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COMMISSION RECOMMENDATION

of XXX

on the regulatory promotion of Gigabit connectivity

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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,

- (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) 2018/1972³ seeks to promote connectivity and access to, as well as take-up of, very high capacity networks (VHCNs)⁴, for the benefit of all citizens and businesses of the Union. These VHCNs include fixed, mobile and wireless networks. The appropriate incentives for investment in new, VHCNs, which foster the development of innovative services, will 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 further to reduce the extent of ex-ante intervention, as reflected in Commission Recommendation (EU) 2020/2245⁵. This Recommendation complements other sources of guidance⁶ on Directive (EU) 2018/1972 and aims to promote the EU internal market for electronic communications network and services. It aims to achieve this through consistent regulatory approaches

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, 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. 4–26*)

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

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

⁵ From 18 markets in 2003, only 2 markets are now considered at European level as justifying the imposition of regulatory obligations (Commission Recommendation EU/2020/8750 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*).

⁶ Commission Recommendation (EU) 2020/2245, 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, points 67 and 68, BEREC Guidelines*.

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 single 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 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 primarily focuses on the market for wholesale local access provided at fixed location (market 1 of Recommendation (EU) 2020/2245). By the same reasoning, this Recommendation should also be applicable 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 must 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 fixed location (market 3(b) listed in Recommendation 2014/710/EU⁷), where such markets are still regulated. 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

⁷ 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).

(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.

- (6) Commercial agreements (including agreements on wholesale access, co-investment agreements and reciprocal access agreements between operators), should, where appropriate, be taken into account by NRAs when assessing the competitive dynamics of a particular wholesale market. Such agreements can contribute to the conclusion that a particular wholesale market no longer warrants ex ante regulation if the agreements: (i) have been entered into on a lasting basis; (ii) are sustainable; and (iii) improve competitive dynamics.
- (7) Where a market is found not to be competitive and one of several undertakings have been designated as having SMP, Directive (EU) 2018/1972 provides for situations where market-driven solutions should be preferred over regulatory obligations, in particular intrusive obligations such as price control. Under certain conditions, Directive (EU) 2018/1972 allows the withdrawal of regulatory obligations, or the application of lighter-touch regulation. This is particularly appropriate (i) for co-investment agreements, commercial wholesale agreements or (ii) other cooperative arrangements, proposed by the SMP operator pursuant to Article 76 or Article 79, or both of Directive (EU) 2018/1972, or where the SMP operator is a wholesale-only operator (Article 80 of Directive (EU) 2018/1972). Furthermore, and as a general principle, NRAs should be open to and duly take into consideration those market initiatives and business models that contribute to VHCNs deployment, beyond what would happen in their absence, while enabling sustainable competition in downstream markets.
- (8) As the deployment of alternative networks progresses, in particular at local/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
- (9) 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 that 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. These objective criteria 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.
- (10) NRAs should update the list of areas subject to geographically segmented remedies based on the criteria thoroughly set out in the market review. The parameters of these 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. This

will help to preserve the balance between the adaptation of remedies to specific competitive circumstances and the necessary predictability and transparency for all stakeholders.

- (11) Commission Recommendations 2010/572/EU⁸ and 2013/466/EU⁹ should no longer be given effect to, and this Recommendation should apply instead. This is due to the evolutions of market conditions observed since the entry into force of these Recommendations, as well as to the entry into force of Directive (EU) 2018/1972.

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. This obligation also serves as a safeguard mechanism in those cases in which there is still SMP but competition is developing to a point where pricing flexibility is applied by the NRA.
- (13) NRAs' experience in imposing non-discrimination obligations under Article 10 of former Directive 2002/19/EC of the European Parliament and of the Council¹⁰ and currently under Article 70 of Directive (EU) 2018/1972 indicate that regulatory approaches still vary across the EU. 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 refrain from imposing non-discrimination obligations on wholesale-only operators, unless the NRAs can establish that there are specific circumstances that justify imposing such obligations.
- (14) Advantages of Equivalence of input (EoI) over Equivalence of output (EoO) may 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;

⁸ 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).

⁹ Commission Recommendation 2013/466/EU of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (OJ L 251, 21.9.2013, p. 13–32).

¹⁰ 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).

and the effectiveness of monitoring and enforcement of non-discrimination obligations on the part of the NRA.

- (15) NRAs should encourage the SMP operator(s) to offer commitments 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. These 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 proportionality assessment 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 implemented in practice as it depends on the wholesale products in question. These 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 at stake. 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 affected undertakings, for example, by taking into account implementation costs and weighing up possible disincentives to the deployment of 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 in the reference offer the KPIs, SLAs and SLGs.
- (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 and/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 average¹¹. In addition, penalties related to KPIs must be proportional, but should be large enough to be dissuasive. In assessing whether the level of wholesale penalties is sufficiently dissuasive, the NRA should bear in mind that a breach of

¹¹In one Member State only aggregated values are available and operators can compare KPIs to the industry average, BEREC BOR (16) 219, p.42.

wholesale obligations on the part of the SMP operator may cause the alternative operator that uses the wholesale access product to be subject to indemnities imposed by the same NRA for problems at the retail level. The wholesale penalty should 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. According to Article 67(2) of Directive (EU) 2018/1972, when carrying out market analyses NRAs should take into account the impact of other types of regulation or measures imposed as well as of other obligations resulting for instance from Directive 2014/61/EU which are relevant in this regard and NRAs should assess the outcomes of these measures on the relevant markets. However, where the operator holding 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 SMP regulation under Directive (EU) 2018/1972, this should prevail over any access obligation resulting from Directive 2014/61/EC. Directive (EU) 2018/1972 allows for more stringent and detailed access regulation, superseding access obligations underpinned on other, more general legislation. This means that the regulatory access obligation to the civil-engineering infrastructure of an operator holding SMP takes precedence over access requirements resulting from Directive 2014/61/EU .
- (20) In accordance with Article 73(2) of Directive (EU) 2018/1972, before imposing any access obligation on networks the NRAs should assess whether imposing access to civil-engineering infrastructure alone would be proportionate to promote competition and end-users' interests. 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 increase the relevance of VHCNs' deployment 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.

¹²Staff 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.

- (22) To support achieve the connectivity targets set out by the Decision (EU) 2022/2481 establishing the Digital Decade Policy Programme 2030¹³, access conditions to the civil-engineering infrastructure of the SMP operator should enable all access seekers that deploy VHCNs to roll out those networks at large scale across the territory. For that reason, NRAs should ensure that, for instance, 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 full exchange of necessary data with access seekers via electronic means.
- (23) The effectiveness of regulated access to the civil-engineering infrastructure of the SMP operator is highly reliant on the availability for access seekers of information 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 equivalent 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 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 not only information 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

- (24) 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 this 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 VHC wholesale access inputs.
- (25) Taking into account 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

¹³Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030, OJ L 323, 19.12.2022, p. 4–26.

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. This could result in lower prices for long-term agreements with volume guarantees, which could reflect access seekers taking on some of the risks associated with uncertain demand. In addition, pricing flexibility at wholesale level is necessary to allow both the access seeker and the SMP operator's retail business to introduce price differentiation on the retail broadband market in order better to address consumer preferences and foster penetration of very high-speed broadband services. Given that competition, and in particular infrastructure competition, has significantly progressed in many markets and areas across Europe since the adoption of Recommendation 2013/466/EU, there is room for applying pricing flexibility on a significantly larger scale than has been the case so far.

- (26) 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 sufficient competitive safeguards are in place. Such competitive safeguards are necessary to prevent such pricing flexibility leading to excessive prices in markets where SMP has been found, or to practices undermining competition, or both.
- (27) 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, this 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 this end, effective non-discrimination obligations should be complemented by guaranteed economic replicability of downstream products.
- (28) The demonstrable retail price constraint can result from the presence of alternative infrastructure and the services provided over this infrastructure. Moreover, in the context of increasing VHCNs coverage and more granular geographic analysis, emerging or prospective infrastructure-based competition could also be found to sufficiently constrain the SMP's operators' ability to raise its prices. Where VHCNs deployment has not yet started within the area, NRAs should assess the likelihood and viability of future VHCN deployment. In order to assess the likelihood of future deployments within a given area, the NRA should, inter alia, be able to refer to the information collected for the purpose of Article 22 of Directive (EU) 2018/1972, provided that planned deployments are considered sufficiently credible and there is no risk of their being frustrated by anti-competitive strategies of the SMP operator. The existence of effective regulated access to civil-engineering infrastructure, following the principles set out in this Recommendation, is an important factor that can contribute to making infrastructure competition a viable and realistic prospect within the review period.
- (29) Furthermore, a demonstrable retail price constraint can also result from a price anchor stemming from other regulated access products which are subject to cost orientation. Where copper-based products (including virtual unbundled local access ('VULA') 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 VHC 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 VHC-based product, such as an entry-level fibre product. 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 that virtual, or active, anchor product with a view to ensuring that pricing flexibility is preserved for other VHC-based products providing 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 undertake an economic replicability test. Such a test is without prejudice to 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 does 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 of the SMP operator and the price of the VHC wholesale input covers the incremental downstream costs and a reasonable percentage of common costs. Where wholesale price regulation for VHC 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 VHC-based services.
- (34) The possibility to apply a scale adjustment to the economic replicability test should be used where justified by specific market circumstances. This 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 this is also undertaken before 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) at 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 or stand-alone products, 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 VHC network markets and characterised by a high degree of concentration and/or a very high degree of market power of the SMP operator, the portfolio approach may not be appropriate.
- (37) The economic replicability test set out by the NRA in advance 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 earned between the most relevant retail products including broadband services (flagship products) and the regulated VHC 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, aims to ensure that VHCN investments and the effect of the recommended pricing flexibility are not hindered by this safeguard. In order to exclude cross-subsidisation between different products in a bundle or portfolio, NRAs should conduct only a single-level test, i.e. between the retail services and the most relevant VHC access input for access seekers (for example fibre access at the cabinet or virtual unbundling). However, a new VHC access input can over time become more relevant (for example fibre unbundling at the optical distribution frame ('ODF')). In this case, the economic replicability test should be run with reference to this 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 above-mentioned competitive safeguards referred to in recital 26 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 these are subnational markets, NRAs should nevertheless consider responding to these diverging competitive conditions by applying differentiated remedies. Such differentiated remedies could include, by lifting 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 VHC 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 ensuring 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 provided in Recommendation 2013/466/EU on costing methodology has been largely followed by NRAs, and the main principles of this 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 this objective when setting prices for wholesale-access services in the markets in question. This methodology models the incremental capital (including sunk costs) and operating costs borne by a hypothetically efficient operator providing all access services, and adds a mark-up 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 (i.e. based on up-to-date technologies, expected demand, etc.) that an efficient network operator would incur to build a modern VHCN today, 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 the 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 the technical equipment and the transmission medium (e.g. fibre), civil-engineering assets (i.e. 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 reusable legacy civil-engineering assets should not be valued at the cost of replacing them with new civil-engineering infrastructure but at the depreciated replacement cost. This would take into account their elapsed useful lifetime and thus the costs already recovered by the regulated SMP operator. As long as it is based on replacement costs, that approach sends efficient market-entry signals for build-or-buy decisions while avoiding the risk of over-recovering costs for reusable legacy civil-infrastructure. Cost over-recovery 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 this depreciated replacement cost. 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 initial RAB corresponding to the reusable legacy 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.
- (52) The initial RAB should be further locked in and rolled forward from one regulatory period to the next to ensure that once a non-replicable, reusable, legacy civil-engineering asset is fully depreciated, this 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, or where the civil-engineering infrastructure of the SMP operator is limited or almost non-existent. 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 assets' lifetime. The NRA should ensure that the asset-valuation method employed is such that civil-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. 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. This 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 VHC 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 makes it possible to progressively transfer the traffic from copper to VHCNs with the deployment of - and switching to - VHCNs. Only traffic volume 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 such an 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 this 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 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 civil-engineering 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/or long-term access-pricing agreements are an important tool to foster VHCN investment, in particular where take-up by consumers is still low. However, to ensure that market entry by efficient competitors is possible, NRAs should accept volume discounts by SMP operators to their own downstream businesses, for example their retail arm, only if these discounts do not exceed the highest volume discount offered in good faith to third party access seekers. Equally, NRAs should accept long-term access-pricing agreements by SMP operators to their own downstream businesses, e.g. their retail arms, only if they do not exceed the highest discount for long-term access that has been offered in good faith to third party access seekers.

ADEQUATELY REWARDING THE INVESTMENT RISK

- (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 (for instance a high inflation rate not reflected in the applicable WACC at the time), 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 risk of investing into new VHCNs is not adequately reflected, the investor will hold back investments to the detriment of end-users and overall connectivity in society.
- (63) SMP operators investing into separate VHCN projects may face a wide array of possible risks. Those risks may vary significantly between types of projects and geographical areas. Accounting for this, 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, i.e. 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 address, whether a single common risk premium sufficiently covers the differences in each area or if several risk premiums at the same time should apply. Regardless of the approach taken, adding the project-specific risk premium to the applicable WACC results in the project-specific WACC.
- (64) The risk premium should be applied on top of the applicable WACC to ensure maximum transparency. This approach is to emphasise that the risk premium only encompasses and rewards the specific additional risk in the situation for which it is intended.
- (65) Once the project-specific WACC has been established, it would appear relevant to conduct a sensitivity check of the total value derived, i.e. the sum of the applicable WACC and the risk premium. Such a check could be based on expert and industry surveys or on other reasonable forward-looking methods to evaluate whether the derived value is aligned with reasonable investor expectations.

- (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) Directive (EU) 2018/1972 has 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. This 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.
- (69) 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 constituting relevant 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 the 2010 NGA Recommendation no longer corresponds to the pace of both VHCN rollout and migration from copper to VHCNs. It should therefore be reduced.
- (70) 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.
- (71) 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.
- (72) Predictability is a key factor in ensuring a favourable framework for investment in VHCN rollout. The recommended costing methodology contributes to that aim by neutralising, in whole or in part, the inflationary effect of end-user migration from legacy networks to VHCNs on copper wholesale access prices.
- (73) 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 Directive (EU) 2018/1972 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 of the migration of customers from copper to VHCNs on the costs of the copper network. NRAs may do this 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 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.

- (74) That price increase should be a transitory measure, applicable 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. Where such a measure is implemented, it should be accompanied by sufficient safeguards to preserve competition, as laid out in point 81 of this Recommendation.

HAS ADOPTED THIS RECOMMENDATION:

AIMS AND SCOPE

1. The aim of this Recommendation, in line 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 single market for electronic communications networks and services;
 - (d) promote the interests of citizens of the Union. It also aims to increase legal certainty and regulatory predictability in view of the long-term horizons for investment in VHCNs.
2. 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') both determine that a market referred to in point 8 below 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.
3. 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 for promoting their consistent and effective implementation with regard to legacy networks and VHCNs where they allow for the provision of broadband services.

4. This Recommendation is without prejudice to the treatment of situations justifying the withdrawal of regulatory obligations, or market-driven solutions in accordance with Directive (EU) 2018/1972, in particular:
 - (a) in the presence of co-investment agreements, commercial wholesale agreements or other cooperative arrangements, proposed by the SMP operator pursuant to Article 76, Article 79, or both, 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.
5. NRAs should be opened to and duly take into consideration on a case-by-case basis the provisions of Directive (EU) 2018/1972, including 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.
6. Where the SMP operator opens a new VHCN to co-investment under Article 76 of Directive (EU) 2018/1972, in accordance with the conditions and procedures set out in Articles 76 and 79 of Directive (EU) 2018/1972, the commitment shall be made binding and no additional obligation shall, in principle, be imposed on the VHCN elements subject to the commitments.
7. Without prejudice to Article 76 of Directive (EU) 2018/1972, the existence of commercial agreements and cooperative arrangements (including those to which the SMP operator is not a party) should also be duly taken into account by the NRA when considering the imposition of possible regulatory obligations on SMP operators. This 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 commercial agreements or legally binding commitments or both 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 agreements or commitments can preserve competition. Where this is the case, NRAs should consider monitoring the impact of those agreements 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 remaining or that might subsequently emerge on the market.
8. The principles set out in this Recommendation apply to the market for wholesale local access provided at a fixed location (market 1 of the 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 the Recommendation (EU) 2020/2245 but which are susceptible to *ex ante* regulation, and cover the following network layers: (a) access to the civil-engineering infrastructure, (b) unbundled access to the copper and fibre loops, or the copper sub-loop, (c) virtual network access, and (d) wholesale broadband access (bitstream services) over copper and fibre networks.
9. 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 this market.

DEFINITIONS

10. For the purposes of this Recommendation, the relevant definitions in article 2 of Directive (EU) 2018/1972 shall apply. The following definitions shall 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. It 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 civil-engineering infrastructure includes, but is not limited to, buildings or entries to buildings, building cables, including wiring, antennae, towers and other supporting constructions, poles, masts, ducts, conduits, inspection chambers, manholes, and cabinets;
 - (c) ‘commercial closure’ means the stage of the decommissioning process where the SMP operator stops selling, at wholesale and retail level, new accesses on the legacy network infrastructure to be decommissioned;
 - (d) ‘common costs’ means shared costs for products or services produced jointly which 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 methods’ means methods 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, with relation to the access products and associated and ancillary services necessary for providing the wholesale inputs to internal and third-party access seekers, 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. EoI as defined here may apply to the access products and associated and ancillary services necessary for providing the ‘wholesale inputs’ to internal and third-party access seekers;
 - (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 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)' are 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. Therefore, 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' is 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' are those legacy civil-engineering assets that are used for the copper network and that can be reused to accommodate a VHCN;
- (r) 'Service level agreements (SLAs)' means commercial agreements under which the SMP operator is obliged to provide access to wholesale services with a specified level of quality;
- (s) 'Service level guarantees (SLGs)' means an integral part of SLAs 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 the investor demands to be compensated for an investment;
- (v) 'Wholesale inputs' 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. Wholesale inputs can be provided over legacy copper network infrastructures or VHC-based infrastructures.

GEOGRAPHIC SEGMENTATION OF REMEDIES

11. 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.

12. The criteria that NRAs may use for geographic segmentation of remedies can be the same as those used for geographic segmentation of markets, the difference being one of degree or stability. They include in particular the number and characteristics of competing networks, distribution of and trends in market shares, prices and behavioural patterns
13. 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 - and potentially annually - within the period of validity of the market analysis in which the segmentation is applied. The conditions of 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

14. 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.
15. In conducting such proportionality assessment, 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 potentially linked 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).
16. 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 an input by input basis.
17. 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 pursuant to points 31 to 38, 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.

18. NRAs should ensure that when 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

19. 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 effectively to replicate new retail offers of the downstream retail arm of the SMP operator from a technical perspective. In particular, NRAs should impose this requirement where strict non-discrimination based on EoI is not fully implemented.
20. 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 prejudice to 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.
21. 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(s) for ordering, delivery and repair necessary for an efficient operator to develop or adapt its own systems and processes in order to offer competitive new retail services are made available to access seekers and
 - (b) the availability of corresponding SLAs and KPIs.
22. 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 give sufficient notice so that the NRA can validate the results of the test and so that access seekers are able to replicate the relevant retail offer in a timely fashion should they choose to do so.
23. 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 relevant particular regulated wholesale input together with all 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.
24. 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(s) in a way that ensures technical replicability.

25. 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

26. 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 in Annex I to this Recommendation. A mechanism to update the KPIs, SLAs and SLGs whenever needed should be in place. When necessary, NRAs should require the SMP operator to include the KPIs, SLAs and SLGs in the reference offer.
27. NRAs should encourage and 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 use their powers to foster the proposal of commitments by the SMP operator. NRAs should foster a multi-stakeholder dialogue between the SMP operator and access seekers to reach an agreement (i) on a comprehensive set of KPIs, SLAs and SLGs and (ii) on their terms and conditions, including an appropriate interval for updating the KPIs, SLAs and SLGs.

Monitoring by the NRA

28. 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.
29. 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. This 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 correctly applied.

Asymmetry of information

30. When the wholesale arm of the SMP operator has prior knowledge of access seekers' deployment plans, NRAs should ensure 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 should require the SMP operator to provide an annual report documenting (i) its practices to prevent the sharing of sensitive information between its wholesale and retail arms; (ii) any allegations of violation, and any (iii) corrective actions that it has taken.

ACCESS TO THE CIVIL-ENGINEERING INFRASTRUCTURE OF THE SMP OPERATOR

31. 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. This obligation may only be imposed in geographic markets where the operator has been identified as having SMP. When imposing the access obligation, NRAs should consider all assets and facilities, underground and aerial, which form part of the civil-engineering infrastructure of the SMP operator.
32. 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 not to be sufficient to address competition problems identified in market analyses carried out under Articles 64 and 67 of Directive (EU) 2018/1972.
33. NRAs should consider mandating access to civil-engineering infrastructure before imposing any network specific access obligations pursuant to Article 73 of Directive (EU) 2018/1972. 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 enabling alternative operators to deploy their own VHCNs up to end user premises, without prejudice to the sharing of in-house wiring pursuant to Article 61(3) of Directive (EU) 2018/1972; and
 - (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.
34. 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 transitory basis, network-specific 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 network specific 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.
35. NRAs should ensure that access to existing civil-engineering infrastructure is provided in accordance with the principles set out in Annex II, and at cost-oriented prices in accordance with the recommended costing methodology set out in points 45 to 56.
36. Where there is a request for a reference offer for access to civil-engineering infrastructure, NRAs should require such an offer to be made available as soon as

possible. The reference offer should be in place no later than 6 months after a request has been made.

37. 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 these facilities.
38. 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

39. 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, that are consistent with all of the following:
 - (a) 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) obligations relating to technical replicability and appropriate monitoring mechanisms, in accordance with points 19 to 25 of this Recommendation when EoI is not fully implemented; and
 - (c) obligations relating to the economic replicability test as recommended in points 43 and 44 of this Recommendation;
 - (d) that 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; or
 - (ii) from emerging or prospective infrastructure-based competition, in areas where the deployment of alternative infrastructures has started and is expected to cover a significant part of the area within the market review period, or
 - (iii) in areas where there is clear evidence to show that the deployment of alternative networks is realistic and viable, in particular where such infrastructure competition is ensured by effective and non-discriminatory access to civil-engineering following the conditions set out in points 31 to 38 of this Recommendation; or, in the absence of a demonstrable retail price constraint resulting from infrastructure-based competition,
 - (iv) a regulated anchor, defined by the NRA in accordance with paragraphs 41 and 42, and subject to a cost-oriented price control obligation in

accordance with the costing methodology specified in points 45 to 56 of this Recommendation.

40. 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 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.
41. The conditions set out in point 38 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 70 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 the regulated anchor

42. The regulated anchor is a cost oriented wholesale access product which constrains VHC 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 which a VHC based retail product can provide in comparison with retail products provided on the basis of the regulated anchor. Similar constraint as exerted by the regulated anchor could be provided, based on national circumstances, by the regulated access to civil-engineering infrastructures.
 - (a) The NRA should define the characteristics of the regulated anchor based on the findings of the market analysis, taking into account the following principles: the anchor product should be subject to cost orientation, based on the costing methodology recommended in points 45 to 56;
 - (b) where a copper-based product (including VULA products provided over an upgraded copper network) is still able to exert a demonstrable retail price constraint over VHC-based products on a forward looking basis, the NRA should define that product as the regulated anchor;
 - (c) only 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 VHC network in the relevant wholesale market as the regulated anchor. The technical performances of this regulated product should be limited to what is required to exert a demonstrable retail price constraint on a forward looking basis. As such, the VHC-based anchor product could be a virtual, or an active, regulated product. That product should be subject to cost orientation based on the costing methodology recommended in points 45 to 56, 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 over higher performance products provided over VHCNs.

Economic replicability test

43. An NRA should be deemed to impose the economic replicability obligations referred to in point 39, first paragraph, point (c) of this Recommendation] when it includes the elements listed in points (a), (b) and (c) of this point, which have been subject to a consultation under Article 32 of Directive (EU) 2018/1972, in the same final measure in which it decides not to impose or maintain regulated wholesale access prices on VHCN wholesale inputs.
- (a) It should include the details of the ex-ante economic replicability test that the NRA will apply. These details should specify as a minimum the following parameters, where applicable, in accordance with the guidance provided in Annex III to this Recommendation:
 - (i) the relevant downstream costs which are taken into account;
 - (ii) the relevant cost standard;
 - (iii) the relevant regulated wholesale inputs and reference prices;
 - (iv) the relevant retail products;
 - (v) the relevant time period for running the test;
 - (vi) the methodology used for determining the flagship products
 - (vii) whether flagship products are intended to be analysed on an individual basis or as a portfolio;
 - (viii) the approach that will be used for any unregulated products that are part of the flagship bundle;
 - (b) It should also include the procedure that the NRA will follow to conduct an *ex-ante* economic replicability test, specifying that the NRA: (i) can start the procedure on its own initiative or at the request of third parties, at any time but no later than 3 months after the launch of the relevant retail product; and (ii) will conclude the test as soon as possible and in any case within 4 months from starting the procedure. However, if the NRA has to follow up on changes in flagship products or revise the result of the replicability analysis according to updated information, that 4-month period can be extended by an additional month, 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, first paragraph, point (c) of this Recommendation is different from and without prejudice to any margin squeeze test that may be conducted *ex-post* under competition law;
 - (c) It should also include the remedy it 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, this 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 provision of the relevant retail offer pending compliance with the requirement for economic replicability.

44. Once the measure has been adopted, the NRA should make public 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. This 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

45. To set the prices for wholesale access products provided over copper networks and VHCN, as well as the prices for access to civil-engineering infrastructure, where cost orientation is appropriate, proportionate and justified pursuant to Articles 67(4) and 68(4) of Directive (EU) 2018/1972, NRAs should adopt a bottom-up, long-run, incremental cost-plus (BU LRIC +) costing methodology to set the **regulated** prices for wholesale access products provided over copper networks and VHCN as well as the prices for access to civil-engineering infrastructure. This methodology should include a bottom-up modelling approach using LRIC as the cost model and with the addition of a mark-up for the recovery of common costs.
46. 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. This is without prejudice to whether a VHCN in the relevant geographic market is subject to an obligation of regulated wholesale-access pricing, which is addressed in point 39.
47. When modelling a VHCN, NRAs should define a hypothetical efficient VHCN, capable of delivering the targets set out Decision (EU) 2022/481, in terms of bandwidth and coverage. 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 infrastructure network for deploying a VHCN.
48. NRAs should value all assets constituting the RAB of the modelled network on the basis of replacement costs. The only exception to this, in principle, is reusable legacy civil-engineering assets.

49. In principle, NRAs should value reusable legacy 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 RPI. 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.
50. When applying the method for asset valuation set out in point 49, NRAs should lock-in the RAB corresponding to the reusable legacy civil-engineering assets and then roll it forward from one regulatory period to the next.
51. 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 civil-infrastructure assets would in general not be replicated in the competitive process.
52. 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.
53. 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, 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 infrastructure.
54. NRAs should allocate the incremental costs on a proportionate basis between all undertakings enjoying access, including the downstream arm of the SMP operator itself.
55. Where the civil-engineering infrastructure owned or controlled by the SMP operator is non-existent or limited, and significant investments are required to deploy new civil-engineering infrastructure for deploying 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. In particular, where the SMP operator would have to incur significant costs for civil-engineering infrastructure - beyond normal maintenance costs – the NRA should assess, in accordance with points 62 to 74, whether the risk profile of that investment justifies applying a higher

risk premium to reflect the corresponding additional and quantifiable risk incurred by the SMP operator.

56. 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 concerned area. NRAs should ensure that prices for access to newly built civil-engineering infrastructure reflect current market conditions and are based on the full costs incurred by the SMP operator, as long as strict non-discrimination is ensured for access to these infrastructures.

Implementation of the costing methodology

57. NRAs should take into account the principle of regulatory transparency and predictability and the need to ensure stability without significant fluctuations: (i) when setting cost-oriented access prices; (ii) when developing the costing methodology recommended in points 45 to 56 (the ‘recommended costing methodology’); and (iii) when implementing the costing methodology once it is finalised.
58. When implementing the recommended costing methodology, NRAs should ensure that inflation is sufficiently taken into account, either as part of the costing methodology or as part of the cost of capital employed. NRAs should make sure that inflation is not double counted.
59. 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. This is, dependent on the NRAs maintaining a price-control obligation throughout that period, except if there are significant and unexpected technological or market developments.
60. When, in the course of implementing the recommended costing methodology, the NRA keeps the methodology in place in accordance with points 45 to 56, NRAs should update the data input into the costing methodology not more than twice during every 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. for taking into account inflation where applicable) and should in any case ensure full recovery over time of the costs incurred to provide the regulated wholesale access services. NRAs should publish the updated outcome of the costing methodology and resulting access prices over the relevant two-and-a-half-year period.

Long-term access pricing and volume discounts

61. Where the SMP operator is subject to price control obligations with respect to VHC wholesale-access products, it may apply price discounts to long-term access contracts or to contracts which are tied to volume commitments, subject to the conditions set out in Annex IV.

Adequately rewarding the investment risk

62. Where NRAs consider price control obligations to be appropriate, they should allow the undertaking a reasonable rate of return on capital employed, taking into account investment-specific risks.
63. 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 current economic conditions (for instance a high inflation rate not reflected in the applicable WACC at the time), 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. In particular, NRAs should carefully evaluate how to account for inflation in the applicable WACC, to ensure that the real WACC remains positive.
64. The deployment of VHCN, 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 affecting household income. As a result, investments in VHCNs are likely to expose operators to higher risks compared to their investments in legacy infrastructures.
65. Therefore, 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 investment risk incurred by the SMP operator. NRAs should be transparent about the application of the risk premium in addition to the applicable WACC.
66. NRAs should assess investment risk partly by taking into account 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.
67. 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 granularity, 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.
68. Once a risk premium has been established, the NRA should conduct a sensitivity analysis, by which it analyses whether the total derived WACC for VHCNs (applicable WACC + premium) aligns with the expectations of a reasonable investor. If the value is too high or too low, the NRA could revisit the derived risk premium and adjust it accordingly to ensure that the project-specific WACC sufficiently rewards investors.

69. As the level of risk may diminish over time, investors might find it optimal to delay investments if such a delay is expected to increase profitability further by allowing more informed investment decisions in the future. Where the NRA considers it necessary to stimulate and accelerate investments, in particular in areas with limited prospects for infrastructure-based competition (such as in sparsely populated areas), they may include in the WACC calculation the option value of waiting.
70. 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 provided for in point 40.
71. In order to promote regulatory predictability, the risk premium applicable to a given investment project should be stable over a sufficient period of time, which should be at least 5 years.
72. Setting the risk premium for at least 5 years means that the risk premium set for the specific project should not be changed within that period. In the event that an additional project is brought to the attention of the NRA, it may consider either: (i) also extending the previously established risk premium also to the new project if that is appropriate; or (ii) without prejudice to point 70, introducing a new, separate risk premium specifically for the new project. Such a separate premium should reflect the risks applicable at the specific time that it is brought to the NRA's attention 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 in detail its reasoning. Similarly, if it proposes a different premium, the NRA should follow the general principles laid out in this Recommendation.
73. 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 decompose of the systematic risks of the different assets.
74. 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 to which it is intended.

MIGRATION TO VHCNs AND DECOMMISSIONING OF THE COPPER NETWORK

75. This chapter aims to provide 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 chapter.

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 2 to 3 years. It is necessary to establish, that an appropriate alternative product of at least comparable quality providing access to the upgraded network infrastructure is made available to access seekers. This 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. Within this 2 to 3-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.
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 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 this 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, 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 relevant 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 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. This includes potential discrimination between the retail branch of the SMP operator (if it is vertically integrated) and access seekers on 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. This 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 provided for in Article 81(2) of Directive (EU) 2018/1972, NRA 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)(a) of Directive (EU) 2018/1972 as established by the NRA. 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 the first subparagraph of Article 81(2) of Directive (EU) 2018/1972, NRAs may consider 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 modalities of this price increase in advance;
 - (b) the conditions mentioned in the second subparagraph of Article 81(2) 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;
 - (d) the price increase should be non-discriminatory and should not allow for margin squeeze.

Done at Brussels,

*For the Commission
Thierry Breton
Member of the Commission*