the SMP operator alone bear the increased costs of the copper network in a context of accelerated migration from copper to fibre. The method used to set the ULL price must lead to the recovery of efficient costs to be shared equitably between all the operators using it.

DT argues that if regulated copper prices develop in line with cost developments for VHCN, further investment incentives for fibre can be achieved by overpricing the ULL tariffs as that would increase the relative attractiveness of VHCN based products in comparison to copper-based networks.

ECTA is of the opinion that artificially raising copper unbundling charges does not foster the deployment of NGA. On the contrary, enabling alternative operators to grow and succeed, including by utilizing the essential facility constituted by the copper network on fully equivalent terms with the SMP operators' self-supply, is the best way of leading alternative operators to achieve sufficient scale and acquire the financial means to invest massively in fibre networks.

8.4. Visionary Analytics Study

On the availability of alternative products of a quality at least comparable to that of products delivered over the legacy networks, the study from Visionary Analytics essentially mentioned as a good practice BEREC's recommendation of establishing a substitution matrix, synthesizing for each regulated wholesale legacy product its alternative on the new network, taking into account parameters including:

- Downstream and upstream bandwidth speeds;
- SLG/SLA parameters and KPIs such as provisioning time, service availability and repair time;

- The details of operational processes in the reference offers concerned, e.g. elements referred to migration from legacy products and infrastructure;
- Locations of Points of Handover (PoHs) of the new services.

On the duration of the notice period, Visionary Analytics notices that the duration recommended by default in the NGA Recommendation (5 years) is long for a fast moving industry, forces to maintain two networks in parallel, and doesn't correspond to the regulatory practice of NRAs. Therefore, Visionary Analytics recommends shortening this notice period under certain conditions, in particular the availability of suitable alternatives. Visionary Analytics also recommends to envisage a commercial closure (stop selling new accesses) of MDFs prior to the decommissioning.

Visionary Analytics Study also envisages the possibility to depart from cost orientation on the prices of legacy services. Some respondents told Visionary Analytics that continuing to apply the NDCM Recommendation will lead to decreased stability and predictability of copper access prices. There is a risk that the LRIC model, which was developed for an expanding market (page 82), overstates the copper price as fixed costs are distributed over a smaller number of users. Visionary Analytics observes that stakeholders are divided on the issue but that such an option could be recommended under certain conditions, including a clear decommissioning trajectory and the effective availability of VHCN products for alternative operators.

Finally, Visionary Analytics recommends encouraging NRAs to actively promote a multi-stakeholder process in order to ensure transparency towards access seekers and to ensure that the process takes into account the challenges faced by all stakeholders.

8.5. Future guidance: fulfilment of the first subparagraph of article 81(2).

8.5.1. Notice period

Article 81(1) of the Code foresees that the SMP operator shall notify the NRA in advance when it plans to decommission parts of its regulated network. In this context, the notice period referred to in article 81(2) should be understood as the period between the moment when the SMP operator formally notifies to the NRA and to other operators its intention to decommission its copper network in a specific area, and the moment when it is allowed to do so by the removal of all access obligations on the legacy network in this area. The notice period can only start after the NRA formally accepts the decommissioning plan proposed by the SMP operator and takes its decision setting the conditions of the lifting of remedies in accordance with article 81(3). The Code does not specify the duration of such period, yet provides that the notification should be done in a timely manner.

An excessively short notice period will prevent access seekers from properly migrating their retail customers to the new infrastructure and from recovering (depreciating) their investments in equipment and copper LLU. On the contrary, the notice period should not force the SMP operator to maintain the legacy network in parallel with a VHCN for longer than necessary. NRAs should ensure, taking into account national and local circumstances, that the duration of the notice period strikes an appropriate balance.

The NGA Recommendation indicated a duration of 5 years for the notice period, unless access seekers and the SMP operator agreed otherwise or fully equivalent access was provided at the point of interconnection. In such cases, the notice period could be shorter. However, there is a large recognition among BEREC, NRAs and stakeholders that the 5-year-period recommended by default should be shortened, as already reflected in NRAs' regulatory practice[287].

As the Code now specifies that unjustified delays to migration should be avoided, and in accordance with the findings of the Visionary Analytics Study[288] as well as the results of the public consultation and the practice in some Member States, the notice period should not exceed 2 to 3 years. The conditions referred to in article 81.2, paragraph (a) of the Code should be already fulfilled at the beginning of the notice period, or at a point prior to the lifting of all remedies enabling the decommissioning that allows a reasonable time for access seekers to migrate their end users. Within this 2 to 3 year limit, the duration should be modulated depending on the products offered, in particular taking into consideration that the timeframe of contracts on market 2 is usually longer than for market 1 products. In this view, NRAs might consider different notice periods for market 1 and market 2 products[289], an approach that has already been adopted by e.g. ARCEP[290]. It should also be noted that depending on national circumstances, various levels of the network might be chosen by the incumbent to implement the decommissioning (which also corresponds to the level used by NRAs to monitor the decommissioning progress)[291]. NRAs may take this into account when specifying the notice period[292]. The notice period should also be modulated according to whether wholesale access product based on the legacy copper infrastructure are being used by alternative operators at the respective handover location and therefore needs to be replaced,

[287] In a majority of MS the currently applicable notice periods are significantly shorter than 5 years; Visionary Analytics Study, paragraph 10.g.
[288] See recommendation 46 of the Visionary Analytics Study, p. 326.
[289] For market 1, the 2/3-year-duration is consistent with the maximum duration of contracts between residential end users and service providers mentioned in article 105 of the Code. It allows access seekers to migrate their customers without having to disrupt their contracts with the customer before its term, thus protecting end users and access seekers.
[290] See case FR/2020/2277-78.
[291] See BEREC Report on a consistent approach to migration and copper switch-off, BoR (22) 69. It appears that for most Member States the level chosen is the MDF. However, it is not the case for all Member States: in Luxembourg, the incumbent has started to decommission its copper network at the level of street cabinets.
[292] In France, ARCEP allows Orange to proceed to a "normal" commercial closure at the level of the MDF or to an "accelerated" commercial closure at the level of individual addresses, depending on whether AOs are already able to offer their services in the concerned area.

and if so, which type (e.g. ULL, bitstream). In particular, the notice period should be shorter and could even be very short (e.g. 6 months) in areas where no alternative operators make use of wholesale access products over the legacy network. Finally, the notice period should be shorter than a 2 to 3 year-period in case the SMP operator and all access seekers making use of the legacy wholesale access products agree to it.

8.5.2. Availability of alternative wholesale access products.

Whether the new infrastructure effectively constitutes an alternative of at least comparable quality is to be assessed by NRAs, taking into account national circumstances. A good practice in this field is for NRAs to establish a substitution matrix[293], explaining for each legacy product which product on the new network is considered to be a relevant alternative of at least comparable quality.

Enjoying passive access to the VHCN remains an important point for alternative operators[294] in Member States where access seekers largely rely on physical access to the network (eg. copper LLU). However, a co-investment offer in the VHC network offered by the SMP operator or by an alternative operator, may also be viewed as a relevant alternative if the NRA considers it presents sufficient guarantees in terms of enabling sustainable competition. In particular, such offers should be opened to all access seekers in a timely manner (e.g. at least from the beginning of the notice period). The availability of access to civil engineering infrastructure[295] may also be an important factor during the migration and switch-off process if alternative operators rely on access to this infrastructure to rollout their network. In such cases, it should therefore be monitored by NRAs during the migration process.

It should be underlined that without prejudice of the outcome of the market review and potential SMP assessment on the VHC network, alternative products do not necessarily need to be regulated products (in particular under article 73), nor do they need to be necessarily offered by the operator of the legacy network itself. Access to products over a VHCN operated by an alternative operator (i.e. different from the operator of the legacy network that

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[293] BEREC's response to Q.35 of the PC: *"Before the migration process starts, a wholesale service substitution matrix identifying for each wholesale legacy service the corresponding wholesale fiber-based NGA service would need to be drawn, in order to give transparency and predictability to the market' players."*

[294] ECTA's answer to Q. 35 of the targeted consultation: "*In copper-to-fibre migration, the ability for alternative operators to obtain passive access to the SMP operators' regulated network elements [...] is a key characteristic of the legacy products that needs to be preserved in at least the same or better form.*'

[295] BEREC's response to Q. 35 of the targeted consultation: "*Having said that, in order to give an answer to the question, it is relevant to say that replacement wholesale access products on the new network depend on national circumstances (e.g. availability of ducts, point-to-point fibre) and examples are ducts and fibre unbundling (in case technically possible and available) as well as VULA42 (or L2 bitstream, with a lower level of adoption). Generally speaking, such replacement wholesale access products provide or enable (e.g. in case of ducts, fibre unbundling) a bandwidth which is at least comparable with the bandwidth of the wholesale access product based on the legacy (copper) infrastructure."*

has SMP) could be considered as a relevant alternative[296]. In such a case the NRA should ensure that the access is provided by the third party operator on a lasting basis, and that the access conditions proposed enable effective competition on the retail market and meet the requirements set in Article 80(2), indent (a)[297].

NRAs should in the substitution matrix define the key performance indicators (KPIs) that they consider relevant for the assessment of whether the alternative products are of at least comparable quality as the ones formerly provided over the legacy network. As reminded by BEREC[298], down and upstream bandwidth speeds are the most important aspects from the end-user perspective and also seem to be most relevant with regard to price setting on the retail market. They are therefore of high importance also for access seekers, in order to be able to compete at retail level. However, BEREC also notices that other parameters of the migration at wholesale level are relevant when assessing the relevance of alternative products. The selected KPIs should therefore concern not only the intrinsic performances of the networks, but also the conditions under which the access is provided, including provisioning and repair time as well as ordering processes.

For most KPIs, in particular for bandwidth speeds[299], VHCN will be able to offer superior performances compared to the legacy network. In such cases, the products on the VHCN should provide at least similar KPIs as the legacy products they replace[300]. However, for some specific services or parameters (e.g. copper-powered applications[301]), the new network cannot provide strictly equivalent performances as the legacy network for technical reasons. In such cases, the assessment of equivalence of the alternatives should not be performed in an overly rigid manner and should focus on the key or core characteristics of a communications network, rather than differences at the fringe. In particular, while indeed legacy copper network can be used to deliver electricity to certain equipment, such networks were not build for the purpose of electricity distribution; hence this feature is only ancillary to the core

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[296] FTTH Council's response to Q.36 of the targeted consultation: *"Provided that an alternative access mechanisms exist (so a VHCN is available), then the SMP operator ought to be permitted to shut down its copper network."* For ECTA, in such cases, *"Decommissioning must occur on the same conditions as elsewhere, notably taking account of duties to give appropriate notice and without adverse effects on regulatory predictability for takers of the SMP operator's access products."* (Response to Q.36 of the targeted consultation).

[297] This is likely to be the case for instance - but not only – in one of the following situations:

- The third party operates a publicly-funded network subject to open access requirements under state aid rules, or
- The third-party operator fulfils the conditions set in article 80 of the Code.
- The third party operator has offered commitments under article 79, possibly in combination with article 76.

[298] BEREC answer to Q. 35 of the PC.

[299] BEREC answer to Q. 35 of the PC.

[300] ECTA's answer to question 35 of the targeted consultation: *"It is also decisive to ensure that SLAs/SLGs for FttH-based networks are not inferior to those for copper local loop unbundling, in terms of the general activation and repair processes and times, as well as regarding improved SLAs/SLGs that are relevant to serve business customer sites"*

[301] Visionary Analytics Study, p. 248

functionality of a communication network. The differences of such fringe functionalities should not influence NRAs' assessment of the equivalence.

Finally, in order to ensure that a relevant alternative is indeed available to access seekers and end-users, a high, near ubiquitous coverage by VHC networks (taking into account, where relevant, premises passed by operators other than the copper network's operator) should be reached in the area where copper decommissioning is envisaged[302]. To this purpose, NRAs may rely for instance on the share of premises passed, connected, or a mix of both. The mapping foreseen in article 22 of the Code could provide relevant information in this perspective.

8.5.3. Transparency and non-discrimination during the migration and decommissioning process.

Migration and decommissioning are complex processes from an operational point of view. They can also involve potential divergences of incentives to migrate between end-users, access providers and access seekers. Aligning as much as possible the views of all interested parties will therefore enhance the success of the migration process which should take place in a fully transparent way. Not only migration and decommissioning conditions themselves, but also the way of setting these conditions, should ensure transparency towards and involvement of access seekers and end-users. As indicated in the Visionary Analytics Study, NRAs should therefore proactively promote a multi-stakeholder process that seeks to ensure that alternative operators are well aware of the plans of the SMP operator[303]. For instance, without prejudice to the last sentence of article 81(2), it is relevant for NRAs to hold a market test as soon as the SMP operator has notified its proposed switch-off plan.

The migration and decommissioning process should be applied in a strictly non-discriminatory manner to access-seekers and to the retail branch of the SMP operator[304]. In particular, the commercial closure mentioned in the following part should happen at the same time for the SMP operator and for access seekers. Once the SMP operator ceases to provide services on the legacy network after all access remedies have been lifted by the NRA in order to allow the decommissioning, this should apply equally to access seekers and to its own retail

[302] BEREC's response to Q. 36 of the PC : *"it has to be noted that the level of coverage of the new and enhanced network is an important condition to be satisfied in order to allow SMP operators to dismiss the old legacy network; the migration process to reach the shut-down of the legacy network would start only at condition that the new network has reached a sufficiently wide coverage (e.g. in terms of percentage of households or access lines) on the defined (geographic) sub-/markets."*

[303] Recommendation 49 of the Visionary Analytics Study, p. 335.

[304] See ECTA's response to Q.36 of the targeted consultation: "*Attention is needed to ensure that SMP operators do not engage in selective commercial decommissioning, by continuing to self-supply copper-based connections, while refusing to supply them to alternative operators. This is critical to avoid surreptitious discrimination in instances of provisioning for use cases such as backup lines and mobile backhaul."*

arm. SLAs applied during the migration phase should ensure similar quality of service for the SMP operator and for access seekers.

NRAs should ensure that the design of the switch-off process by the SMP operator, in particular as regards its timing and agenda, does not allow strategic behaviour that would risk weakening competition at wholesale or retail level[305]. Examples of such strategic behaviour would include misleading public communications or delaying migration and decommissioning in specific areas where the SMP operator is not the operator that rolled out the alternative VHC network[306].

8.6. Gradual relaxation of remedies in order to allow the decommissioning once the second subparagraph of article 81(2) is fulfilled.

The NGA Recommendation provided a relatively limited role and flexibility to NRAs as regards the definition of the migration path, in particular the progressive lifting of remedies, in case of decommissioning of parts of or of the entire network. It envisaged only two possibilities. The first one was that an agreement was reached between the SMP operator and access seekers on the migration path. The second one was, in the absence of such an agreement, that the NRA should only ensure that a notice period of 5 years was respected by the SMP operator and enough information was timely provided by the SMP operators to access seekers. With the Code, NRAs may lift all access obligations once all conditions mentioned in article 81(2) are fulfilled. This opens the possibility for NRAs to withdraw gradually these obligations, under certain conditions, thereby defining a "decommissioning path", until the final stage where the NRA lifts all access obligations, allowing the SMP operator to decommission the copper network. This could smoothen and accelerate the migration process.

8.6.1. Commercial closure

In particular, allowing the SMP operator to apply a "commercial closure" prior to the actual decommissioning of the legacy network would accelerate the migration while preserving competition and the rights of access seekers and end-users. This commercial closure would entail that the access provider would have to maintain existing accesses but would not have to provide new accesses anymore where an alternative VHC network is available. This means that end-users as well as access seekers, when ordering new broadband products, would only be able to do so on the VHCN infrastructure. Combined with natural customer turnover - due to factors such as house moves or changes of retail supplier - and with the perspective of the copper decommissioning (which would encourage customers to migrate to VHCN

[305] FTTH Europe expressed concerns that incumbents would not switch off copper, but rather switch over customers from copper to fibre via lock-in strategies that would undermine the business case of FTTH alternative operators. FTTH Europe's also voiced concerns that incumbents would lower wholesale prices in view of FTTH entry in order to keep wholesale customers.
[306] BEREC response to Q. 36 of the PC.

beforehand), this would accelerate natural migration at retail and wholesale levels while giving enough time to wholesale operators to migrate their activities on the legacy network. NRAs should therefore allow the SMP operator to implement such a commercial closure in due time before the decommissioning, a view supported by the findings of the Visionary Analytics Study[307].

8.6.2. Prices for legacy services during the migration and switch-off process.

In cases where NRAs consider relevant to adapt, during the migration process, the access prices of the infrastructure to be decommissioned, it is recommended that they express their intention to do so in a market review and that they set the details of this adaptation simultaneously to the review of the decommissioning plan proposed by the SMP operator and to the NRA's decision setting the conditions of withdrawal of remedies in accordance with the second subparagraph of article 81(3).

The NDCM Recommendation introduced the objective of pricing stability when implementing the BU-LRIC+ cost model, in particular by neutralising[308] the inflationary effect on copper prices of migration from legacy copper networks to VHCN[309]. This approach, providing predictability for market players, remains relevant in general and is therefore kept in this Recommendation. However, when a decommissioning plan, fulfilling the conditions of the first subparagraph of Article 81(2), is notified by the SMP operator and approved by the NRA, the programmed closure of the legacy network decommissioning in itself provides sufficient predictability to market players and can justify adjusting the regulatory approach. NRAs may therefore, when setting the price for access to the legacy networks, take into account the volume effect of migration in order to reflect the inefficiencies and increased cost of maintaining two networks in parallel[310], by allowing the SMP operator to increase the prices of products provided over the legacy copper network. By bridging the possible price gap between copper and fibre products, this would also reduce the incentive that could exist for some access seekers and end-users to remain on the copper network as long as that network is not shut down[311].

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[307] See Recommendation 47 of the Visionary Analytics Study, p. 333.

[308] Recitals 25 and 39 of the NDCM Recommendation.

[309] As the number of customers on the copper network diminishes, the fixed costs of the network have to be recuperated from a lower number of customers, thus increasing the network's cost per customer.

[310] ARCEP has considered in case FR/2020/2284 a potential increase of access prices to Orange's copper network in the future in order to take into account the cost of maintain two networks in parallel and to accelerate the presentation by Orange of a detailed switch-off plan. ARCEP has launched a public consultation on the subject on 7 February 2022. Also worth mentioning is Ofcom's approach mentioned in p.333 of the Visionary Analytics Study, which decided that after a period where there will be parallel price control on FTTC and FTTP, to remove price controls on FTTC in areas where FTTP is available, at least two years after the stop sell date. This will likely lead to price increases on FTTC. See p.18 of Ofcom's 2021 market review.

[311] BEREC report on migration and copper switch-off, p.19: in Italy, during migration until the local exchange is switched-off, the price of the NGA "substituting" wholesale service, including possibly fibre VULA, is equalized to the wholesale price of the "substituted" copper service. See also WiK report for FttH Council

However, as stated in the conclusions of the Visionary Analytics Study[312], in order to ensure the efficiency of this adjustment, to preserve competition and to avoid windfall profits benefitting the incumbent, such a measure should be accompanied by sufficient safeguards. In particular, NRAs should in principle only allow the increase of copper prices where the following conditions are met:

- The timeline and level of this price increase are set in advance, for instance in the NRA's decision on the lifting of remedies according to article 81(3), to ensure certainty and predictability for operators;
- Wholesale prices for access to copper should remain non-discriminatory and should not lead to excessive retail prices;
- Conditions mentioned in article 81(2) are already fulfilled and the notice period has begun when the price increase takes place – which means that this price increase should not last for longer than 2 to 3 years in principle;
- NRAs should remain vigilant that the SMP operator does not squeeze margins if it is vertically integrated. Imposing an ERT might be excessively burdensome for products delivered over a network with a limited remaining lifetime. However, NRAs should ensure that the removal of cost orientation is reflected adequately by a related increase of the SMP operator's retail prices, so as to also incentivise the retail customers to migrate to VHC networks.
- In compliance with article 81(2), which states that NRAs may withdraw regulatory obligations if the SMP operator has complied with the conditions and process notified, the price increase should be accompanied by a binding and enforceable commitment of the SMP operator on the date when it ceases to provide any service on the legacy network. This would ensure that the price increase for the legacy access products does not incentivize the SMP operator to delay the copper decommissioning in order to benefit from this price increase for a longer period.

Europe on copper switch-off, pp 34-35: "*Literature suggests that, if there is a wide spread between the copper access price (LLU) and the price for renting access to an incumbent's fibre network, the alternative operator will remain on copper, impeding efforts by the incumbent to decommission its legacy infrastructure […] All things being equal, charging the same price for copper and fibre, or even a higher price for copper should create the right incentives for alternative operators to migrate. However […] if copper is priced at or above fibre levels, incumbents may have less incentive to invest in fibre. Thus […] the timing of actions to adjust relative prices to foster migration is important. In an environment where incumbents have not yet invested in fibre or reached agreements to access fibre networks of others, the incentive mechanism that in theory should be most likely to trigger investment by incumbents and migration by altnets, is one in which there is initially a gap between copper and fibre prices, but where the incumbent is permitted to rapidly switch-off its copper network and transfer all access seekers to the (higher) fibre prices, or to raise copper prices to or above the level of fibre once fibre has been deployed*".

[312] Recommendation 48 of the Visionary Analytics Study, p. 338.

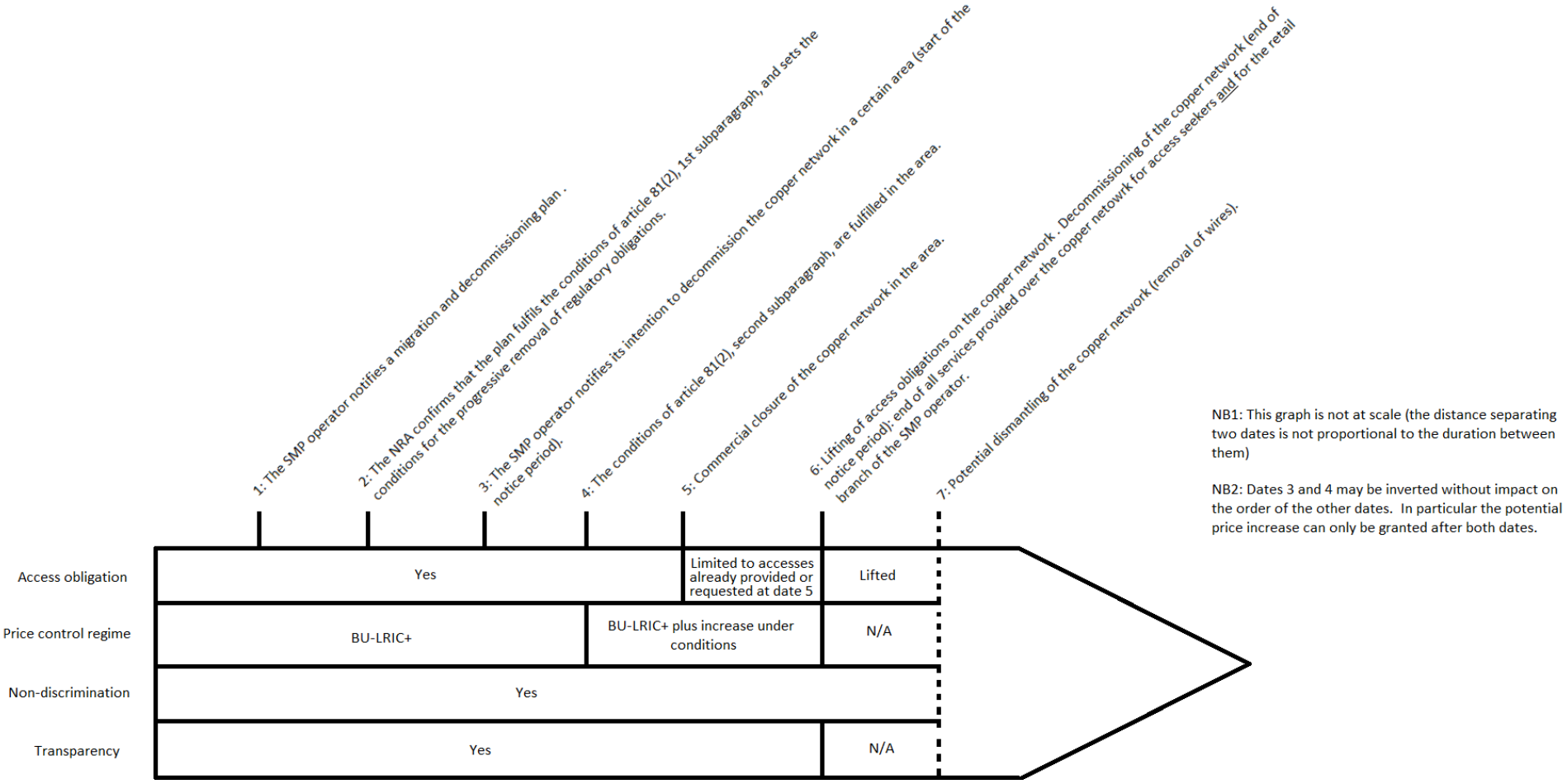

Chart 1: potential stages of the decommissioning path

9. GUIDANCE ON GEOGRAPHIC SEGMENTATION OF REMEDIES

Regulatory framework

Significant variations of competitive conditions within Member States can already be observed[313] and are likely to increase in the coming years. In accordance with article 64(3) of the Code, NRAs should take into account these variations, in particular the degree of infrastructure competition, at the stage of market definition, potentially defining separate geographic markets. The SMP Guidelines[314] and the Staff Working Document accompanying the 2020 Recommendation on Relevant Markets[315] specify how NRAs should proceed with the geographic market definition. The Code also opens the possibility for NRAs to take into account variations of competitive conditions by differentiating remedies on a geographic basis[316]. However, it is clear from the Code that differentiating markets or remedies are not two equivalent possibilities, as confirmed by the SMP Guidelines[317] and by the 2020 RRM[318].

Regulatory practice

Currently, as mentioned in table 16, both approaches have been adopted by a significant number of NRAs. A higher number of NRAs have applied a segmentation of markets than remedies, with 3 NRAs having applied both.

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[313] See recitals 35-36 of the 2020 Recommendation on Relevant markets, as well as p. 17 of the accompanying staff working document: *"This trend is likely to increase in the future, as the infrastructure-based competition is developing at a different pace within Member States, which in turn leads to different competitive conditions at subnational level. For instance, the wholesale broadband access market used to be characterized by a ubiquitous copper network owned by the national incumbent. With the competition of cable networks that cover, in most of the cases, only parts of the country, the progressive deployment of fibre by various actors and the switch-off of the copper network in certain areas, competitive conditions are likely to become heterogeneous within many Member States."*

[314] See points 46-49 and 51 of the SMP Guidelines.

[315] See recitals 37-39 and point 3 of the 2020 RRM, as well as point 2.5 of the accompanying SWD.

[316] Recital 172 of the Code : "*Such an assessment [...] does not preclude a national regulatory authority from finding that a mix of such remedies together, even if of differing intensity, in line with the proportionality principle, offers the least intrusive way of addressing the problem. Even if such differences do not result in the definition of distinct geographic markets, they should be able to justify differentiation in the appropriate remedies imposed in light of the differing intensity of competitive constraints*."

[317] Point 50 of the SMP guidelines.

[318] See p. 21 of the SWD accompanying the 2020 RRM: "*Geographic differences of competitive conditions that are significant and sufficiently stable over time are in principle to be treated at the level of market definition"* and recital 39 of the 2020 RRM: "*Segmentation of remedies may be used to address less significant or less stable variations in competitive conditions, including by adjusting remedies periodically or punctually, without thereby undermining regulatory predictability".*

Table 16: Criteria and variations used by NRAs applying geographic segmentation of remedies (as of 27/04/2022).

	Market 1	Ex-market 3b	Market 2
Geographic segmentation of markets	Finland Hungary Poland Spain	Finland Germany Hungary Ireland Lithuania Poland Portugal Spain Slovenia	Austria Croatia Finland Ireland
Geographic segmentation of remedies	Cyprus Belgium Denmark Slovenia	Denmark France	France
Mix	Italy	Belgium Italy	Portugal

Source: article 7/32 notifications

Among the NRAs applying remedies segmentation, the criteria for the segmentation of remedies, as well as the differences of remedies subsequently applied, differ between Member States (see table 17.) As regards the criteria used, the number of competing networks (with a coverage requirement for a network to be counted), and the incumbent's market shares, are the most frequently used criteria though with various thresholds. It can also be noticed that same or similar criteria are also frequently used for the differentiation of geographic markets[319].

Table 17: Criteria and variations used by NRAs applying geographic segmentation of remedies (as of 27/04/2022).

Member State	**Criteria for remedies segmentation**	**Substance of the remedies differentiation**
Belgium[320]	• Number of NGA operators on top of the incumbent.	• 0 operator: full set of remedies on incumbent. • 1 operator: full set of remedies on incumbent, light set on alternative operator. • 2 or more operators: light set of remedies for all operators.
Cyprus[321]	• Vectoring implemented or not by the incumbent	• Incumbent may supply virtual product instead of LLU if

[319] See table 2 of the SWD accompanying the 2020 RRM.
[320] See cases BE/2018/2073-74.
[321] See case CY/2016/1883

	• Rural versus urban areas	vectoring implemented. • Agreement of alternative operators is necessary to implement vectoring in urban areas, not necessary in rural areas.
France[322]	• Number of operators able to provide wholesale bitstream products	• Cost orientation and transparency obligations are lifted in the more competitive areas.
Italy[323]	• Incumbent's wholesale and retail market shares. • Alternative operators' coverage.	• Lighter transparency obligations and partial (market 1) or full (ex-market 3b) pricing flexibility in more competitive areas.
Portugal[324]	• Number and coverage of alternative operators.	• Margin squeeze test instead of cost orientation in more competitive areas.
Slovenia[325]	• Incumbent's retail market share. • Number and coverage of alternative operators.	• Pricing flexibility in the more competitive areas.
Spain[326]	• Number and coverage of alternative operators.	• No obligation to provide virtual local access to fibre in more competitive areas.

Source: article 7/32 notifications

Given the variety of situations in Member States, it is not possible to precise a universal list of criteria and thresholds that should always be fulfilled to trigger a remedies segmentation. However, there is a large consensus that the criteria used for the segmentation of remedies should be based on indicators similar to those for the definition of geographic markets. These criteria, as listed in point 3 of the 2020 RRM, include "*the number and characteristics of competing networks, distribution of and trends in market shares, prices and behavioural*

[322] See case FR/2020/2279
[323] See cases IT/2019/2181-82
[324] See case PT/2016/1890.
[325] See case SI/2021/2355.
[326] See case ES/2021/2330.

patterns."[327]. In any case, the segmentation of remedies should be considered for cases where such variations in market conditions are either not sufficient or not stable enough to warrant the definition of separate geographic markets.

Public consultation.

Among the respondents that recognize the potential benefits of a geographic segmentation of remedies to tailor regulatory treatment to local circumstances (BEREC, ETNO, DT, TIM), some of them express the need for caution on this issue (BEREC, ETNO, Orange), as it could undermine predictability and represent a heavy burden for operators and NRAs. ECTA is rather against segmentation of remedies, pointing the consequences in terms of fragmentation. In any case, all respondents agree that should a remedy segmentation take place, it should be argued and specified in the market analysis. For both ETNO and ECTA, a geographic differentiation of remedies - instead of market - should be applied where the boundaries of competitive areas are not stable. An operator active on the business markets, expressed its opposition vis-à-vis any kind of segmentation on dedicated business connectivity market (or on mass-market products that serve businesses), as it would prevent them from having a nationwide offer. As regards the specific case where the criteria for geographic segmentation of remedies would be used to review remedies periodically, a majority of respondents (ECTA, Orange, UKE, FTTH council) are rather against such an approach, pointing the potential burden it could represent, and its impact on predictability.

Visionary Analytics Study

Visionary Analytics Study suggests to summarise the circumstances under which differentiated market definition versus differentiated remedies should be preferred, with a specific focus on VHCN. Visionary Analytics Study also concludes that NRAs should refrain from adjusting geographic differentiated remedies out-of-cycle unless the geographically differentiated changes in competitive dynamics are substantial and that if a substantial shift is known at the time of a market review, the NRA should signal whether it considers an out-of-cycle adjustment likely, and how it intends to proceed.

Geographic segmentation of remedies based on variations of competitive conditions insufficiently substantial to define separate geographic markets.

The segmentation of remedies based on differences of competitive conditions (i.e. in the absence of stability issues) relates to cases where NRAs, after analysing demand and supply substitution, conclude that variations of competitive conditions do not lead to the definition of different geographic markets, but that they require different remedies to solve competitive

[327] Finding 45 of the Visionary Analytics Study, p. 227. These criteria, as listed in point 3 of the 2020 RRM, include "*the number and characteristics of competing networks, distribution of and trends in market shares, prices and behavioural patterns*."

concerns in a proportionate manner[328]. For instance, the conditions for the application of pricing flexibility (cf. section 7.1 of this document) might be fulfilled only in certain areas. If NRAs conclude that these differences are not substantial enough to lead to the definition of separate geographic markets, they should apply a geographic segmentation of remedies. In any case, the market review should clearly set out why competitive conditions in certain areas are different from other areas, the criteria used to define the boundaries of areas with different competitive conditions, and why these differences of competitive conditions do not lead to the definition of separate geographic markets but call for different remedies.

Geographic segmentation of remedies based on insufficiently stable variations of competitive conditions.

These cases refer to situations where NRAs consider that differences of competitive conditions could lead to the definition of different geographic markets but that the boundaries of these hypothetical geographic markets would not be stable throughout the entire period of validity of the market review. In these circumstances, NRAs should define segmented remedies in order to still take into differing intensity of competitive constraints and accordingly, apply appropriate and proportional remedies[329]. It logically follows that in such cases, at least one review of the remedies segmentation will be necessary before the end of the time frame of the market analysis. In some cases, multiple periodic reviews might even be needed, usually done annually. Currently, only the Italian NRA has foreseen such periodic reviews of remedies[330]. The Belgian NRA has also adopted a dynamic approach to the differentiation of remedies, but the differentiation is self-executing and is triggered as soon as conditions are fulfilled (with a transitory period), without a formal review by the NRA[331]. It should also be noticed that the Irish NRA has carried out a mid-term assessment of ex market 3b[332] (already foreseen in the market review[333]), limited to the revision of the geographic markets' respective boundaries, based on the same criteria as in the market review. While this approach has allowed to apply more targeted and dynamic remedies, with regulatory predictability for operators, it indicates that a geographic segmentation of remedies might have been relevant in this case. In other cases of geographic segmentation of markets, the Commission commented that the criteria used by NRAs were too static[334]. This might also indicate that in such cases, a segmentation of remedies, accompanied by periodic reviews, would have been more appropriate.

[328] See BEREC's answer to q. 39 of the targeted consultation: "*Geographic segmentation of remedies allows for a fine-grained regulation, leading to a more proportionate set of obligations when having still SMP in the national or subnational markets.*" See also cases FR/2020/2279, BE/2018/2073-2074, DK/2017/1993-1994 and SI/2021/2356.
[329] See recital 172 of the Code.
[330] See case IT/2019/2181.
[331] See case BE/2018/2074.
[332] See case IE/2021/2343
[333] See case IE/2018/2090
[334] See cases LT/2019/2184, PL/2019/2160-2161 and IE/2019/2214.

For the purpose of the new Recommendation, the Commission considers that such reviews of remedies should provide legal certainty and predictability for market players. Therefore, their conditions should already be set in the original remedies decision accompanying the market analysis they are based on. These conditions should include in particular the timeframe of the review (for instance a yearly periodicity) and the precise criteria applied to define the areas where different remedies will apply. These criteria, as well as the different set of remedies applied in the various areas defined, should remain constant if one or more reviews of remedies are foreseen or take place within the framework of the initial market analysis[335].

A geographic segmentation of remedies accompanied by a periodic review might be particularly relevant in Member States that observe a fast deployment of VHCNs. Regularly monitoring the rollout of the VHCN and adapting the remedies accordingly could allow NRAs to take into account the rollout on a forward-looking basis, while managing the uncertainty related to the timing and location of this rollout.

[335] See BEREC's answer to q. 41 of the targeted consultation: "*In order to find the adequate equilibrium for all actors, BEREC agrees that the criteria to perform a review of the geographical segmentation of remedies should be included from the start in the market analysis if the NRA foresees the possibility of a relevant variation of competitive conditions for the geographical segmentation applied in the market analysis (acc. to Art. 68 (6) EECC).*"

ANNEX I – SUMMARY OF THE CONSULTATION ACTIVITIES

In order to provide all interested parties with the opportunity to express their views and present their experience with the two recommendations[336], the Commission organized a series of consultation activities between July 2020 and April 2022.

(1) A public consultation ('targeted consultation') was organized to collect feedback from stakeholders and took place from 16 July 2020 to 7 October 2020. The Commission published a "Factual Summary Report" of the results of the targeted consultation.

(2) The Commission also organized workshops, discussions and exchanges with NRAs, stakeholders, BEREC, etc.

1. Preliminary findings observed in the replies to the targeted consultation:

The targeted consultation took place in the period between 16 July 2020 and 7 October 2020. 24 respondents (in particular: BEREC, ETNO, ECTA, FttH Council and individual operators) presented their experience with the current recommendations and expressed their views on their revision.

Here are the main findings:

Non-discrimination obligation

There is a broad agreement among respondents that the non-discrimination obligation is an essential tool of *ex ante* regulation.

BEREC, in its reply, indicates that Equivalence of Input (EoI)[337] - which is imposed to some degree by the majority of NRAs regarding NGA wholesale local access products - is essential to create a level playing field between operators. Although, according to BEREC, in individual cases and depending on the circumstances, Equivalence of Output (EoO)[338] could be more appropriate and proportional. BEREC expects that importance of the obligation of non-discrimination will continue to grow in the coming years. In this vein, BEREC indicates that Key Performance Indicators, Service Level Agreements and Service Level Guarantees play a key part to monitor the application of that obligation.

According to ETNO members, their experience throughout Europe shows that the principles from the NDCM Recommendation on EoI and on economic replicability tests in many

[336] The 2010 NGA Recommendation and the 2013 NDCM Recommendation.

[337] Equivalence of Inputs (EoI)' means the provision of services and information to internal and third-party access seekers on the same terms and conditions, including price and quality of service levels, within the same time scales using the same systems and processes, and with the same degree of reliability and performance.

[338] 'Equivalence of Output (EoO)' means the provision to access seekers of wholesale inputs comparable, in terms of functionality and price, to those the SMP operator provides internally to its own downstream businesses albeit using potentially different systems and processes.

instances are difficult to implement. This can sometimes lead to disproportional regulatory constraints in the given circumstances. In their opinion, EoO can be effective in dealing with discriminatory practices.

On the other hand, ECTA and alternative operators (e.g. Illiad) claim that further progress is needed to ensure non-discrimination on a solid ex-ante basis, based on Article 70 of the EECC and related articles. This is also needed to ensure that NRAs explicitly impose strict internal-external non-discrimination on SMP operators.

Economic replicability test (ERT[339])

BEREC considers that the ERT plays a key role for the development of NGA infrastructures and the use of wholesale NGA offers. BEREC is of the view that the existing guidance is sufficient and that there is no need for more.

ETNO and its members, as well as Liberty Global, believe that the ERT is still a valid tool, and that is important to preserve the flexibility to adapt the application of the ERT to national or regional circumstances.

According to ECTA and BREKO, the ERT has had limited success in ensuring effective access. ECTA members mentioned concrete problems they are facing with the ERT.

The FTTH Council considers that the concept of ERT should be reviewed in order to reflect the evolution of market conditions and the new regulatory landscape stemming from the Code, particularly the development of new operators deploying FttH networks, and the increasing shift towards infrastructure competition.

Promoting pro-investment and pro-competition approaches in relation to price control obligations

According to BEREC, price control obligation should be imposed on non-competitive markets but certain level of flexibility (i.e. pricing flexibility, anchor definition) could be useful to promote investments in new technologies together with sufficient safeguard mechanisms.

ETNO and some of its members (Deutsch Telekom and TIM) support the current guidance principles from the NDCM Recommendation under which price flexibility may be imposed. Additionally, ETNO and its members ask for more support for co-investment schemes.

ECTA is of the opinion that the introduction of wholesale pricing flexibility for SMP operators has enabled the dominant telecom companies to limit competition. It also claims

[339] The economic replicability test ensures that "*the margin between the retail price of the SMP operator and the price of the NGA wholesale input covers the incremental downstream costs and a reasonable percentage of common costs*" (point 64 of the recital of the NDCM Recommendation).

that effective non-discrimination obligations do not justify the lifting of price control obligations.

Some operators (Iliad and Open Fibre) expressed doubts about the lifting of wholesale price regulation (pricing flexibility) being a beneficial solution for the improvement of competition in wholesale and retail access markets. Iliad is of the opinion that the pricing flexibility approach could potentially be detrimental to the competition by discouraging investment by alternative operators.

With respect to the risk premium, according to BEREC and some operators (in particular Vodafone and Liberty Global) the guidance provided in the NGA Recommendation regarding the factors of uncertainty, such as uncertainty relating to retail and wholesale demand, to the costs of deployment, civil engineering works and managerial execution, etc. are still relevant. ETNO indicates that the imposition of price control on NGA/VHC services should be avoided in the presence of a retail constraint and effective non-discrimination, and that therefore the issue of risk premium should in principle concern only the less competitive areas. ECTA rejects the notion that project-specific risk premiums over and above the regulated weighted average cost of capital (WACC)[340] of SMP operators should be applied and projected onto the wholesale tariffs that alternative operators are charged with.

Regarding the regulated price anchor[341] as defined in the NDCM Recommendation, most stakeholders agree that the copper anchor continues to be relevant in many Member States. Although the competitive pressure stemming from this regulated anchor will diminish in the years to come, many of the respondents (ETNO and BEREC in particular) agree that the anchor should be defined by the NRA, mainly based on the extent of NGA/VHCN coverage and demand patterns.

The economic consultancy firm Oxera believes that further specific guidance is needed on the notion of 'fair and reasonable' pricing. This is particularly the case given that certain business models, most notably wholesale-only businesses may not be subject to strict price control obligations and will instead be required to comply with the requirement to set prices that are 'fair and reasonable'.

Cost methodology

BEREC believe that the BU LRIC+ (Bottom Up Long Run Incremental Cost Plus) cost modelling of a modern efficient network at current costs as recommended in the NDCM Recommendation is still relevant state-of-the-art principles. It provides the appropriate build

[340] The WACC represents the value for which the investor needs to be compensated for an investment. In the context of telecoms regulation, the WACC is calculated by the relevant national regulatory authority and added to the maximum allowed wholesale price that the regulated operator can charge for access to its infrastructure.

[341] Pursuant to point 6.c of the NDCM Recommendation, the copper anchor is a cost oriented copper wholesale access product which constrains the NGA prices in such a way that NGA services will be priced in accordance with the consumers' willingness to pay for the additional capacity and functionalities an NGA based retail product can provide in comparison with a copper based retail product.

or buy signals promoting efficient entry and maintaining incentives to invest in new and enhanced networks, in particular VHC networks.

Alternative operators (e.g. Vodafone, Liberty Global) would not change the current recommended approach based on long run incremental cost model, including a mark-up for common costs. On the other hand, SMP operators claim that NRAs in general should move away from the cost orientation on VHCNs as this may have a negative effect on investment in such networks.

Regulation of civil engineering infrastructure

Access to civil engineering infrastructure is regulated in many Member States, but the regulatory approaches vary. Almost all respondents agree that the non-discriminatory access to physical infrastructure is essential for an efficient fibre roll-out and effective competition.

The vast majority of respondents think that the principles identified in Annex II of the NGA Recommendation (on the application of the principle of equivalence for access to the civil engineering infrastructure of the SMP operator) continue to be relevant. A majority of respondents (including ECTA and its members, BEREC, Vodafone, Open Fibre and Orange) agree, with some nuances, that EoI is generally appropriate for access to civil engineering infrastructure. ETNO believes that the proportionality of EoI for access to civil engineering infrastructure should be assessed on a case by case.

On the issue of a possible differentiated regulatory treatment of non-legacy civil engineering infrastructure (in particular ducts that are being built for fibre deployments), ETNO and several of its members consider that the same regulatory framework should apply to legacy and non-legacy infrastructure, although ETNO suggests that a first mover advantage should be granted for new investments. BEREC highlights that the existing recommendations already foresee a differentiated approach between legacy and non-legacy infrastructure and considers that it is still relevant today. The majority of respondents (including ECTA, the FttH Council and different alternative operators) share the view that the BCRD[342] should not replace obligations based on the SMP regime, which are seen by many stakeholders as more effective. A limited number of respondents (Deutsche Telekom and TIM) suggest that access to civil engineering infrastructures should in principle not be regulated on the basis of the SMP regime but through symmetric provisions, and in particular the BCRD. ETNO and several of its members insist on the need to ensure that SMP obligations and BCRD obligations are coherent and well balanced between telecom operators and the other physical infrastructure owners.

Almost all respondents recognise that, in accordance with the EECC (Articles 72 and 73), priority in terms of access obligations should be given to the physical infrastructure access. However, most of them believe that important preconditions must be met, i.e. access to civil

[342] Directive 2014/61/EU on measures to reduce the cost of deploying high-speed electronic communications networks ('the Broadband Cost Reduction Directive').

engineering will be the appropriate stand-alone remedy where there is a realistic prospect for infrastructure-based competition.

Commercial agreements, cooperative arrangements and commitments

None of the respondents has prior experience in commercial and cooperative arrangements leading to a review of the market analysis. While ETNO suggests that longer regulatory cycles require some flexibility (and in their view SMP operators can request an early review of the market in case of significant changes to market dynamics), BEREC and some operators (in particular Vodafone) and associations (ECTA) insist on the need to foster regulatory predictability. Consequently, they suggest that the standard for market changes leading to a market review before the end of the market analysis cycle should be very high.

Migration

For ECTA and BEREC, non-discrimination during the migration process is an important aspect, pointing among other things to the risk that the timetable of the switch-off could be used strategically by the SMP. On the assessment of comparability of new and legacy products, ETNO suggests that this assessment should be based on the retail offers of the SMP operator. ECTA and BEREC mention that factors at wholesale level should also be taken into account (for instance KPIs/SLA/SLGs). BEREC mentions that some parameters might be market-specific (e.g. for the market for wholesale high-quality access provided at a fixed location). In cases where the NGA/VHCN network is not rolled out by the SMP, BEREC points out that this could have an impact on the SMP assessment. In case NGA/VHCN is rolled out by alternative operators, ETNO calls for relaxed obligations on the copper switch-off (for instance regarding the notice period for transition), while ECTA insists that obligations should be fully maintained. FttH Europe is of the opinion that too restrictive conditions for copper switch-off might hamper migration. There is a consensus that pricing incentive is a good way to foster migration, but divergent views on which direction to go (e.g. ETNO considers copper prices should go up, while ECTA believes the opposite).

Geographic differentiation of remedies

Among the respondents that recognize the potential benefits of a geographic segmentation of remedies to tailor regulatory treatment to local circumstances (BEREC, ETNO, DT, TIM), some of them express the need for caution on this issue (BEREC, ETNO, Orange). ECTA is rather against this approach. On the setbacks, some respondents argue that it undermines predictability and that it represents a heavy burden for operators and NRAs. In any case, should a remedy segmentation take place, it should be defined and reasoned in the market analysis (a view shared by all respondents). For ETNO, a geographic differentiation of remedies - instead of market - should be applied where the boundaries of competitive areas are not stable (a view shared by ECTA). An operator active on the business markets, expressed its opposition vis-à-vis any kind of segmentation on dedicated business connectivity market (or on mass-market products that serve businesses), as it would prevent them from having a nationwide offer. As regards the specific case where the criteria for

geographic segmentation of remedies would be used to review remedies periodically, a majority of respondents (ECTA, Orange, UKE, FTTH council) are rather against such an approach that would be burdensome and lack predictability.

2. Results of the other consultation activities

The Commission gathered additional inputs through a series of workshop and discussions:

- **On 15 April 2021, during the drafting process of the Visionary Analytics Study (Annex II), a workshop was organized with NRAs**;

The workshop was dedicated to the following topics: approaches towards price regulation, non-discrimination obligations and access to civil engineering infrastructure (CEI).

Exchanges on approaches towards price regulation focused on several issues ranging from risk premium and WACC pricing flexibility. It was also noted that predictability is a key factor for investment. The discussions on non-discrimination obligations focused on the boundary between EoI and EoO, which may be difficult to define. Discussions on CEI stressed the important of access to information in order to have an effective access. Finally, the last part of the workshop on migration from copper to fibre focused on the issues relating to the migration process (e.g. how to be not too intrusive at the retail level).

- **On June 9 2021, during the drafting process of the Visionary Analytics Study, a workshop was organized with stakeholders;**

Stakeholders (operators, consulting group, professional associations, etc.) gave their main inputs relating to key points of the current recommendations by answering questions on the following topics: approach towards price regulation (e.g. cost orientation, pricing flexibility, etc.), implementation of price control (e.g. calculation of the NGA risk premium), non-discrimination obligations (e.g. implementation of EoI/EoO, guidance on SLAs, etc.), access to CEI and migration (Art.81 EECC).

- **From 17 March 2022 to 7 April 2022, a series of meetings was organized with BEREC.**

On 17 March 2022, the European Commission presented the main elements of the Access Recommendation revision's project and answered preliminary questions. BEREC co-chair emphasized that the presentation showed a lot of continuity with existing guidance and margin of manoeuvre from NRAs.

Following this first discussion, several follow-up meetings on specific technical points (e.g. access to duct, application of the recommended costing methodology in the context of migration to fibre) were organized.

ANNEX II – SUMMARY OF THE VISIONARY ANALYTICS STUDY

The European Commission published a summary of the Final Report of a study entitled "Regulatory Incentives for the Deployment of Very High Capacity Networks in the Context of the Revision of the Commission's Access Recommendations" that was conducted in late 2020 and the first half of 2021 by a team led by Visionary Analytics.

The overall objectives of this study were to support the Commission in assessing the effects of the NGA and NDCM Recommendations, as well as exploring the need to revise the guidance in the field of access regulations. The results of the study provide an evidence base for the development of a new recommendation.

Here are the main findings of the retrospective analysis (1) and a suggested way forward (2) as summurized in the Final Report.

1. Findings of retrospective analysis

a. Implementation of the recommended approach towards pricing flexibility and price regulation

The NGA Recommendation contemplates remedies that NRAs should adopt to address the risk that incumbents would seek to monopolise new broadband services provided over legacy infrastructure (including civil enginieering infrastructure) and thereby limit consumer choice. Adopted three years later, the NDCM Recommendation seeks to bring about a consistent application of pricing and non-discrimination remedies by NRAs that find SMP in Markets 1/2020 and 3b/2014, while at the same time incentivising NGA deployment by SMP operators.

NRAs mandate a series of wholesale access products to preclude the concerned SMP operators from using their market power in these markets and refusing to deal with access seekers. The mandated access products are:

a) Local loop unbundling service on copper network (ULL)

b) Sub loop unbundling on copper network (SLU)

c) Shared access service on copper network

d) Fibre local loop unbundling (fiber LLU). FTTH can be deployed according to different types of architecture (Ethernet Point-to-Point (P2P), Gigabit Passive Optical Network (GPON) over P2P, GPON over Point-to-multipoint (P2MP) and Wavelength Division Multiplexing PON), of which some are technically more difficult to unbundle.

e) Virtual Unbundled Local Access (VULA) on Fibre to the Cabinet Network (VULA (FTTC[343]))

f) VULA on Fiber to the Home Network (VULA (FTTH))

g) Dark fibre in access network, i.e. an ancillary service mandated on the SMP operator consisting of the provision of a dark fibre, often as an alternative access to ducts in the absence of space (e.g. for backhaul to reach street cabinets in the case of sub-loop unbundling).

h) Duct access on access network

i) Bitstream service at central access on legacy infrastructure (copper from the central office)

j) Bitstream service at central access on FTTC and Fixed Wireless Access (FWA) infrastructure

k) Bitstream service at central access on FTTH infrastructure

Mandated access to the terminating segment (i.e. to the wiring and cables and associated facilities inside of buildings or up to the first concentration or distribution point) is advocated in Point 18 NGA Recommendation. However, in line with the definition of Art. 61(3) EECC, such access could in principle be imposed as a symmetric remedy.

The products listed from d) to h) and j) and k) are NGA/ VHCN access products. **Error! Reference source not found.** shows which NRAs mandate SMP operators to provide these wholesale access products and whether they impose a non-discrimination obligation and price controls on top of the access obligation.

NRA regulation of wholesale access products:

	Fibre LLU	VULA (FTTC)	VULA (FTTH)	Dark fibre	Duct access	Bitstream FTTC - FWA	Bitstream (FTTH)
Access mandated	CZ, DE, DK, EE, FI, HR, HU, LT, LV,	AT, VE, CY, CZ, DE, EL, FI, HR,	AT, BE, CY, CZ, EL, ES, FI, HR, HU, IE,	CZ, DE, DK, FR, HR, HU, IE, IT, LT, LU,	BE, DE, EE, ES, FR, HR, HU, IE, IT, LT, LV, PL,	BE, CY, CZ, DE, EE, EL, FI, HR, HU, IE,	BE, CZ, DK, EE, ES, FI, HR, HU, IE, IT, LT,

[343] Fibre-to-the-cabinet (FTTC): An access network structure in which the optical fibre extends from the exchange to the cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire but could use another technology, such as wireless.
Source: www.ofcom.org.uk/__data/assets/pdf_file/0013/63220/nga_glossary.pdf

	LU, MT, PL, SE, SI, SK	HU, IE, IT, LT, LV, SI, SK	IT, IS, LT, LU, LV, MT, SI, SK	LV, PL	PT, SI, SK	IT, LT, LU, LV, PL, SK	LU, LV, PL, SK
Non-discrimination mandated	CZ, DE, DK, EE, FI, HR, HU, LT, LU, LV, MT, PL, SE, SI, SK	AT, BE, CY, CZ, DE, EL, FI, HR, HU, IE, IT, LT, LV, SI, SK	AT, BE, CY, CZ, EL, ES, FI, HR, HU, IE, IT, LT, LU, LV, MT, SI, SK	CZ, DE, DK, FR, HR, HU, IE, IT, LT, LU, LV, PL	BE, DE, EE, ES, FR, HR, HU, IE, IT, LT, LV, PL, PT, SI, SK	BE, CY, CZ, DE, EE, EL, FI, HR, HU, IE, IT, LT, LU, LV, PL, SK	BE, CZ, DK, EE, ES, FI, HR, HU, IE, IT, LT, LU, LV, PL, SK
Price control	CZ, DE, DK, EE, FI, HR, HU, LT, LU, LV, MT, PL, SI	AT, BE, CY, NCZ, DE, EL, FI, HR, HU, IE, IT, LT, LV, SI	AT, BE, CY, CZ, EL, ES, FI, HR, HU, IE, IT, LT, LU, LV, MT, SI	CZ, DE, DK, FR, HR, HYU, IE, IT, LT, LU, LV, PL	BE, DE, EE, ES, FR, HR, HU, IE, IT, LT, LV, PL, PT, SI, SK	BE, CY, DE, EE, EL, HR, HU, IE, IT, LT, LU, LV, PL	BE, DK, EE, ES, HR, HU, IE, IT, LT, LU, LV, PL

Source: BEREC's 2020 Regulatory Accounting Report, Figure 61, p. 67

The advocated costing methodology set out in the NDCM Recommendation in case NRAs should impose price controls is widely supported by stakeholders, despite some of them suggesting a possible need for improvement and on the frequency of the review of the parameters of the cost models used.

Many NRAs do not (or no longer) apply NGA specific risk premia, while the few NRAs applying risk premia follow the guidance of the NGA Recommendation. Some explicitly do the computation themselves, while others use benchmarks.

Moreover, the recommended price band has ensured the stability of the monthly wholesale rates for ULL across the EU. However, we have noted a growing divergence between the regulated maximum rates for LLU set across the EU. These divergencies reflect national differences, but also result from differences in the application of the costing methodologies used.

The use of long-term pricing agreements and volume discounts varies. Only a few NRAs report volume discounts being applied by the SMP operator on the price of regulated wholesale access products and no NRA reports specific evidence of a link between volume discounts and investments in VHCN. On the other hand, a significant number of NRAs report the use of long- term pricing agreements in their respective Member States with some agreeing that these discounts support VHCN deployment.

At the time of the adoption of the NGA Recommendation, imposing pricing remedies was seen as generally the most appropriate way to deal with a finding of SMP, entailing market power to fix tariffs. The NDCM Recommendation, however, advocated a more nuanced approach: in certain circumstances, pricing flexibility should be viewed as the default option. Currently, cost orientation continues to be imposed by many NRAs for access to one or more NGA wholesale products, however the use of the pricing flexibility proposed by the NDCM Recommendation, though still limited to date, is taking up. The NRAs concerned tend to follow the guidance provided and believe that the guidance provided in the NDCM Recommendation will likely continue to be adequate to deal with the future technological and market evolution. NRAs applying the recommended pricing flexibility (or those that applied a margin squeeze test instead of cost orientation), consider the approach to have contributed to promoting an efficient investment in NGA/VHCNs, leading to an increase in NGA/VHCNs and a better quality of service for end-users.

The use of the Economic Replicability Test (ERT) recommended by the NDCM Recommendation faces certain challenges. NRA approaches regarding the transparency of the process of designing the test vary and are sometimes alleged to be unsatisfactory. The process through which the effectiveness of the ERT is monitored varies strongly and is in some Member States allegedly ineffective. Moreover, the timing of the execution of the tests and of their follow up also diverges substantially.

The study shows that a *copper anchor* continues to be potentially relevant in many Member States. However, different *anchor products* may be appropriate across the EU in the future given the diverging market evolutions in the various Member States.

Finally, only a few NRAs that have designated an operator as having SMP on the market for wholesale local access have departed from cost orientation beyond the scenario of ERT, effective non-discrimination remedies, and retail price constraints as envisioned in the NDCM Recommendation. For example, a few NRAs have imposed ‘fair and reasonable’ pricing obligations on SMP operators for wholesale broadband access products.

b. The recommended non-discrimination obligations

There is substantial variation between the non-discrimination obligations (Equivalence of Input (EoI) and Equivalence of Output (EoO) imposed by NRAs. When deciding on whether to impose EoI or EoO for specific access products, NRAs seldom proceed to a quantitative

cost/benefit analysis, but rather rely on a qualitative estimation of the need to ensure 'stricter' non-discrimination for the wholesale access products at stake.

Several comments received from stakeholders acknowledge that any requirement to set up EoI will have a cost. Calls from operators to move from EoO to EoI are sometimes motivated by (potential) information sharing between wholesale and retail arms of the SMP operator. Beyond that specific issue, these calls seem to reflect problems related to the enforcement or the functioning of EoO rather than to the current guidance. Similar monitoring and enforcement problems are in some cases raised even when EoI is imposed.

According to the findings, very few NRAs perceive causal links between strict non-discrimination and incentives to invest in VHCN deployment. In fact, no NRA acknowledged that such obligations may decrease access providers' incentives to invest in VHCN deployment.

The analysis shows that all NRAs foresee a Technical Replicability Test (TRT) or at least mandate Key Performance Indicators (KPIs) ensuring non-discriminatory replicability of the retail services of the SMP operator by alternative operators. However, comments received suggest there is some room for improvement. The manner in which KPIs are monitored varies substantially across the EU. Several comments by access seekers relate to alleged weaknesses in the monitoring and enforcement. In some Member States, there appears to be a lack of transparency as to how the NRA monitors KPIs, and what happens if they are not adhered to. In fact, comments received sometimes go beyond the non-discrimination issue. Operators seem concerned with Quality of Service (QoS) issues, stressing that KPIs set by NRAs are sometimes not ambitious enough.

Finally, the study found that Service Level Agreements (SLAs) and in many cases also Service Level Guarantees (SLGs) on the provision of wholesale broadband access products are provided by SMP operators across the EU. However, access seekers' comments suggest that in some cases the billing procedure and the level of the SLG payments foreseen would not be sufficiently dissuasive to ensure that the SMP operator complies with its delivery obligations.

c. Regulation of civil engineering infrastructure and relations between asymmetric SMP regulation and symmetric access

The study findings show that the scope of the physical infrastructure access obligations imposed on SMP operators varies across the EU. On the other hand, the guidance on transparency (availability of a reference offer) and pricing (cost orientation) seems to be followed by nearly all NRAs. Still, there is more variation in the guidance on the equivalence of inputs (EoI) set out in Annex II of the NGA Recommendation which is advocated to ensure effective access. Finally, two NRAs regulate duct access in Market 4/2014, reminding us that access to civil engineering infrastructures (CEIs) can also be indispensable for the establishment of dedicated connections.

The analysis has shown several potential obstacles to the use of civil engineering:

- Pricing. However, it is not clear whether the alleged problem is confined to countries in which access to civil engineering is mandated under national laws transposing the BCRD or whether the guidance of the NDCM Recommendation on cost orientation of access was not duly followed.
- Lack of enforceable QoS and costly ancillary obligations

At the same time, proper design and enforcement of the access obligations seem to be crucial for an effective access remedy.

Generally, NRAs do not differentiate between the pricing of newly built and legacy civil engineering infrastructures. However, NRAs have differing views on whether SMP operators retain sufficient incentives to invest in new civil engineering infrastructures with a sufficient capacity to host alternative operators where necessary when SMP access obligations are imposed.

The analysis also shows that most NRAs consider that in a large majority of cases, the BCRD alone is not sufficient to ensure effective access to relevant civil engineering infrastructures for access seekers. Access seekers share that view. According to some stakeholders, negotiated symmetric access, as under the BCRD, may provider stronger investment incentives than SMP regulated access, at least under specific circumstances.

d. Cooperative or sharing arrangements between operators aiming to foster the deployment of new fixed networks

For the deployment of FTTH, operators use a mix of cooperative arrangements and commercial agreements for wholesale broadband access (entailing in some cases the grant of IRUs). The latter affect the competitive dynamic more rapidly. Most of the agreements have been taken into account during the market reviews. However, the threshold applied by some NRAs to determine whether to reduce regulatory obligations in the geographical coverage of the arrangements seems to be the same as for the definition of distinct geographical markets.

The study also looked at the conditions that could trigger changes in the obligations. It found that at this stage, NRAs are very reluctant to determine ex-ante conditions that would trigger a relief in regulatory obligations in areas affected by cooperation arrangements. Instead, they stress the need for review of remedies on a case-by-case basis. Generally, NRAs want to set the bar for the initiation of non-routine market reviews relatively high. However, there seems to be some consensus on the criteria that cooperative arrangements should fulfil to justify such non-routine reviews. Looking from a different perspective, there is evidence that the absence of regulatory obligations leads to cooperative arrangements. Conversely, according to some operators, NRAs could foster such agreements also where regulated access is imposed.

The online survey and interviews revealed that operators decided to enter into cooperative arrangements for the economic benefits that such agreements were expected would yield, rather than for hypothetical regulatory relief[344]. In the same vein, economic literature provides very little empirical evidence of the impact of co-investment agreements on ultra-fast broadband deployment.

e. Geographic dimension of regulation, in particular regarding the geographic segmentation of remedies

The number of NRAs that differentiate remedies geographically is limited so far. Moreover, the scope of the differentiation and approaches differs among them substantially. In the future, there might even be less scope for differentiated remedies if NRAs follow the more granular approach to the geographic market definitions advocated by the 2018 SMP Guidelines and the 2020 Recommendation on Relevant Markets.

However, a geographic segmentation of remedies is likely to be used increasingly for 'fine tuning' remedies according to geographical differences in competitive constraints that the SMP operator is facing in the same geographical market.

NRAs overwhelmingly support the usage of similar criteria for the geographic segmentation of remedies and the definition of distinct sub-national markets, though some advocate that more case-specific criteria should also be used for the segmentation of remedies to better reflect differences in competitive dynamics within a market in which an operator has been designated as having SMP.

While the assessment must be prospective, or forward-looking, under the competition law methodology used for the definition of subnational markets[345], NRAs currently segmenting remedies do not base segmentation on a prospective analysis, but on the current status of competition in the market.

Stakeholders advocate an assessment of cost as well as of benefits before implementing a geographic segmentation of remedies because segmentation is likely to increase administrative costs and to reduce predictability for access seekers.

f. Regulatory incentives to foster migration from copper to fibre

The study found that the NGA Recommendation brought about uniformity in the overall approach, but not for the details of its implementation. Variations may result from differences

[344] At the same time, SMP operators which entered or consider entering into such agreements plead for a predictable approach by NRAs as regards the possible reduction of remedies, and in particular pricing obligations. This expectation goes beyond the arrangements caught by Article 76 EECC and the BEREC guidelines on co-investment.
[345] As required in Point 25 of the 2018 SMP Guidelines.

in the state of evolution of the networks from the regulated SMP operators in their respective Member States.

Many NRAs say that they are not aware of the SMP operators' plans to decommission, partially or totally, the copper network over the next 5-10 years. This may suggest that in many Member States decommissioning is still not a topical issue.

Field research suggests that the 5 years default notice period set in Point 39 NGA Recommendation no longer seem to correspond with the periods set by most NRAs. Several stakeholders consider that the notice period should be reconsidered.

There also seems to be little support for NRAs to set mandatory deadlines for (partial) switch-off from the legacy networks to foster migration to new built fibre networks.

The study also found that views are divided on whether departing from the principle of cost orientation to set access prices to legacy networks would be appropriate to hasten migration to fibre networks. In any case, pricing alone will not achieve efficient migration to fibre.

Lastly, several comments suggest the need for a clear monitoring system to ensure that the migration process is non-discriminatory, as there are concerns that SMP operators could use a copper switch-off to gain a competitive advantage.

2. A suggested way forward

A successor to the two Recommendations is called for in order to take subsequent market, legal and regulatory developments into account. Overall, our results suggest that many aspects of the current Access Recommendations remain fit for purpose, but with further refinement needed.

All of our forward-looking recommendations must be understood in conjunction with the ongoing evolution of:

- Overall EU policy goals as regards the digitalisation of the EU as a whole
- The changes in focus embodied in the EECC itself in comparison to the previous Regulatory Framework for Electronic Communications (RFEC)
- Changes that are already visible in electronic communications markets in the EU Member States, including changes that are visible since 2018 when the EECC was enacted.

Below we outline proposed changes to the Access Recommendations together with other closely related policy measures that merit consideration.

Issue	Recommendation
Price regulation and pricing flexibility	
Non-discrimination as a precondition for granting pricing flexibility	Recommendation 1. We recommend that the successor recommendation require effective non-discrimination, rather than requiring equivalence of input (EoI) as a prerequisite in all cases. EoI would be a sufficient condition (but not a necessary condition) for recognising a non-discrimination regime as being effective, and thus meeting the non-discrimination criteria necessary to grant pricing flexibility. The successor recommendation should set forth a succinct list of suggested KPIs based on NRA experience that can be presumed, as part of an overall effective implementation of non discrimination by the NRA, to provide non-discrimination sufficiently effective to meet the non discrimination criteria necessary to grant pricing flexibility.
The “copper anchor”	Recommendation 2. The reference to the "copper anchor" should be updated to provide constructive guidance and criteria as to how a suitable anchor product should be identified. The ideal anchor product would be (1) an entry level product that is used, or amenable to being used, by alternative operators to provide their own retail products and (2) with a price that is either price regulated or else constrained in such a way that regulation is not necessary. If a virtual fibre-based access product is chosen, its speed and quality should be defined and constrained. It is important, however, to bear in mind that an anchor product is not the only form of retail price constraint recognised by the EECC in the context of pricing flexibility.
The Economic Replicability Test (ERT)	Recommendation 3. Principles on which to choose ERT flagship products would appear to have merit. National circumstances would need to be taken into account, including the degree of market power of the SMP operator, and the prevalence and nature of bundled offerings. Factors that the NRA should take into account include (1) how the SMP operator packages its most popular offerings in practice (e.g. whether as individual connectivity offerings, versus, for instance, bundles that include unregulated elements such as content); and (2) whether selection of a portfolio as an ERT flagship would provide a strong SMP operator with too much scope to abusively price individual narrower offerings.
How to reflect unregulated services within a portfolio in the ERT	Recommendation 4. Identify best practices on how to conduct the ERT when a flagship product is a bundle that includes unregulated elements. The most promising approach in general appears to be to apportion the retail price to the different elements of the bundle, but it is not clear that this approach is best in all Member States or in all

	circumstances. Further exchange of best practice on these issues, especially in the context of some relevant BEREC workstream, might be helpful.
	Recommendation 5. The successor recommendation should clarify that information needed to allocate the price of a flagship retail bundle across regulated elements and any non-regulated elements of the retail bundle for purposes of the ERT constitutes "*information, necessary for national regulatory authorities, other competent authorities and BEREC to ensure conformity with the provisions of …"* the EECC, and thus falls within the scope of Art. 20(1) EECC. The SMP operator must respond to these information requests, even where they involve non-regulated services.
Scale economies: EEO, REO, and scale adjustments	Recommendation 6. The successor recommendation should provide principles for determining the market share to be used in any scale adjustment to the scale of the SMP operator. The scale adjustment should reflect the overall level of competition for broadband and for VHCN in the Member State, taking into account (as appropriate) factors which for instance might include (1) the number of competitors that are likely to be sustainable at each level of the value chain, (2) the current HHI at each level of the value chain and its expected evolution over time, (3) the size of the largest competitors relative to that of the SMP operator, and (4) the size of the broadband and VHCN markets in the Member State (which might influence the number of competitors that can be economically sustainable). A scale adjustment will not necessarily be required in every Member State.
Negotiated volume discounts and long term pricing and the ERT	Recommendation 7. The handling of long term discounts and volume discounts in the ERT requires a case by case analysis. In most cases, long term discounts and volume discounts to wholesale prices should be ignored when conducting the ERT. Guidance should reflect the fact that in most cases, scale adjustments to the EEO/REO based on undiscounted wholesale prices will be the simplest and best way to ensure that the ERT is effective in protecting competition. If, however, the discount structure is imposed by the NRA as a price control measure, or if the market is such that most alternative operators achieve some level of wholesale discounts in practice, then it will typically be appropriate to reflect them in the ERT.
The time frame in which the ERT should be conducted	Recommendation 8. Permitting the NRA to initiate the ERT up to three months after the launch of the relevant retail product and completed within four months thereafter continues to be appropriate. If the TRT is conducted in advance of the launch of the

	SMP operator's new retail offering, however, it will often be desirable that the ERT be conducted at the same time.
Ensuring transparent process and stakeholder engagement	Recommendation 9. Transparency continues to be important for the conduct of the ERT. Point 56(a) and Annex II NDCM Recommendation identify a number of aspects of the ERT that must be subject to public consultation in advance: (1) the relevant downstream costs taken into account; (2) the relevant cost standard; (3) the relevant regulated wholesale inputs concerned and the relevant reference prices; (4) the relevant retail products; and (5) the relevant time period for running the test. The successor recommendation should expand the list to include, where applicable: (6) how flagship products will be determined, (7) whether flagship products are intended to be individual versus portfolio products, and (8) what approach will be taken to any unregulated products that are part of the flagship bundle
Flexibility and measures to protect facilities-based competition by preventing unfair price competition	Recommendation 10. In specific circumstances, an SMP operator might have the incentive to set (geographically differentiated) prices of wholesale access services at a low level that makes the success of facilities-based wholesale VHCN competitors unlikely in certain areas. This might possibly arise in Member States where facilities-based competition is emerging or is likely to emerge over a portion of the national territory (which the NRA will typically know based on Art. 22 EECC survey data).
The price band	Recommendation 11. A successor recommendation should no longer provide a price band for wholesale access products.
Pricing of SMP CEI	Recommendation 12. The guidance on costing methodology in Points 25 through 42 of the NDCM Recommendation continues to be relevant for new SMP CEI. This implies valuation based on the use of BU-LRIC modeling and current costs.
	Recommendation 13. The guidance on costing methodology for reusable SMP CEIs that appears in the current Access Recommendations and in Recital 187 EECC continues to be broadly fit for purpose overall. NRAs typically use a BU-LRIC model to compute the topology and routing of the network, and thus the quantity of reusable civil engineering infrastructure, but not its valuation. The adjustments to the value in the regulatory accounting base that are called for in Recital 187 EECC to deal with (1) the average accumulated depreciation of SMP CEI, (2) the fraction of SMP CEI that is fully depreciated, and (3) the fraction of SMP CEI that is reusable, as well as (4) an adjustment based on a relevant price index continue to be appropriate and fully relevant for reusable SMP CEI. If it is impractical to use the regulatory

	accounting valuation, the current valuation can be used as a proxy, in which case the adjustments for depreciation are still required but not the application of a relevant price index. In this regard, we do not see a need for the successor recommendation to distinguish between reusable SMP CEI built for the legacy copper network versus reusable SMP CEI that was built for VHCN as regards costing and pricing methodology, as long as the CEI in question can be used for VHCN today.
Calculation of the (NGA) risk premium	Recommendation 14. In line with current guidance in the NGA Recommendation and elsewhere, and in the interest of clarity, any incremental risk premium associated with specific fibre-based deployment projects should continue to be separately tabulated from the legacy WACC. In computing the price of price-controlled wholesale access services, the risk premium should be added to the WACC.
	Recommendation 15. The successor recommendation should emphasise that the purpose of the risk premium today is to promote VHCN deployments (including all forms that appear in the BEREC Guidelines) and to compensate the SMP operator for the extra risks that it incurs in deploying VHCN.
Compensation for downside risk being too quickly withdrawn	Recommendation 16. Instead of requiring review of the VHCN risk premium at regular intervals with the implication that the new VHCN risk premium immediately supersedes the old, a successor recommendation might acknowledge the permissibility of the use of a smoothing algorithm so as to reduce the risk to investors that the expectation of return on capital employed disappears too quickly. In the event that smoothing is not employed, then reviewing the risk premium every five years in line with the market review should be preferred in order to provide some limited smoothing effect.
Compensation for the “option value” of deploying now rather than waiting	Recommendation 17. The use of real options techniques in calculating the NGA/VHCN risk in order to quantify additional risk-based costs to which the SMP operator is subject, notably for relinquishing its implicit option to wait and see, may be appropriate in some circumstances. Real options are typically inappropriate however if the SMP operator is forced by competitive factors to deploy immediately, inasmuch as the option value of waiting in that case is negligible. If more experience in the use of the technique is accumulated over time, it might be appropriate for NRAs that choose to do so (for instance, those that are less well staffed) to use the real option calculations of comparably situated NRAs as a benchmark and as an alternative to doing these complex calculations themselves.

Other possible revisions that might be considered in order to accelerate VHCN deployment	Recommendation 18. The use of fair and reasonable pricing is well established in the EECC and in the corresponding practice of the NRAs; however, its meaning is heavily dependent on the nature of the regulated service. As regards SMP wholesale access services subject to price control obligations, the ability of fair and reasonable pricing to substitute for a concrete standard for price controls in cases where an objective quantitative standard is truly required is questionable. Fair and reasonable pricing may nonetheless have value in a limited number of cases where strict quantitative price controls are not required (i.e. some form of pricing flexibility has been granted), but where the NRA still needs to have the ability to intervene if prices are set at levels that appear to be inappropriate or excessive.
Non-discrimination obligations	
Choosing EoI versus EoO	Recommendation 19. Equivalence of inputs (EoI) is in principle the surest way of achieving effective protection from discrimination; in practice, however, its advantages over EoO will vary considerably from one Member State to the next, and from one wholesale access product to the next. A well-crafted EoO regime, with good enforcement and suitable KPIs/SLAs/SLGs, can in many cases approach the effectiveness of an EoI regime. EoI provisions are largely self-enforcing, whereas EoO can be challenging to enforce in cases where the SMP operator does not itself consume the same wholesale access product that it offers to competitors. The successor recommendation should therefore continue to call for a case by case proportionality assessment of EoI versus EoO, in line with current practice. Both costs and benefits should be considered not only from the perspective of the SMP operator, but also from the perspectives of alternative operators and of the NRA.
	Recommendation 20. In general, NRAs should duly justify their choices between EoO and EoI on a wholesale product by product basis, taking Member State characteristics and market characteristics into account. If however a single wholesale input is used in multiple wholesale products, then the decision should be made on an input by input basis.
The process by means of which KPIs, SLAs, and SLGs are set	Recommendation 21. The successor recommendation could encourage NRAs to consider enabling the SMP operator to offer comprehensive commitments in order to implement effective non-discrimination, subject to a consultation and approval process designed to seek consensus with alternative operators and overseen by the NRA. The potential advantages of such a multi-stakeholder process are obvious.

	Recommendation 22. The frequency with which KPIs are updated (and SLAs and SLGs where appropriate) should be set by means of the same multi-stakeholder process described in Recommendation 21. A cycle shorter than the market review cycle is likely to be appropriate.
	Recommendation 23. When designing or refining the non-discrimination framework, the NRA should consider utilising the same consensus-based multi stakeholder process described in Recommendation 21 to establish KPIs, SLAs and SLGs to ensure that the Quality of Service of wholesale products is in line with competitive market needs in the Member State.
The process by means of which KPIs, SLAs, and SLGs are monitored and enforced	Recommendation 24. It is important that the process of monitoring KPIs is fully transparent. The successor recommendation should make clear that the NRA "shall" make public on its website any decision to remedy non-compliance.
	Recommendation 25. Penalties related to KPIs must be proportional, but should be large enough to be dissuasive. In Member States where it is feasible to do so, the NRA should encourage the SMP operator and the alternative operators to establish in advance a level of SLG penalties that are likewise proportional but dissuasive. In assessing whether the level of wholesale penalties is sufficiently dissuasive, the NRA should bear in mind that a breach of wholesale obligations on the part of the SMP operator may cause the alternative operator that uses the wholesale access product to be subject to indemnities imposed by the same NRA for problems at the retail level – the wholesale penalty should be large enough to cover the retail indemnity.
	Recommendation 26. If the NRA identifies a pattern of repetitive breaches of non-discrimination obligations (as demonstrated for instance by means of monitoring of KPIs) on the part of the SMP operator, the NRA should consider imposing periodic penalty payments as referred to in Art. 29 EECC in order to motivate the SMP operator to refrain from repeating the breaches. Penalties that progressively increase in response to a pattern of repeated infractions could be appropriate in some circumstances.
	Recommendation 27. The successor recommendation could urge the NRA, for payment of penalties that are largely under its control (such as repeated discrimination as identified by KPIs), to strive to ensure that dissuasive payments are made without undue delay through a pre-established process for payment and billing. It could also require the NRA to report on the level of penalties that it has imposed and on the delay, where relevant, from complaint to

	payment of the penalty. The NRA should consider the promotion of alternative dispute resolution provisions (e.g. in the reference offer) that seek to accelerate the dispute resolution process.
	Recommendation 28. We encourage Member States to monitor any delays in payment of penalties so as to ensure that their dissuasive effect is not lost. To the extent feasible, Member States should design administrative and/or judicial enforcement procedures related to the payment of penalties (for instance, SLGs) so as to avoid unreasonable delay.
The Technical Replicability Test (TRT)	Recommendation 29. The TRT should serve to ensure that alternative access seekers can technically replicate the retail offer of the SMP operator on the basis of the regulated wholesale input they receive. In the interest of proportionality, it need not be required for minimal changes to an existing retail offer of the SMP operator that prima facie do not imply a risk to technical replicability (such as for instance changes to price or to contract duration). Where a flagship retail product is a bundle that includes both regulated and unregulated elements, the TRT should be applied only to the regulated elements.
	Recommendation 30. The TRT should continue to be implemented in advance, wherever feasible, of the SMP operator launching a new retail offer that depends on a new relevant wholesale input being available. If the TRT is conducted in advance of the launch of the SMP operator's new retail offering, it is desirable (but not required) that the ERT be conducted at the same time.
How to deal with potential commercial agreements where an SMP operator and an alternative operator would like to put in place a service at higher quality than that covered in current reference offers	Recommendation 31. Commercial agreements between the SMP operator and alternative operators to offer additional wholesale access services with QoS beyond that covered by existing Reference Offers should not be prohibited. The SMP operator should be encouraged to meet reasonable requests for such services.
How to deal with information asymmetry	Recommendation 32. In crafting non-discrimination plans, NRAs should be sensitive to the need to ensure that the SMP operator does not use information about the deployment plans of alternative operators for its own competitive advantage. In particular, NRAs should ensure that the retail arm of a vertically integrated SMP

	operator is not informed in advance of network deployments and/or the evolution of competitors in cases where this knowledge might provide the SMP operator with a competitive advantage. We recommend that the successor recommendation oblige SMP operators (except for those where the risk of abuse of information is low, such as wholesale-only operators) to provide an annual report documenting its practices in this regard, any known allegations of violation, and any corrective actions that it has taken. Beyond this, NRAs must have both the authority and the responsibility to investigate any allegations that the SMP operator has improperly used information about the plans of competitors for its own competitive advantage, and to impose dissuasive penalties if and as appropriate.
Access to Civil Engineering Infrastructure	
Effective access to legacy ducts and other SMP CEI	Recommendation 33. The successor recommendation should urge NRAs to assess whether mandating SMP operators to provide access to all sections of their civil engineering that may be needed in order for alternative operators to deploy their fibre network between their ODFs and their end-users would be proportionate to address the market power of the SMP operator, taking into account the feasibility for alternative operators to use alternative civil engineering infrastructure such as ducts. Where relevant, NRAs should also identify different points of delivery at which the physical infrastructure could be accessed. Such an access obligation could where appropriate and proportionate also encompass ducts of the backhaul networks, and shelters susceptible to host operators' passive and active equipment, to the extent that such related facilities have enough capacity. Where the conditions are met, the NRA might find it appropriate to define a separate market for access to physical infrastructure as envisioned in the 2020 RRM rather than attempting to impose the access remedy under Art. 72/73 EECC.
	Recommendation 34. In line with the principle of technological neutrality, under a successor recommendation, the SMP operator should not be allowed to refuse access solely because the access seeker intends to use the access to deploy VHCN based on technologies other than FTTH unless such access would objectively lead to exhaustion of available space for future fibre deployments on that specific route. The burden of proof should be on the SMP operator.
	Recommendation 35. In Member States where there is history of unsatisfactory responses by the SMP operator (a) to reasonable

	requests for renovation, repair or bypass of SMP CEI, or (b) to reasonable requests request to expand the capacity of a duct, pole, or other similar element of CEI; and to the extent that it is deemed to be proportionate, the successor recommendation should encourage NRAs to require SMP operators (1) to establish procedures for the certification of qualified workers or subcontractors authorised to make such interventions; and (2) to define the procedure to be followed for such interventions. At a minimum, the SMP operator must be informed of all work undertaken in this way. Where work is undertaken on behalf of an alternative operator, the NRA will need to set rules to who pays for work, and who owns the resultant infrastructure (typically the SMP operator), in instances where (1) the SMP operator or (2) a contractor approved by the SMP operator makes improvements to the SMP operator's infrastructure at the request of an alternative operator.
	Recommendation 36. NRAs should be vigilant against unreasonable SMP operator labour practices that require SMP staff to be present, and paid for, even where their presence is superfluous.
Improving the quality of databases and ordering processes	Recommendation 37. The provisions on the quality of databases and ordering processes that are already visible in Point (17) of the NGA Recommendation should be strengthened so as to substantially increase the likelihood that the database of SMP CEI is fully current and up to date. The expected updating of the BCRD might already address this; if not, the successor to the Access Recommendations should do so. The NRA should however consider the causes of any defects in the current database (taking into account the number of orders for SMP CEI currently placed, and the number that could be expected if the database were improved) in order to assess whether more effort invested would be proportionate and warranted.
	Recommendation 38. A successor recommendation for the Access Recommendations should provide principles-based guidance as to which elements of the public database on SMP CEI should be publicly visible.
	Recommendation 39. The successor recommendation should reinforce the importance of providing end-to-end ordering of CEI such as ducts where proportionate, as a complement to any point-to-point ordering processes that may already exist. Those Member States that currently have CEI ordering procedures that allow only point-to-point orders potentially waste time and effort, and consequently depress take-up of SMP CEI. The same legal and

	implementation considerations that were raised in Recommendation 37 are also relevant here.
Aligning the successor to the Access Recommendations with the BCRD	Recommendation 40. A successor recommendation should reinforce the principle that CEI that is subject to an SMP access obligation should not simultaneously be subject to the national transposition of the BCRD or its successor. This is primarily a matter for the successor to the BCRD to consider, but those drafting the successor to the Access Recommendations should be cognizant of the issue.
Cooperative arrangements and other structural arrangements	
The conditions under which an out-of-cycle review of the obligations of the SMP operators is warranted	Recommendation 41. Where a proposed cooperative arrangement is credibly expected to lead to a noteworthy change in competitive dynamics in line with Art. 3(4)(d) EECC, the NRA should consider whether regulatory changes are warranted outside of the normal market review period. In assessing the possible need for out-of-cycle changes, the NRA should also consider the importance of fostering regulatory predictability. Where an anticipated cooperative arrangement that is expected to lead to a noteworthy change in competitive dynamics is known at the time of a market review, the NRA should signal whether it considers an out-of-cycle adjustment likely, and how it intends to proceed to assess the arrangement.
	Recommendation 42. In conducting an out-of-cycle review of remedies (whether in the context of a new cooperative agreement or an updating of geographically differentiated remedies), the NRA should take a consistent view in its assessment of the market and its imposition of remedies. There will be instances where changes in market dynamics are insufficient to support a finding that SMP is no longer present, but sufficient to justify differentiated remedies. NRAs may wish to offer prospective guidance as to how they expect to interpret anticipated changes in the competitive environment.
NRA engagement in the process of forming cooperative arrangements	Recommendation 43. In the interest of promoting regulatory predictability, the NRA should proactively engage in a balanced way with stakeholders if a cooperative arrangement with large impact on competitive dynamics is anticipated. NRAs may wish to offer prospective guidance as to how they expect to interpret anticipated changes in the competitive environment.
Geographic differentiation	
The methods to be used for geographically	Recommendation 44. The successor recommendation should summarise the circumstances under which differentiated market definition versus differentiated remedies should be preferred, with a

differentiated market definition versus differentiated remedies	specific focus on VHCN.
The conditions under which an out-of-cycle revision is warranted	Recommendation 45. In the interest of fostering VHCN investment by means of predictability, NRAs should refrain from adjusting geographic differentiated remedies out-of-cycle unless the geographically differentiated changes in competitive dynamics are substantial. If a substantial shift is known at the time of a market review, the NRA should signal whether it considers an out-of-cycle adjustment likely, and how it intends to proceed.
Migration from legacy infrastructure	
Re-thinking the recommended five-year notice period	Recommendation 46. A successor recommendation should envision a shorter notice period than five years, and should allow for more differentiated treatment to reflect areas where a no-longer needed location serves alternative operators who purchase ULL, VULA, or bitstream. A shorter notice period could be possible where suitable alternatives are promptly available, where the deployment is high in the area served by the MDF, and especially where the wholesale offerings that have been sold are centralised products such as bitstream rather than product that require local infrastructure such as ULL. We suggest that the default notice period be set to two years in light of Art. 105 EECC, which prevents most contracts concluded between consumers and providers of publicly available electronic communications services from imposing a commitment period longer than 24 months.
	Recommendation 47. In revising the notice period that the SMP operator must give prior to de-commissioning legacy facilities, the successor recommendation should envision commercial closure of an MDF (i.e. not accepting new orders for legacy wholesale services) prior to point in time at which the MDF is closed for all existing SMP services.
Possible departure from the principle of cost-orientation for legacy services	Recommendation 48. There have been suggestions over the years that the SMP operator should be forced to shut down its copper network in order to accelerate migration to a fibre-based infrastructure. Even though the proposals are well-meaning, doing so would appear to be ill-advised. In particular, the SMP operator should be free to build or to decommission where it sees fit. Other than in the context of a migration from copper-based to fibre-based services, artificially raising or lowering the price of copper-based wholesale access services likewise seems inadvisable. The

	successor recommendation should, however, permit the NRA to deregulate (or allow for an increase of) the wholesale price of legacy copper services as a transitory measure until the copper switch off takes place and when sufficient safeguards against abuse are present, such as (1) commercial closure of the legacy network has already been firmly committed, (2) the SMP operator's VHCN network has already been rolled out, and (3) alternative operators have realistic prospects to offer services over the SMP operator's VHCN network.
The degree to which NRA should oversee the migration process	Recommendation 49. The successor recommendation could encourage NRAs to engage in the migration process by proactively promoting a multi-stakeholder process that seeks to ensure that alternative operators are well aware of the plans of the SMP operator and that stakeholders have ample opportunity to find solutions to the challenges of the migration that are in line with overall societal welfare. As in other aspects of broadband policy, the potential advantages of such a multi-stakeholder process are obvious.

ANNEX III – SUMMARY OF BEREC OPINION