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COMMISSION RECOMMENDATION

of 6.2.2024

on the regulatory promotion of gigabit connectivity

{SWD(2024) 18 final}

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THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 292 thereof,

Whereas:

- (1) The availability of gigabit connectivity is one of the essential building blocks of the digital transition, and is therefore at the forefront of the Union digital vision for 2030, as laid out in the Digital Compass Communication¹ and Decision (EU) 2022/2481 of the European Parliament and of the Council².
- (2) In addition to the three other general objectives of promoting competition, the internal market and end-user interests, Directive (EU) 2018/1972 of the European Parliament and of the Council³ seeks to promote connectivity and access to, as well as take-up of, very high capacity networks (VHCNs)⁴, for the benefit of all people and businesses in the Union. These VHCNs include fixed, mobile and wireless networks. The appropriate incentives for investment in new VHCNs, which encourage the development of innovative services, should strengthen the international competitiveness of the Union while delivering benefits to its consumers and businesses. It is therefore crucial to promote sustainable investment in the development of VHCNs, by means of an appropriately designed and predictable regulatory framework.
- (3) In recent years, many electronic communications markets have seen strong competition. This has made it possible to further reduce the extent of *ex ante* intervention⁵, as reflected in Commission Recommendation (EU) 2020/2245⁶. This

¹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 2030 Digital Compass: the European way for the Digital Decade, COM(2021) 118 final/2, 9. 3. 2021.

² 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).

³ Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (OJ L 321, 17.12.2018, p. 36).

⁴ As defined in Article 2, point (2), of Directive (EU) 2018/1972.

⁵ Out of 18 markets in 2003, only 2 markets are now considered at Union level as justifying the imposition of regulatory obligations.

⁶ 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 Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (OJ L 439, 29.12.2020, p. 23).

Recommendation complements other sources of guidance⁷ on Directive (EU) 2018/1972 and aims to promote the internal market for electronic communications networks and services. It aims to achieve this through consistent regulatory approaches that favour investment in VHCNs while maintaining and ensuring effective competition. Consistency between the regulatory approaches taken by the national regulatory authorities (NRAs) of the various Member States is of fundamental importance to both avoid distortions in the internal market and create legal certainty for all undertakings, in particular those investing in network deployment. It is therefore appropriate to provide guidance to NRAs aimed at: (i) preventing any inappropriate divergence in regulatory approaches; (ii) encouraging regulation focused on bottlenecks; and (iii) the attenuation or complete lifting of regulatory obligations when justified by market developments. These three aims should be achieved while allowing NRAs to take due account of national circumstances when designing appropriate remedies in those circumstances where such regulation is still necessary.

- (4) Creating regulatory predictability is essential to promoting efficient investment and innovation in VHCNs. Applying a consistent and stable regulatory approach over time is crucial to give investors the confidence needed to design sustainable business plans. To provide the necessary predictability over a longer time period (i.e. beyond the lifetime of an individual market review), NRAs should clarify as much as possible, when imposing regulatory remedies under Directive (EU) 2018/1972, how foreseeable changes in market circumstances might affect the relevant remedies.
- (5) The aim of this Recommendation, in accordance with the general objectives set out in Article 3(2) of Directive (EU) 2018/1972, is to improve the regulatory conditions needed to:
 - (a) promote connectivity, access to and take-up of very high capacity networks ('VHCN');
 - (b) promote effective competition;
 - (c) contribute to the development of the internal market for electronic communications networks and services;
 - (d) promote the interests of people in the Union.
 - (e) It also aims to increase legal certainty and regulatory predictability in view of the long-term horizons for investment in VHCNs.
- (6) The scope of this Recommendation should cover the regulatory obligations to be imposed on operators designated as having significant market power (SMP) on the basis of a market analysis procedure carried out under Articles 64 and 67 of Directive (EU) 2018/1972. As a result of the development of competition in electronic communications markets, *ex ante* regulation should at this stage only focus on remaining competition bottlenecks. As pointed out in Recommendation (EU) 2020/2245, two markets are considered to be susceptible to *ex ante* regulation at Union level: the market for wholesale local access provided at a fixed location (market 1) and the wholesale dedicated capacity market (market 2). This Recommendation should

⁷ Commission Recommendation (EU) 2020/2245, points 67 and 68 of Communication from the Commission — Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications network and services (OJ C 159, 7.5.2018, p. 1), Guidelines issued by the Body of European Regulators for Electronic Communications (BEREC).

focus primarily on the market for wholesale local access provided at fixed location (market 1 of Recommendation (EU) 2020/2245). This Recommendation should not, in principle, apply to the wholesale dedicated capacity market (market 2 of Recommendation (EU) 2020/2245) given: (i) the specific characteristics of products demanded by large and/or technologically advanced businesses; and (ii) the heterogeneity and specificity of the retail and wholesale products, and associated processes, on that market. However, the guidance provided in this Recommendation on access to civil-engineering infrastructure should be applicable irrespective of whether such access is imposed in the context of: (i) regulating the market for wholesale local access provided at a fixed location (market 1); (ii) regulating any other market, including the wholesale dedicated capacity market (market 2); or (iii) regulating a separate upstream market for access to civil-engineering infrastructure when such a market has been identified and deemed susceptible to *ex ante* regulation. Moreover, measures adopted by NRAs, in particular with respect to migration to VHCNs and to the switch-off of legacy networks, may have an impact on market 2. Where such an impact exists, it should be duly taken into account by NRAs. Finally, this Recommendation should also apply to other fixed wholesale access markets not referred to in Recommendation (EU) 2020/2245 for which, to be able to regulate *ex ante*, the NRA needs to prove that the three criteria set out in Article 67(1), second subparagraph, of Directive (EU) 2018/1972 are met. This could be of particular relevance to wholesale markets also encompassing or limited to central access provided at a fixed location (market 3(b) listed in Commission Recommendation 2014/710/EU⁸), where such markets are still regulated.

- (7) Directive (EU) 2018/1972 refers to several situations where market-driven, self or co-regulation solutions have an impact on the need to carry out the regulatory intervention or on the design of the regulatory obligations. Each situation provided by Directive (EU) 2018/1972 is individual in its purposes, assessment by NRAs and potential regulatory outcome. For instance, in case of co-investment commitments in new VHCNs offered by the SMP operator in accordance with Article 76 and 79 of Directive (EU) 2018/1972 and compliant with these provisions, in principle, the NRAs cannot impose any (additional) obligations with respect to the new VHCNs, if one potential co-investor has entered into a co-investment agreement with the SMP operator. For commitments on cooperative arrangements offered by the SMP operator in accordance with Article 79 of Directive (EU) 2018/1972, in principle, the NRAs should perform a market test on them, which may ultimately lead NRAs to lower the regulatory burden on the SMP operator.
- (8) Commercial agreements (including agreements on wholesale access, co-investment agreements and reciprocal access agreements between operators, and including those that the SMP operator is not part of), should, where appropriate, be taken into account by NRAs when assessing the competitive dynamics of a particular wholesale market. Such agreements can lead to the conclusion that a particular wholesale market no longer warrants *ex ante* regulation if certain conditions are met. As a general principle, NRAs should duly take into consideration market initiatives such as commercial agreements and business models that contribute to the deployment of VHCNs, beyond

⁸ 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 on a common regulatory framework for electronic communications networks and services (OJ L 295, 11.10.2014, p. 79).

what would happen in their absence, while enabling sustainable competition in downstream markets.

- (9) As the deployment of alternative networks progresses, in particular at local or regional level, competitive conditions will increasingly vary between different areas of the same Member State (for instance between urban and rural areas). NRAs should take geographic differences in competitive conditions into account, even at the level of market definitions.
- (10) Where separate geographic markets have been identified, NRAs should ensure that regulation is withdrawn in geographic markets that are found to be effectively competitive in the absence of regulation. However, if such differences are either not stable enough or are insufficient to determine whether there are separate geographic markets, NRAs should apply geographically segmented remedies if necessary to solve, in a proportionate way, the competition problems identified in the various areas defined. The segmentation should be based on objective criteria, similar in nature to the ones used for geographic market segmentation. Those objective criteria should include: (i) the number and characteristics of competing networks; (ii) the distribution of and trends in market shares; (iii) prices; and (iv) behavioural patterns. Geographic surveys performed under Article 22 of Directive (EU) 2018/1972 are likely to be relevant in helping NRAs to perform this task.
- (11) NRAs should update the list of areas subject to geographically segmented remedies based on the criteria set out in detail in the market review. The parameters of those updates (their periodicity, the nature of the different remedies applied in the different areas and, where appropriate, a notice period) should be drawn up from the start. That will help to preserve the balance between the adaptation of remedies to specific competitive circumstances and the necessary predictability and transparency for all stakeholders.

APPLICATION OF A NON-DISCRIMINATION OBLIGATION

- (12) The obligation of non-discrimination, set out in Article 70 of Directive (EU) 2018/1972, is one of the key remedies that can be imposed on SMP operators to promote effective competition in a relevant market. That obligation also serves as a safeguard mechanism in those cases in which there is still an SMP operator but competition is developing to a point where pricing flexibility is applied by the NRA.
- (13) The NRAs' experience in imposing non-discrimination obligations under Article 10 of Directive 2002/19/EC of the European Parliament and of the Council⁹ and, currently, under Article 70 of Directive (EU) 2018/1972, indicates that regulatory approaches still vary across the Union. Nevertheless, there is a broad agreement that the non-discrimination obligation is an essential tool of *ex ante* regulation to foster competition in the presence of a vertically integrated SMP operator. On the other hand, where the SMP operator is a wholesale-only operator meeting the conditions set out in Article 80(1) of Directive (EU) 2018/1972, it would in principle have no incentive to discriminate between downstream providers. As a consequence, NRAs should in principle refrain from imposing non-discrimination obligations on wholesale-only

⁹ 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 (OJ L 108, 24.4.2002, p. 7).

operators, unless the NRAs can establish that there are specific circumstances that justify imposing such obligations.

- (14) The advantages of equivalence of input (EoI) over equivalence of output (EoO) can vary considerably from one wholesale access product to the next. Where the NRA finds that EoI would not be proportionate for a given product or process, a well-crafted EoO regime, with appropriate monitoring and suitable key performance indicators (KPIs)/service level agreements (SLAs)/service level guarantees (SLGs), can in many cases be sufficient and contribute to the further development of competition. For both EoO and EoI, the effectiveness of the non-discrimination obligation is heavily dependent on the quality of the reference offer; the degree to which KPIs, SLAs and SLGs are comprehensive, effective, and reflect the real needs of alternative operators; and the effectiveness of monitoring and enforcement of non-discrimination obligations on the part of the NRA.
- (15) NRAs should duly take into account the commitments of the SMP operator(s) offered under Article 79 of Directive (EU) 2018/1972 with a view to ensuring the effective and efficient application of the non-discrimination obligation. NRAs should assess the costs and benefits of imposing the provision of regulated wholesale inputs on an EoI basis, compared to other forms of non-discrimination obligations, in particular EoO. While providing regulated EoI is likely to trigger higher compliance costs than other forms of non-discrimination, the cost-benefit analysis should also factor in the long-term monitoring costs of NRAs. Those long-term monitoring costs might be higher for EoO and in some instances outweigh the implementation costs in the long term. A case-by-case assessment of the proportionality of EoI versus EoO should therefore be undertaken. In practice, NRAs need to take into account a number of factors when determining if the obligation of EoI is likely to be effectively implemented, as it depends on the wholesale products in question. Those factors include: (i) a quantitative cost/benefit analysis, including implementation costs for both the SMP operator and the access seeker; and (ii) a qualitative estimation of the need to ensure 'stricter' non-discrimination for the wholesale access products in question. In particular, NRAs might consider that the provision of wholesale inputs over new systems on an EoI basis is more likely to create sufficient net benefits, and thus be proportionate, given the comparatively lower incremental compliance costs to ensure that newly built systems are EoI-compliant. On the other hand, NRAs should also consider whether obligations are proportionate for the undertakings affected, for example, by taking into account implementation costs and weighing up possible disincentives to deploying new systems, relative to more incremental upgrades, in the event that the deployment of new systems would be subject to more restrictive regulatory obligations. In Member States with many small-scale undertakings designated as having SMP, the imposition of EoI on each of those undertakings can be disproportionate. In general, it is assumed that a wholesale product is built up from various inputs (such as assets, IT processes, etc.). In practice, the boundary between EoI and EoO at product level will not be clear-cut and EoI is unlikely to be implemented across all of the inputs to wholesale products.
- (16) When imposing a non-discrimination obligation under Article 70 of Directive (EU) 2018/1972, and in order to ensure its effective application, NRAs should require the SMP operator to implement: (i) KPIs; (ii) corresponding SLAs alongside KPIs; and (iii) corresponding SLGs, if there is a breach of the SLAs. A mechanism should be put in place to update the KPIs, SLAs and SLGs whenever needed. When necessary,

NRAs should require the SMP operator to include the KPIs, SLAs and SLGs in the reference offer.

- (17) KPIs play a key role in ensuring effective monitoring of non-discrimination. The process of monitoring KPIs should be fully transparent. NRAs should make public any reports or decisions to remedy non-compliance. Indeed, almost all NRAs require KPIs to be available to all authorised operators (systematically or on request). Aggregated values can also be made available and operators can compare KPIs to the industry average¹⁰. In addition, penalties related to KPIs should 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 have the side effect of the alternative operator that uses the wholesale access product being subject to compensation damages imposed by the same NRA for problems at the retail level. The wholesale penalty should therefore be large enough to cover the retail indemnity.

ACCESS TO CIVIL-ENGINEERING INFRASTRUCTURE

- (18) Effective access to civil-engineering infrastructure is of prime importance for the deployment of VHCNs. In addition to symmetric or asymmetric regulation imposed under Directive (EU) 2018/1972, providers of electronic communications networks can require access, on fair and reasonable terms, to the existing physical infrastructure of network operators including those operating in sectors other than the electronic communications sector, pursuant to the provisions of Directive 2014/61/EU of the European Parliament and of the Council¹¹. Pursuant to Article 67(2) of Directive (EU) 2018/1972, when carrying out market analyses NRAs are to take into account the impact of other relevant types of regulation or measures imposed, as well as of other obligations resulting, for instance, from Directive 2014/61/EU, and NRAs are to assess the outcomes of those measures on the relevant markets. However, where the operator with SMP controls a well-developed civil-engineering infrastructure that can be reused for deployment of VHCNs, and to which no equivalent alternative exists, obligations resulting from Directive 2014/61/EU would generally not be sufficient to appropriately address the competition problems identified in the market analysis.
- (19) Whenever an asset is subject to an access obligation as a result of an SMP regulation under Directive (EU) 2018/1972, that should prevail over any access obligation resulting from Directive 2014/61/EU. Directive (EU) 2018/1972 allows for more stringent and detailed access regulation, superseding access obligations underpinned on other, more general legislation. That means that the regulatory access obligation concerning the civil-engineering infrastructure of an operator with SMP takes precedence over access requirements resulting from Directive 2014/61/EU.

¹⁰ In one Member State only aggregated values are available and operators can compare KPIs to the industry average, BEREC BOR (16) 219, p.42.

¹¹ 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 (OJ L 155, 23.5.2014, p. 1). This directive is in the process of being replaced under the proposal for a Regulation of the European Parliament and of the Council on measures to reduce the cost of deploying gigabit electronic communications networks and repealing Directive 2014/61/EU (Gigabit Infrastructure Act), COM(2023) 94 final.

- (20) In accordance with Article 73(2) of Directive (EU) 2018/1972, before imposing any access obligation on networks the NRAs are to assess whether imposing access to civil-engineering infrastructure alone would be proportionate to promote competition and the interests of end-users. That is likely to be the case where access to the civil-engineering infrastructure controlled by the SMP operator enables the development of end-to-end infrastructure-based competition. Moreover, under certain market conditions¹², NRAs may decide on a separate market for civil-engineering infrastructure.
- (21) In some Member States, regulated access to ducts has played a key role in the deployment of VHCNs. Because deployment of VHCNs first occurs in urban areas and gradually moves towards more rural areas, regulated access to poles will make it more necessary to deploy VHCNs, especially outside urban areas. Furthermore, Article 72 of Directive (EU) 2018/1972 allows for extensive access to civil-engineering infrastructure, going beyond the assets strictly corresponding to the downstream product market.
- (22) To create a level playing field among other market participants and the SMP operator, it is important that access to the civil-engineering infrastructure of the SMP operator is provided on a strictly equivalent basis. Reference offers, KPIs, SLAs and SLGs are instrumental in ensuring a proper application of the principle of equivalence. Conversely, it is important that any asymmetric knowledge the SMP operator possesses on the rollout plans of third-party access seekers is not used by the SMP operator itself to gain any commercial advantage.
- (23) To help achieve the connectivity targets set out by the Decision (EU) 2022/2481, conditions for access to the civil-engineering infrastructure of the SMP operator should enable all access seekers that deploy VHCNs to roll out those networks on a large scale across the territory. For that reason, NRAs should ensure that the SMP operator provides pre-set request forms for access to its civil-engineering infrastructure. The SMP operator should also provide documents and information in a standard format and should use automated tools to deal with access requests. Likewise, NRAs should ensure that the SMP operator: (i) approves access requests for multiple locations simultaneously; (ii) responds to such requests at short notice; and (iii) enables the full exchange of necessary data with access seekers via electronic means.
- (24) The effectiveness of regulated access to the civil-engineering infrastructure of the SMP operator is highly reliant on the availability of information to access seekers about the location, spare capacity, and availability of that infrastructure. Where the relevant information is contained in an internal database of the SMP operator, all access seekers, including the SMP operator's retail arm, should be provided with equal access to that database. Access by alternative operators to the SMP operator's database should not be denied on grounds of information confidentiality. Depending on national circumstances, the SMP operator could be required to fulfil its regulatory obligation to make available information on its civil-engineering infrastructure via a single information point (SIP), as provided for by Directive 2014/61/EU. The SMP operator

¹² Staff Working Document accompanying 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 Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code, SWD(2020) 337 final, 18.12.2020.

could in that way reduce its compliance costs, as it might not need to maintain a separate database or web portal for regulatory purposes. Access seekers paying for access to the SMP operator's data base or web portal might also reduce their costs, as access to the SIP is free of charge in general. Access seekers could also have efficiency gains, as the SIP would contain information not only on the SMP operator's civil-engineering infrastructure, but also on the existing physical infrastructure of other network operators and public sector bodies.

NON-IMPOSITION OF REGULATED WHOLESALE ACCESS PRICES ON VHCNs

- (25) NRAs that consider imposing price control obligations with respect to VHCNs should carefully assess the appropriateness and proportionality of such obligations, taking into account in particular their possible impact on incentives to invest in VHCNs, and the need to protect competition. In conducting that assessment, NRAs should take into consideration market initiatives, in particular binding commitments proposed by SMP operators under Article 79 of Directive (EU) 2018/1972, that allow parties to diversify the investment risk while enabling sustainable competition in the downstream markets. The implementation of functional or voluntary separation in accordance with Article 78 of Directive (EU) 2018/1972 should be duly taken into account in the assessment of the appropriateness of not imposing price regulation on VHCN wholesale access inputs.
- (26) Where there are uncertainties regarding the rate of materialisation of demand for the provision of very high capacity services, it is important, in order to promote connectivity and access to, as well as take-up of, VHCNs, to allow those operators investing in VHCNs a certain degree of pricing flexibility where sufficient competition safeguards are present, as mentioned in recital (193) of Directive (EU) 2018/1972. Such pricing flexibility is necessary to enable SMP operators to test price points and conduct appropriate penetration pricing. It also allows SMP operators and access seekers to share some of the investment risk by differentiating wholesale access prices according to access seekers' chosen level of commitment. That could result in lower prices for long-term agreements with volume guarantees, which could reflect the fact that access seekers are taking on some of the risks associated with uncertain demand. In addition, pricing flexibility at wholesale level may be a suitable way to allow both the access seeker and the SMP operator's retail business to introduce price differentiation onto the retail broadband market to better address consumer preferences and improve the penetration of very high-speed broadband services. Given that competition, and in particular infrastructure competition, has significantly progressed in many markets and areas across the Union since the adoption of Commission Recommendation 2013/466/EU¹³, there could be room, depending on the circumstances, to apply pricing flexibility on a significantly larger scale than has been the case so far.
- (27) With respect to VHCNs, NRAs should consider not imposing or lifting price control obligations pursuant to Article 74 of Directive (EU) 2018/1972, provided that specific conditions are met, in particular that sufficient competitive safeguards are in place. Such competitive safeguards are necessary to prevent such pricing flexibility leading

¹³ 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).

to excessive prices in markets where SMP has been found, or to practices undermining competition, or both.

- (28) In particular, a demonstrable retail price constraint resulting from infrastructure competition or a price anchor stemming from other regulated access products, or both, should be present. If an operator would still have SMP, such a demonstrable retail price constraint would not be sufficiently strong to justify a conclusion that the relevant wholesale market is effectively competitive. However, that retail price constraint should prevent the operator that has SMP at the wholesale level from setting excessive retail prices. Moreover, pricing flexibility should be accompanied by additional safeguards to protect competition. To that end, effective non-discrimination obligations should be complemented by guaranteed economic replicability of downstream products.
- (29) Furthermore, a demonstrable retail price constraint can also result from a price anchor that stems from other regulated access products which are subject to cost orientation. Where copper-based products (including virtual unbundled local access products provided over an upgraded copper network) are still able to exert a demonstrable retail price constraint over VHCNs on a forward-looking basis, those products should be defined as the regulated anchor. Where the product offered by the SMP operator on the legacy access network is no longer able to exercise a demonstrable retail price constraint on the VHCN wholesale product (for example in the event of a copper switch-off, or where the NRA finds that retail products provided over copper are not substitutable with those provided over VHCNs), it could be replaced by a VHCN-based product, such as an entry-level fibre product. Where the NRA concludes that the definition of a copper-based product or an entry-level fibre product could be insufficient to exert an effective price constraint on the SMP, the NRA should have the possibility to define an effective anchor. This could be a combination of anchors (copper and VHCN) or the NRA could define as an anchor a portfolio of regulated products that is sufficiently representative of the consumer demand and network architecture. The technical performances of that regulated product should be limited to what is required to exert a demonstrable retail price constraint. The NRA should therefore identify the technical characteristics of the virtual or active anchor product or products with a view to ensuring that pricing flexibility is preserved for other VHCN-based products that provide higher levels of performance.
- (30) To establish whether access seekers can economically replicate a downstream offer provided by the SMP operator using the regulated wholesale input available, in cases where wholesale price regulation is not imposed the NRA should carry out an economic replicability test. Such a test does not affect *ex post* margin squeeze tests applied under competition law by the Commission or national competent authorities, or both.
- (31) In addition, NRAs may also apply an *ex ante* margin squeeze test to regulated wholesale inputs where necessary, in particular: (i) in the context of long-term pricing and volume discounts; or (ii) to ensure sufficient economic space between different regulated wholesale inputs. NRAs should specify in advance the methodology they will follow to conduct those tests. The guidance provided in this Recommendation on the economic replicability test should not apply to such cases.
- (32) The purpose of the economic replicability test is to ensure, in combination with other competition safeguards, that SMP operators do not abuse pricing flexibility to exclude actual and potential competitors from the market.

- (33) NRAs should ensure that the margin between the retail price offered by the SMP operator and the price of the VHCN wholesale input covers the incremental downstream costs and a reasonable percentage of common costs. Where wholesale price regulation for VHCN wholesale inputs is not imposed on the SMP operator and additional safeguards are implemented in accordance with this Recommendation, 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). The use of the EEO standard enables NRAs to support the SMP operator's investments in VHCNs and provides incentives for innovation in VHCN-based services.
- (34) The possibility to apply a scale adjustment to the economic replicability test should be used where justified by specific market circumstances. That could especially be the case where market entry or expansion has been frustrated in the past or where very significant imbalances in terms of economies of scale and scope exist between the SMP operator and its competitors. In such cases, NRAs should determine the scaling factor with care in order to ensure that efficient competitive entry and economic replicability are a realistic prospect.
- (35) Following a market analysis, the NRA should set out and make public in advance in its decision establishing remedies the procedure and parameters it will apply when carrying out the *ex ante* economic replicability test. The NRA may carry out that test before the launch of a new retail offer by the SMP operator, for instance if the NRA considers it appropriate to align the timing of the economic replicability test with the technical replicability test if it is also carried out before the launch. The NRA does not need to carry out the test for each and every new retail offer, but only for those flagship products which it identifies. An NRA may carry out the test: (i) on its own initiative, for example in the initial stages of the implementation of a measure that allows pricing flexibility on VHCNs (particularly where regulated wholesale access prices were imposed in the past); or (ii) to respond to changes in the structure of the market, for example as a result of technological developments.
- (36) The economic replicability test can be applied either to: (i) individual products, which can be either bundled offers (which can also include non-regulated products) or stand-alone offers, for instance an internet-only offer; or (ii) to a portfolio of products, which is a set of individual products. A portfolio approach provides the SMP operator with more flexibility in the pricing of individual products and may better reflect market realities, for example in Member States with contestable VHCN markets and in which competition in the relevant segments of the product market mainly concerns a specific set of retail products in each segment. However, in Member States with less contestable VHCN markets and which are characterised by a high degree of concentration or a very high degree of market power of the SMP operator, or both, the portfolio approach may not be appropriate. In any event, NRAs should discuss with the operators concerned the scope and nature of an *ex ante* economic replicability test and, based on national circumstances, whether the operators should consider conducting the test before the actual launch of the retail product(s).
- (37) The economic replicability test set out in advance by the NRA should be sufficiently detailed and should include, at a minimum, a set of relevant parameters to ensure predictability and the necessary transparency for operators. NRAs should apply a long-run incremental cost plus (LRIC+) model, while taking into account the SMP operator's audited downstream costs. NRAs should also assess the margin on the most

relevant retail products including broadband services (flagship products) as compared to the regulated VHCN access input most used, or identified. They should do this, under a forward-looking approach, as the most suitable approach for delivering the retail products for the market review period in question. The design of the test, applying to the SMP operator's audited downstream costs and only for flagship products, should aim to ensure that VHCN investments and the effect of the recommended pricing flexibility are not hindered by this safeguard. In order to prevent cross-subsidisation between different products in a bundle or portfolio, NRAs may conduct not only a single-level test, namely between the retail services and the most relevant VHC access input for access seekers (for example fibre access at the cabinet or virtual unbundling), but NRAs should also have the possibility to submit each relevant wholesale input to an economic replicability test; accordingly, there could be several single level tests between one retail product and different relevant wholesale inputs. However, a new VHCN access input can over time become more relevant (for example fibre unbundling at the optical distribution frame). In that case, the economic replicability test should be conducted with reference to the new input instead of with reference to the input initially most used. If national competitive circumstances show a difference between geographic areas in terms of the VHCN 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. In that case, the economic replicability test should seek to ensure that prices for 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.

- (38) NRAs might not be able to find the competitive safeguards referred to in recital (27) of this Recommendation across the entire defined market. Where the NRA cannot conclude that the different competitive conditions are stable over time, and also cannot conclude that the different competitive conditions are such that they could justify a decision that those are subnational markets, NRAs should nevertheless consider responding to those diverging competitive conditions by applying differentiated remedies. Such differentiated remedies could include the lifting of wholesale price regulation only in those areas where the necessary competition safeguards apply. Where an NRA considers that competitive and regulatory conditions are such that the SMP operator is sufficiently constrained in its price setting, the NRA may refrain from imposing price regulation with respect to wholesale VHCN products.

CONSISTENT APPROACHES TO PRICE CONTROL OBLIGATIONS

- (39) Where the conditions for pricing flexibility are not met and where the imposition of regulated wholesale access prices is warranted, NRAs should ensure that the costing methodology provides a clear incentive for investment through predictable and stable regulated prices.
- (40) Cost recovery is a key principle, ensuring that operators can both recover the costs that are efficiently incurred and receive an appropriate return on capital invested.
- (41) A costing methodology that provides the appropriate 'build-or-buy' signal strikes an appropriate balance between static efficiency and dynamic efficiency. Static efficiency means ensuring efficient entry. Dynamic efficiency means ensuring sufficient incentives to invest and, in particular, deploy VHCNs and hence ensure sufficient incentives to deliver new, faster and better quality broadband services.

- (42) The recommended costing methodology should ensure transparency and consistency across the Union while reflecting specific national circumstances. In that regard, the guidance on costing methodology provided in Commission Recommendation 2013/466/EU has been largely followed by NRAs, and the main principles of that methodology remain relevant, including making it possible to properly take account of prevailing and foreseeable specific economic conditions. The guidance should therefore be adjusted, in particular to reflect the progressive shift towards VHCNs.
- (43) The bottom-up, long-run, incremental, cost-plus (BU LRIC+) costing methodology best meets that objective when setting prices for wholesale-access services in the markets in question. That methodology models the incremental capital (including sunk costs) and operating costs borne by a hypothetically efficient operator providing all access services, and adds a markup for a strict recovery of common costs. The BU LRIC+ methodology therefore allows for the recovery of the total efficiently incurred costs.
- (44) The BU LRIC+ methodology calculates the current costs on a forward-looking basis (namely, based on up-to-date technologies, expected demand, etc.) that an efficient network operator would incur to build a modern VHCN today, and which is able to provide all such services. Therefore, the BU LRIC+ methodology provides for efficient and reliable signals for entry.
- (45) Where cable, fibre (fibre to the home ('FTTH') or fibre to the building ('FTTB')) and, to a lesser extent, wireless networks are competing against copper networks, SMP operators typically react by progressively replacing their copper with VHCNs. Therefore, since operators would not build a copper network today, the BU LRIC+ methodology calculates the current costs of deploying a modern and efficient VHCN.
- (46) Such an efficient VHCN would be capable of delivering the targets set out in Decision (EU) 2022/2481. In practice, a modern and efficient VHCN would generally be an FTTH network.
- (47) Valuation of the assets of such a VHCN based on current costs best reflects the underlying competitive process and, in particular, the replicability of those assets.
- (48) In contrast to assets such as technical equipment and the transmission medium (e.g. fibre), civil-engineering assets (namely, ducts, trenches and poles) are assets that are unlikely to be replicated. Technological change and the level of competition and retail demand are not expected to be such as to allow alternative operators to deploy a parallel civil-engineering infrastructure, at least where the legacy civil-engineering infrastructure assets can be reused to deploy a VHCN.
- (49) The regulatory asset base ('RAB') corresponding to the civil-engineering assets should not be valued at the replacement cost but at the cost recorded in the SMP operator's audited regulatory accounts, net of depreciation. The costs considered should be well documented and clearly related to expenditure in civil-engineering assets. That would take into account the elapsed useful lifetime of the assets and thus the costs already recovered by the regulated SMP operator. That approach sends efficient market-entry signals for build-or-buy decisions while avoiding the risk of over-recovering, especially for reusable legacy civil-engineering infrastructure. The excessive recovery of costs would not be justified to ensure efficient entry and preserve the incentives to invest because the build option would not be economically feasible for that asset category.

- (50) The indexation method should be applied to calculate such depreciated costs. The preference for such a method is due to its practicability, robustness and transparency. It would rely on: (i) historical data on expenditure, accumulated depreciation and asset disposal, all of which are available from the regulated SMP operator's statutory and regulatory accounts and financial reports; and (ii) a price index, such as the retail price index ('RPI'), which is publicly available.
- (51) Therefore, the RAB corresponding to the civil-engineering assets should be set at the regulatory accounting value, net of the accumulated depreciation at the time of calculation, indexed by an appropriate price index, such as the RPI. For new civil-engineering assets both the net depreciation and the RPI will be zero or close to zero because no or little time has passed since their roll-out.
- (52) The initial RAB should be further locked in and rolled forward from one regulatory period to the next to ensure that once a civil-engineering asset is fully depreciated, that asset is no longer part of the initial RAB and therefore it no longer represents a cost for the access seeker, in the same way as it is no longer a cost for the SMP operator. That approach would further ensure sufficient remuneration for the SMP operator and simultaneously provide regulatory certainty to both the SMP operator and access seekers over time.
- (53) An alternative approach could be used in situations where the NRA has established that the indexation method would be inappropriate, in particular where the historical records of the SMP operator are unreliable. In such cases, the RAB corresponding to the reusable legacy civil-engineering assets may be valued on the basis of current costs adjusted for depreciation over the lifetime of the assets. The NRA should ensure that the asset-valuation method employed is such that civil-engineering infrastructure assets would, in general, not be replicated.
- (54) The pricing of access to newly built civil-engineering infrastructure of the SMP operator for VHCN deployment by alternative operators could have an impact on the SMP operator's incentives to build new civil-engineering infrastructure with sufficient capacity to host alternative networks. Where the new civil-engineering infrastructure of the SMP operator has been deployed within the geographic scope of the market or within the clearly delineated areas within the geographic scope of the market, and where it co-exists with the legacy civil-engineering infrastructure, NRAs should set individual prices for access to the newly built civil-engineering infrastructure assets, applicable within the area concerned. In principle, civil-engineering infrastructures which are merely repaired, renovated or maintained should not be considered as newly built. The price for access to the newly built civil-engineering infrastructure should reflect current market conditions and should be based on the full actual costs incurred by the SMP operator, as long as strict non-discrimination is ensured in the terms and conditions of access to such infrastructure. Such an approach would provide the right incentives for investing in new civil-engineering infrastructure. Moreover, depending on market circumstances, building significant new civil-engineering infrastructure may represent for the SMP operator a risk-investment profile higher than the risk profile associated with the reuse of legacy civil-engineering infrastructure. That risk profile would involve risks in terms of incurred costs and in terms of expected revenues. NRAs should carefully assess the relevant market circumstances and, when applicable, reward the higher and quantifiable risk-investment profile by way of a (higher) risk premium.

- (55) Active copper lines are decreasing as customers migrate to cable, fibre or mobile networks. Modelling a single, efficient VHCN for copper and VHCN access products would neutralise the inflationary volume effect that arises when, modelling a copper network, fixed network costs must be distributed over a decreasing number of active copper lines. It is possible to progressively transfer the traffic from copper to VHCNs by deploying - and switching to - VHCNs. Only traffic moving to other infrastructures (e.g. cable, mobile) would result in a rise in unit costs.
- (56) In light of both the principle of technological neutrality and different national circumstances, NRAs require sufficient flexibility to model this type of efficient VHCN. The VHCN could therefore be based on any of the various access technologies and network topologies available to operators for rolling out a VHCN.
- (57) An FTTH or FTTB network could be considered to be the typical form of a modern and efficient VHCN. Under that approach, the cost calculated for the VHCN should be adjusted to reflect the different features of a copper network where it is necessary to determine the wholesale access price to the copper network. For that purpose, the NRAs should estimate the cost difference between an access product based on a VHCN and an access product based on copper by making the relevant network-engineering adjustments in the VHCN model.
- (58) If the topology of the VHCN to be modelled is different from the copper network to the extent that adjustment within the VHCN engineering model is not feasible, NRAs could obtain the copper cost by modelling an overlay network, where two parallel networks (copper and fibre) share to an extent the same network for civil-engineering infrastructure. Under that approach, the inflationary volume effect would be neutralised for civil-engineering assets because the modelled copper and fibre networks would share the use of those assets, and therefore the unit costs of those assets would remain stable. However, except for civil-engineering assets, the modelling of two parallel networks (copper and fibre) could still lead to an inflationary volume effect for copper assets because of the declining traffic on the copper network.

LONG-TERM ACCESS PRICING AND VOLUME DISCOUNTS

- (59) Volume discounts and long-term access-pricing agreements can be important tools to foster VHCN investment, in particular where take-up by consumers is still low. NRAs may accept volume discounts and long-term access-pricing agreements by SMP operators on their own downstream businesses if they do not foreclose market entry for efficient competitors (including infrastructure competition) and do not undermine the existing market position of efficient competitors. That is the case where the volume discounts and long-term access-pricing agreements offered by an SMP operator to its retail arm do not exceed the discount, or where the agreements are no better than those offered in good faith to third party access seekers.

ADEQUATELY REWARDING THE INVESTMENT RISK OF NEW VHCN PROJECTS

- (60) The weighted average cost of capital ('WACC') employed should reflect the current market situation. If the applicable WACC does not sufficiently take into account the current economic conditions, it could be relevant to update the applicable WACC, thus ensuring the relevant macroeconomic parameters for the applicable WACC.
- (61) The return on capital allowed *ex ante* for investment into VHCNs should strike a balance between providing sufficient incentives for operators to invest on the one hand

(implying a sufficiently high rate of return) and promoting allocative efficiency, sustainable competition and maximum consumer benefits on the other (implying a rate of return that is not excessive).

- (62) If there are price-control obligations with respect to VHCN wholesale access products on a specific market, the regulated return allowed should adequately reflect both the cost of deploying the network and the risk taken by the SMP operator at the time of the investment. If the additional and quantifiable risk of investing in new VHCNs is not adequately reflected, the investor will hold back investments to the detriment of end-users and overall connectivity in society.
- (63) The deployment of VHCNs, in particular in rural and sparsely populated areas, involves committing to significant capital investments, with expected payoffs extending far into the future, thus increasing exposure to demand-side risks. Demand for advanced services such as those enabled by VHCNs is also likely to be more sensitive to changes in household incomes. As a result, investments in VHCNs are likely to expose operators to higher risks compared to their investments in legacy infrastructures.
- (64) SMP operators investing in separate VHCN projects may face a wide range of possible risks. Those risks may vary significantly between types of projects and geographical areas. Accounting for that, NRAs should acknowledge the additional risk for each project undertaken by the SMP operator. In principle, such considerations may result in multiple risk premiums being applicable, namely a premium for each specific VHCN project or, if the projects are sufficiently similar, one common risk premium. It would be for the NRA to decide whether a single common risk premium sufficiently covers the differences in each area or if several risk premiums should apply at the same time. Regardless of the approach taken, adding the project-specific risk premium to the applicable WACC results in the project-specific WACC.
- (65) The risk premium should be applied, where appropriate, on top of the applicable WACC to ensure maximum transparency. That approach is to emphasise that the risk premium only encompasses and rewards the specific additional and quantifiable risk in the situation for which it is intended.
- (66) A project-specific WACC should be evaluated at the time of the investment and should provide stability and consistency for the SMP operator. Risks and uncertainties change over time and may therefore change the NRA's perception of the risk premium allowed for the specific project.
- (67) To ensure that investors are rewarded for the risk taken at the time of the investment, NRAs should allow for a stable risk premium for the specific project over a sufficiently long period of time.

MIGRATION

- (68) This Recommendation also aims at providing guidance to NRAs on the application of Article 81 of Directive (EU) 2018/1972 in situations where the entire legacy copper loop is decommissioned and end-users are migrated to a VHCN. Incremental upgrades of copper networks are not included in the scope of this Recommendation.
- (69) Directive (EU) 2018/1972 introduced the objective of promoting connectivity and access to, as well as take-up of, VHCNs and stated that unjustified delays to migration to VHCNs should be avoided. Therefore, Article 81 of Directive (EU) 2018/1972 provides for the possibility of withdrawing access obligations on the copper network

to enable its switch-off. That Article should be applied in a way that makes the migration and copper switch-off process as smooth and fast as possible, while preserving effective competition.

- (70) Once the conditions in Article 81(2) of Directive (EU) 2018/1972 are fulfilled and a relevant notice period is complied with, access obligations on the copper network may be lifted to allow for switch-off. Moreover, to encourage migration, some regulatory obligations may already be relaxed before the full lifting of access obligations. A prerequisite for the relaxation of certain access obligations is that the end-users and access seekers on which the relaxation will have an impact should have effective access to products on VHCNs that constitute appropriate alternatives to products delivered over the legacy network, in accordance with Article 81(2) of Directive (EU) 2018/1972. Once such access is effectively established, migration should be encouraged and switch-off should be authorised within a reasonable timeframe. The 5-year duration recommended in Commission Recommendation 2010/572/EU¹⁴ no longer corresponds to the pace of both VHCN roll-out and migration from copper to VHCNs. It should therefore be reduced to the period between 2 and 3 years, and in some situations, based on national circumstance, to an even shorter period.
- (71) NRAs should ensure the availability of alternative products provided over the VHCN of at least comparable quality to those that were provided over the legacy network on the basis of Article 73 of Directive (EU) 2018/1972. Depending on their characteristics and on the conditions under which they are offered, wholesale access products provided over a VHCN on a commercial basis, or by a different operator than the SMP operator, may be considered a relevant alternative to wholesale access products provided over the legacy network.
- (72) As part of the gradual relaxation of regulatory obligations before the lifting of all obligations, a commercial closure of the legacy network encourages migration and can constitute a relevant intermediary step towards full switch-off.
- (73) Predictability is a key factor in ensuring a favourable framework for investment in VHCN roll-out. The recommended costing methodology contributes to that aim by neutralising, in whole or in part, the inflationary effect on copper wholesale access prices of end-user migration from legacy networks to VHCNs.
- (74) Once a decommissioning plan has been notified by the SMP operator of the legacy network in accordance with Article 81(1) of Directive (EU) 2018/1972, and where the conditions set in accordance with Article 81(2) of that Directive are met in a given area, the existence of a transparent timetable and conditions for the decommissioning process will ensure predictability for all stakeholders. As part of the gradual relaxation of regulatory obligations before the total withdrawal of those obligations in the context of the decommissioning of the copper network, NRAs may take into account the inflationary effect on the costs of the copper network of the migration of customers from copper to VHCNs. NRAs may do that by allowing the SMP operator to increase the prices of copper wholesale access products in areas where the wholesale and retail customers present on the copper network effectively have the possibility to migrate to a VHCN. That would make it possible to take into account the economic inefficiencies resulting from maintaining two networks in parallel, in order to incentivise the SMP

¹⁴ Commission Recommendation 2010/572/EU of 20 September 2010 on regulated access to Next Generation Access Networks (NGA) (OJ L 251, 25.9.2010, p. 35).

operator of the legacy network to present a decommissioning plan and effectively proceed to decommissioning as soon as possible. By potentially bringing copper prices closer to VHCN prices, that would also incentivise end-users and access seekers to migrate to the VHCN before the switch-off of services on the legacy network.

- (75) That price increase should be a transitory measure, subject to a binding and enforceable commitment from the SMP operator to decommission its copper network, which would apply only in areas where the notice period for the copper switch-off has started. The NRA should ensure that the application of the price increase is not prolonged by any undue delay in the implementation of the switch-off plan. In order to ensure that, the NRA may consider, for example, penalties or a claw-back mechanism. Where such a measure is implemented, it should be accompanied by sufficient safeguards to preserve competition, as presented in point 81 of this Recommendation.
- (76) While promoting an attenuation or complete lifting of regulatory obligations when justified by market developments, NRAs should remain vigilant, monitor market developments and intervene when warranted to preserve competition, the internal market and the interests of end-users,
- (77) Commission Recommendations 2010/572/EU and 2013/466/EU should no longer be given effect to, and this Recommendation should apply instead. This is due to the trends in market conditions observed since the adoption of those Recommendations, and due to the entry into force of Directive (EU) 2018/1972.

HAS ADOPTED THIS RECOMMENDATION:

SCOPE OF APPLICATION

1. Where, in the course of the market analysis procedures carried out under Articles 64 and 67 of Directive (EU) 2018/1972, national regulatory authorities (NRAs) determine that a market referred to in point 7 of this Recommendation is not effectively competitive and identify undertakings that individually or jointly have significant market power ('SMP') on that market (as SMP operator(s)), NRAs should assess what are the proportionate and appropriate obligations to be imposed pursuant to Article 68 of Directive (EU) 2018/1972.
2. This Recommendation concerns the application of the obligations referred to in Article 68(1) of Directive (EU) 2018/1972 and sets out a common approach to promoting their consistent and effective implementation with regard to legacy networks and VHCNs where they allow for the provision of broadband services.
3. This Recommendation is not intended for situations justifying the withdrawal of regulatory obligations, in accordance with Directive (EU) 2018/1972, in particular:
 - (a) where the SMP operator has offered co-investment commitments in new VHCNs pursuant to Article 76 of Directive (EU) 2018/1972;
 - (b) where the SMP operator is a wholesale-only operator in the sense of Article 80 of Directive (EU) 2018/1972.
4. In accordance with the provisions of Directive (EU) 2018/1972, NRAs should duly take into consideration, on a case-by-case basis, those commercial agreements, and cooperative arrangements, that can contribute to VHCN deployment, by diversifying the risk of investment, while enabling sustainable competition in the downstream markets.

5. Regardless of co-investment commitments under Article 76 of Directive (EU) 2018/1972, the existence of cooperative arrangements should also be duly taken into account by the NRA when considering the imposition of possible regulatory obligations on SMP operators. That is especially the case where the SMP operator offers legally binding commitments under Article 79 of Directive (EU) 2018/1972 on conditions for access, including cooperative arrangements. In particular, in areas where legally binding commitments under Article 79 of Directive (EU) 2018/1972 are in place, under which access to a VHC network is available to third parties, NRAs should assess whether the terms and conditions proposed by the SMP operator can be considered fair and reasonable and whether the commitments can preserve competition. Where that is the case, NRAs should consider monitoring the impact of those commitments and refrain from introducing intrusive remedies, in particular price-control obligations. Such price-control obligations should be considered by NRAs only where necessary to address significant competition problems that currently exist or that might subsequently emerge on the market.
6. In the same vein, NRAs should, where appropriate, take into account when assessing the competitive dynamics of a particular wholesale market the commercial agreements, including those that the SMP operator is not part of. Such agreements can lead to the conclusion that a particular wholesale market no longer warrants *ex ante* regulation if the agreements:
 - (a) have been entered into on a lasting basis;
 - (b) are sustainable; and
 - (c) improve competitive dynamics.
7. The principles set out in this Recommendation apply to the market for wholesale local access provided at a fixed location (market 1 of Recommendation (EU) 2020/2245). The principles set out in this Recommendation also apply to other wholesale fixed access markets identified by NRAs, which are not covered by Recommendation (EU) 2020/2245 but which are susceptible to *ex ante* regulation, and cover, for instance, the following network layers:
 - (a) access to the civil-engineering infrastructure;
 - (b) unbundled access to the copper and fibre local loops, or the copper sub-loop;
 - (c) virtual network access;
 - (d) wholesale broadband access (bitstream services) over copper, coaxial cable and fibre networks.
8. This Recommendation is not applicable to the wholesale dedicated capacity market (market 2 as referred to in Recommendation (EU) 2020/2245), except where, and to the extent that, access to civil-engineering infrastructure is regulated on the basis of an SMP finding in that market.

DEFINITIONS

9. For the purposes of this Recommendation, the relevant definitions in Article 2 of Directive (EU) 2018/1972 apply.

The following definitions also apply:

 - (a) ‘bottom-up modelling approach’ means an approach that develops a cost model starting from the expected demand in terms of subscribers and traffic and

which then models the efficient network required to meet the expected demand, and assesses the related costs using a theoretical network-engineering model, for the purpose of calculating the cost on the basis of an efficient network using the latest technology employed in large-scale networks;

- (b) ‘civil-engineering infrastructure’ means physical infrastructure assets and other facilities offering the possibility to host electronic communications networks elements, in particular buildings or entries to buildings, building cables, including wiring, antennae, towers and other supporting constructions, poles, masts, ducts, conduits, inspection chambers, manholes and cabinets;
- (c) ‘commercial closure’ means the stage of the decommissioning process where the SMP operator stops selling, at wholesale and retail level, new accesses to the legacy network infrastructure to be decommissioned;
- (d) ‘common costs’ means shared costs for products or services produced jointly that are not attributable to any single product or service;
- (e) ‘current costs’ means the costs resulting from valuing an asset at its replacement cost, namely the costs of replacing it with either the same asset or another asset of similar performance characteristics, allowing for wear and tear and adjustments for efficiency;
- (f) ‘depreciation’ means a method for allocating the value of an asset over the life of the asset, thus influencing the profile of the allowable earnings for the asset owner in any given period;
- (g) ‘downstream costs’ means the costs of retail operations, including marketing, customer acquisition, billing, and other network costs, incurred in addition to those network costs already included in the wholesale access service;
- (h) ‘equivalence of inputs (EoI)’ means, in relation to the access products and associated and ancillary services necessary for providing the wholesale inputs, 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;
- (i) ‘equivalence of outputs (EoO)’ means the provision to access seekers of wholesale inputs that are 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;
- (j) ‘incremental costs’ means costs that are directly associated with the production of a business increment, that is to say the additional cost of supplying a service over and above the situation where the service was not provided, assuming all other production activities remain unchanged;
- (k) ‘key performance indicators (KPIs)’ means indicators that measure the level of performance in the provision of the relevant wholesale services;
- (l) ‘long-run incremental costs (LRIC)’ means the incremental costs corresponding to a time horizon where all factors of production, including capital equipment, are variable in response to changes in demand due to changes in the volume or in the structure of production and where all investments are considered as variable costs;

- (m) ‘mark-up’ means the addition made to the incremental cost of a specific service in order to allocate and recover the common costs through allocation to all services for which those common costs are relevant;
- (n) ‘new retail offer’ means any new retail offer of services, including bundles of services, by an SMP operator based on already existing or new regulated wholesale inputs;
- (o) ‘regulatory accounting value’ means the value of an asset as recorded in the audited regulatory accounts of an undertaking which considers actual utilisation and lifetimes of the assets, which are typically longer than those recorded in statutory accounts and which are more in line with technical lifetimes;
- (p) ‘regulatory asset base (RAB)’ means the total capital value of the assets used to calculate the costs of the regulated services;
- (q) ‘reusable legacy civil-engineering assets’ means those legacy civil-engineering assets that are used for the copper network and that can be reused to accommodate a VHCN;
- (r) ‘service level agreement (SLA)’ means a commercial agreement under which the SMP operator is obliged to provide access to wholesale services with a specified level of quality;
- (s) ‘service level guarantee (SLG)’ means an integral part of an SLA that specifies the level of compensation payable by the SMP operator if it provides wholesale services with a quality inferior to that specified in the SLA;
- (t) ‘VHC networks-based wholesale layer’ means a network layer at which access is granted to access seekers on a VHC-based network and where several ‘wholesale inputs’ can be provided;
- (u) ‘weighted average cost of capital (WACC)’ represents the percentage value at which the investor demands to be compensated for an investment;
- (v) ‘wholesale input’ means an access product required for access seekers to supply end-users with a broadband service on a retail market and consisting of an active or passive product or a virtual access product offering equivalent functionalities to a passive access product, which can be provided over legacy copper network infrastructures or VHC-based infrastructures.

GEOGRAPHIC SEGMENTATION OF REMEDIES

10. Where geographic differences in the conditions of competition are insufficient, or not stable enough, to lead to the definition of separate geographic markets, NRAs should impose, where justified, differentiated remedies by geographic area within a given geographic market.
11. The criteria that NRAs may use for geographic segmentation of remedies should be the same as those used for geographic segmentation of markets, the difference being one of degree or stability. They should include the number and characteristics of competing networks, and distribution of and trends in market shares, prices and behavioural patterns.
12. When NRAs differentiate remedies because differences in the conditions of competition are not stable enough to define separate geographic markets, they should

consider updating the resulting segmentation periodically within the period of validity of the market analysis in which the segmentation is applied. The criteria for such updates should be clearly defined in the market analysis itself, and should be based on the same criteria as those used for the initial geographic segmentation of remedies, thereby assuring maximum predictability and a level playing field.

NON-DISCRIMINATION

Ensuring equivalence of access

13. The surest way to achieve effective non-discrimination and promote competition is, in principle, by the application of EoI, which ensures a level playing field between the SMP operator's downstream businesses and third-party access seekers. Where NRAs consider the imposition of a non-discrimination obligation on SMP operators pursuant to Article 70 of Directive (EU) 2018/1972, they should examine whether it would be proportionate to require SMP operators to provide relevant wholesale inputs on an EoI or EoO basis.
14. In conducting such an assessment of proportionality, the NRA should take into account, in particular:
 - (a) incremental costs and compliance delays resulting from the application of EoI or EoO, including the costs of monitoring non-discrimination;
 - (b) the potential effect of the non-imposition of regulated wholesale access prices on VHCNs;
 - (c) the potentially positive effect the application of strict non-discrimination in the form of EoI or EoO might have on investment in VHCNs, innovation and competition;
 - (d) any voluntary commitment by the SMP operator to provide wholesale inputs to access seekers on an EoI or EoO basis, as long as such a voluntary offer meets the conditions set out in this Recommendation;
 - (e) the number and size of the SMP operator(s);
 - (f) experiences from currently implemented standards.
15. Where proportionate, strict non-discrimination in the form of EoI or EoO should be applied at the most appropriate level or levels in the value chain to those wholesale inputs which the SMP operator provides to its own downstream businesses. In general, NRAs should justify their choices between EoI and EoO on a wholesale product-by-product basis, taking national circumstances into account. If, however, a single wholesale input is used in multiple retail products, then the decision should be made on the multiple wholesale products.
16. When considering the application of EoI, NRAs should first consider introducing it at the deepest possible network level at which competition will be effective and sustainable in the long term. Where civil-engineering infrastructure access is imposed in accordance with points 30 to 37 of this Recommendation, NRAs should carefully consider the benefits and costs of implementing EoI for civil-engineering infrastructure, taking into account in particular how such a measure could contribute to enabling infrastructure-based competition.

17. NRAs should ensure that where a non-discrimination obligation is imposed, access seekers can use the relevant systems and processes with the same degree of reliability and performance as the SMP operator's own downstream retail arm.

Ensuring technical replicability of the vertically integrated SMP operator's new retail offers

18. NRAs should require SMP operators which are subject to a non-discrimination obligation to provide access seekers with regulated wholesale inputs that allow the access seeker to effectively replicate new retail offers of the downstream retail arm of the SMP operator from a technical perspective. In particular, NRAs should impose that requirement where strict non-discrimination based on EoI is not fully implemented.
19. To that end, and to guarantee a level playing field between the SMP operator's downstream retail arm and third-party access seekers, NRAs should ensure that internal and third-party access seekers have access to the same technical and commercial information on the relevant regulated wholesale input, without affecting applicable rules on business confidentiality. The relevant information includes information on new regulated wholesale inputs or on changes to existing regulated wholesale inputs, to be provided in accordance with lead times set on a case-by-case basis.
20. When assessing the technical replicability of the SMP operator's new retail offer, the NRA should take into account:
 - (a) whether the corresponding wholesale input or inputs for ordering, delivery and repair, which are necessary for an efficient operator to develop or adapt its own systems and processes to offer competitive new retail services, are made available to access seekers for a reasonable period of time before the SMP operator or its downstream retail arm launches its own corresponding retail service;
 - (b) the availability of corresponding SLAs and KPIs.
21. 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. The NRA should require the SMP operator to notify the new retail offer with sufficient notice for the NRA to validate the results of the test and for the access seekers to be able to replicate the relevant retail offer in a timely fashion, if they choose to do so.
22. 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 make use of a particular relevant regulated wholesale input, together with all the information needed for the NRA to assess replicability, with sufficient notice before the launch of such retail offers. Such notice should be sufficient for both the NRA to conduct the technical replicability test and for access seekers to be able to replicate the relevant retail offer in a timely fashion, should they choose to do so.
23. Where the NRA considers that technical replicability of the new retail offer is not ensured, it should require the SMP operator to amend the relevant regulated wholesale input or inputs in a way that ensures technical replicability.

24. If the NRA considers that a retail offer which is not technically replicable would result in significant harm to competition, it should require, under Article 30 of Directive (EU) 2018/1972, the SMP operator to withdraw or delay the provision of the relevant retail offer pending compliance with the requirement of technical replicability.

Monitoring compliance with non-discrimination obligations

25. When imposing a non-discrimination obligation under Article 70 of Directive (EU) 2018/1972, in order to ensure compliance and effective application, NRAs should require the SMP operator to implement KPIs, SLAs alongside KPIs, and SLGs in case of a breach of the SLAs, in accordance with the principles set out in Annex I to this Recommendation. A mechanism should be in place to update the KPIs, SLAs and SLGs whenever needed. When necessary, NRAs should require the SMP operator to include the KPIs, SLAs and SLGs in the reference offer.
26. NRAs should duly consider any commitments proposed by the SMP operator in relation to non-discrimination in accordance with Article 79 of Directive (EU) 2018/1972. In particular, such commitments can be proposed in relation to KPIs, SLAs and SLGs, including for their conditions, especially when access seekers agree with the proposals advanced by the SMP operator. NRAs should foster a multi-stakeholder dialogue between the SMP operator and access seekers to reach an agreement or inform a decision on the following:
- (a) a comprehensive set of KPIs, SLAs and SLGs;
 - (b) their terms and conditions, including an appropriate deadline for updating the KPIs, SLAs and SLGs.

Monitoring by the NRA

27. NRAs should ensure that the principle of equivalence is effectively applied. Where KPIs indicate that the SMP operator may not be complying with its non-discrimination obligation, the NRA should intervene by investigating the matter in more detail and, where necessary, enforce compliance. NRAs should make public, for example on their website, decisions to remedy non-compliance.
28. In addition to KPI reports, NRAs should ensure that SMP operators keep track of all elements necessary to monitor compliance with the equivalence of access requirement. That information should allow NRAs to make regular checks, verifying that the SMP operator provides the required level of information to third-party access seekers and that the procedures, in particular for ordering and provisioning, are applied correctly.

Asymmetry of information

29. When the wholesale arm of the SMP operator has prior knowledge of access seekers' deployment plans, NRAs should ensure that such information is not shared with the retail arm of the SMP operator, to prevent the SMP operator from gaining an undue competitive advantage. At a minimum NRAs should ensure that the personnel involved in the retail activities of the SMP operator do not participate in company structures of the SMP operator responsible, directly or indirectly, for managing access to wholesale inputs. NRAs may require the SMP operator to provide an annual report documenting the following:

- (a) its practices to prevent the sharing of sensitive information between its wholesale and retail arms;
- (b) any allegations of violation;
- (c) any corrective actions that it has taken.

ACCESS TO THE CIVIL-ENGINEERING INFRASTRUCTURE OF THE SMP OPERATOR

- 30. Where necessary and proportionate to address the competition problems identified, and where capacity is available in the civil-engineering infrastructure of the SMP operator, NRAs should mandate access to civil-engineering infrastructure pursuant to Article 72 of Directive (EU) 2018/1972. That obligation may only be imposed in geographic markets where the operator has been identified as having SMP. The scope of that obligation may differ between geographic areas, if the geographic segmentation of remedies is applied as referred to in points 10, 11 and 12 of this Recommendation. When imposing the access obligation, NRAs should consider all assets and facilities, underground and above ground, which form part of the civil-engineering infrastructure of the SMP operator.
- 31. Except in specific circumstances (such as where the civil-engineering infrastructure owned or controlled by the SMP operator is non-existent or extremely limited or where the NRA duly establishes that demand for access to civil-engineering infrastructure owned or controlled by the SMP operator is non-existent or very limited), access obligations to physical infrastructure resulting from Directive 2014/61/EU are likely to be insufficient to address competition problems identified in market analyses carried out under Articles 64 and 67 of Directive (EU) 2018/1972.
- 32. Before imposing any other access obligations pursuant to Article 73 of Directive (EU) 2018/1972, NRAs should consider first whether mandating access to civil-engineering infrastructure alone could address the identified competition problems. In particular, access to civil-engineering infrastructure as the only access remedy is likely to be sufficient to address the identified competition problems when both of the following conditions are met:
 - (a) the SMP operator has control over an extensive civil-engineering infrastructure that enables alternative operators to deploy their own VHCNs up to end-users' premises, without affecting the sharing of in-house wiring pursuant to Article 61(3) of Directive (EU) 2018/1972;
 - (b) a sufficient degree of end-to-end infrastructure-based competition has emerged or there is a viable and realistic prospect that such competition will emerge within the period covered by the market review.
- 33. Where the prospect for end-to-end infrastructure-based competition is viable and realistic but such competition has not yet materialised, NRAs should assess whether it is necessary to impose or to maintain, on a transitional basis, other access obligations before solely relying on regulated access to civil-engineering infrastructure. In such cases, NRAs should set up an appropriate transition period for the application of other access obligations before relying solely on regulated access to civil-engineering infrastructure, in order to allow an efficient operator sufficient time to duplicate the access network.
- 34. NRAs should ensure that access to existing civil-engineering infrastructure is provided in accordance with the principles set out in Annex II to this

Recommendation, and at cost-oriented prices in accordance with the recommended costing methodology set out in points 48 to 59 of this Recommendation.

35. Where there is a request for a reference offer for access to civil-engineering infrastructure, NRAs should require such an offer to be made as soon as possible. The reference offer should be in place no later than six months after a request has been made.
36. NRAs should, in accordance with market demand, encourage, or, where possible under national law, oblige the SMP operator, when building civil-engineering infrastructure, to install sufficient capacity so that other operators can also make use of those facilities.
37. NRAs should work with other authorities with a view to creating a database containing information on the geographical location, available capacity and other physical characteristics of all civil-engineering infrastructure which could be used for the deployment of VHCNs in a given market or market segment. Such a database should be accessible to all operators.

NON-IMPOSITION OF REGULATED WHOLESALE ACCESS PRICES ON VHCNs

38. It is recommended that the NRA should not impose or maintain regulated wholesale access prices on VHCN wholesale inputs, pursuant to Article 74 of Directive (EU) 2018/1972, in instances where – as part of the same measure – the NRA imposes on the SMP operator non-discrimination obligations concerning VHCN wholesale inputs, pursuant to Article 70 of Directive (EU) 2018/1972, and where all the following conditions are met:
 - (a) the NRA imposes obligations to apply EoI, or EoO where the NRA has established that EoI obligations would be disproportionate and that EoO obligations would be sufficient to ensure effective non-discrimination;
 - (b) the NRA imposes obligations relating to technical replicability and appropriate monitoring mechanisms, applied in accordance with points 18 to 24 of this Recommendation, where EoI is not fully implemented;
 - (c) the NRA imposes obligations relating to the economic replicability test, applied in accordance with points 46 and 47 of this Recommendation;
 - (d) there is a demonstrable retail price constraint resulting from one of the following:
 - (i) infrastructure-based competition, either from the provision of retail services over one or more alternative infrastructures that are not controlled by the SMP operator;
 - (?) clear and realistic commitments resulting from the geographic survey for the deployment of alternative networks to cover a significant part of the area within the market review period, especially if supported by effective access agreements to the civil-engineering infrastructures controlled by the SMP operator or if the deployment has already started;
 - (?) a regulated anchor, defined by the NRA in accordance with points 41 to 45 of the Recommendation, and subject to a cost-oriented price control obligation, applied in accordance with the

recommended costing methodology set out in points 48 to 59 of this Recommendation.

39. In markets where the conditions listed in point 38 of this Recommendation are fulfilled only in certain areas, NRAs should differentiate remedies and maintain or impose price control obligations in accordance with Article 74 of Directive (EU) 2018/1972 only in those areas where such conditions are not fulfilled. The imposition of differentiated remedies within a particular geographic market should not alter the NRAs' underpinning assumptions for implementing the recommended costing methodology and therefore should not lead to a divergent outcome compared to the alternative scenario of non-imposition of differentiated remedies.
40. The conditions set out in point 38(d) of this Recommendation should not be seen as the only circumstances under which NRAs can decide not to impose regulated access prices for VHCN wholesale inputs. Depending on the demonstration of effective non-discrimination and on competitive conditions, there may be other situations where the imposition of regulated wholesale access prices is not warranted under Directive (EU) 2018/1972. In particular, and in accordance with point 71 of this Recommendation, that could be when the business case to deploy a VHC network would be marginally viable even in the absence of any regulation in that area, for instance in areas of lower population density.

Definition of the characteristics of a regulated anchor

41. The regulated anchor is a cost-oriented wholesale access product, or a combination of such products, which constrains VHCN prices in such a way that related services will be priced in accordance with consumer willingness to pay a premium for the additional capacity and functionalities that a VHCN-based retail product can provide, in comparison with retail products provided on the basis of one or more regulated anchors. The regulated anchor can be a combination of copper- and VHCN-based products, or based on a portfolio of products. A similar constraint to that exerted by the regulated anchor could be provided, based on national circumstances, by the regulated access to civil-engineering infrastructures.
42. The NRA should define the characteristics of the regulated anchor based on the findings of the market analysis, taking into account that the anchor product should be subject to cost orientation, based on the recommended costing methodology set out in points 48 to 59 of this Recommendation.
43. Where a copper-based product (including virtual unbundled local access products provided over an upgraded copper network) is still able to exert a demonstrable retail price constraint on VHCN-based products on a forward-looking basis, the NRA should define that product as the regulated anchor or as one of the regulated anchors.
44. 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 due to the existence of alternative networks or regulated access to civil-engineering infrastructures, the NRA should define an entry-level regulated product provided over a VHCN in the relevant wholesale market as the regulated anchor or as one of the regulated anchors. The technical performances of that regulated product should be limited to what is required to exert a demonstrable retail price constraint on a forward-looking basis. As such, the VHCN-based anchor product could be a virtual or an active regulated product, or both. That product should be subject to cost orientation based on the recommended costing methodology set out in points 48 to

59 of this Recommendation, while pricing flexibility should be provided for all other products provided over VHCNs. Where the SMP operator deploys a VHCN, the NRA should allow the SMP operator to provide an anchor offering similar performances to the most recent copper-based anchor, provided that the anchor is able to exert a demonstrable retail price constraint.

45. Where the NRA concludes that the definition of a copper-based product or an entry-level fibre product could be insufficient to exert an effective price constraint on the SMP, NRAs should have the possibility to define an effective anchor which could be a combination of anchors (copper- and VHCN-based products) or to define as an anchor a portfolio of regulated products that is sufficiently representative of the consumer demand. The technical performances of each regulated product should be limited to what is required to exert a demonstrable retail price constraint on a forward-looking basis. As such, each anchor product could be a virtual, or an active, regulated product. Each product should be subject to cost orientation based on the recommended costing methodology set out in points 48 to 59 of this Recommendation, while pricing flexibility should be provided for all other products provided over VHCNs.

Economic replicability test

46. An NRA should be deemed to impose the economic replicability obligations referred to in point 38(c) of this Recommendation where it adopts a final measure in which it decides not to impose or maintain regulated wholesale access prices on VHCN wholesale inputs, and includes in the same final measure the following elements, which have been subject to a consultation under Article 32 of Directive (EU) 2018/1972:
- (a) the measure should include the details of the *ex ante* economic replicability test that the NRA will apply. Those details should specify as a minimum the following parameters, where applicable in accordance with the guidance provided in Annex III to this Recommendation:
 - (1) the relevant downstream costs which are taken into account;
 - (2) the relevant cost standard;
 - (3) the relevant regulated wholesale inputs and reference prices;
 - (4) the relevant retail products;
 - (5) the relevant time period for running the test;
 - (6) the methodology used for determining the flagship products;
 - (7) whether flagship products are intended to be analysed on an individual basis or as a portfolio;
 - (8) the approach that will be used for any unregulated products that are part of the flagship bundle;
 - (b) the measure should also include the procedure that the NRA will follow to conduct an *ex ante* economic replicability test, specifying that the NRA:
 - (1) 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;

- (2) will perform and conclude the test as soon as possible and in any case within four months from starting the procedure. However, if the NRA has to handle complex cases, such as portfolio tests, or follow up on changes in flagship products or revise the result of the replicability analysis according to updated information, that four-month period can be extended by an appropriate time, provided that the NRA duly justifies the necessity of this extension. Furthermore, if a technical replicability test is also required, the timing of the two tests (namely the technical replicability test and the economic replicability test) should be aligned as much as possible.

The procedure should make clear that the *ex ante* economic replicability test to be performed by NRAs under point 38(c) of this Recommendation is different from and without affecting any margin squeeze test that may be conducted *ex-post* under competition law;

- (c) the measure should also include the remedy the NRA will adopt when the offer of the SMP operator fails the test, making use of the enforcement tools provided under Directive (EU) 2018/1972 to ensure compliance. Where appropriate, that remedy should include a request for the SMP operator to address the economic replicability issue in accordance with the NRA's guidance and on the basis of the results of the *ex ante* economic replicability test performed. Where the NRA considers that a retail offer which is not economically replicable would significantly harm competition, it should make use of its powers under Article 30(3), second subparagraph, point (b) of Directive (EU) 2018/1972 to ask the SMP operator to withdraw or delay the relevant retail offer pending compliance with the requirement for economic replicability.
47. Once the measure has been adopted, the NRA should publish on its website the roadmap and the details of the *ex ante* economic replicability test as part of the final measure. The NRA should consider using all the enforcement tools provided under Directive (EU) 2018/1972 to ensure compliance with all aspects of the imposed measures. In particular, NRAs should use their powers under Article 20 of Directive (EU) 2018/1972 to obtain, from the SMP operator and, where necessary, from other undertakings, the information necessary to design and apply the economic replicability test. That should include the information needed to allocate the price of a flagship retail bundle across the different components of the bundled offer for the economic replicability test.

CONSISTENT APPROACHES TO PRICE CONTROL OBLIGATIONS

Costing methodology

The recommended costing methodology

48. To set the prices for wholesale access products provided over copper networks and VHCN where cost orientation is appropriate, proportionate and justified pursuant to Article 67(4) and Article 68(4) of Directive (EU) 2018/1972, NRAs should adopt a bottom-up, long-run, incremental cost-plus (BU LRIC +) costing methodology. That methodology should include a bottom-up modelling approach using LRIC as the cost model and with the addition of a markup for the recovery of common costs.
49. 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, which is a VHCN. That is without affecting whether a VHCN in the relevant geographic market is subject to an obligation of regulated wholesale access pricing, which is addressed in point 38 of this Recommendation.

50. When modelling a VHCN, NRAs should define a hypothetical efficient VHCN, capable of delivering the targets set out in Decision (EU) 2022/2481, in terms of bandwidth and coverage, as well as taking take-up into account. When modelling a VHCN, NRAs should include: (i) any existing civil-engineering assets that are generally also capable of hosting a VHCN; and (ii) civil-engineering assets that will have to be newly constructed to host a VHCN. Therefore, when building the BU LRIC + model, NRAs should not assume the construction of an entirely new civil-engineering infrastructure network for deploying a VHCN.
51. NRAs should value all assets constituting the regulatory asset base ('RAB') of the modelled network on the basis of replacement costs. The only exception to this, in principle, is civil-engineering assets, including reusable legacy civil-engineering assets.
52. In principle, NRAs should value civil-engineering assets and their corresponding RAB on the basis of the indexation method. Specifically, NRAs should set the RAB for that type of asset at the regulatory accounting value net of accumulated depreciation at the time of calculation, indexed by an appropriate price index, such as the retail-price index ('RPI'). NRAs should consider the costs which are well documented and clearly related to expenditure in civil-engineering assets. For the reusable legacy civil-engineering assets, NRAs should examine the accounts of the SMP operator, where available, to determine whether they are sufficiently reliable as a basis to reconstruct the regulatory accounting value. They should otherwise conduct a valuation on the basis of a benchmark of best practices in comparable Member States. NRAs should not include reusable legacy civil-engineering assets that are fully depreciated but still in use.
53. When applying the method for asset valuation recommended in point 52 of this Recommendation, NRAs should lock in the RAB corresponding to civil-engineering assets and then roll it forward from one regulatory period to the next.
54. Where NRAs can establish that the indexation method would not be appropriate, they may decide to value reusable legacy civil-engineering assets and their corresponding RAB on the basis of current costs adjusted for depreciation over the lifetime of the assets. NRAs should not take into account the value of reusable legacy civil-engineering assets that are fully depreciated but still in use and should also ensure that the asset-valuation method that is used reflects the fact that reusable legacy civil-engineering infrastructure assets in general cannot be replicated in the competitive process.
55. NRAs should set the lifetime of the civil-engineering assets at a duration corresponding to both the expected period of time during which the asset is useful and the demand profile. This is usually not less than 40 years for ducts.
56. In light of the principle of technological neutrality, NRAs should consider various approaches to modelling the hypothetical efficient VHCN, depending on the access technology and network topology that best fit national circumstances. When determining the access prices of services that are not based on a VHCN, NRAs should adjust the cost calculated for the modelled VHCN to reflect the different features of wholesale access services that are not based on a VHCN. For that

purpose, the NRAs should estimate the cost difference between an access product based on, for example, fibre to the home ('FTTH') and an access product based on copper by replacing the optical elements with efficiently priced copper elements, where appropriate, in the VHCN engineering model. Where appropriate, NRAs could otherwise obtain the copper cost by modelling a VHC overlay network, where two networks (copper and FTTH) share to an extent the same civil-engineering infrastructure.

57. NRAs should allocate the incremental costs on a proportionate basis between all undertakings enjoying access, including the downstream arm of the SMP operator itself.
58. Where the civil-engineering infrastructure owned or controlled by the SMP operator is non-existent or limited, and significant investments are required for new civil-engineering infrastructure to deploy VHCNs, NRAs should ensure that the approach to price-control obligations for access to civil-engineering infrastructure preserves incentives to invest, both in the VHCNs themselves and in the civil-engineering infrastructure that would host them.
59. NRAs should set individual prices for access to newly built civil-engineering infrastructure of the SMP operator whenever: (i) cost orientation has been imposed for both the legacy and the newly built civil-engineering infrastructure; and (ii) where the newly built civil-engineering infrastructure has already become widespread within the area concerned. NRAs should ensure that prices for access to newly built civil-engineering infrastructure reflect the regulatory accounting value of the assets, in accordance with point 52 of this Recommendation.

Implementation of the costing methodology

60. NRAs should take into account the principle of regulatory transparency and predictability and the need to ensure stability without significant fluctuations:
 - (a) when setting cost-oriented access prices;
 - (b) when developing the recommended costing methodology set out in points 48 to 59 of this Recommendation (the 'recommended costing methodology');
 - (c) when implementing the costing methodology once it is finalised.
61. Once NRAs have finalised the recommended costing methodology, they should consider keeping it in place, in application of Article 3(4), first subparagraph, point (a), of Directive (EU) 2018/1972 in order to promote regulatory predictability by seeking to ensure stable access prices over at least two appropriate review periods. That recommendation is dependent on the NRAs maintaining a price-control obligation throughout that period and should not apply if there are significant and unexpected technological or market developments.
62. When, in the course of implementing the recommended costing methodology, the NRA keeps the methodology in place in accordance with points 48 to 59 of this Recommendation, NRAs should update the data input into the costing methodology not more than twice during each market review period. When updating the model, NRAs should in principle, and provided that market conditions have remained stable, only adjust such data in line with the real changes in individual input prices (e.g. to take inflation into account where applicable) and should in any case ensure recovery over time of the costs efficiently 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 two-and-a-half-year period.

Long-term access pricing and volume discounts

63. The SMP operator may apply price discounts to long-term access contracts or to contracts which are tied to volume commitments for VHCN wholesale access products, subject to the conditions set out in Annex IV to this Recommendation.

Adequately rewarding the investment risk on new VHCN projects

64. Where NRAs consider price control obligations to be appropriate, they should allow the undertaking an efficient rate of return on capital employed, taking into account investment-specific risks.
65. When establishing the applicable WACC, NRAs should ensure that it reflects current macroeconomic parameters. If the applicable WACC does not sufficiently take into account prevailing economic conditions, the NRA should consider updating the applicable WACC, thus ensuring the correct macroeconomic parameters in the foundation of the project-specific WACC for new investments.
66. When applying the rate of capital costs, NRAs should ensure that inflation is not double counted, as it could have already been taken into account within the costing methodology implementation.
67. When setting access prices to VHCNs, NRAs should consider applying, in addition to the applicable WACC, a risk premium to reflect any additional and quantifiable risk of the new investment network project, including of newly built civil-engineering infrastructures, incurred by the SMP operator. NRAs should be transparent about the application of the risk premium in addition to the applicable WACC.
68. NRAs should assess investment risk by taking into account one or several of the following factors of uncertainty:
- (a) uncertainty relating to retail and wholesale demand;
 - (b) uncertainty relating to the costs of deployment, civil-engineering works and managerial execution;
 - (c) uncertainty relating to technological progress;
 - (d) uncertainty relating to market dynamics and the changing competitive situation, such as the degree of infrastructure-based competition;
 - (e) macroeconomic uncertainty.
69. The risks are likely to vary considerably between different levels of VHCN coverage in different geographical areas. NRAs should therefore assess investment risk with a sufficient level of detail, considering as much as possible the specific characteristics and the planned area or areas of the investments. Where minor differences or no clear differences in investment risk between separate geographic areas can be observed, the NRAs should consider all areas as bearing the same investment risk.
70. As the level of risk may diminish over time, investors might find it optimal to delay investments if such a delay is expected to further increase profitability by allowing more informed investment decisions in the future. On that basis, NRAs may find that including in the WACC calculation the option value of waiting could have an impact

on stimulating and accelerating investments, in particular in areas with limited prospects for infrastructure-based competition (such as sparsely populated areas).

71. Investment uncertainty denotes a range of possible outcomes, including favourable as well as adverse outcomes. When using the estimated cost of capital to set price controls, NRAs should have regard to the effects of such controls on investor expectations as to the rate of return over the lifetime of the investment. In order not to undermine investment, NRAs should avoid setting price controls at levels that would suppress the expected rate of return below the estimated cost of capital, taking into account the risk that adverse scenarios may materialise, such as lower than expected demand or higher than expected costs. In cases where expected profitability in the absence of price controls is already marginal, NRAs should consider not imposing price control obligations, at least until a significant part of the associated uncertainty is resolved, as referred to in point 70 of this Recommendation.
72. In order to promote regulatory predictability, the risk premium applicable to a given new investment project should be stable over a sufficient period of time, which should be consistent with the time period of the NRA's market analysis, usually for at least five years.
73. Setting the risk premium for at least five years means that the risk premium set for the specific project should not be changed within that period. In the event that an additional new investment project is brought to the NRA for it to take a decision, it may consider either: (i) extending the previously established risk premium also to the new project if that is appropriate; or (ii) without affecting point 71 of this Recommendation, introducing a new, separate risk premium specifically for the new project. Such a separate premium should reflect the risks applicable at the time when the NRA takes a decision as well as the specificities of the new project. If the NRA decides that the already applicable risk premium is also a sufficient incentive for the new project, it should present its reasoning in detail. Similarly, if it proposes a different premium, the NRA should follow the general principles guiding this Recommendation.
74. To estimate the cost of capital that corresponds to the systematic risk of investment in VHCNs, for setting the risk premium, NRAs may partly rely on detailed financial models that make it possible to compare the volatility of returns of VHCNs and legacy networks. Where sufficient information is available, for instance from financial markets, NRAs may also partly rely on quantitative estimation techniques that make it possible to break down the systematic risks of the different assets.
75. In exceptional circumstances where NRAs are not able to appropriately quantify the additional investment risk, in particular due to a lack of resources or unforeseen time constraints making it impossible to collect reliable data, NRAs may determine the risk premium on the basis of a benchmark of best practices in comparable Member States or regions, or both. NRAs using a benchmark to set the risk premium should ensure that the data inputs considered in calculating such a benchmark represent similar circumstances and were made for similar purposes as those that apply to the investment project for which it is intended.

MIGRATION TO VHCNs AND DECOMMISSIONING OF THE COPPER NETWORK

Conditions for the decommissioning plan to fulfil Article 81(2), first subparagraph, of Directive (EU) 2018/1972

76. When the SMP operator announces its intention to decommission its copper network, NRAs should ensure, in accordance with Article 81(2), first subparagraph, of Directive (EU) 2018/1972, that an appropriate notice period for transition is in place so that alternative operators are informed well in advance of the decommissioning. That notice period should not be longer than two to three years. It should be established that an appropriate alternative product of at least comparable quality providing access to the upgraded network infrastructure is made available to access seekers. That should be established before the notice period starts, or sufficiently in advance of access obligations on the legacy network being lifted to allow for the decommissioning. Those conditions should be considered by the NRA if necessary to safeguard competition and the rights of end-users. Within this two to three-year range, the exact notice period should be determined by taking into account the actual use by access seekers of the network to be decommissioned or the type of access product provided on the legacy network and the new networks. In particular, more time might be required for access seekers to migrate from or to passive products (e.g. access to ducts or dark fibre) than from or to active products (e.g. bitstream type of access) as the point of handover is more likely to change between the copper network and the VHCN for passive products. Likewise, based on national circumstances, some situations may require a shorter notice period. That is especially the case when the SMP operator and all access seekers making use of the legacy wholesale access products agree to it.
77. In order to assess, in accordance with Article 81(2), first subparagraph, of Directive (EU) 2018/1972, whether the plan ensures the effective availability of alternative access products of at least comparable quality as those that were available using the legacy infrastructure, NRAs should establish a substitution matrix detailing which access products on the new or upgraded network infrastructure correspond to which access products provided on the legacy network under Article 73 of Directive (EU) 2018/1972. The KPIs and SLAs used in that regard should reflect not only the intrinsic technical performances of both networks, but also all relevant access conditions. Depending on the circumstances in the area concerned, the alternative access offer may be provided by the SMP operator of the copper network, or by another operator that has deployed the VHCN in that area. The alternative offer may be provided as the result of regulatory obligations where such obligations have been imposed, of commitments made binding under Article 79 of Directive (EU) 2018/1972, or of a commercial agreement. In any case, the NRA should assess whether the SMP operator of the copper network establishes the availability of an alternative access product meeting the conditions set out in Article 81(2) of Directive (EU) 2018/1972.
78. To ensure that the alternative access products enable access seekers to reach the same end-users as the legacy infrastructure in accordance with Article 81(2), first subparagraph, of Directive (EU) 2018/1972, NRAs should determine a coverage threshold to be reached in an area by VHCNs offering products considered as appropriate alternatives to the regulated products provided on the legacy network

before access obligations on the legacy network are fully lifted in that area, thus allowing for decommissioning.

79. NRAs should ensure full transparency towards, and the involvement of, all stakeholders during the design and implementation of the decommissioning process and timetable. NRAs should also ensure that the decommissioning process does not lead to discriminatory behaviour. That includes potential discrimination between the retail branch of the SMP operator (if it is vertically integrated) and access seekers as regards access conditions to the copper network during the migration and decommissioning phase. In particular, the SMP operator should not continue to provide access to its own retail arm after it has ceased providing services to access seekers as a result of the lifting of access obligations by NRAs with a view to allowing for decommissioning in accordance with Article 81(2), second subparagraph, of Directive (EU) 2018/1972. That also includes differences that are not justified on the basis of objective criteria concerning the switch-off timeline between areas where the VHCN has been rolled out by the operator with SMP in the legacy network and areas where the VHCN has been rolled out by another operator.

Gradual relaxation and withdrawal of remedies, including copper price control

80. As part of the decommissioning process in a certain area provided for in Article 81(2) of Directive (EU) 2018/1972, NRAs should consider allowing the SMP operator to implement a commercial closure, subject to an appropriate notice period. Such commercial closure should only take place once an alternative access product is available pursuant to Article 81(2), second subparagraph, point (a), of Directive (EU) 2018/1972 as established by the NRA, if the available access product would be necessary to safeguard competition and the rights of end-users. However, accesses already existing at that point should be maintained until the complete withdrawal of remedies on the legacy network.
81. Where the wholesale prices for access to copper networks are subject to cost orientation, in accordance with the recommended costing methodology, and once a decommissioning or replacement plan notified by the SMP has been assessed by the NRA as complying with Article 81(2), first subparagraph, of Directive (EU) 2018/1972, NRAs may consider, as one option among several, a progressive relaxation of the price control obligation, by allowing the SMP operator to progressively increase wholesale prices for access to copper networks. Such a price increase should only be applicable in areas where the notice period for the copper switch-off has started. The NRA should ensure that the period of applicability of the price increase is not prolonged by any undue delay in the implementation of the switch-off plan. Where such a measure is implemented, it should be accompanied by sufficient safeguards in order to preserve competition, including the following:
- (a) the NRA should set the detailed rules for that price increase in advance;
 - (b) the conditions mentioned in Article 81(2), second subparagraph, of Directive (EU) 2018/1972 should be met, in particular the availability of products delivered over the VHCNs for all end-users in the areas concerned by the price increase in order to ensure that end-users and access seekers can effectively migrate to the VHCN;
 - (c) the price increase should not lead to excessive retail prices hampering the conditions for competition in the market;

- (d) the price increase should be non-discriminatory and should not allow for margin squeeze;
- (e) the price increase should be subject to a binding and enforceable commitment by the SMP operator as to the end date of all services provided over the copper network;
- (f) the price increase should not last longer than the notice period for the copper switch-off.

This Recommendation is addressed to the Member States.

Done at Brussels, 6.2.2024

For the Commission
Thierry Breton
Member of the Commission

