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BEREC report on pricing for access to infrastructure and civil works according to the BCRD

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Introduction

The broadband cost reduction directive (BCRD) aims to facilitate and incentivise the roll-out of high-speed electronic communications networks by promoting the joint use of existing physical infrastructure and by enabling a more efficient deployment of new physical infrastructure so that such networks can be rolled out at lower cost. The BRCD in particular contains rules with regard to access to existing physical infrastructure (Article 3), coordination of civil works (Article 5) and access to in-building physical infrastructure (Article 9). In case the involved parties are not able to reach an agreement or access is refused, either party is entitled to refer the issue to the competent national dispute settlement body (DSB). Since the determination of pricing terms is one of the more complex issues addressed by the BRCD it will be studied in more detail. The focus of the report is on pricing in cases of Article 3 as it is the most relevant Article for most Member States (MSs).

The report is based on replies to a questionnaire from NRAs of 24 MSs (AT, BE, BG, HR, CY, CZ, DE, DK, EE, FI, FR, GR, HU, IE, IT, MT, NL, PL, PT, RO, SI, ES, SE, UK) in which the relevant regulations regarding access to existing physical infrastructure and to civil works have been transposed and are in place.

Access to existing physical infrastructure (Article 3)

Relevance and effect of different access regimes on BCRD pricing: Path dependency

In many countries Electronic Communications Network (ECN) operators had been able to use existing infrastructure before the BCRD was transposed and continue to be able to use it according to different regulatory regimes (according to State aid regulations, asymmetrical access regime addressing ECN operators with SMP, symmetrical access regime which addresses all ECN operators) or using voluntary access offers. Pricing methodologies and current prices for access to existing physical infrastructures according to the BCRD therefore need to be analysed against the background of past and current access regimes that give similar access rights.

Looking at access to existing infrastructure NRAs assessment with regard to the importance of the BCRD for the MS in question differs significantly. For 10 MSs (ca. 42%), the importance of the BCRD access regime is considered to be relatively low at this point in time, whereas for 10 different MSs (ca. 42%), it is expected to be relatively high compared to the importance of other access regimes.

A path dependency is likely in the sense that the BCRD price will be related to past prices in place before implementation of the BCRD. It seems that in cases where multiple regimes could be applied, pricing methodologies which are comparatively strict (e.g. asymmetric SMP regulation) will usually prevail over the principles of fair, reasonable and non-discriminatory prices as defined in the BCRD. Therefore in many, but not in all cases, potential path dependency originates from an asymmetric access regime. In 12 MSs, path dependency is observed or considered likely while it is excluded or considered uncertain in 12 MSs.

Pricing methodologies according to the BCRD regime

Transposition of the BCRD across MSs differs as to the level and the detail of specifications on pricing. In 10 MSs (BE, CZ, HR, EE, ES, FR, GR, IE, MT, NL) no indication beyond the BCRD's "fair and reasonable pricing" is given in the law while in 14 MSs (AT, BG, CY, DE, DK, FI, HU, IT, PL, PT, RO, SI, SE, UK) the law includes further guidance on pricing or foresees publication of rules regarding pricing methodologies.

The main principle of pricing used in the BCRD is "fair and reasonable", a broad term that needs interpretation taking into account the context of the BCRD. It mentions a fair opportunity of cost recovery taking into account the impact of the requested access on the business plan of the access provider. Reference to recovery of cost leads some DSB to explicitly interpret "fair and reasonable" as "cost orientation", both in general (AT, CZ, EE, PT, SI) or within the framework of a case-specific approach (HU, IT). However, other DSBs have specified a more general approach, where reference is made to the impact of pricing on the business model and investments and/or to the opportunity cost of providing access (DE, DK, HR, SE, UK). Some DSBs also place the focus on existing market prices, mainly regulated prices, as a relevant element to be considered (PL, ES, FI, IT) in order to avoid introducing distortions on the market.

Consideration of the impact on the business plan of the access provider leads to an intention or obligation to differentiate between pricing principles applicable for ECN operators and non-ECN operators in some countries (CZ, DE, PL, ES, UK) while the majority of MSs foresees no such a-priori differentiation (CY, DK, EE, HU, IT, PT, RO, SI). The rationale for following an explicit approach to differentiate in these MSs is that access of competitors has an impact on the business plan of the ECN operator while it has no impact on the non-ECN operator's. It typically arises in cases where the infrastructure operator is an ECN operator.

NRAs of most MSs (AT, CY, CZ, DE, DK, EE, FI, HR, HU, IE, IT, MT, UK) share the opinion that access according to the BCRD also has relevance for physical infrastructure that will be built in the future and, consequently, price setting according to the BCRD might have an impact on future investments. For ECN operators, the incentive to invest is considered to be more directly affected by such pricing. In some other countries (ES, NL), however, access to the infrastructure on the basis of BCRD, for the time being, has been limited in scope, because of availability of infrastructures provided under other regimes (e.g. SMP regulation) or under agreements on infrastructure sharing among parties.

The case-by-case approach of dispute resolution was stressed in all of the MSs' replies as dispute settlement decisions are, by nature, taken case by case. Because they are inherently based on current and factual data of the parties involved, the adopted pricing methodology should always be able to catch specific characteristics of the case. However, there are still very few practical cases of such case-specific application of the BCRD pricing across MSs.

Pricing decisions

In most of the countries analysed, despite the fact that they have transposed the BCRD into their national legislations, there were no pricing decisions taken under this regime. Concrete

prices were only reported by Italy, Poland (prices based on benchmarking) and Portugal (reference offer published by utility operators, not yet subject to any DSB decision). The few concrete prices mentioned in the questionnaire essentially refer to asymmetric (SMP) regulation.

Coordination of civil works (Article 5)

With regard to the coordination of civil works (Article 5) no specific provisions on pricing are found in the laws that transposed the BCRD in BE, CZ, DE, DK, EE, ES, GR, HR, IE, IT, MT, NL (except reasonable compensation) RO and UK, whereas some rules on cost sharing are provided in the law in AT, FI, HU, PT and SI. Very few countries plan rules on apportioning costs. Concrete disputes were decided by the DSB in DE only, where sharing of excavation costs is generally foreseen.

In-building physical infrastructure (Article 9)

With regard to access to in-building physical infrastructure (Article 9) 15 MSs (AT, HR, CY, DE, DK, FI, FR, GR, IE, IT, NL, PL, PT, RO, ES) had introduced such regulation prior to the BCRD implementation, whereas 7 MSs (BE, BG, CZ, EE, HU, SE, UK) introduced it for the first time in the course of transposition of the BCRD. 9 MSs (AT, HR, DE, DK, HU, IT, PT, RO, UK) have adopted some guidance and pricing methodologies.

Introduction and objective

The broadband cost reduction directive (BCRD) aims to facilitate and incentivise the roll-out of high-speed electronic communications networks by promoting the joint use of existing physical infrastructure and by enabling a more efficient deployment of new physical infrastructure so that such networks can be rolled out at lower cost. The BRCD in particular contains rules with regard to access to existing physical infrastructure (Article 3), coordination of civil works (Article 5) and access to in-building physical infrastructure (Article 9). In case the involved parties are not able to reach an agreement or access is refused, either party is entitled to refer the issue to the competent national dispute settlement body (DSB).

In 2017 a report was completed on the „Implementation of the BRCD"[1] giving an overview of the tasks appointed to National Regulatory Authorities (NRAs) and how they were implemented. In particular the report has examined the challenges NRAs are faced with as DSBs as well as the solutions they use to resolve them. One of the challenges identified in some Member States (MSs) relates to the price setting for access to existing physical infrastructure as foreseen in Article 3 para 5. Since the determination of pricing terms is one of the more complex issues addressed by the BRCD, it will be studied in more detail in this follow-up report. Pricing terms might become relevant in all three areas of the BCRD (access to existing physical infrastructure, coordination of civil works and access to passive in-building infrastructure). However, the focus of the report is on Article 3 as it is the most relevant Article for most MSs.

While 'physical infrastructure' (Article 2 para 2) does not only concern ducts and poles but extends to network elements such as inspection chambers, masts, pipes, manholes, cabinets, buildings or entries to buildings, antenna installations and towers the report focuses on pricing of ducts and poles. This is because for most NRAs ducts and poles represent the main field of application of the BCRD.

The report is based on a questionnaire sent to NRAs, which was answered by 28 NRAs of 28 countries (AT, BE[2], BG, HR, CH, CY, CZ, DE, DK, EE, FI, FR, GR, HU, IE, IT, ME, MT, NL, NO, PL, PT, RO, RS, SI, ES, SE, UK; for Country Abbreviations see Chapter 4). 4 of them (CH, ME, NO[3], RS) are non-MSs and the BCRD has not been transposed; therefore the replies will not be included in the report. The report will thus be based on the 24 replies by NRAs from MSs. In those MSs, it is indicated that the relevant regulations regarding access to existing physical infrastructure have been transposed and are in place now[4].

The report is set up as follows: Chapter 1 looks at access to existing infrastructure (Art 3 BCRD) with subsections on the relevance of different regimes for access to existing physical infrastructure, pricing methodologies set out for pricing according to the BCRD including short paragraphs summarising individual MSs' approaches and finally a summary of the few existing

[1] BoR (17) 245: Implementation of the Broadband Cost Reduction Directive

[2] The questionnaire underlying this report has been answered by the BIPT, the federal NRA, however some aspects of the BCRD fall outside the scope of the BIPT's competences.

[3] Nevertheless, Norway is currently working on the transposition of the BCRD.

[4] In some parts of Belgium (i.e.Brussels), the BCRD has not yet been fully transposed.

pricing decisions taken on the basis of the BCRD. Chapter 2 looks at the coordination of civil works and Chapter 3 deals with access to in-building physical infrastructure.

1 Access to existing physical infrastructure (Art. 3 BCRD)

Article 3 of the BCRD lays out one of the key areas where potential synergies can be realised for the deployment of high-speed electronic communications networks. In this case, already existing physical infrastructures outside of buildings[5] are addressed and, apart from several exceptions, made available for electronic communications network (ECN) operators such that they in turn can deploy high-speed networks at considerably lower costs. According to Article 3 (5) the DSB is required to issue a binding decision to resolve a dispute including the setting of fair and reasonable terms and conditions, including price where appropriate. Therefore the report aims at interpreting the terms “fair and reasonable” in the context of the BCRD (see Section 1.2.1).

Before analysing pricing methodologies for access to existing physical infrastructure according to the BCRD regime in Section 1.2, the first part of this chapter focuses on whether and how access to existing physical infrastructure has been possible in the past or is still possible using a legal basis or regulation other than the BCRD and the pricing methodologies defined in this context.[6]

1.1 Relevance of different regimes for access to existing physical infrastructure

In many MS, ECN operators are faced with several possibilities to use existing infrastructure. Furthermore, in the past, in many MSs existing physical infrastructures had been accessible in many MSs to a differing degree even before the BCRD was transposed into national law. In general and across MSs, access to these infrastructures can be granted according to different possibilities, namely:

- voluntarily, possibly without a legal obligation to do so,
- according to State aid regulations which address ECN operators deploying publicly funded infrastructure (based on EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks (2013/C 25/01) and/or the General Block Exemption Regulation (GBER),
- according to an asymmetrical access regime which addresses ECN operators with SMP (based on Art. 8 of the Access Directive),

[5] Article 9 of the BCRD deals with access to in-building physical infrastructure and is described in chapter 3 of this report.

[6] Examples for the latter could be the publication of guidelines by a NRA or the application and more detailed specification of pricing principles in dispute settlements.

- according to a symmetrical access regime which addresses all ECN operators (based on Art. 12 of the Framework Directive[7] or national legislation independent of the EU Regulatory Framework),
- according to a symmetrical access regime which addresses all network operators, including ECN and non-ECN operators (based on Art. 3 of the Broadband Cost Reduction Directive or national legislation independent of the BCRD).

Both of these factors (first, access has been granted in the past and second, access can be granted according to different possibilities today) require that pricing methodologies and actual prices for the access to existing physical infrastructures according to the BCRD are not analysed in isolation, but rather against the background of past and current access regimes that give similar access rights.

In many cases, these access regimes have been or are accompanied by specific pricing methodologies.

- On the one hand, these methodologies can differ from methodologies that are laid out in Article 3 of the BCRD or from any further legislative or regulatory specification that has been established in a specific MS. This means that a rather similar access right is priced differently depending on which access regime is used for access. A reason could be that the pricing terms mentioned in Article 3 of the BCRD ("fair and reasonable") are interpreted differently than what is used when determining prices for access according to an SMP regime, which generally focuses on cost-oriented prices instead.
- On the other hand, there are cases where methodologies across existing access regimes within a country do not differ due to historical path dependency and/or consistency concerns. Examples in this regard could be that
    - even before the implementation of the BCRD NRAs either granted access to an extensive network of physical infrastructures of the SMP operator (e.g. ES, FR, PT) or that
    - NRAs granted access to all network operators' facilities, including ECN and non-ECN infrastructures, and thus already had a symmetric access regime in place. AT, CY and ES[8] had a symmetric access regime in place which was based on Art. 12 of the Framework Directive. Other MSs such as PL and PT

[7] In the past (since the enactment of the BCRD in 2014), two symmetric access regimes with a slightly different scope existed in parallel. With the EECC there will be changes with regard to the symmetric access regimes outside of buildings.

[8] The former CMT adopted in 2009 a decision imposing symmetrical measures to promote and facilitate sharing of fibre deployments within and near buildings, valid only for buildings without Common Telecommunications Infrastructures (those built before 1998). This decision obliges the first operator deploying the in-building physical infrastructure to provide access to such infrastructure. This regulatory measure –which goes beyond mere access to passive infrastructure, and involves the sharing of the network elements available inside the buildings, was adopted on the basis of specific national provisions contained in Spanish Law, that were similar in nature to article 12 Framework Directive.

have issued national legislation on symmetric regulation independent of the EU Regulatory Framework. For PL national legislation addressed non-ECN operators only.

If this regime for access to existing physical infrastructure prevailing before the BCRD gave ECN operators, especially alternative operators, a meaningful possibility to roll-out high-speed electronic communications networks, it is very likely that the transposition of the BCRD at a later stage built upon the already existing regime(s) and the experience gained in the past. For example, if a NRA used a specific pricing methodology for asymmetric access to the SMP operator's physical infrastructure and this regime seemed to significantly support deployment of high-speed networks, it is likely that at least some of the methodological aspects of the asymmetric access regime will be transferred when transposing the BCRD.

1.1.1 Relevance of different regimes for access to existing physical infrastructure

This section analyses how access obligations that are laid out in Article 3 of the BCRD and transposed into national law compare to other access regimes that might be in place in a specific country. In many cases, this information will be helpful in the assessment of methodologies that NRAs use for BCRD pricing, which will be analysed in more detail in chapter 1.2. As mentioned before, many NRAs make use of past experience in regulating access to existing physical infrastructure when determining a pricing methodology for access according to the BCRD.

Table 1 provides an overview of the (current) relative importance of the BCRD access regime for access to existing infrastructure at this point in time. For 4 out of the 24 MSs (ca. 16%), there is no information about the relative importance of the BCRD. For 10 MSs (ca. 42%), the relative importance of the BCRD access regime is relatively low, which means that other regimes seem to be more important. 10 MSs (ca. 42%) expect relatively high importance of the BCRD access regime or at least the same level of importance as for other regimes (i.e. other symmetric access regime still in place, asymmetric access regime or access according to State aid guidelines). The results are described in the next paragraphs in more detail.

Table 1: Relative importance of BCRD access regime at this point in time (Art. 3)

Rel. importance	high	low	n. a. / no information
Countries	CZ, DE, DK, FI, HU, IT, MT, PL, RO, SE	AT, BG, CY, EE, ES, FR, IE, NL, PT, UK	BE, GR, HR, SI
Number of countries	10 (42%)	10 (42%)	4 (16%)

As pointed out, the importance of the BCRD across MSs differs significantly.

The relative importance of the BCRD access regime is considered to be high in 10 MS:

- In 2 of them (CZ[9], RO[10]), access to the SMP operator's infrastructure is currently not regulated. Furthermore, no other symmetric access regime exists in parallel to the respective law that transposed the BCRD. Therefore, apart from access to infrastructures built with the support of state aid, the BCRD is the only way to gain access to physical infrastructure to a significant extent. This results in a relatively high importance of the BCRD access regime.
- In 4 MSs (HU, IT, MT, SE), the relative importance of access according to the BCRD regime is at least as high as for other regimes. In most cases, an asymmetric access regime and access according to State aid regulations are in place, for which the respective NRAs assigned a similar level of importance (HU, IT, SE). For Malta, a similar level of importance has been assigned to BCRD access as for other existing symmetric access regime.[11]
- Although the remaining 4 MSs (DE, DK, FI, PL) all have an existing asymmetric access regime to the SMP operators' physical infrastructure, the importance of the BCRD for access to existing physical infrastructure is much higher than that of the asymmetric and other access regimes. Possible reasons are that the availability of existing physical infrastructure that can be used for the deployment of high-speed networks and is owned by the SMP operators is very limited or that the access remedy is restricted by several conditions which limit the potential to deploy high-speed networks on a larger scale (e.g. can only be used as an annex product to sub-loop unbundling to access ducts between MDF and cabinet).

The relative importance of the BCRD access regime appears to be low in 10 countries:

- In 3 MSs (ES, PT[12], UK[13]), for the time being the relevance of access to existing physical infrastructure according to the BCRD is low compared to the asymmetric access regime, which gives access to the SMP operators' physical infrastructure (both ducts and poles). In all of them, the SMP operator owns physical infrastructure to a significant degree and has been obliged to provide access before the transposition of the BCRD.
- In 5 MSs (BG, CY[14], EE, FR, IE), low importance of access according to the BCRD compared to an asymmetric access regime holds true for ducts, but not for poles. For poles

[9] The Czech Republic removed the obligation to grant access based on an asymmetric SMP regime at the same time the BCRD was transposed.

[10] In Romania market 3a, 3b and lately market 4 are not regulated. There is an asymmetric obligation which allow an limited access to the SMP's infrastructure regarding to interconnection facilities..

[11] Two symmetric regimes (Article 3 of the BCRD, and Article 12 of the Framework Directive, as transposed into distinct National Laws) do exist in parallel. Access according to the BCRD would be the only relevant provision at law that allows access to existing non ECS infrastructure, thus the relevance of the BCRD access regime being classified as "high".

[12] Despite the relatively low relevance of the BCRD regime regarding access to ducts compared with the SMP regulation regime, the access to poles of electricity companies is becoming more significant.

[13] In the case of the United Kingdom, the NRA is not aware of any use of the BCRD, especially regarding the SMP operator's infrastructure. However, in theory, Art. 3 of the BCRD could still have relevance in the UK, if voluntary agreements based on the obligation to grant access are common, but not known to the NRA.

[14] For Cyprus, ECN infrastructure is addressed in a separate symmetric access regime, which has relatively high importance

and partially also other infrastructures (e.g. manholes, cabinets, dark fibre, etc.), the picture in these 5 MSs is much more diverse as a lot of pole infrastructure that can be used for high-speed ECN deployment is owned by utility network operators. Therefore, the BCRD's importance in this regard is often higher than for ducts and in some of these countries even higher than that of other access regimes.

- In Austria, relevance of access to existing physical infrastructure according to the BCRD is low compared to symmetrical access to infrastructure (based on Art. 12 Framework Directive) because most access requests concern dark fibre which is outside the scope of the BCRD. Furthermore, availability of ducts is limited. Therefore, operators use an access to dark fibre, while duct access on the basis of the BCRD is not of importance.[15]
- In the Netherlands, the overall importance of access to existing physical infrastructure is described to be low.[16] Firstly, there is a relatively small amount of ducts in the Netherlands. Furthermore, access seekers and infrastructure owners are known to agree informally on infrastructure sharing and have done so in the past.

The remaining column summarizes answers of another 4 countries (BE[17], GR, HR[18], SI) where the relative importance of the BCRD regime could not be determined based on the replies to the questionnaire because of missing information.

1.1.2 Hierarchy of different regimes for access to existing physical infrastructure

Another aspect that might influence pricing methodologies applied for access to existing physical infrastructure is the hierarchy of the mentioned access regime. In a case where, in theory, multiple regimes could be used for access to such infrastructures, pricing is directly related to a hierarchy that is potentially determined by law or by the respective NRA. Only in countries where similar or identical pricing methodologies are applied across all relevant access regimes, hierarchical issues do not play a role for the resulting access price. This section provides an overview of potential overlaps of access regimes and how specific countries deal with such cases.

Regarding the hierarchy between **asymmetrical regulation and the BCRD**, Recital 17 of the BCRD states that *"in the case of physical infrastructure access obligations imposed pursuant to the Union regulatory framework for electronic communications, such as those on*

[15] Symmetric regulation according to Art. 12 FD was previously in place and continues to be applicable and is of high importance in Austria. Therefore transposition of the BCDR into Austrian law did not change the situation due to the fact that cases decided since then also deal with access to dark fibre, which is outside the scope of the BCRD. Operators prefer access to dark fibre.

[16] In general, the BCRD gives access to ECN and non-ECN infrastructures and a separate symmetric regime gives access to ECN infrastructures. Before the BCRD was transposed ECN operators were obliged to grant access to passive infrastructure upon reasonable request. The SMP operator KPN is not obliged to give access to its physical infrastructure, but to dark fibre instead.

[17] In Belgium, the NRA only oversees the access to infrastructures owned by ECN operators. Non-ECN infrastructures can only be addressed by the respective regulatory authorities.

[18] In Croatia, the regulations of the BCRD regarding access to existing infrastructure only apply to non-ECN infrastructure. ECN operators are addressed by a different symmetric access regime, which had been in place even before the BCRD was transposed.

undertakings having significant market power, this would be already covered by specific regulatory obligations that should not be affected by this Directive." Therefore, access according to the BCRD should not impair asymmetrical obligations that address SMP operators. As long as the latter obligations are stricter, either in their scope or in their terms and conditions, including price, they need to be applied in cases where access to an SMP operator's regulated physical infrastructure is requested. Pricing in these cases, even if they are dealt with on the basis of the BCRD, should follow the asymmetric access regime.

In respect of a potential overlap between **State aid regulations and the BCRD**, Recital 25 states that "Without prejudice to applicable State aid rules, Member States should be able to provide rules on apportioning the costs associated with the coordinated deployment." Even though this quote refers to cases of coordination of civil works, this might also be relevant for access to existing physical infrastructure. Hence, it can be concluded that specific pricing decisions and the underlying pricing methodology for access according to the BCRD should not affect any obligations or regulations that have their origin in applicable State aid rules.

However, some NRAs (DK, EE, IT, PL, PT) provided further insights into which of the several access regimes that exist in parallel will be treated superior to others. Analysing the answers at hand, it seems that in cases where multiple regimes could be applied, those access obligations and pricing methodologies that are described to be the strictest will be used by the respective NRA. Typically, this translates into access to existing physical infrastructure being granted based on the pricing methodologies of the asymmetric regime rather than according to a BCRD methodology.[19]

1.1.3 Effect of other regimes on pricing methodologies and pricing decisions according to the BCRD

This section analyses the effect of other access regimes on the choice and application of pricing principles in context of the BCRD. A potential path dependency should be interpreted independently of hierarchical aspects as the former has implications not only for cases where multiple regimes can be applied (e.g. a request to a SMP operator's physical infrastructure or to infrastructures funded by State aid). Path dependencies can rather have substantial influence on the BCRD's pricing methodology in general and thus for all potential use cases.

Section 1.1.1 showed that the relevance of the BCRD regime for access to existing physical infrastructure is highly dependent on the existence or past existence of other access regime and in particular on their suitability and usability to deploy high-speed networks. This correlation also seems to have an effect on the interpretation of pricing principles originating from the legislative act that transposes the BCRD or from any other guidance that the respective NRA uses for price setting in dispute settlements. In many cases, potential path dependency originates from an asymmetric access regime, but there are also some countries where aspects of a symmetric access regime's pricing methodology are used. These facets are described in more detail in the following paragraphs.

[19] Again, the pricing methodologies and the resulting prices potentially do not necessarily differ between access regimes in a particular country.

Table 2: Path dependency of pricing methodology for BCRD access regime (Art. 3)

Path dependency	observable	likely	uncertain	excluded
Countries	AT, CZ, EE, IT, PL, PT	BE, CY, ES, FI, GR, IE	FR, MT, NL, SE, SI, UK	BG, DE, DK, HR, HU, RO
Number of countries	6 (25%)	6 (25%)	5 (21%)	7 (29%)

- 6 countries (AT, CZ, EE, IT[20], PL, PT) where a relatively well-functioning access regime to physical infrastructure had been in place even before the BCRD was transposed transferred the previously applied pricing methodology (or at least important aspects of it) also to access pricing according to BCRD requests.
- For several more countries (BE, CY, ES, FI, GR, IE), pricing methodologies for access according to the BCRD have not been specified in detail, but it seems rather likely that for these countries past experience from price setting will also be used for BCRD access requests.
- For a number of countries (FR, MT, NL, SE, SI, UK), it is uncertain whether major aspects of other regime's pricing methodologies will be transferred. In most of these cases (FR, MT, NL, SE, UK), the reason for the uncertainty is that the pricing methodologies for access according to the BCRD have not been specified in detail and have to be determined in future disputes or other guidance.
- In the remaining countries (BG, DE[21], DK, HR, HU, RO), new pricing methodologies are used or will be used in the future for access according to the BCRD. In some of the important aspects, those methodologies usually differ significantly from pricing principles of other regimes. Therefore, no clear path dependency is observable and also not to be expected in the future in cases where further specification of the pricing methodology is necessary for dispute resolution. However note that a lack of path dependency with regard to the methodology used to determine BCRD prices does not necessarily exclude similar prices in absolute terms.

In the previous section it was also argued that hierarchical definitions, which might follow from legislative regulations or from NRA decision taking in dispute settlements, can influence the choice of pricing methodologies that are applied in specific cases. The analysis of the replies to the questionnaire indicates that pricing methodologies which are comparatively strict (e.g.

[20] Pricing methodology in Italy is case-specific, however the SMP access regime was well defined before the BCRD came into force and it significantly influenced BCRD decisions. In fact, in one dispute case the same SMP pricing methodology (BU-LRIC) has been used, in another case the approved SMP Reference Offer has been used as reference for various aspects.

[21] However there is a situation where path dependency will likely be observable in Germany, namely when access requests overlap with access products that are regulated according to the SMP-regime (annex product to sub-loop unbundling to access ducts between MDF and cabinet). For these cases the Explanatory Document of the legislator implementing the BCRD determines that the regulated price is to be used as reference price.

asymmetric SMP regulation or State aid regulations) will usually prevail over the principles of fair, reasonable and non-discriminatory prices as defined in the BCRD.

1.2 Pricing methodologies for access to existing physical infrastructure according to BCRD regime

This section starts off by looking whether and if yes at what institutional level specifications on pricing have been given.

- In 10 MSs (BE, CZ, HR, EE, ES, FR, GR, IE, MT, NL), the law transposing the BCRD does not give any further indications on costs and fees to be charged, except for the general indication that they should be fair and reasonable as foreseen in the BCRD.
- In 14 MSs (AT, BG, CY, DE, DK, FI, HU, IT, PL, PT, RO, SI, SE, UK) the law goes beyond a mere transposition of the BCRD in that guidance on pricing going beyond mentioning "fair and reasonable" is included or publication of rules regarding pricing methodologies is foreseen.

In some of the 14 MSs above, the legislation provided for a rather extensive guidance for access pricing (e.g. DE, UK), in other ones it provided only for some aspects of the pricing methodologies (AT[22], IT), in addition to what is already foreseen in the BCRD.

However, whether the BCRD has been implemented with or without specific guidance for pricing, almost all the countries already have some elements of a specific methodology in place to approach pricing decisions in the framework of dispute settlement.

Such a methodology is explicitly foreseen in 5 MSs (BG, CZ[23], PT, RO, UK).

In some cases, the methodology has already been applied to take binding decisions (IT), in other cases the methodology is at least defined at a general level, for example inspired by other regulatory regimes, but not yet applied. This aspect has been analysed in the previous section and will be taken up again in section 1.2.1.1.

Such a methodology or elements of it may be contained in explanatory documents of the legislation or guidelines written by the NRAs or rather consist of past experience with dispute resolution. It therefore differs considerably in its degree of binding the DSB in its decisions which are always taken on a case-by case basis (see section 1.2.2).

1.2.1 General interpretation of "fair and reasonable" prices (as foreseen in the BCRD)

The main principle of pricing used in Art. 3 (5) of the BCRD is "fair and reasonable", a pricing principle used in a number of contexts in regulation and competition law. Obviously it is a

[22] Guidance in the Austrian law that goes beyond BCRD: Appropriate compensation has to be paid, which shall account for the costs of constructing, including acquisition costs, current operating costs, and other costs arising from joint use as well as the levels of compensation customary on the market.

[23] Methodology to be used in dispute resolutions has already been created and made public on the DSB's website.

broad term that needs interpretation taking into account the context of the BCRD. When interpreting "fair and reasonable" prices, further specifications of the BCRD are to be found in Art. 3 (5) subpara 3 and Recital 19 (bold added):

According to Art. 3 (5) subpara 3,

"…*any price set by the DSB shall ensure that the access provider has a fair opportunity to recover its costs and shall take into account the* ***impact of the requested access on the business plan*** *of the access provider, including the* ***investments*** *made by the network operator to whom access is requested, in particular in the physical infrastructures used for the provision of high-speed electronic communications services."*

Recital 19 adds further aspects:

"When determining prices for granting access, the dispute settlement body should ensure that the access provider has a ***fair opportunity to recover its costs*** *incurred in providing access to its physical infrastructure, taking into account specific national conditions and any tariff structures put in place to provide a fair opportunity for cost recovery taking into account* ***any previous imposition of remedies*** *by a national regulatory authority. In so doing, the dispute settlement body should also take into account the* ***impact of the requested access on the business plan*** *of the access provider, including the* ***investments*** *made by the access provider to whom the access is requested, in particular investments made in the physical infrastructure to which the access is requested" In the specific case of access to physical infrastructures of public communications network providers, the investments made in such infrastructure may directly contribute to the objectives of the Digital Agenda and downstream competition may be influenced by free-riding. Hence, any access obligations should fully take into account the economic viability of those investments based on their risk profile, any time schedule for the return on investment and impact of access on downstream competition and consequently on prices and return on investment, any depreciation of the network assets at the time of the access request, any business case underpinning the investment, in particular in the physical infrastructures used for the provision of high-speed electronic communications services, and any possibility previously offered to the access seeker to co-deploy."*

When defining a methodology, the majority of DSBs refer directly to the above elements to specify what they consider as reasonable and fair. However, the focus is on different elements and in some MSs aspects are added to the interpretation when defining a more detailed pricing methodology.

Recital 19 addresses different aspects such as

- cost recovery and closely related previous imposition of remedies by NRA (1.2.1.1) - relation to path dependency dealt with in the last section
- impact on business plan (rationale for differentiation in pricing methodologies/guidance between physical infrastructure of ECN operators and non-ECN operators) (1.2.1.2)
- incentive for investment: the relevance of the pricing methodology for future investments in constructing new infrastructures (1.2.1.3)

Each of these aspects will be analysed in the following sections in turn.

1.2.1.1 Relevance of cost-recovery and previous imposition on remedies

Reference to recovery of cost leads some DSBs to explicitly interpret "fair and reasonable" as "cost orientation", both in general (AT, CZ, EE, PT, SI) or within the framework of a case-specific approach (HU, IT). In all of these cases, there is also a reference to a reasonable rate of return on costs (in some cases, WACC is mentioned). The following table refers to the specific approach adopted by DSBs in the context of cost-orientation.

Table 3: Specific cost-oriented methodology under BCRD access regime (Art. 3)

Methodology	Number of countries	Country
FAC-HCA	2	EE, HU[24]
FAC-CCA	1	AT[25]
LRIC-CCA	2	CZ, IT[26]
Incremental cost	2	HU, IT
cost orientation (without further specification)	2	PT, SI

A strong overlap can be seen with countries where path dependency has been identified in the previous section. In some of those countries (AT, CZ, EE, IT, PT), a relatively well-functioning access regime to physical infrastructure had been in place even before the BCRD was transposed and therefore the previously applied pricing methodology (or at least important aspects of it) is (are) transferred to access pricing according to BCRD requests. Most of them had access regimes in place which were based on SMP regulation, while in Austria it was based on symmetric regulation.

Some DSBs also place the focus on existing market prices as the relevant element to be considered (PL, ES, FI, IT), to avoid introducing distortions on the market, in case alternative ways to get access to existing infrastructures already exist. Such market prices often use the cost oriented regulated price as reference point. In Poland, BCRD prices are based on benchmarking through the analysis of the contracts known by the NRA. A path dependency is likely in these MSs in the sense that the BCRD price will be related to past prices in place before implementation of the BCRD.

[24] In case of transformation or fitting for common use of the physical infrastructure, "avoidable costs" methodology is used, which is similar to "incremental costs of access provision".
[25] In Austria the methodology used (e.g. fully distributed cost that also distribute the risk of investment among the operators) is specified in disputes on a case-by-case basis. Cost of capital is calculated with WACC and is part of the costs.
[26] Bottom-Up approach is specified in case of LRIC methodology.

Other DSBs have specified a more general approach, which explicitly refers to recovery of cost without mentioning “cost-orientation”; in these cases, a more relevant reference is made to a number of factors[27] such as the impact of pricing on the business model and investments and/or to the opportunity cost of providing access (DE, DK, HR, SE, UK). Most of these countries have been grouped in the category where path dependency is excluded (DE[28], DK, HR), or uncertain (SE, UK).

In conclusion we see a reference to cost recovery or cost orientation in interpreting fair and reasonable prices in most countries. The impact of pricing on the business model and investments seems to be the distinctive point of BCRD pricing as compared to other existing regimes (e.g. SMP regulation, see also section 1.1); considering this also implies a case-specific regime, which is the other peculiarity of BCRD pricing schemes.

1.2.1.2 Impact on the business plan: Differentiation between ECN operators and non-ECN-operators?

The BCRD introduced a claim to access infrastructures of non-ECN operators as a rule in the EU regulatory framework. The pricing principle “fair and reasonable” does not refer to a distinction between ECN and non-ECN. However, in taking into account the impact on the business plan of the access provider, the reasoning of Recital 19 refers to the impact of access on downstream competition for ECN operators. In some MSs this is interpreted as asking for a differentiation of the pricing methodologies adopted for access to physical infrastructure of ECN operators, on the one side, and of non-ECN operators, on the other side.

On this point, in the majority of MSs no a-priori differentiation of treatment between ECN and non-ECN operators (CY, DK, EE, HU, IT, PT, RO, SI) is foreseen, whereas for some of them an intention or an obligation to differentiate (CZ, DE, PL, ES, UK)[29] prevails.

The rationale for following an explicit approach to differentiate in these MSs is that access of competitors has an impact on the business plan of the ECN operator while access requests have no impact on the non-ECN operator’s business plan. This impact typically arises in cases where the infrastructure operator is an ECN operator. Therefore, the DSB is supposed to give a particular importance to set access prices to infrastructure such that investments are not disincentivised.

In this sense, for example in CZ, for ECN operators the physical network costs are distributed on the base of capacity actually used by both parties, while in case of non-ECN operators, only costs for incrementally used capacity are taken into account for depreciation. Similarly, in Poland for non-ECN operators, prices can cover only incremental cost of granting access (not the cost of the total investment, which should be covered by other utilities, for example

[27] See Recital 19 for a full list of these factors.

[28] However there is a situation where path dependency will likely be observable in Germany, namely when access requests overlap with access products that are regulated according to the SMP-regime (annex product to sub-loop unbundling to access ducts between MDF and cabinet). For these cases the Explanatory Document of the legislator implementing the BCRD determines that the regulated price is to be used as reference price.

[29] Note that rather than explicitly differentiation may also occur implicitly when using different parameters (e.g. WACC) within the same general approach.

service of electric energy). Along the same line, in DE the law foresees that access prices for non-ECN operators are based on incremental costs. A mark-up on these costs is to be applied to incentivise voluntary access granting. Currently, a public consultation is under way which among other aspects deals with the question of how to determine the mark-up. For ECN operators, the law foresees that the impact on the business plan should be taken into account, including that investment costs are covered.

Finally, in Italy, while there is no specific indication on the differentiation between the treatment of ECN and non-ECN operators, the general principle of cost orientation may be applied slightly differently case-by-case. In a specific dispute the ducts of a non-ECN operator have been remunerated only by the OPEX associated to the infrastructure, because the CAPEX had been already remunerated by the price of the other non-ECN services.

In ES, prices should be set considering the investment made in the physical infrastructure in order to avoid scenarios that distort competition due to the lack of investment of undertakings whose business model is based on the use of others' infrastructure

While there are more countries where differentiation of prices depending on the nature of the infrastructure owner is not an issue[30], it can be argued that other approaches will be developed with a particular attention to the business case of ECN operators. This seems to be also in line with the general objective of fostering investment in electronic communication services and an increase in ultra-broadband coverage in the EU.

1.2.1.3 Relevance of the pricing methodology on future investments in building new infrastructures

Most MSs (AT, CY, CZ, DE, DK, EE, FI, HR, HU, IE, IT, MT, UK) shared the opinion that access according to the BCRD also has relevance for physical infrastructure that will be built in the future and, consequently, pricing set under BCRD might have an impact on future investments. Such an effect on investment may in principle exist for both, ECN and non-ECN operators. However, the incentive to invest for ECN operators is more directly affected by pricing. Therefore, the differentiation between ECN operators and non-ECN operators discussed in the previous section can also be explained by the intention to incentivise investment in infrastructure that may directly contribute to the objectives of the Digital Agenda (see Recital 19). Access pricing according to the BCRD should incentivise physical infrastructure to be built in the future to be future proof in that it allows their shared use and sustainability. This reasoning equally applies to other types of public utility (non-ECN) infrastructure; they should hence plan their future networks in a way that such infrastructure could be used to install electronic communications networks, if there is an interest.

In some other countries (ES, NL), access to the infrastructure on the basis of the BCRD, for the time being, has been limited in scope, because such access is provided under other

[30] Again note that differentiation may also occur implicitly when using different parameters (e.g. WACC) within the same general approach.

regimes (e.g. SMP regulation) or under voluntary agreements on infrastructure sharing among parties.

The majority (AT, CY, CZ, DE, DK, EE, ES, HU, IT, PL, PT, SE, UK) of countries when determining the methodology to set access prices puts more emphasis on the incentive to invest into the construction of new physical infrastructure. In practical terms, pricing can take account of the business model underlying the investment, guaranteeing the sustainability of the investment, for example by setting an appropriate cost of capital (see for example UK's pricing methodology in the country cases paragraph of this chapter).

1.2.2 Case-specific characteristics of the methodology/guidance

The case-by-case approach of dispute resolution was stressed in all of the MSs' replies as dispute settlement decisions are, by nature, taken case by case. Because they are inherently based on current and factual data of the parties involved, the adopted pricing methodology should always be able to catch specific characteristics of the case. However, there are still very few practical cases of such case-specific application of the BCRD pricing across MSs.

For example, the characteristics of the specific infrastructures (e.g., the location of the infrastructure, situated in a historical city centre) have been considered in Italy by the DSB in a specific case to set appropriate pricing reflecting cost and investment levels.

Similarly, in Poland, the DSB has considered setting differentiated prices depending on the location of infrastructures, the highest prices in dense areas and lowest in rural areas should be set.

To conclude this section, it is worth underlining the relationship between the above outlined pricing methodology for access to physical infrastructure under the BCRD and the pricing of access for physical infrastructure under the other access regimes listed in section 1.1.

From the point of view of some NRAs (AT, CZ, BE, CY, EE, IT, PT), the same principles of pricing methodologies are applied in all the access regimes. Other NRAs (DE, HU, ES, UK) underlined that, in general and compared to other regimes, different methodologies are applied under the BCRD, where the decision is set case-by-case and, in resolving a dispute, the precise approach will depend on the specific circumstances of each dispute. Yet, it is worth noting that the position of the first group of NRAs might, in fact, not be essentially in contrast with the position of the second group, as the application of the same general principles may on a case-by-case, lead to the adoption of different methodologies.

That being said, consistency in pricing among different regimes might be of interest and can be obtained by applying the same principles in all the cases, or, more directly, by using benchmarks of the other pricing regimes (typically SMP's reference offer).

In the following, the relevant country cases report the guidance or the methodology (to be) applied by DSBs, focusing on the additional specifications that go beyond what is foreseen by the BCRD.

1.2.3 **Country cases**

CZECH REPUBLIC

In the Czech Republic, a public methodology has been adopted by the NRA, in the form of a cost model, for possible dispute settlements; the methodology may be used also by access seekers and providers during their negotiations. The cost model supports a price calculation for one-off charged services and for monthly rental of infrastructure elements.

The basic methodology for price setting is cost orientation based on LRIC-CCA principles. There is a different treatment of depreciation according to the type of the service provider, ECN or non-ECN. If the service provider is an ECN operator, then the depreciation takes into account the capacity to be used by both access seeker and access provider (i.e. costs of unused capacity are equally divided according to the portion of capacity used by each party), while in case of a non-ECN undertaking, only incremental capacity used by the access seeker is taken into account. This approach should prevent discrimination of ECN operators/access providers as they are not forced to bear the whole cost of unused capacity.

Price calculation in dispute settlement would need to take into account all specific conditions of the case in question, i.e. the type of infrastructure, cost for its deployment, its operational costs etc. The approach is then case-specific.

DENMARK

In Denmark, the guidance states that assessment of fair and reasonable terms and conditions, including prices, is on a case by case basis, taking account of the specific circumstances. The guidance lists a number of conditions; for instance, additional costs relating to maintenance and adjustments and additional costs to secure net integrity can be considered. Furthermore, the guidance states that it can be relevant to include commercial agreements regarding access to physical infrastructure and also specifies that the term of notice in the individual agreement can influence the assessment of whether an agreement is fair. The assessment can include costs relating to an exceptional business structure and costs relating to specific circumstances, e.g. cover costs for re-establishment with regard to the geographic area (i.e. infrastructure crossing wet-lands, motorways, railways, protected areas etc.), also taking into account whether a geographic area is urban or rural, and how access will affect the access providing network operator’s business plan.

FINLAND

In the law transposing the BCRD in Finland, it is stated that reasonableness of the access price can be assessed taking into account several references, comparing the price to be set with:

- the corresponding access price in the market;
- the price of building similar but separate infrastructures;
- the average costs approved by the regulatory authority or industry interest groups.

In addition, the special characteristics of the project in question can be used, for example geographical location, quality of ground, possible regulations concerning building and safety issues or timetable of the project. Moreover, the price should also be based on the real usage of infrastructure.

GERMANY

In setting fair and reasonable prices when resolving a dispute regarding access to existing physical infrastructure, the DSB has to make sure that network operators which are obliged to give access are not affected in their business. Therefore, prices have to at least cover all costs that occur because of the access provision. This has to hold for infrastructure of both ECN and non-ECN operators.

The legislative reasoning that accompanied the transposed BCRD mentions several costs that can occur when granting access (i.e. costs for maintenance and modifications, costs for necessary safety precautions that limit potential consequences for network safety or specific liability precautions for the case of caused damages).

The law foresees a differentiation of access prices for non-ECN operators and ECN operators. Fair and reasonable, in the case of non-ECN operators, translates into prices that are based on the incremental costs that occur when providing access, plus a reasonable mark-up on these costs, which is supposed to serve as an incentive to grant access voluntarily. The reason for applying incremental costs in this case is that the construction of the non-ECN physical infrastructure is usually done even without the potential shared use of ECN-operators and is being financed by other utilities. The costs for the original investment must therefore not be reflected in the price in these cases.

In case of access to ECN operators' existing infrastructure, it shall be ensured that the impact of the access provision on competition is taken into account when determining prices. The prices shall therefore also take the original investment and business plan into account. The economic viability of the original investment is considered by looking at: risk profile, time schedule for the return on investment, impact of the access on downstream competition and consequently on prices and return on investment, depreciation of the network assets, business case underpinning the investment, possibility previously offered to the access seeker to co-deploy.

The German NRA (BNetzA) published a public consultation to discuss how these provisions could be implemented in practice, especially in dispute settlements[31]. One specific issue is to determine the mark-up on top of incremental costs for non ECN-operators and the second main issue is how the DSB (or involved parties in voluntary negotiations) can identify the impact of the requested access on the initial business plan of the access provider in the case of an ECN-operator. One of the proposals in the consultation is to determine prices on the

[31] See https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Breitband/Entgeltmassstaebe_DigiNetzG/Consultation_Pricing_Principles_DigiNetzG.pdf?__blob=publicationFile&v=2

basis of the original investor's opportunity cost of granting access, which would result in the compensation of potentially lost revenues (as the analysis of these statements is still ongoing, no conclusions can be drawn at this point). Important factors when deciding on the general method in the future will be transparency, feasibility and predictability.

As there is a differentiation between existing infrastructures of ECN and non-ECN operators, case-specific characteristics play a role. In general, for the access to ECN operators' infrastructure, these are relevant as they also influence how the existing business plan is impacted by access to physical infrastructure.

HUNGARY

Reasonableness of costs in the context of access to existing physical infrastructure are assessed by looking only at avoidable costs, in case of transformation or fitting for common use of the physical infrastructure.

The DSB overviews the reasonableness of costs by looking at direct costs (amortization, cost of capital rental fee and cost of operation and maintenance) and proportioned General and Administrative Expense (G&A costs), in case of common use of the physical infrastructure. These rules are valid for infrastructure of both ECN and non-ECN operators.

In case the demand is related to access to the physical infrastructure of high-speed networks, in determining the price of access, the DSB will take into account the effects of the price on the market position of the network operator.

ITALY

In Italy, the BCRD transposition law has further specified that the DSB takes a binding decision setting price conditions of access that guarantee recovery of cost for the operator providing access, which has to be rewarded of any additional cost incurred in order to provide access.

Price conditions do not have to cover the cost incurred by the operator providing access if such costs are already recovered in other possible tariffs designed to guarantee a fair recovery of such cost.

Assessment of fair and reasonable terms and conditions, including prices, is on a "case by case" basis, taking account of the specific circumstances. Such conditions, in general, are valid for infrastructures of both ECN and non-ECN operators.

"Fairness and reasonableness" of prices is in general interpreted as cost orientation. In practice, when setting access prices in a couple of disputes concluded with binding decisions taken by the DSB, in one case, the same costing methodology has been used as in the last access market analysis, i.e. a bottom-up LRIC costing model, whereas in the other case, cost orientation has been applied in order to guarantee recovery of cost for the operator providing access.

Despite the fact that in Italy, there is no specific indication on the differentiation between the treatment of ECN and non-ECN operators, the general principle of cost orientation may be applied slightly differently case by case.

Finally, in a dispute case settled by the DSB in order to set access prices, cost inputs have been considered in relation to the characteristics of the specific infrastructures (e.g., the location of the infrastructure that in this specific case was situated in an historical city centre).

PORTUGAL

The publication of a regulation containing the pricing methodology by the NRA in Portugal (ANACOM) is foreseen by the transposition law (see article 19th of Decree-law 123/2009 changed by Decree-law 92/2017 which transposed the BCRD)[32]. It is foreseen that prices should be cost oriented, taking into consideration: a) cost derived from the construction, maintenance, repair and improvement of the infrastructures; b) administrative cost incurred with the treatment of the requests, namely the requests for installation, repair or removal of cables or other elements of ECN's; c) cost related to follow-up of interventions.

Furthermore the law foresees an obligation to publish a reference offer. Several ECN operators (e.g. ONI, NOS, Vodafone) and utilities (IP, EDP) already published their reference offers of access to infrastructures (ducts, poles) which had been modified after intervention of the NRA.

In this sense, ANACOM by decision of 15 September 2017[33] has already initiated the procedure in order to prepare the Regulation on the methodology to be used to determine the value of remuneration payable by electronic communications companies for access to and use of infrastructure suitable for carrying electronic communications networks. Before the transposition of BCRD, the symmetric law (DL123) already foresaw that the infrastructure access prices should be cost oriented.

ROMANIA

Price conditions for access to the physical infrastructure shall ensure that the network operator (ECN or non-ECN) providing the infrastructure has the possibility of recovering its costs, taking into account:

- the investments made for rolling out the physical infrastructure within the scope of the access,
- the costs incurred in providing such access,
- the impact of the requested access on the business plan of the network operator, in particular as regards the investments that will be related to the physical infrastructure to which access is requested.

When setting price conditions, improvements of the physical infrastructure by the provider of public electronic communications networks shall also be considered, to the extent that these improvements also benefit the network operator.

[32] The publication of this pricing methodology is also foreseen in the 2018-2020 Multi-Annual Activities Plan of ANACOM.

[33] Please consult ANACOM decision of 15th September 2017 available at https://www.anacom.pt/render.jsp?contentId=1418141&languageId=1

In general, price decisions are taken case by case through dispute settlement.

SWEDEN

In Sweden, the understanding of what is a fair and reasonable compensation may vary depending on the type of physical infrastructure and the industry in which the network owner operates. Costs in this context should be understood as estimated cost of access, including costs for applying rights of way for broadband or other similar process costs, compensation for landowners and increased operating and maintenance costs (e.g. electricity, refrigerators, various types of controls, extra equipment, necessary infrastructure adaptation and security measures).

Compensation should, however, not be paid for obviously unnecessary or excessive costs; the costs should therefore be relevant to the requested access. The network owner should also not be compensated for e.g. lost monopoly gains or for increased competitive pressure. When determining the level of compensation, the impact of the access on the network owner's business plans and investments should also be considered. Normally, a certain premium in addition to the costs should be fair and reasonable. However, it is not intended that pricing should disincentive infrastructure investments. This is particularly important for the infrastructures used to provide high speed electronic communications services, as such pricing could in practice neutralize the purpose of the Directive (see recital 19 of the Directive).

UK

The UK regulation largely follows the BCRD and does not go beyond minimum requirements of European Directives.

Ofcom published guidance which explains some of the considerations to be taken into account to determine disputes. Guidance is at a relatively high level, because the regulation of access to infrastructures (ATI Regulations) applies to what is potentially a very wide range of cases, involving different types of physical infrastructure and different types of network providers.

Guidance is kept under review and will be amended as appropriate in the light of further experience, the developing law and practice and any change to Ofcom's powers and responsibilities.

Interpretation of fair and reasonable prices (as foreseen in the BCRD) is based on the following considerations.[34]

- The access price should ensure that the infrastructure operator has a fair opportunity to recover its costs:

[34] Paragraphs 5.11 – 5.29 of Guidance which accompanies the Access to Infrastructure regulation. See https://www.ofcom.org.uk/__data/assets/pdf_file/0025/95191/Guidance-under-the-Communications-Access-to-Infrastructure-Regulations-2016.pdf

- this includes, at least, any incremental costs incurred in facilitating and providing access. This might include upfront costs incurred to facilitate multiple transactions to provide access (e.g. system development costs), upfront costs incurred to facilitate a particular transaction to provide access (e.g. approving plans, inspecting installation), ongoing costs associated with a particular transaction to provide access (e.g. higher ongoing maintenance costs as a result of providing access). Any incremental costs to be efficiently incurred.
- with respect to upfront costs incurred to facilitate multiple transactions, it may be appropriate to spread these costs over multiple access seekers rather than, for example, recovering them from the access seeker making the first request. Moreover, where it is sufficiently demonstrated that costs incurred will benefit the infrastructure operator, it may be appropriate for the infrastructure operator to bear a proportion of these costs.
- the access price may also allow for a reasonable return on the activity of facilitating and providing access.

- The impact of the access on the infrastructure operator's business plan, including investments made by the operator, in particular in the physical infrastructure used for the provision of high-speed electronic communications services, is taken into account:
  - if the infrastructure operator claims that any such impacts exist, it will be considered whether – and if so, to what extent – the access price should compensate the infrastructure operator for these impacts. In particular, consideration will be given to whether access undermines the infrastructure operator's fair opportunity to recover its costs;
  - for example, an infrastructure operator which is also a network provider may face greater downstream competition as a result of granting access, which could reduce the profitability of the investment in the physical infrastructure in a way that undermines its viability. Therefore, the price of access should ensure that the viability of investments in physical infrastructure is not undermined;
  - the relevance of other impacts in the context of specific disputes is considered. This will typically arise in cases where the infrastructure operator is a network provider. For example, greater downstream competition may have an impact on an infrastructure operator's ability to recover its investments in something other than the physical infrastructure to which access is provided;
  - there may be circumstances where access to non-telecoms infrastructure could have an impact on the infrastructure operator's business plan that may need to be compensated for in the access price. For example, in circumstances where the infrastructure operator could demonstrate plans to use the relevant infrastructure itself, while it would be entitled to refuse access (e.g. on the grounds of the non-availability of space), it may instead be willing to offer access if the price reflects the impact on its own plans to use the relevant infrastructure.
  - in evaluating any relevant impacts on the infrastructure operator's business plan, the factors set out in Recital 19 to the Directive will be considered.

- Article 8 of the Framework Directive will be considered if the infrastructure owner is an ECN operator; what this means in practice will likely depend on the specific circumstances of each dispute. The impact on the business plan will typically arise in cases where the infrastructure operator is an ECN operator, but also might apply to non-ECN operators in some circumstances.

Case-specific characteristics will be assessed on its facts on a case by case basis.

1.3 Prices for access to existing physical infrastructure

In the scope of the present report, NRAs were specifically asked about BCRD prices (question 3 of point 1.3 of questionnaire). From the answers received, we conclude that most of the prices of access to existing physical infrastructures available refer essentially to asymmetric (SMP) regulation. Nevertheless, there are countries (e.g. Estonia, Portugal) where BCRD prices are expected to be found using the same method as applied in SMP regulation. Therefore, in the particular case of the price of access to the infrastructure of the SMP operator, the BCRD price should be equal or very similar to the SMP-price.

In most of the countries analysed, despite the fact that they have transposed the BCRD into their national legislations, there were no pricing decisions taken under this regime.

In France, the tariff of access to poles was discussed between an electricity operator and municipalities. In Italy, two disputes have been settled by the NRA under the BCRD regime: in the first dispute, prices are confidential, but for the second dispute, prices are available. In Poland, BCRD prices are based on benchmarking (through the analysis of the contracts known by the NRA). In Portugal, several ECN operators (e.g. ONI, NOS, Vodafone) and utilities (IP, EDP) already published their reference offers for access to infrastructures (ducts, poles) which also include prices. While these prices were not determined by the DSB they have to adhere to the principles stated in the law that transposed the BCRD and were in some cases adapted in central aspects after intervention by the NRA.

The BCRD prices can have recurrent and non-recurrent (one-off) components. The main (recurrent) price component of access to physical infrastructures refers to occupation of ducts and poles, being applicable either in the scope of the BCRD regime or in other regimes. There exists also the case of payment of IRU prices (in Italy, access is generally paid as an IRU for various durations - 10, 15, 20 years).

For the scope of the present BEREC report, only the NRAs of Italy[35], Poland and Portugal[36] presented BCRD prices:

[35] Prices found by the NRA following a dispute resolution procedure in the scope of BCRD transposition.

[36] The prices presented correspond to the access to ducts of a road concessionary (I.P. – Infraestruturas de Portugal) and access to poles of an electricity distribution company (EDP – Energias de Portugal), which are complementary to the access to ducts and poles provided by SMP operator.

Table 4: BCRD prices of occupation/Use of infrastructures (ducts and poles)

Country	Periodicity	Ducts	Poles
IT	Yearly basis (IRU with duration of 20 years)	4,51 (1st sub-duct) + 0,35 (additional sub-duct) €/meter	n.a.
PL	Monthly basis	0,32 (110 mm) €/meter	1,05 €/pole
PT	Monthly basis	0,0314 €/cm^2/meter	1,25 €/pole

The recurrent price component can be a duct (or pole) occupation price or an IRU.

In the case of access to ducts, it is possible to have a duct occupation price per full duct or sub-duct (this implies a reservation of this duct or sub-duct for the ECN operator) or a price which is driven by the space occupied by the ECN cables (in this case one can have several cables from different ECNs sharing the same tube). Other recurrent price components could be the price of occupation of a manhole/chamber covering entry point in manholes, cable joints and/or spare cables.

In the case of access to poles, the access price is frequently a price per pole regardless of the number of the cables attached to the pole. Nevertheless, there could be also the case (e.g. in SMP regulation) that the pole access price is accounted per cable attached to the pole and not per pole itself.

Other non-recurrent (one-off) prices are also relevant. According to the Cypriot NRA (OCECPR), they may correspond to the following components: technical study, availability checking, equipment installation and other preparatory work. According to the Portuguese NRA (ANACOM), these could be the price of the feasibility analysis of duct occupation (base price plus price per manhole) or of pole occupation and the price of supervision (by the infrastructure owner) of works performed by ECNs in ducts/poles (e.g. installation, intervention – cable replacement, fibre joints).

2 Coordination of civil works (Art. 5 BCRD)

BCRD provisions on the coordination of civil works

Art. 5 of the BCRD foresees that network operators performing directly or indirectly civil works either fully or partially financed by public means have to meet reasonable requests to coordinate civil works on transparent and non-discriminatory terms. Such requests shall be met provided that they do not entail any additional costs, they do not impede control over the coordination of the works and the request is filed as soon as possible. Rules on apportioning costs associated with the coordination of civil works may be provided by the MSs.

When a case is referred to the DSB, it shall resolve the dispute including the determination of fair and non-discriminatory terms, conditions and charges where appropriate. Recital 25 mentions that reasonable requests need to ensure that any additional costs are covered. Without prejudice to applicable State aid rules, Member states should be able to provide rules on apportioning the costs associated with the coordinated deployment.

Specification in the national implementing Acts

While the Polish NRA (UKE) has not been determined as the DSB for the coordination of civil works, no specific provisions on pricing are found in the laws of the following MSs: BE[37], CZ, DE, DK, EE, ES, GR, HR, IE, IT, MT, NL (except reasonable compensation), RO and UK.

In AT, FI, HU, PT, SE, SI some rules on cost sharing are provided by the law: In Austria, expenses shall be shared in a proportionate manner. Incremental costs need to be covered. In Finland, the costs of co-deployment shall be shared in proportion to the estimated cost of stand-alone construction. In Hungary, it is determined that avoided costs/additional costs are relevant. In Portugal, the access requesting ECN operator shall bear its share of investment that results from its association with the civil works. Thus, the costs associated with the construction (e.g. excavation) or with the expansion of infrastructure are foreseen to be split using an incremental cost approach. In Slovenia, the requesting party shall bear a proportionate part of the investment. The costs of the investor have to be proven to the DSB. In Sweden conditions on cost-sharing are supposed to be fair, non-discriminatory and transparent.

In France, the law contains guidance that the access requesting ECN operator bears the additional costs of the coordination and a fair share of common costs, according to the proportion of the use of infrastructure and respective facilities of the ECN and the network operator (surface areas of ducts, and number and linear weights of aerial cables).

Rules on apportioning costs beyond the national laws

In Bulgaria, the Ministry prepared rules specifying that pricing has to reflect all relevant cost and to prevent anti-competitive cross-subsidisation. In Denmark, rules could have been provided by the Ministry which was however deemed to be unnecessary.

In Germany, the law foresees that the NRA publishes rules on how to apportion costs related to the coordination of civil works, which will then become binding for the DSB. However, no further guidance is contained in the law itself. The explanatory memorandum of the implementing Act mentions that the requesting party has to bear additional costs caused by

[37] In Belgium a specific DSB (with participation of BIPT) has been determined. Specific provisions on pricing should be found in fedrate laws (“decresse” from the regional)

the coordination (referring to Recital 25 of BCRD). Rules on how to apportion costs have not been published yet.

In Malta, the competent infrastructure regulator may provide rules for cost sharing, but has not done so yet.

In Austria, it is considered that excavation cost could be split up 50:50 or shared depending on the respective market shares. Decisions will be taken on a case-by-case basis.

In Finland, industry interest groups defined a recommendation on cost allocation[38]. In order to promote joint construction of telecommunications and energy networks, the branch organisations (Ficom and Finnish Energy) have provided guidelines on apportioning the costs related to joint construction. The quidelines include principles how to share the costs in sparsely and densely populated areas in different construction stages between telecom and energy operators. According to the guidelines, it is considered that excavation cost could be split up 50:50 in densely populated areas and 30:70 (telecom/energy) in sparsely populated areas.

Differentiation ECN/non-ECN

In Cyprus, for ECN operators guidance on the methodology ahs already been specified in 2008 by secondary legislation[39]. It foresees that all interested ECN share common costs, and fees. For non-ECN operators access is based on transparent and non-discriminatory terms.

No differentiation for apportioning of costs between ECN and non-ECN is foreseen in FR, DE, PT and SI. However, in the German consultation document it is discussed whether the distinction foreseen in the law for access prices for existing infrastructure should also be applicable for the coordination of civil works.

Pricing decisions

No pricing decisions with regard to the coordination of civil works have been taken in AT, BG, BE, CZ, DK, EE, ES, FI, FR, HR, HU, IE, IT, MT, NL, PT, RO, SE, SI and UK.

In Germany, four coordination requests have been taken to the DSB of which three have been decided in favour of the requesting party. A request for coordination regarding a regional district backbone funded by State Aid was declined, hence no rules on cost apportioning were determined. The other three cases concerned municipal development activities for new housing areas where ECN operators requested coordination of civil works with municipalities or their subsidiaries that were in charge of developing the new housing area. In two requests

[38] The guidelines can be found at: https://www.ficom.fi/sites/default/files/pictures/Liite_Yhteisrakentamisen_kustannusjakotaulukko%20.pdf

[39] "Procedures for the acquisition of rights of way Order (P.I. 10/2012)". The document is available in Greek Language: http://www.ocecpr.org.cy/sites/default/files/EC_Order_DikaiomataDielefsis_KDP10-2012_20-1-2012_MI.doc)

concerning the same housing area, the requesting parties had to carry the additional costs of coordination only since the development costs had already been fully covered by development charges imposed on house owners by the municipality. In the latest decision, in addition to bearing the additional costs of coordination, the requesting party had to share equally the excavation costs with the municipality which had foreseen rolling out electricity and fibre themselves.

3 Access to in-building physical infrastructure (Art. 9 BCRD)

In-building infrastructure is one of the most obvious bottlenecks of network deployment where duplication of infrastructure is typically considered economically inefficient. Ex-post installation of such infrastructure is costly and highly inconvenient. Complexity is added by the number of parties that may be involved, such as the house owner, tenant and the ECN operator, which may face different investment incentives, depending on the distribution of property rights.

Article 9 of the BCRD stipulates access to in-building physical infrastructure under fair and non-discriminatory conditions for the purpose of network deployment. This section highlights the status of Article 9 implementation among countries and practical aspects affecting pricing.

3.1 Regulating access to in-building physical infrastructure

A vast majority of MSs enforce access to in-building physical infrastructure. A total number of 15 MSs have had introduced such regulation prior to the BCRD implementation. AT and GR mentioned Article 12 of the Framework Directive to be the source for this regulation. Former regimes (adjusted accordingly if necessary) are considered in line with Article 9 of the BCRD. There are 7 countries which introduced access to in-building physical infrastructure for the first time in the course of BCRD implementation.

Table 5: Regulation of in-building physical infrastructure prior to BCRD

	Prior to BCRD	**BCRD – no former regulations**
Countries	AT, HR, CY, DE, DK, FI, FR, GR, IE, IT, NL, PL, PT, RO, ES	BE, BG, CZ, EE, HU, SE,UK
Number of countries	15	7

Italy has no guidance in its law regarding pricing for access to in-building physical infrastructure under the BCRD (transposition law is coherent with BCRD, with no additional points), however it is under consideration and a relevant guidance is expected in the future.[40] MT and SI stated that there is no legal guidance on access to in-building physical infrastructure.

3.2 Practical aspects affecting pricing of access to in-building physical infrastructure

The following practical aspects affect pricing of access to in-building infrastructure:

Cost of deployment

[40] Currently, in Italy a methodology already exists for pricing of access to in-building infrastructure of ECN operator under symmetrical and asymmetrical regulations.

Typically, costs of network deployment per end user are rising when getting closer to the end user. Formal arrangements have to be made with every building owner separately. Installation work in the buildings is complicated and needs to be precise. This makes the investment costly and time consuming. Aforementioned practical aspects have a significant impact on the pricing. At the same time, it makes duplication of infrastructure highly inefficient.

Infrastructure assignment

In case of in-building physical infrastructure, there is always one link to each end user. Duplication of infrastructure is subject to cost and time constraints, but more importantly, it is typically not welcomed by the owner and inhabitants of the building due to invasive installation work. Wireless networks however are often considered as an insufficient alternative in such cases. Therefore access to existing in-building physical infrastructure is the only reasonable way to allow alternative operator to compete with the infrastructure owner.

Ownership

According to the general principle of property law, any object permanently connected to the immovable property becomes integral part of this property (lat. *superficies solo cedit*). This rule can be applied to in-building physical infrastructure. For example in Portugal, the owner of the building in principle also owns any in-building physical infrastructure. However, that is not generally the case in other MSs. In Spain, this only applies for buildings with *common* telecommunications infrastructures (ICT) (since 1998) where the consideration of common elements applies. If ECN operators roll out in-house infrastructure in a building where no ICT plan was developed, they become the owner of it. In other countries like Poland it is generally the case that operators bear the costs of deploying in-building physical infrastructure and thus own the infrastructure afterwards. As a result, there are examples of different approaches regarding ECN and non-ECN infrastructure owners. Access to in-building physical infrastructure is for the benefit of the inhabitants and the owner of the building. Therefore, in case of infrastructure owned by non-ECN operators (e.g. building owner), access for the purpose of providing services to the inhabitants of the building is free of charge. On the other hand, infrastructure owned by ECN operators is supposed to generate profits; thus access is subjected to payment.

3.3 Pricing methodology

According to the specific practical aspects of access to in-building physical infrastructure mentioned above, most countries tend to develop a new approach adapted to those circumstances. Regardless of the significance of access to in-building physical infrastructure, 9 MSs have adopted some guidance and pricing methodologies (See Table 6 below).

Table 6: Guidance on pricing methodology for access to in-building infrastructure

Country	Pricing guidance
AT	• appropriate compensation of costs (construction costs, acquisition costs, operating costs, other costs arising from joint use as well as the levels of compensation customary on the market) • case-by-case approach • no differentiation between ECN operators and house owner
HR	• fair, non-discriminatory and cost-oriented prices • case-by-case approach • no differentiation between ECN operators and house owners
DK	• pricing based on additional costs and benchmarks • case-by-case approach • no differentiation between ECN operators and house owners
DE	• pricing based on incremental costs for non-ECN operators (house-owner) • in case ECN operator invests in in-house infrastructure he may use it free of charge (subject to some conditions)
HU	• additional costs are relevant, direct costs (amortization, cost of capital, cost of operation and maintenance) and proportioned G&A costs • no differentiation between ECN operators and house owners
IT[41]	• fair and reasonable prices with the exception of the SMP operator (stricter methodology of BU-LRIC) • assessed case-by-case on the base of costs incurred by operators and looking at cost of capital, risk premium, economies of scale and vertical integration • SMP prices as a reasonable reference for other vertically integrated operators • wholesale-only or passive-only model justifies a higher degree of flexibility
PT	• In-building infrastructures belong to the owner of the building who is obliged to assure open, non-discriminatory and transparent access to the ECN free of charge
RO	• cost recovery taking into account investments, costs of providing access and impact on the business model • no differentiation between ECN operators and house owners
UK	• the same factors will be taken into account as would be for access to existing infrastructure

Particularly in the case of non-ECN infrastructure owners, certain adjustments may be required. Obviously, such an approach could be developed upon previous experience. However, based on the answers provided in the questionnaire no clear path dependency has been observed. On the other hand, there seems to be a strong preference among the MSs to

[41] Methodology for pricing of access to in-building infrastructure of ECN operator under symmetrical and asymmetrical regulations.

apply a case-by-case approach regarding pricing for the access to in-building physical infrastructure.

4 Abbreviations for countries

Abbreviation.	Country
AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland

Abbreviation	Country
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
ME	Montenegro
MT	Malta
NL	Netherlands

Abbreviation	Country
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Republic of Servia
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

5 Abbreviations for NRAs

Abbreviation	Country
ACM	Netherlands
AGCOM	Italy
AKOS	Slovenia
ANACOM	Portugal
ANCOM	Romania
ARCEP	France
BIPT	Belgium
BNetzA	Germany
CNMC	Spain
COMREG	Ireland

Abbreviation	Country
CRC	Bulgaria
CTU	Czech Republic
DBA	Denmark
EETT	Greece
ETRA	Estonia
FICORA	Finland
HAKOM	Croatia
ILR	Luxembourg
MCA	Malta
NMHH	Hungary

Abbreviation	Country
OCECPR	Cyprus
OFCOM	United Kingdom
PTS	Sweden
RRT	Lithuania
RTR	Austria
RU	Slovakia
SPRK	Latvia
UKE	Poland

6 Further abbreviations

ANO	Alternative Network Operator
BEREC	Body of European Regulators for Electronic Communications
BoR	Board of Regulators

DSB	Dispute Resolution Body
EECC	European Electronic Communications Code
ECN	Electronic Communication Network
FAC-CCA	Fully allocated cost with current cost accounting
FAC-HCA	Fully allocated cost with historic cost accounting
GBER	General Block Exemption Regulation
LRIC-CCA	Long run incremental cost with current cost accounting
MS	Member State
NRA	National Regulatory Authority
WACC	Weighted Average Cost of Capital

Annex: Questionnaire

1 Access to existing physical infrastructure (Art. 3 BCRD)

1.1 Relevance of different regimes for access to existing physical infrastructure

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD		SYMMETRICAL REGULATION BEFORE BCRD	ASYMMETRICAL SMP REGULATION	STATE AID REGULATION	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN OPERATORS	NON-ECN OPERATORS	ECN AND POSSIBLY NON-ECN OPERATORS	ECN OPERATORS (WITH SMP)	ECN OPERATORS	
COLUMN	(1)	(2)	(3)	(4)	(5)	(6)
1. Are there any legislative provisions with regard to the respective access regime (columns 1 through 5 of this table) that grant access?	*Please select from dropdown*	*Please select from dropdown*	*Please select from dropdown*	*Please select from dropdown*	*Please select from dropdown*	
2. If yes, please specify any usage restrictions that might apply (e.g. access ancillary to other remedies (LLU), access only to specific parts of the network).						
3. Are certain infrastructures (e.g. passive infrastructures owned by municipalities) excluded from the respective obligation to grant access?						
4. If possible, please give an estimate about the percentage of the total amount of each type of infrastructure (e.g. length of ducts, the total amount of poles or other measures of quantities) that are in scope of the respective access regime.	Ducts: Poles: Other:	Ducts: Poles: Other:	Ducts: Poles: Other:	Ducts: Poles: Other:	Ducts: Poles: Other:	

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD		SYMMETRICAL REGULATION BEFORE BCRD	ASYMMETRICAL SMP REGULATION	STATE AID REGULATION	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN OPERATORS	NON-ECN OPERATORS	ECN AND POSSIBLY NON-ECN OPERATORS	ECN OPERATORS (WITH SMP)	ECN OPERATORS	
COLUMN	(1)	(2)	(3)	(4)	(5)	(6)
5. Please indicate each access regime's importance for the access to existing physical infrastructures by assigning qualitative levels of importance (high, medium, low, none, not applicable).	Ducts: *Please select from dropdown* Poles: *Please select from dropdown* Other: *Please select from dropdown*	Ducts: *Please select from dropdown* Poles: *Please select from dropdown* Other: *Please select from dropdown*	Ducts: *Please select from dropdown* Poles: *Please select from dropdown* Other: *Please select from dropdown*	Ducts: *Please select from dropdown* Poles: *Please select from dropdown* Other: *Please select from dropdown*	Ducts: *Please select from dropdown* Poles: *Please select from dropdown* Other: *Please select from dropdown*	
6. If there is a significant overlap between different access regimes (meaning access to specific infrastructures is possible under multiple access regimes), please indicate this in the respective columns and give more details, e.g. in which circumstances each regime is used. Please also indicate whether, in practice, the introduction of the BCRD regime has replaced use of another regime, or has been built on an earlier regime.						

1.2 Pricing methodologies for access to existing physical infrastructure according to BCRD regime

ACCESS ACCORDING TO BCRD REGIME	TRANSPOSED BCRD	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN AND NON-ECN OPERATORS	
COLUMN	(1)	(2)
1. Is there any national legislative guidance for access pricing given by the law that transposed the BCRD?	*Please select from dropdown*	
2. If yes, please describe the guidance given or the methodology that is specified.		
3. If your NRA or other national entities further specified or plan to specify the guidance and/or methodology given in the law that transposed the BCRD, please describe those specifications. Please also specify the typology (e.g. regulation, position paper, recommendation, dispute settlements, etc.).		
4. How is the general principle of "fair and reasonable" prices (as foreseen in the BCRD) interpreted based on your national legislative provisions and further specifications your NRA or other entities might have developed?		
5. Does the above mentioned methodology (legislative and/or additional specifications) differentiate between physical infrastructure of ECN operators and of non-ECN operators?	*Please select from dropdown*	
6. If yes, please describe the differences that the guidance/methodology entails in this respect. In particular and in both cases (differentiation or no differentiation), please describe what the guidance specifies about whether and how the following are taken into account: • the "fair opportunity to recover […] costs" (Art. 3 (5)) • the "impact of the requested access on the business plan of the access provider" (Art. 3 (5)) • the "objectives set out in Article 8 of Directive 2002/21/EC" (Art. 3 (5)) • other factors listed in Recital 19 of the BCRD		

ACCESS ACCORDING TO BCRD REGIME	TRANSPOSED BCRD	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN AND NON-ECN OPERATORS	
COLUMN	(1)	(2)
7. Does the methodology consider case-specific characteristics (e.g. relating to cost difference stemming from geographical properties like population density or relating to feasible returns due to the respective competitive environment)?	*Please select from dropdown*	
8. If yes, please describe the relevant characteristics.		
9. Is access according to the BCRD also relevant for physical infrastructure that will be built in the future? Do you expect significant future investments by ECN operators into the construction of physical infrastructure?	*Please select from dropdown*	
10. Is the incentive to invest into the construction of new physical infrastructure one of the relevant factors when determining the methodology to set access prices?	*Please select from dropdown*	
11. How does the above pricing methodology for access to physical infrastructure under BCRD compare to pricing of access for physical infrastructure under the other access regimes listed in section 1.1 of this questionnaire?		

1.3 Prices for access to existing physical infrastructure

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD		SYMMETRICAL REGULATION BEFORE BCRD	ASYMMETRICAL SMP REGULATION	STATE AID REGULATION	VOLUNTARY (COMMERCIAL) ACCESS	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN OPERATORS	NON-ECN OPERATORS	ECN AND POSSIBLY NON-ECN OPERATORS	ECN OPERATORS	ECN OPERATORS	ECN AND NON-ECN OPERATORS	
COLUMN	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Which pricing methodology is being used in the respective access regime as following a general principle? In case of "other" or if more than one principle applies, please specify in the box below the dropdown menu.	*Please select from dropdown*	*Please select from dropdown*	*Please select from dropdown*	*Please select from dropdown*	*Please select from dropdown*		
2. Have there been any pricing decisions/agreements for access to existing physical infrastructure according to the respective access regime?	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	
	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	
	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	
3. If possible, please specify the respective prices. Please restrict your answer to the price component that covers the occupation of ducts, poles or other infrastructures).[42]	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	[43]Ducts:	
	Poles:	Poles:	Poles:	Poles:	Poles:	Poles:	
	Other:	Other:	Other:	Other:	Other:	Other:	

[42] If you want to specify other price components (e.g. additional costs for feasibility analyses, contract management etc.), please make use of question 12 of this table.

[43] In case of voluntary (commercial) access to ducts and poles, please indicate an average price respectively, if several access agreements are known to you.

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD		SYMMETRICAL REGULATION BEFORE BCRD	ASYMMETRICAL SMP REGULATION	STATE AID REGULATION	VOLUNTARY (COMMERCIAL) ACCESS	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN OPERATORS	NON-ECN OPERATORS	ECN AND POSSIBLY NON-ECN OPERATORS	ECN OPERATORS	ECN OPERATORS	ECN AND NON-ECN OPERATORS	
COLUMN	(1)	(2)	(3)	(4)	(5)	(6)	(7)
4. If prices (only its component that covers occupation, see question 3) differ between different access regimes, please explain why.	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	
	Poles:	Poles:	Poles:	Poles:	Poles:	Poles:	
	Other:	Other:	Other:	Other:	Other:	Other:	
5. If different prices (only its component that covers occupation, see question 3) have been set under the same access regime, please explain why.	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	
	Poles:	Poles:	Poles:	Poles:	Poles:	Poles:	
	Other:	Other:	Other:	Other:	Other:	Other:	
6. In case specific values (e.g. cost of capital, amortization period etc.) have been set/assumed to determine prices (only for its component that covers occupation, see question 3), please indicate the parameters and its values.	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	
	Poles:	Poles:	Poles:	Poles:	Poles:	Poles:	
	Other:	Other:	Other:	Other:	Other:	Other:	
7. Are prices (only its component that covers occupation, see question 3) a function of the space/volume used within a duct or by the amount of microducts used within a duct? Are prices (only its component that covers occupation, see question 3) a function of the space used or of the number of cables attached to a pole?	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	
	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD		SYMMETRICAL REGULATION BEFORE BCRD	ASYMMETRICAL SMP REGULATION	STATE AID REGULATION	VOLUNTARY (COMMERCIAL) ACCESS	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN OPERATORS	NON-ECN OPERATORS	ECN AND POSSIBLY NON-ECN OPERATORS	ECN OPERATORS	ECN OPERATORS	ECN AND NON-ECN OPERATORS	
COLUMN	(1)	(2)	(3)	(4)	(5)	(6)	(7)
8. Are prices (only its component that covers occupation, see question 3) a function of the length of ducts, of the amount of poles used or of a different measure of quantity respectively?	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	
	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	
	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	
9. Are prices (only its component that covers occupation, see question 3) a function of access/contract duration?	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	
	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	
	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	
10. Are prices (only its component that covers occupation, see question 3) to be paid recurrently (as opposed to one-off)?[44]	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	Ducts: *Please select from dropdown*	
	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	Poles: *Please select from dropdown*	
	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	Other: *Please select from dropdown*	

[44] In case of IRU prices, please indicate this information in column „Remarks“.

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD		SYMMETRICAL REGULATION BEFORE BCRD	ASYMMETRICAL SMP REGULATION	STATE AID REGULATION	VOLUNTARY (COMMERCIAL) ACCESS	REMARKS
PHYSICAL INFRASTRUCTURE OF	ECN OPERATORS	NON-ECN OPERATORS	ECN AND POSSIBLY NON-ECN OPERATORS	ECN OPERATORS	ECN OPERATORS	ECN AND NON-ECN OPERATORS	
COLUMN	(1)	(2)	(3)	(4)	(5)	(6)	(7)
11. Are prices (only its component that covers occupation, see question 3) differentiated by / a function of any other variable? If so, please specify the respective parameter(s) and in which way prices depend on these parameters.	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	
	Poles:	Poles:	Poles:	Poles:	Poles:	Poles:	
	Other:	Other:	Other:	Other:	Other:	Other:	
12. If prices for access to existing infrastructures contain other components than the occupation of ducts, poles or other infrastructures (see question 3 of this table), please describe them. Please also specify any differentiation (e. g. by length/amount etc.) that is done and describe if prices are to be paid recurrently (see questions 7 through 11 of this table).	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	Ducts:	
	Poles:	Poles:	Poles:	Poles:	Poles:	Poles:	
	Other:	Other:	Other:	Other:	Other:	Other:	

2 Coordination of civil works (Art. 5 BCRD)

COORDINATION ACCORDING TO BCRD REGIME	TRANSPOSED BCRD	REMARKS
ORIGINALLY PLANNED CIVIL WORKS OF	ECN OPERATORS AND NON-ECN OPERATORS	
COLUMN	(1)	(2)
1. Is there any national legislative guidance for the apportioning of costs associated with the coordination of civil works given by the law that transposed the BCRD (see Art. 5 (2))?	*Please select from dropdown*	
2. If yes, please describe the guidance given or the methodology that is specified.		
3. If your NRA or other national entities further specified or plan to specify the guidance and/or methodology given in the law that transposed the BCRD, please describe those specifications. Please also specify the typology (e.g. regulation, position paper, recommendation, dispute settlements, etc.).		
4. Are incremental costs covered by the ECN operator requesting coordination of civil works according to the above mentioned methodology?	*Please select from dropdown*	
5. Additionally, are excavation (and planning) costs being split between the ECN operator requesting coordination of civil works and the operator that originally planned the civil works according to the above mentioned methodology?	*Please select from dropdown*	
6. If yes, in which way are these costs apportioned?		
7. Does the above mentioned methodology (legislative and/or additional specifications) differentiate between coordination of civil works that were originally planned for the deployment of ECN infrastructure and those planned for non-ECN infrastructure?	*Please select from dropdown*	
8. If yes, please describe the differences that the guidance/methodology entails in this respect.		
9. Have there been any decisions regarding the charges related to the coordination of civil works according to the BCRD regime?	*Please select from dropdown*	

COORDINATION ACCORDING TO BCRD REGIME	TRANSPOSED BCRD	REMARKS
ORIGINALLY PLANNED CIVIL WORKS OF	ECN OPERATORS AND NON-ECN OPERATORS	
COLUMN	(1)	(2)
10. If possible, please specify the respective charges or the respective decision(s) to apportion costs.		

3 Access to in-building physical infrastructure (Art. 9 BCRD)

ACCESS ACCORDING TO RESPECTIVE REGIME	TRANSPOSED BCRD	SYMMETRICAL REGULATION/OTHER LAW BEFORE BCRD	REMARKS
PHYSICAL INFRASTRUCTURE PROPERTY OF	ECN OPERATORS AND/OR HOUSE OWNERS	ECN OPERATORS AND/OR HOUSE OWNERS	
COLUMN	(1)	(2)	(3)
1. Are there any legislative provisions with regard to the respective access regime that grant access?	*Please select from dropdown*	*Please select from dropdown*	
2. Is there any national legislative guidance for pricing of access to in-building physical infrastructure in the respective regime?	*Please select from dropdown*	*Please select from dropdown*	
3. If yes, please describe the guidance given or the methodology that is specified.			
4. If your NRA or other national entities further specified or plan to specify the guidance and/or methodology for the respective regime, please describe those specifications. Please also specify the typology (e.g. regulation, position paper, recommendation dispute settlements, etc.).			
5. Does the above mentioned methodology (legislative and/or additional specifications) differentiate between in-building physical infrastructures that are owned by house owners and those that are owned by ECN operators?	*Please select from dropdown*	*Please select from dropdown*	
6. If yes, please describe the differences that the guidance/methodology entails in this respect.			
7. Have there been any pricing decisions for access to in-building physical infrastructure according to the respective regime?	*Please select from dropdown*	*Please select from dropdown*	
8. If possible, please specify the respective price(s) and the type of access to in-building physical infrastructure (e.g. in-building ducts, tubes or cables/wiring).			