

Technical and economic replicability assessment in the context of symmetric access

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Contents

1. Executive Summary	2
2. Introduction and objectives	5
3. Market structure and applications of symmetric regulation.....	7
3.1 NRA experience on network coverage	7
3.2 NRA experience on the use of the infrastructure for the local access segment	12
3.3 Effects of symmetric regulation on market structure	13
4. NRA implementation of symmetric regulation	15
4.1 Scope and type of symmetric obligations	15
4.1.1 Type and scope of symmetric regulation/obligations	15
4.1.2 Instances of symmetric obligations regarding access and use of network elements	17
4.1.3 Specific requirements for performing symmetric obligations	18
4.2 Legal basis	20
4.2.1 EU legislation concerning symmetric obligations.....	20
4.2.2 Imposition of symmetric obligations in accordance with Article 5 AD / Article 12 FD / Article 9 BCRD ...	21
4.2.3 National legislation concerning symmetric regulation that goes beyond the transposition of AD/FD/BCRD	22
4.2.4 Additional national legislation (i.e. other than symmetric obligations) to foster NGA deployment	24
5. TECHNICAL and Economic Replicability.....	26
5.1 Key Messages	26
5.2 Country Cases.....	27
6. Glossary	30
7. Annexes.....	31
7.1 NRA Respondents	31
7.2 Questionnaire sent to NRAs	32

1. Executive Summary

33 NRAs responded to the questionnaire although not every NRA responded to every question.

The first part of the questionnaire sought to understand the market structure with a view to explore the relationship between market structure and the use of symmetric regulation.

Of the 29 respondents that provided detail on the use of symmetric regulation, NRAs from nine countries have imposed symmetric obligations.

In terms of technology used for NGA coverage, as one would expect, FTTC/VDSL was used as a technology mostly by SMP operators: in 24 countries, the SMP operator had deployed FTTC/VDSL and in no country had FTTC/VDSL not been deployed by the SMP operator (although it had been deployed to only a limited degree in Sweden). FTTC/VDSL was also deployed by the cable operator in two countries (Estonia, Poland) but only to a limited extent (less than 30% coverage). FTTC/VDSL was deployed by non-SMP operators (other than cable operators) in six countries but again, it was only to a limited extent. Only in Finland had non-SMP operators deployed FTTC/VDSL widely but this was spread across multiple SMP and non-SMP operators (there are multiple regionally defined SMP operators in Finland, some of which are cable operators).

When it came to FTTH/B, the picture was more mixed: in 21 countries, FTTH/B had been deployed by the SMP operator to some extent, in nine countries, cable operators had also deployed FTTH/B to some extent and in 17 countries, non-SMP operators had deployed FTTH/B to some extent. However, of those 17 countries, in only Iceland have non-SMP operators deployed FTTH/B to a significant extent (more than 60% of households).

Finally, when it comes to HFC/DOCSIS, not unsurprisingly, this was the preferred technology choice of cable operators: in 22 countries, cable operators had deployed this to some extent whereas in only four countries had SMP operators deployed HFC/DOCSIS and in 10 countries, non-SMP operators had deployed HFC/DOCSIS.

The analysis of the market structure and the application of symmetric regulation showed that countries that have imposed symmetric obligations correspond to reasonable/significant coverage by both SMP operators and non-SMP operators and countries that have not imposed symmetric obligations have a larger spread across categories. However, the analysis does not draw any conclusions regarding causal relationships between market structure and the use of, or effects of symmetric regulation.

The second part of the questionnaire sought to assess the scope and type of symmetric obligations in those countries in which it had been imposed, the type and range of regulatory powers that had been used by the NRA to impose symmetric regulations and whether any formal assessment of technical and economic replicability had been undertaken in the context of the imposition of symmetric regulation.

Of those NRAs that have imposed symmetric regulation, most NRAs have imposed in-building wiring and local access obligations and a majority had also imposed it on the backhaul segment. In terms of the type of symmetric regulation imposed, seven out of nine NRAs had imposed it to civil infrastructure, and in five, symmetric regulations applied to dark fibre (although usually in very specific settings). Two NRAs (BNetzA and EETT) had imposed obligations in the context of vectoring that are symmetric in nature but are not symmetric regulations as far as the term is interpreted for this report (obligations imposed in the context of vectoring are imposed as part of a suite of SMP obligations in a market review of Market 3a). Other than these vectoring obligations, there were no instances of active remedies (imposed through symmetric obligations). There is no clear correlation between the type of symmetric obligation imposed (access to civil infrastructure, dark fibre or active remedies) and the scope of those obligations regarding the part of the network they apply to. NRAs that have implemented symmetric regulations based on the BCRD (Broadband Cost Reduction Directive) or similar national laws have done so with a focus on in-building wiring and the local access segment.

The legal basis for imposing symmetric regulations has come from a mix of the current regulatory framework (mostly Article 12 Framework Directive, also Article 5 Access Directive), from the BCRD and from national law which usually predates the transposition of the BCRD and often overlaps with it to a high degree. Often, legal powers that had been granted to the NRA were subsequently amended to incorporate the BCRD. This has meant that it is not always possible to identify which specific aspect of national legislation was used to impose symmetric regulation; indeed, unless proposals to impose symmetric regulation are challenged in national courts (symmetric regulation imposed under Article 12 FD and Article 5 AD are not subject to Article 7/7a proceedings by the Commission), it might not be possible to identify the legal basis through the regulatory measure used by the NRA. Nonetheless, it is clear that the BCRD has been increasingly used since it has been in force since 2016 – in four countries symmetric regulation was imposed using powers from the BCRD and in six countries, it has been imposed using powers from the regulatory framework (in some countries, both the BCRD and the regulatory framework have been used). In two countries (France, Spain), symmetric regulation has been imposed using powers from national regulation which overlaps with aspects of the regulatory framework. Given that the deadline for transposing the BCRD into national law was July 2016, it does appear that NRAs have found the BCRD to be a practicable tool for imposing symmetric regulation although the role of NRAs can be more reactive than when using the regulatory framework as the BCRD sets out a role for the competent authority (the NRA in almost all cases) as a dispute resolution body when access seekers and access providers cannot agree the terms and conditions of passive infrastructure access.

Article 9(2) of the BCRD states that “every public communications network provider has the right to access any existing in-building physical infrastructure with a view to deploying a high-speed electronic communications network if duplication is technically impossible or economically inefficient”. Therefore, although it has been postulated that the BCRD might be a factor for the very limited use of a formal assessment (of economic and technical replicability) on the basis of Article 12(3), in principle, such an assessment should also apply to the BCRD when it is used to impose obligations for the sharing of in-building infrastructure. It is possible that assessments and resultant decisions made in the context of the application of the BCRD would be for individual cases in which the NRA has become engaged in a dispute resolution role whereas an assessment when applying Article 12(3) FD is of a more general nature.

However, it is not possible to firmly draw such a conclusion in this report as this issue was not explored in the questionnaire. In fact, a structured assessment of economic and technical replicability has been undertaken in only three MSs – France, Italy and Croatia. Of course, the limited use of technical and economic assessments under Article 12(3) stems not only from the growing use of the BCRD but also from the use of alternative regulatory and legislative tools to impose symmetric regulation such as planning rules providing access to buildings and national legislation to facilitate infrastructure deployment. Indeed, when symmetric obligations have multiple sources including the regulatory framework, NRAs are using Article 12(3) in a more limited and targeted manner (to set access prices and conditions) in conjunction with the broader obligations to impose obligations on infrastructure owners to provide fair and reasonable access from the BCRD and from other alternative regulatory tools.

In the three mentioned MSs that have used a structured assessment of economic and technical replicability, there are broad similarities in approach. All have assessed technical and economic aspects together. NRAs assess the practicability of alternative infrastructure deployment and if this is deemed impractical, appropriate access and price conditions are imposed. In this respect, the approach is not dissimilar to that for imposing access to physical infrastructure under the SMP framework although the policy objectives and regulatory principles are less prescriptive.

The technical assessment focuses on constraints in accessing in-building wiring and ducts whereas the economic assessment focuses on the supply side and demand parameters that determine the commercial viability of deploying alternative infrastructure. Among the factors that were assessed to determine replicability were:

- supply side parameters such as deployment/upgrade costs depending on the density of the geotype;
- demand side parameters such as take-up rates of high capacity services and the (incremental) prices that consumers would be prepared to pay;
- market structure parameters such as retail operators' eagerness for certain types of wholesale access products (e.g. in France, passive access for FTTH) and a general assessment of potential competition development on the national market;
- for a new network, new services that would emerge to run on top of it were important factors in determining the replicability of networks as well as determining access prices that did not undermine investment;
- the availability of space to deploy fibre in existing buildings and the lack of space in in existing ducts;
- denial of access and administrative delays by landlords as well as difficulties to access private and public land for local access;
- planning rule restrictions that prohibit low cost deployment options such as deploying cable/wiring to the outside of buildings;
- the attainable speeds of alternative NGA technologies when compared to FTTH/B.

2. Introduction and objectives

This descriptive report implements the strategic priority described at paragraph 1.4 of the 2018 BEREC WP¹. This report examines NRA experiences of assessing technical or economic replicability when considering the imposition of symmetric access obligations as required by Article 12(3) of the Framework Directive as well as Article 61(3) of the EECC. It builds on the work undertaken as part of WP2017² which examined the rationale for and scope of symmetric obligations, to the extent of promoting NGA deployment, end-to-end connectivity and competition, with no prejudice to the SMP obligations (remedies). In 2017, in the context of discussions on the EECC, BEREC also produced a position paper on Symmetric Regulation³.

The 2017 report by BEREC provided an analytical and descriptive framework on the implementation of symmetric regulation by NRAs in Europe. The Position Paper, responding to proposals in the then draft Code (EECC), set out BEREC's view that it is important to preserve flexibility that enable NRAs to impose proportionate symmetric access obligations where NRAs determine that access seekers do not have viable alternatives to non-replicable assets such as wiring, cables and associated facilities inside buildings or up to an appropriate concentration or distribution point.

The latest version of the draft EECC refers to symmetric obligations in Article 61: "*Powers and responsibilities of the national regulatory authorities and other competent authorities with regard to access and interconnection*". This brings together aspects of symmetric regulation that are currently found in Article 5 of the Access Directive and Article 12(3) of the Framework Directive. Article 61(3) of the EECC empowers the NRAs to set symmetric obligations not only up to the first concentration or distribution point but, providing certain criteria are met, beyond the first concentration or distribution point in some specific circumstances (e. g. areas with lower urbanization). As required by Article 61(3) of the EECC, BEREC will publish guidelines in which it will set out these criteria, among other things, for determining both the first concentration/distribution point and how far beyond the first concentration/distribution point symmetric obligations can extend in certain circumstances. The national decisions on assessing replicability in the context of symmetric access have to take utmost account of the BEREC guidelines, whose adoption is set by Article 61 of the EECC.

The rationale of, and scope for replicability of access network assets and associated facilities, in the context of the transitions to NGA networks, has been gaining prominence. In such a framework, this report investigates NRAs' current experiences of assessing technical and economic replicability, and of determining the node (concentration point) in the network at which access has been mandated. As this report makes clear, these powers are not the only means by which NRAs can impose symmetric obligations and although Article 12(3) requires NRAs to assess 'economically inefficient or physically impracticable' duplication of infrastructure, NRAs that have relied on other powers to impose symmetric regulation might not have needed to undertake an assessment of economic and technical replicability.

The report draws upon the results of a survey of NRAs. A questionnaire was issued to all 35 members of the Remedies Working Group in 2018. 33 responses were received, organized into a database and analyzed.

The drafters' group discussed their work and took on board the final comments of the whole Remedies group.

¹ See BEREC Work Programme 2018, BoR (17) 238
https://bereg.europa.eu/eng/document_register/subject_matter/bereg/annual_work_programmes/7528-bereg-work-programme-2018, p. 15.

² BoR (17) 39, "*Report on the implementation of symmetric regulation: description of existing practices and consideration of future challenges*" (Internal document).

³ See BoR (17) 86 "*Ensuring continued NRA powers to impose symmetric access obligations*"
https://bereg.europa.eu/eng/document_register/subject_matter/bereg/opinions/7031-ensuring-continued-nra-powers-to-impose-symmetric-access-obligations-amendments-to-article-59-article-13-annex-i-of-the-european-electronic-communications-code.

3. Market structure and applications of symmetric regulation

This section provides our analysis relating to NGA market structure within each country.

This does not aim to provide comparative analysis of demand/supply side characteristics, but it is intended to provide some context for the imposition of symmetric regulation by taking a look at the market structure.

33 NRAs responded to the questionnaire⁴: Austria, Belgium, Bulgaria⁵, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland⁶, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia⁷, Slovakia, Slovenia, Spain⁸, Sweden, Switzerland, United Kingdom⁹.

All NRAs provided the latest available data. Most of them refer to their 2017 NGA infrastructure status, some of them to 2016 and few to 2018.

In case NRAs did not provide any data on coverage, or they responded with a “n/a” or “0”, we assumed 0% of households are covered.

In this report, we refer to homes/households (HH) passed and take-up of services. Homes/households passed refer to homes/households that have NGA infrastructure deployed on the street on which the homes/households are located as well as instances in which the NGA infrastructure extends from the street into individual properties. Take-up refers to homes/households that subscribe to a service that is delivered over NGA infrastructure. Homes/households refer to any type of residential dwelling unit.

3.1 NRA experience on network coverage

To get an overview of NGA market structure we asked NRAs to provide data on network coverage by technology and by operator type.

NRAs were asked to provide information on the coverage by technology in the following categories: *i*) FTTC/VDSL (excluding cable operators); *ii*) HFC/DOCSIS 3.0 and *iii*) FTTH/B. For each of these categories, NRAs were asked about the percentage of homes/households covered by three types of operators: *i*) SMP operator; *ii*) cable operators and *iii*) other competing operators.

The collected data has been depicted in the following figures, each of them referring to a single technology. The degree of coverage is classified into the following categories: *i*) no coverage;

⁴ Lithuania and Netherlands have not provided data on Question A1 and on Question A2.

⁵ The Bulgarian NRA – CRC – did not provide data on HHs covered, since gathers information for the number of subscribers and does not collect information about network coverage in households. Therefore, we have not included Bulgaria in the analyses concerning the HHs covered.

⁶ Ficora provided coverage data by technology without dividing them by operators (SMP/cable/others).

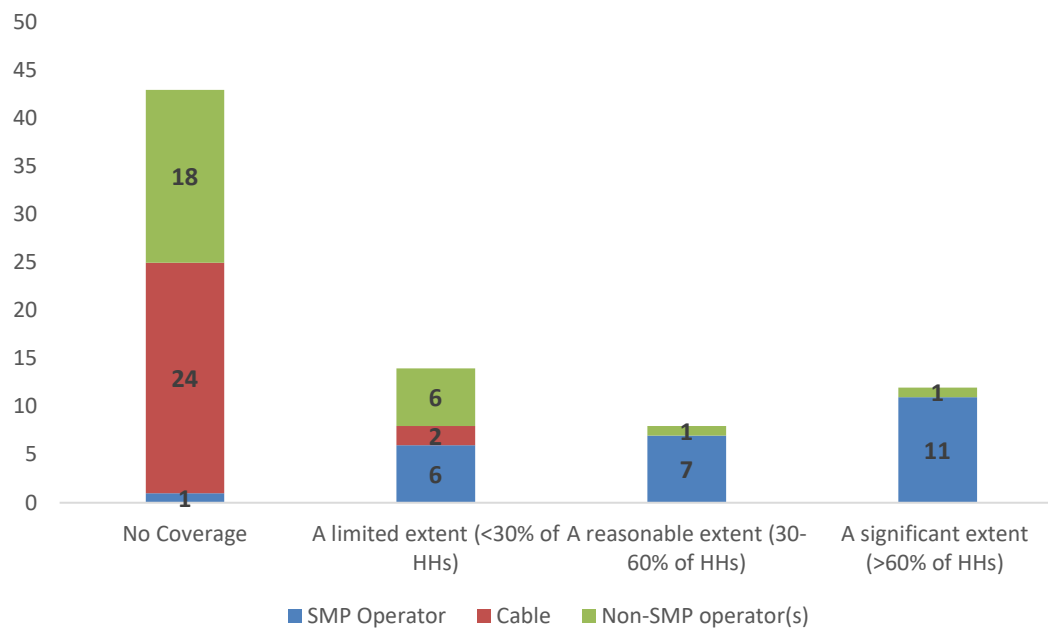
⁷ The gathering process on coverage was still ongoing when the questionnaire was sent. Therefore, the NRA has provided an estimation of the coverage ensured.

⁸ Spain used the concept of “building unit” instead of “household”, considered as more accurate to the purpose of this questionnaire. In Spain, the proportion between building unit and household is 1.43. In this section, we use the data reported by CNMC, without conversion from “building unit” to “households”, because the conversion has no impact in the analysis.

⁹ There are two SMP operators in the UK – BT in the UK excluding the Hull Area, and KCOM in the Hull Area.

ii) limited extent of coverage (<30% of HHs); iii) reasonable extent (30%-60% of HHs) and iv) significant extent (>60% of HHs), counting the number of NRAs responding for each.

Figure 1 - Coverage classes by FTTC/VDSL technology



The data reported in Figure 1 shows that, as one would expect, FTTC/VDSL is used mostly by SMP operators. In 11 countries (Belgium, Cyprus, Denmark, Hungary, Iceland, Italy, Luxembourg, Malta, Poland¹⁰, Switzerland and UK), SMP operators rely on this technology to cover more than 60% of HHs and in another seven countries (Croatia, Czech Republic, Estonia, Germany, Greece, Norway and Slovenia), SMP operators rely on FTTC/VDSL to cover between 30% and 60% of HHs. In six countries (France, Romania, Serbia, Slovakia, Spain and Sweden), coverage is lower than 30% and in Portugal, the SMP operator has not deployed any FTTC/VDSL technology^{11,12}.

Cable operators have not deployed FTTC/VDSL – in only two countries (Estonia and Poland) have cable operators deployed FTTC/VDSL and then only to a limited extent (lower than 30%).

Other competing operators (non-SMP, non-cable operators) rely on FTTC/VDSL technology in six countries (Austria, Germany, Greece, Italy, Poland and Sweden) and then to a limited extent.

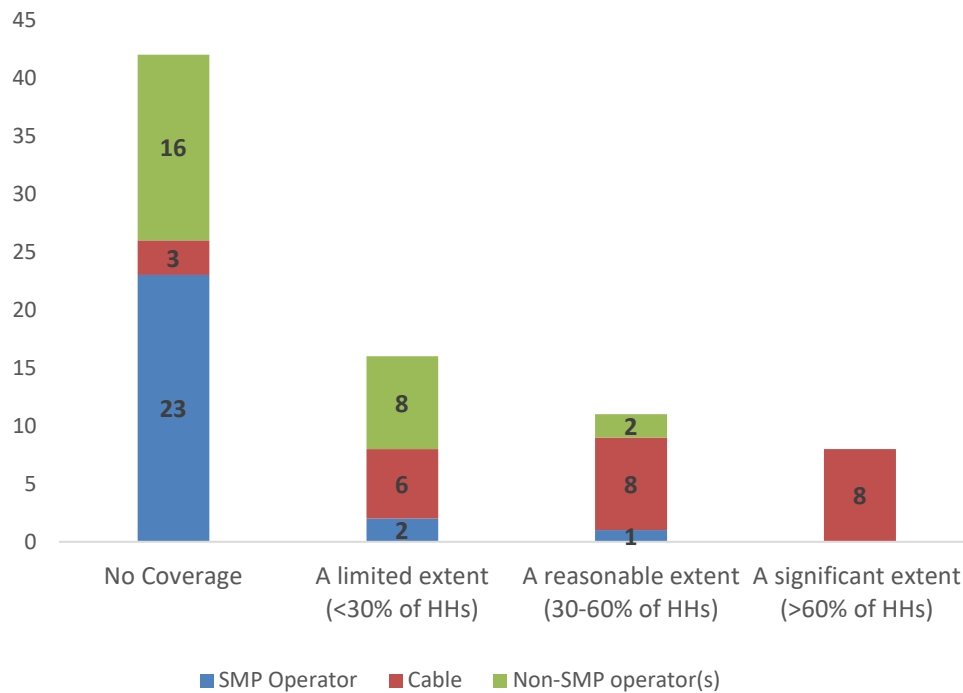
Figure 2 shows an analogous analysis regarding HFC/DOCSIS 3.0 technology.

¹⁰ Polish NRA was not able to divide fibre coverage among the infrastructures FTTC and FTTH/B. Therefore, the FTTC infrastructure coverage refers to all the fibre coverage.

¹¹ In Romania no operator has been identified as having SMP for the provision of services in markets 3a and 3b.

¹² Finland doesn't appear in Figure 1 as there are multiple SMP and non-SMP operators using a mix of technologies and therefore there is no data on technology deployment broken down by operator type.

Figure 2 - Coverage classes by HFC/DOCSIS 3.0 technology



The overall picture of deployment of HFC also follows an expected pattern. In only three countries have SMP operators deployed HFC and in two of these (Hungary, Norway) it has been to a limited extent (less than 30%). Only in Denmark does the SMP operator cover between 30% and 60% of HHs - this is because the SMP operator owns the main cable network.

HFC/DOCSIS 3.0 technology has been used by cable operators to at least some degree in 22 countries. In eight countries (Belgium, Cyprus, Germany, Hungary, Malta, Portugal, Switzerland and Luxembourg) cable operator(s) covers more than 60% of HHs, in eight countries (Austria, Czech Republic, Poland, Romania, Serbia, Slovenia, Sweden and UK) the coverage is between 30% and 60% and in six cases (Croatia, Denmark, France, Norway, Slovakia and Spain) coverage is lower than 30% (although in Denmark, the SMP operator controls the largest cable operator and therefore overall HFC coverage is above 60%). In three countries (Estonia, Greece and Italy) operators do not use this technology¹³.

¹³ Finland doesn't appear in Figure 2 as there are multiple SMP and non-SMP operators using a mix of technologies and therefore there is no data on technology deployment broken down by operator type.

Figure 3 - Coverage classes through FTTH/B technology

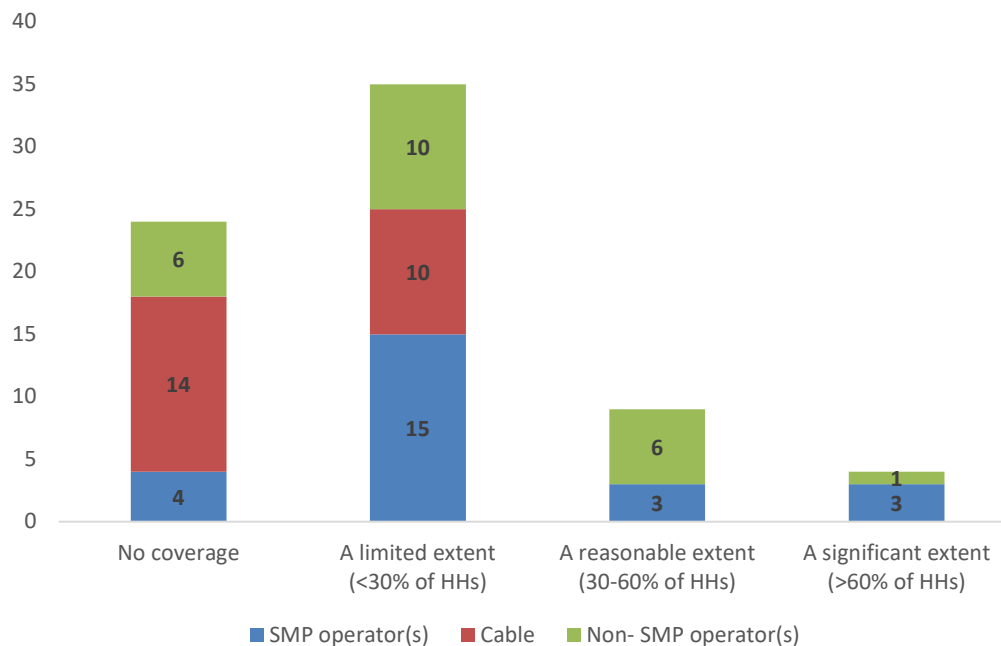


Figure 3 shows that all three types of operator have deployed FTTH/B technology. At least some degree of coverage using FTTH/B has been deployed by SMP operators in 21 countries, by cable operators in 10 countries and by non-SMP operators in 17 countries.

Of the 21 cases where SMP operators have deployed FTTH/B, in 15 countries (Austria, Belgium, Croatia, Czech Republic, Denmark, France, Germany, Hungary, Italy, Malta, Norway, Romania, Serbia, Slovakia and UK), FTTH/B coverage extends to only a limited extent (less than 30% of HHs), in three countries (Estonia, Iceland¹⁴ and Slovenia), the coverage is between 30% and 60% of HHs and in three cases (Portugal, Spain, Luxembourg), it extends to more than 60% of households.

Of the 11 countries in which cable operators have deployed FTTH/B (Croatia, Denmark¹⁵, Estonia, France, Germany, Hungary, Norway, Portugal, Serbia, Slovenia and Spain), coverage is limited (15% or lower).

Of the 17 countries in which there has been some FTTH/B deployment by non-SMP operators, coverage is limited in 10 countries¹⁶ (Austria, Croatia, France, Germany, Greece, Italy, Serbia, Slovakia, Slovenia, UK), while it extends to between 30-60% in six countries (Czech Republic, Denmark, Norway, Portugal, Romania and Spain). Only in Iceland does FTTH/B coverage from non-SMP operators cover more than 60% of HHs.

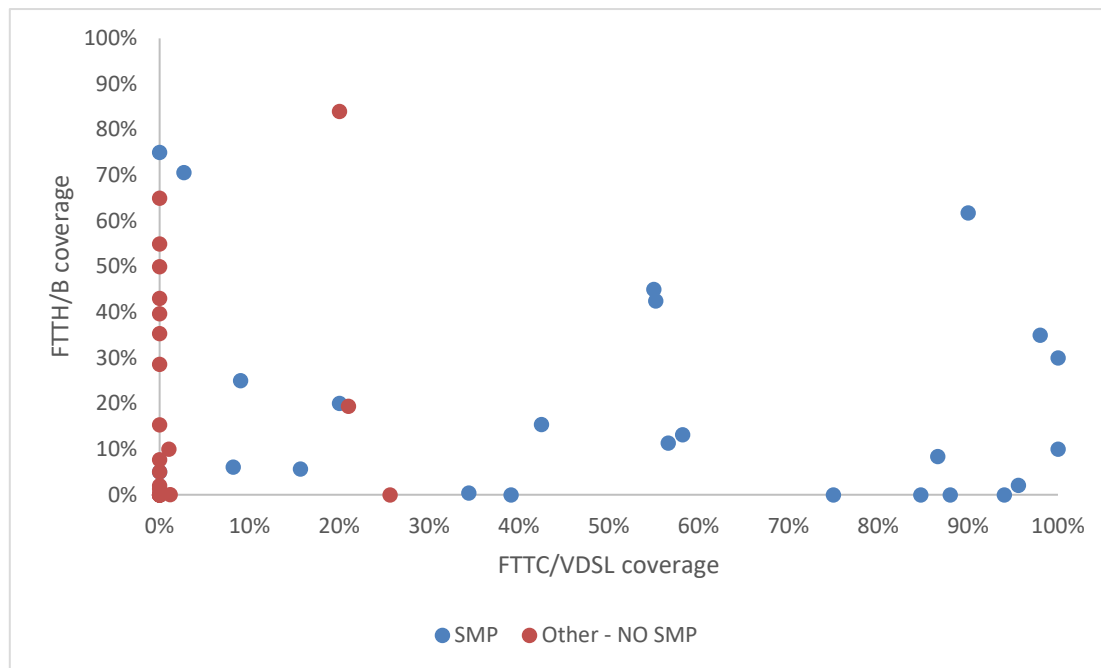
¹⁴ The FTTH/B coverage provided by the Icelandic NRA – PTA – is included in the ranges [30%-35%] for SMP and [60%-65%] for the alternative operator. We assumed the upper bounds for this analysis.

¹⁵ FTTH is deployed by a regional power utility company which has merged with the (2nd.) cable operator.

¹⁶ In Finland, there are multiple SMP and non-SMP operators using a mix of technologies and therefore there is no data on technology deployment broken down by operator type. Hence, Finland does not appear in Figure 3.

In order to analyze the relationship between FTTC and FTTH coverages, the following figure shows, for each country, the percentages of FTTC and FTTH coverage realized by the SMP operator and by non-SMP operator(s).

Figure 4 - FTTC/VDSL and FTTH/B coverages per country (SMP and NON-SMP operators)



Where operators have deployed NGA infrastructure, both SMP operators and non-SMP operators appear to elect for one technology (i.e. either FTTC/VDSL or FTTH/B) with SMP operators having a preference for FTTC/VDSL and non-SMP operators having a preference for FTTH/B. FTTC/VDSL often does offer a less costly upgrade path from copper based infrastructure for SMP operators and so, as expected, SMP operators rely mostly on FTTC/VDSL technology; indeed, in three countries (Cyprus, Greece¹⁷ and Switzerland) the SMP operator relies only on this technology (i.e. FTTH/B coverage is minimal/zero); in 16 countries (Austria, Belgium, Croatia, Czech Republic, Denmark, France, Germany, Hungary, Iceland, Italy, Malta, Norway, Romania, Serbia, Slovakia and UK), the FTTH/B coverage by the SMP operator is between 0% and 30% (irrespective of FTTC/VDSL coverage). Only in five countries (Estonia, Luxembourg, Portugal, Slovenia and Spain) is FTTH/B coverage is higher than 30% (irrespective of FTTC/VDSL coverage).

Non-SMP operators have a preference for FTTH/B technology. In ten countries (Austria, Croatia, France, Germany, Greece, Italy, Serbia, Slovakia, Slovenia and UK), the FTTH/B coverage by non-SMP operators is included between 0% and 30% (irrespective of FTTC/VDSL coverage) and in seven countries (Czech Republic, Denmark, Iceland, Norway, Portugal, Spain and Sweden) the FTTH/B coverage is higher than 30% (irrespective of FTTC/VDSL coverage)¹⁸.

¹⁷ Recently, the SMP operator in Greece has announced its intention to deploy FTTH in some areas

¹⁸ Since BNetzA and Ficora provided an overall coverage of FTTC/VDSL technology without a breakdown into type of operators, Germany and Finland are not included in the graph.

3.2 NRA experience on the use of the infrastructure for the local access segment

To identify the extent to which NGA network operators rely on own build infrastructure versus access to others' civil infrastructure for the deployment of the mass-market NGA networks, NRAs were asked to provide data on the infrastructure used for the local access segment, including in-building wiring by each NGA operator, for both SMP and non-SMP operators¹⁹.

Figure 5 - Infrastructure by type of operators

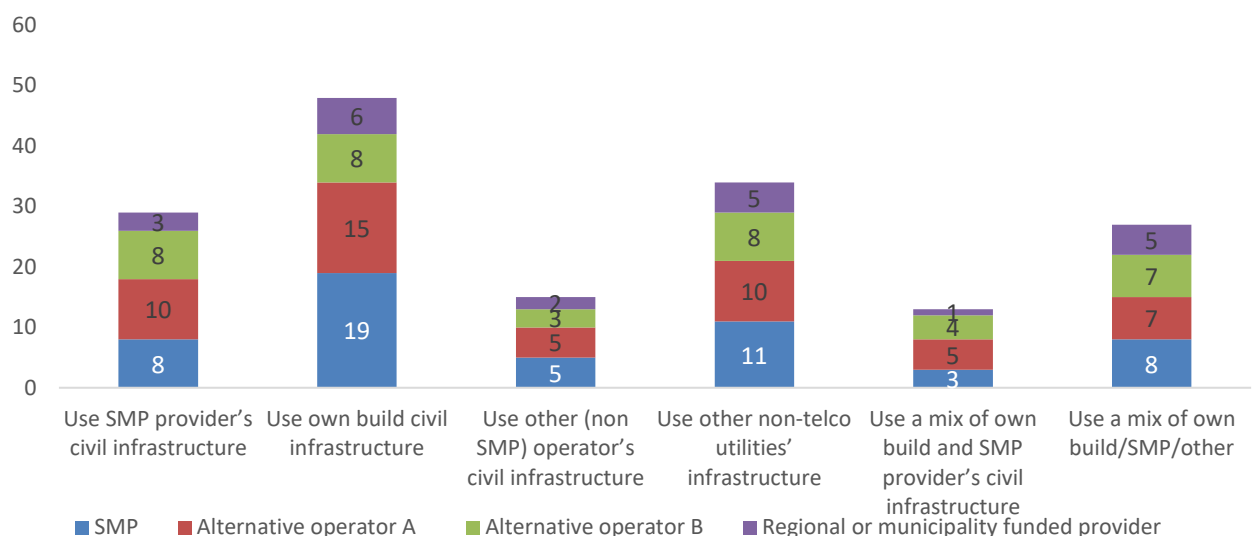


Figure 5 shows the infrastructure being used by 168 NGA network operators (there can be more than one operator per country). Concerning the use of the SMP provider's civil infrastructure, the data shows that in 12 countries (Croatia, Cyprus, France, Germany, Hungary, Malta, Portugal, Slovenia, Spain, Sweden, Switzerland²⁰ and the United Kingdom), alternative operators use the SMP provider's civil infrastructure and in three cases (Croatia, France²¹ and Portugal) regional or municipality funded providers use the SMP operator's civil infrastructure.

In addition, the analysis shows that 48 out of 168 NGA operators rely only on their own build civil infrastructure and that in many countries, both SMP operators and non-SMP operators use their own civil infrastructure. In 19 countries (Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland²², France, Germany, Greece, Latvia, Luxembourg, Malta,

¹⁹ Poland stated that they haven't exact data on in-house/building wiring.

²⁰ In Switzerland there exists no public data on the matter. For the local access segment from the network offices up to the building entry point, the NRA considers as possible for all operators who own civil infrastructure that they rely in part on the civil infrastructure of another telco or a non-telco competitor (if it is not on the duct infrastructure of the incumbent/SMP, the conditions are commercially set). Furthermore, the in-building wiring is typically owned by the house owner (typically - regarding NGA infrastructure - with multiyear usage rights for the network building operator), thus in Switzerland there is necessarily a mix with "other" infrastructure.

²¹ In France there are many local public initiative networks operators. Most of them are public-private partnerships between local authorities; some of these private partners are vertically integrated operators (such as Orange or SFR), others are wholesale-only operators (Altitude, Axione, Covage and TDF).

²² Ficora's given answers include all operators in Finland, where there are over 70 operators and therefore Ficora's answers are written in general way. These 70 operators use own build infrastructure, infrastructure owned by other

Portugal, Serbia, Slovenia, Spain, Sweden and Switzerland), the operators using their own civil infrastructure are SMP operators and in 17 countries (Belgium, Croatia²³, Cyprus, Denmark, Finland²⁴, Germany, Greece, Hungary, Iceland, Italy, Malta, Portugal, Serbia, Spain, Sweden, Switzerland, United Kingdom)²⁵, non-SMP operators use their own civil infrastructure to varying degrees (this analysis takes into account only the general use of own build infrastructure without any assessment of how large the use is).

There are 34 instances in which operators use the civil infrastructure of other non-telco utilities infrastructure – this comprises 11 SMP operators, 18 alternative operators and 5 regional or municipality funded providers. In eight countries, there is more than one operator that uses the civil infrastructure of non-telco utilities.

3.3 Symmetric regulation and market structure

Among respondent NRAs, in nine countries (Croatia, Cyprus, France, Germany, Greece, Hungary, Italy, Poland, and Spain), NRAs reported having imposed symmetric obligations.

We have analyzed the collected data on symmetric regulation and market structure. To this aim, we have selected two indicators: *i)* coverage of SMP operator; *ii)* coverage of the biggest alternative (non-SMP) operator. All different technologies have been included in this analysis.

For each country, the values referring to all indicators for NRAs that have imposed symmetric regulation (identified by the acronym “SyRI”) have been compared with the values for NRAs that have not imposed symmetric regulation (identified by the acronym “NoSyRI”). The subdivision into two classifications (SyRI vs NoSyRI) helps to identify any common distribution of the analyzed indicators.

These two indicators – SMP coverage and biggest non-SMP coverage – have been analyzed together and they are shown in the following figure, where the blue dots represent SyRI countries and red dots represent NoSyRI countries. The SMP coverage is calculated as the sum of the coverages ensured with each technology. The biggest non-SMP coverage is calculated irrespective of the used technology, i.e. it includes FTTC/VDSL, HFC/DOCSIS 3.0 and FTTH/B.

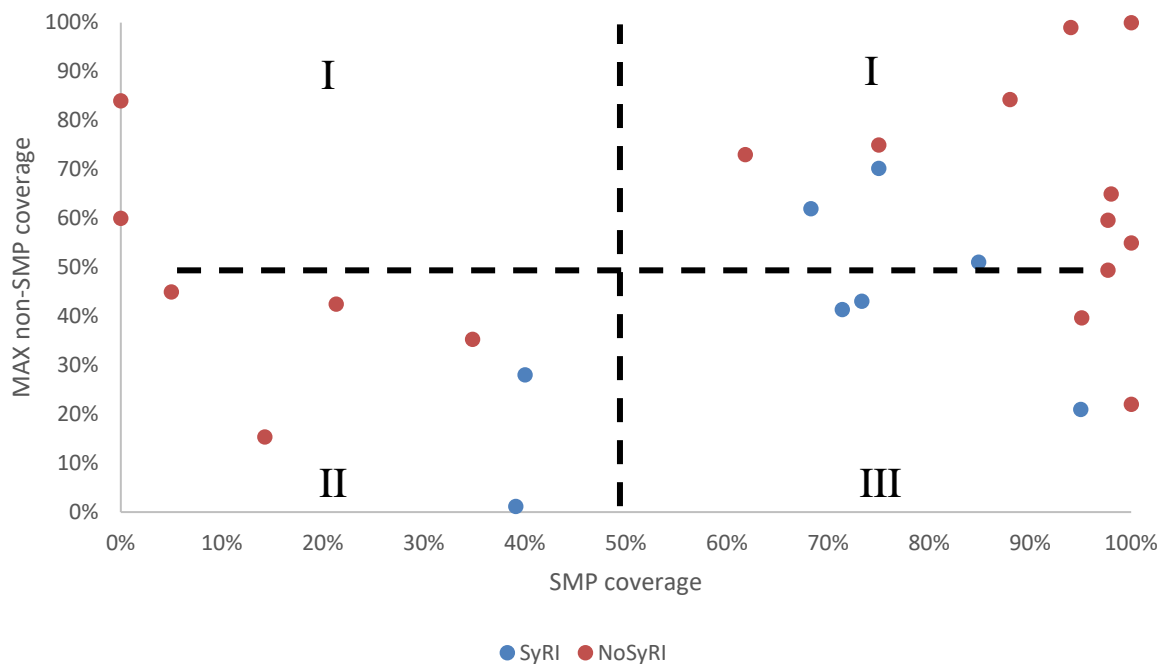
SMP operator and other non-telco infrastructure. Ficora concluded that the not specified over 70 operators “use a mix of own build/SMP/other infrastructures”.

²³ In Croatia, alternative operators use their own build infrastructure to a limited degree and they mostly use the SMP operator’s civil infrastructure.

²⁴ The comments reported in footnote 24 refers to the case of non-SMP operators in Finland as well.

²⁵ In order to avoid double-counting, these countries include all the cases referring to non-SMP operators, i.e. “Alternative Operator A” (red box in the figure), “Alternative Operator B” (green box in the figure) and “Regional or municipality funded provider” (purple box in the figure).

Figure 6 - SMP and biggest non-SMP coverage



The x-axis shows the percentage of HNs covered by the SMP operator using any NGA technology (FTTC/VDSL, HFC/DOCSIS 3.0 and FTTH/B) and the y-axis shows the percentage of HNs covered by the biggest non-SMP operator using any NGA technology (FTTC/VDSL, HFC/DOCSIS 3.0 and FTTH/B). Only the largest non-SMP operator was considered in this analysis because in most cases (except in some Nordic countries in which there were a lot of smaller regionally focused non-SMP operators), the coverage by the biggest non-SMP operator can be used as a proxy for how competitive the market is.

Figure 6 shows that the SyRI countries are concentrated on the border between quadrants III and IV (corresponding to reasonable/significant coverage by both SMP operators and non-SMP operators). The data shows that NoSyRI countries have a larger spread across categories than the SyRI countries and there are a cluster in both quadrant IV (significant coverage by both SMP and non-SMP operators) and toward the left-hand side of the graph (characterised by low coverage from SMP operators). This analysis does not draw any conclusions regarding causal relationships between market structure and the use of, or effects of symmetric regulation.

4. NRA implementation of symmetric regulation

4.1 Scope and type of symmetric obligations

Table 1 – Scope of symmetric obligations invoked by NRAs

	In-building wiring	Local access	Backhaul segment	Other	Legal power
Croatia	✓	✓	✓	✓	RF
Cyprus	✓	✓	✓		RF
France	✓	✓			RF, NL
Germany		✓ ²⁶	✓ ²⁷		BCRD, vectoring ²⁸
Greece	✓	✓	✓		BCRD, RF, vectoring
Hungary				✓	BCRD
Italy	✓	✓	✓	✓ ²⁹	RF, BCRD
Poland	✓	✓	✓	✓	RF, BCRD
Spain	✓				NL

RF: Regulatory Framework
 BCRD: Broadband Cost Reduction Directive
 NL: National Law

Of those NRAs that have imposed symmetric regulation (i.e. that do not only have the legal basis at hand but have actually *applied* such regulation in binding decisions), most NRAs have imposed in-building wiring and local access obligations. The legal basis for imposing symmetric regulations (see Section 4.2) can come from a mix of the regulatory framework, the BCRD (Broadband Cost Reduction Directive) and from national law. In some countries, national law that mandated the sharing of network infrastructure was introduced before the BCRD entered into law and was broadly similar to the BCRD and/or aspects of the regulatory framework that were subsequently introduced into legislation.

For example, in Spain, CNMC imposed symmetric obligations in 2009 based on national law whose provisions were broadly similar (but not identical) to those of the regulatory framework (Article 5 AD, Article 12 FD). As a result, CNMC has not formally assessed economic or technical replicability as per Article 12 (3). In France, the law on modernising the economy (LME) was introduced in 2008 and set out a system of rights and obligations for operators deploying FTTH networks so that the French Postal and Communication Code (CPCE) mandated that passive access to FTTH networks must be provided under transparent and non-discriminatory conditions. ARCEP's decisions to impose symmetric obligations refer to both the LME and to Article 12 FD and Article 5 AD which are consistent with each other.

4.1.1 Type and scope of symmetric regulation/obligations

Among nine NRAs that made decisions regarding symmetric regulations, in seven instances access has been provided to civil infrastructure (Croatia, Cyprus, Germany, Greece, Hungary,

Italy, and Poland). In five cases symmetric regulations were applied to dark fibre (Cyprus, France, Germany, Italy³⁰ and Poland).

Two NRAs (BNetzA, EETT) have imposed obligations in the context of vectoring that are symmetric in nature but are not treated as symmetric obligations in this report. The decisions on vectoring were made in the context of market reviews on relevant markets in which asymmetric obligations were imposed on the SMP operator. In Greece, symmetric obligations were imposed on access to active remedies when VDSL vectoring was deployed in street cabinets. Similarly, in Germany, any operator that deployed vectoring in the proximity area of MDFs is obliged to offer access to active remedies at the street cabinet.³¹ In both cases, these 'symmetric' obligations in the context of vectoring stem from the nature of vectoring equipment which prevents more than one operator from accessing the copper loop using their own vectoring deployment. Other than these two cases, there was no other instance of active remedies being imposed through symmetric obligations in the context of vectoring.

Table 2 – Type of symmetric obligations invoked by NRAs

	Civil infrastructure	Dark fibre	Active remedies	Other
Croatia	✓			✓ ³²
Cyprus	✓	✓		
France		✓		
Germany	✓	✓ ³³	✓ ³⁴	
Greece	✓		✓	
Hungary	✓			
Italy	✓	✓		
Poland	✓	✓		✓ ³⁵
Spain				✓ ³⁶

²⁶ In case of vectoring deployment, a kind of symmetric regulation has been imposed in the near shore areas in which operators using vectoring in the proximity areas of MDFs are obliged to offer VULA at the street cabinet. In case of BCRD, duct access that has been imposed by the dispute settlement body in the individual case depends on the specific request.

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²⁸ Obligations in the context of vectoring are symmetric in nature but are not symmetric obligations as such. The decision on vectoring was made in the context of a regulatory order based on a market review of market 3a in which asymmetric obligations were imposed on the SMP operator. The 'symmetric' vectoring obligations stem from the nature of vectoring equipment which prevents more than one operator from accessing the copper loop using their own vectoring deployment.

²⁹ In building entrance (civil infrastructures that connect the last manhole outside the private property and the base of the building).

³⁰ In Germany and Italy NRAs imposed symmetric access to dark fibre only in very specific settings.

³¹ Besides active remedies at street cabinets, there are also L2-BSA (Layer 2 bitstream access) obligations that cover any vectoring deployment, both within and outside the proximity areas.

³² Access to fibre wiring inside building up to the first concentration point.

³³ Limited to the proximity areas of MDFs in case of vectoring deployment.

³⁴ Limited to the proximity areas of MDFs in case of vectoring deployment.

³⁵ Access to be provided to copper wiring (in-building and up to first concentration point) as well as to civil infrastructure and dark fibre

³⁶ Access to in-building wiring

Three NRAs stated that ‘other’ obligations have been imposed. In Croatia, in addition to mandating access to civil infrastructure, symmetric access to fibre in the local access segment was mandated in the distribution node if the fibre is connected to in-building wiring.

There is no clear correlation between the type of symmetric obligation imposed (access to civil infrastructure, dark fibre or active remedies) and the scope of those obligations regarding the part of the network they apply to. NRAs that have implemented symmetric regulations based on the BCRD or similar national laws have done so with a focus on in-building wiring and the local access segment. Six NRAs have extended symmetric regulations to the backhaul segment as a result of the transposition of the BCRD. Some NRAs have extended symmetric obligations to any part of the network. This is the case in Croatia, Greece and Poland and the regulatory powers that were used stem from the BCRD as well as from national legislation which often predates the BCRD.

In France, symmetric obligations vary by type of geography in order to make access points more technically and commercially viable and attractive for passive access seekers. In the most densely populated areas (covering 6.4 M homes or office units), the access point is mainly inside the building, with some exceptions for small buildings and for low-density neighbourhoods of the densest areas. In these, access does not extend to the local access segment. In the less dense areas (covering nearly 30M homes or office units), the access point is outside buildings at a level that provides access to 1,000 dwellings and professional premises³⁷.

4.1.2 Instances of symmetric obligations regarding access and use of network elements

In terms of the nature of the symmetric obligations that have been imposed, there are differences in scope. In **Greece** symmetric obligations have been imposed on access to civil infrastructure (ducts, sub-ducts, manholes, etc.), exempting dark fibre, on all network operators on a national level through NRA regulation.

In **Croatia**, in addition to access to civil infrastructure, symmetric access obligations apply to fibre wiring inside buildings up to the first concentration point. Any operator that plans to deploy FTTH network in an area with density of more than 500 users (households, business users etc.) per square meter is obliged to publish its deployment intention and to establish access to a distribution point with a capacity of at least 300 dedicated fibre connections. If the in-building fibre wiring is deployed as a part of published fibre deployment, access to users in that building must be provided at that distribution point. In **Poland**, symmetric access must be provided not only to dark fibre but also to copper wiring in local access segment, including in-house wiring.

In **Italy**, symmetric access obligations have been imposed on network elements identified as bottlenecks - the terminating segment for fibre optics and the civil infrastructure related to building entry segment. The terminating segment has been defined as a ‘continuous length’ of optical fibre that connects the customer premise equipment up to the first concentration point inside or outside the building. The building entry segment has been defined as the civil

³⁷ The access point can be closer to the dwellings (gathering a minimum of 300 lines) if there is a dark fibre offer to a more remote access point that aggregates a minimum of 1,000 dwellings and professional premises.

infrastructures between the first manhole outside the private entry and the access point of the terminating segment inside the private property³⁸. For the building entry segment (local access), the symmetric access applies to the civil infrastructure (duct) but in exceptional cases, an operator may provide dark fibre as a substitute to duct access.

In **Spain**, a similar approach has been taken in which the first operator deploying fibre within a building must make access available to third parties at reasonable prices. The competitive problems that have been used to justify the imposition of the symmetric measures relate to the scarcity of space available inside buildings for the purposes of fibre deployment, and the difficulty for subsequent operators of dealing with house owners, once a first operator had already been granted a permit for deploying fibre inside a building.

In **France**, any operator that has deployed or is planning to deploy optical fibre up to the premises is subject to symmetric obligations. If the party that is deploying optical fibre is not responsible for managing the network – for instance in the case of a property developer – there is an obligation to designate a building operator to manage the lines that can cater to and satisfy other operators' requests for access. Currently, there are over seventy operators that are subject to the symmetric access framework, some of them national (Free, Orange, SFR) while most of them are local public initiative networks (PINs) which are in most cases a subsidiary of one of the six majors acting in the local authorities' private partnership market.

4.1.3 Specific requirements for performing symmetric obligations

While the main objective of symmetric obligations is to provide access to network elements, there are also ancillary obligations and requirements that address competition issues in a similar manner to SMP obligations. Of NRAs that have imposed symmetric obligations, six NRAs have imposed requirements for non-discrimination (Cyprus, Greece, France, Croatia, Italy, Poland), five have imposed transparency requirements (Greece, France, Italy, Poland, Spain), five have set price controls (Greece, France, Italy, Poland, Spain) and one has imposed cost accounting (France).

Non-discrimination, transparency, and price controls

In **Germany**, access has to be granted on fair and reasonable terms. With regard to pricing, the law goes beyond a mere transposition of the BCRD in that extensive guidance on pricing is included. The law foresees a differentiation between pricing for ECN operators and non-ECN operators. Recently pricing decisions have been taken for both categories.³⁹

In **Greece**, transparency and non-discrimination requirements have been imposed as ancillary requirements for civil infrastructure access. Price controls have been imposed for active remedies, but these apply only in the context of VDSL vectoring at street cabinets and these obligations were imposed as part of a market analysis that imposed access obligations on the SMP operator - these obligations were extended to all operators that deploy vectoring. In Italy, transparency and non-discrimination obligations were imposed as symmetric obligations in

³⁸ Decision n. 538/13/CONS.

³⁹ For more details on the methodology of pricing in the German Telecommunications Act as well as recent decisions on pricing see the final BEREC report for pricing of access to infrastructure and civil works according to the BCRD, which will be published in March 2019. The consultation draft is published as BoR (18) 163.

relation to network bottlenecks. In **Poland**, in cases of dispute resolution concerning access conditions under the symmetric access framework, the NRA can determine conditions of access including charge controls and non-discrimination conditions. In case of a dispute, the regulation requires that the price determined by the NRA should take account of the risk incurred. The price for access to civil infrastructures is based on a cost orientation rule and its methodology is common to all network operators, as set out in the BCRD.

4.1.4 Setting of terms of symmetric access

We asked NRAs who had implemented symmetric access regulation / obligations to provide detail about how they went about implementing these obligations – see Table 3 below.

Table 3 - How are symmetric access terms set by National legislation and/or NRAs

	Number of countries	Countries
Symmetric pricing is set ex-ante under the regulatory framework	2	France [†] , Greece*
Symmetric pricing is set ex-ante by other mechanism	3	Cyprus, France [∞] , Poland
Symmetric pricing is set ex-post based on dispute resolution	6	France, Germany, Greece, Italy, Poland, Spain
(non-price) terms of product set ex-ante under the regulatory framework	2	France, Greece*
(non-price) terms of product set ex-ante by other mechanism	2	Cyprus, Poland
(non-price) terms of product set ex-post based on dispute resolution	5	Croatia, France, Greece, Italy, Poland

[†] In accordance with the Framework, the law and ARCEP regulatory decisions set the financial conditions of access, which should be reasonable and objective, efficient, pertinent, non-discriminatory, allow for risk premium.

* Access to active remedies where VDSL vectoring has been deployed at street cabinets

[∞] National law requests that FTTH wholesale prices are examined by ARCEP before entering into force for Public Initiative Networks (PINs) in accordance with ARCEP's FTTH PIN pricing guidelines.

Most NRAs stated that symmetric pricing and other conditions are set ex-post through dispute resolution.

In **Spain**, operators are only obliged to set prices that are not excessive (so that *de facto* they would not constitute a denial of access or lead to the creation of entry barriers) but also so that the operator granting access can recoup costs borne when making the deployment. Prices of access to the network elements available inside buildings have been determined through dispute resolution.

In **France**, the NRA specified in its decisions that terms and conditions governing the price of access must be reasonable and comply with the principles of non-discrimination, objectivity, relevance and efficiency⁴⁰. With regard to access to public access networks (PINs), following

⁴⁰ Additionally, Law No. 2015-990 of 6 August 2015 for growth, activity and equal economic opportunities published on 7 August 2015 in the Official Journal, inspired by the EU State aid guidelines, introduced in Article L. 1425-1 of the General Code of Local and Regional Authorities (CGCT) tariff principles for access by operators to PINs: the financial conditions for access to these public networks have to be objective, transparent, non-discriminatory and

a public consultation, the NRA adopted guidelines on the pricing conditions for access to very high-speed fibre optic public networks. These tariffs have to be notified to the NRA before they enter into force and the NRA can invite the local authority to modify the tariff conditions.

In **Poland**, symmetric pricing is set ex-ante by national law. If necessary, the NRA may, in addition to setting conditions through dispute resolution, also impose on a provider an obligation to offer access to infrastructure covering particular aspects such as access prices.

In **Italy**, the NRA defined ex-ante BU-LRIC tariffs for the SMP operator in the wholesale access market analysis concerning access to civil infrastructure, access to the fibre optic terminating segment, and access to the infrastructure of the building entry segment. Non-SMP operators are obliged to apply fair and reasonable access prices as set out in a specific decision concerning symmetric regulation (Decision n. 538/13/CONS). In assessing the fair and reasonable prices in case of disputes, the Italian NRA considers costs incurred by operators (cost of capital, risk premium, economies of scale and vertical integration). The SMP operator's prices may serve as a reasonable reference in order to assess prices applied by other vertically integrated operators, whereas the adoption of a wholesale-only or passive-only business model justifies a higher degree of flexibility.

4.2 Legal basis

The second part of chapter 4 provides information about the legal basis that NRAs invoke to impose symmetric obligations.

4.2.1 EU legislation concerning symmetric obligations

The EU legal basis for symmetric obligations is based both on the **EC regulatory framework** (Article 5 AD, Article 12 (3) FD), and on Article 9 **BCRD** (2014/61/EU). The relevant articles read as follows:

Article 5 (1) a) AD: "In particular, without prejudice to measures that may be taken regarding undertakings with significant market power in accordance with Article 8, national regulatory authorities shall be able to impose,...to the extent that is necessary to ensure end-to-end connectivity, obligations on undertakings that control access to end-users, including in justified cases the obligation to interconnect their networks where this is not already the case (...)"

*Article 12 (3) FD: "Member States shall ensure that national authorities (...) have the power to impose obligations in relation to the sharing of **wiring inside buildings** or up to the first concentration or distribution point where this is located outside the building, on the holders of the rights referred to in paragraph 1 and/or on the owner of such wiring, where this is justified on the grounds that duplication of such infrastructure would be economically inefficient or physically impracticable." (emphasis added).*

*Article 9 (2) BCRD: "Member States shall ensure that, subject to the first subparagraph of paragraph 3, every public communications network provider has the right to access any existing **in-building physical infrastructure** with a view to deploying a high-speed electronic*

proportional, and to ensure compliance with the principle of free competition in electronic communications markets and the open nature of such infrastructures and networks.

communications network if duplication is technically impossible or economically inefficient.” (emphasis added).

4.2.2 Imposition of symmetric obligations in accordance with Article 5 AD / Article 12 FD / Article 9 BCRD

As mentioned above, in nine countries, the legal powers have already been invoked by the NRA to issue decisions on symmetric obligations in relation to the deployment of NGA networks. In Croatia, France, Greece, Italy, Poland and Spain, actions of NRAs fell within the scope of powers set out in Article 5 AD, Article 12 FD or Article 9 BCRD.

In **Croatia**, Article 12 FD (and respectively Article 30 of the Croatian Electronic Communications Act) have been the basis for the ordinance in which HAKOM defined rights and conditions of access and share of electronic communications infrastructure and associated facilities in greater detail.

In **Cyprus**, the NRA (OCECPR) issued two orders: in 2012, the *acquisition of rights of way order* and in 2015 the *in-house wiring order* which transpose elements of the regulatory framework and the BCRD respectively.

In **France**, ARCEP issued decisions on symmetric obligations in relation to the deployment of FTTH networks.

In **Greece**, EETTs Regulation 859/3/2018 “Co-location and Facility Sharing” (amending previous Regulation 750/7/2015 in order to harmonize it with the transposition of the BCRD into national law) imposes an obligation to electronic communication providers to grant access to their network infrastructure in order to facilitate NGA development in accordance with Article 12(3) of the FD. In **Italy**, the NRA’s (AGCOM) symmetric access regulation has been approved with decision n. 538/13/CONS prior to the adoption of the BCRD and it seeks to promote high speed broadband deployment under Article 89 of the Italian ECC (which transposes Article 12 FD).

In **Poland**, the NRA (UKE) issued several decisions on symmetric obligations in relation to the deployment of NGA networks, which - since the implementation of BCRD - exclusively referred to powers mentioned in BCRD. These decisions included dispute resolutions and recent decisions obliging seven network operators to share their in-building technical infrastructure on conditions laid down in a reference offer.

In **Spain**, the regulation of the NRA (CNMC) on symmetric access dates to February 2009, before the 2002 Regulatory Framework was amended in November 2009. CNMC thus relied on a provision of the former 2003 Spanish Telecommunications Act, which is similar in nature to the provisions contained in Article 12 FD and which allowed the NRA to impose access and other obligations to operators in exceptional circumstances regardless of their SMP status.

The following table provides an overview of the responses to the question “*Have you imposed symmetric regulation and related obligations on any provider in relation to the deployment of NGA networks (e.g. access to fibre and / or civil infrastructure)?*”

Table 4 - Imposition of symmetric obligations

Yes, have imposed under national regulation other than the transposition of the regulatory framework or the Broadband Cost Reduction Directive (BCRD)	ES
Yes, have imposed using powers from the regulatory framework (Article 5 AD, Article 12 FD)	HR, IT, PL, CY, EL
Yes, have imposed using powers from the BCRD	DE, HU, IT, PL, CY, EL
Yes, have imposed under both national regulation (other than the transposition of the regulatory framework or the Broadband Cost Reduction Directive (BCRD)) and using powers from the regulatory framework (Article 5 AD, Article 12 FD)	FR
No, have not imposed	AT, BG, CH, CZ, DK, EE, FI, ISL, LU, LV, MT, NOR, PT, RO, SI, SK, RS, UK
Have not imposed but have seriously considered / currently considering.	SE
Other	BE

Only NRAs that have taken decisions to impose symmetric obligations in relation to the deployment of NGA networks have been included as having imposed symmetric obligations; the existence of symmetric powers (e.g. from the transposition of the BCRD) that have not led to an active decision by the NRA is not, on its own, deemed to constitute the imposition of symmetric obligations.

4.2.3 National legislation concerning symmetric regulation that goes beyond the transposition of AD/FD/BCRD

Five respondents (Austria, Finland, France, Latvia, Serbia) stated that their legal basis (irrespective of whether a regulatory decision has actually been made) for the imposition of symmetric obligations is also based on (additional) national legislation.

In **Austria**, the *Telecoms Act 2003* provides for symmetric access to any infrastructure that can be used for telecommunication purposes, including in-house physical infrastructure or in-house wiring, irrespective of who (telecom-provider, other network-provider, private property-owner) owns that infrastructure. The NRA (RTR/TKK) can be called upon for dispute settlement by any party concerned (i.e. access seeker, infrastructure-owner). RTR/NKK has not yet taken decisions on symmetric obligations in the access-network (NGA-deployments; in-house-infrastructure) or on replicability matters.

In **Finland**, according to the *Joint Construction Act*, network operators must, on request, provide other network operators with access to their physical infrastructure. The rights and obligations set out in the act are applied reciprocally between different network operators as well as to cooperation between telecommunications operators. According to the obligation to provide access, a telecommunications operator requesting access must be provided with access to, for example, protective pipes, cable ducts, manholes, distribution cabinets, poles and buildings, i.e. to other passive parts of the network. On the basis of the Joint Construction

Act, regulation on significant market power (asymmetric obligations) take precedence over (symmetric) obligations set out in the act. Therefore, if an obligation to provide access has been imposed on an undertaking in an SMP decision, the undertaking cannot be obligated to provide similar access based on the Joint Construction Act. However, if a specific obligation to lease, for example, a cable duct has not been imposed on an undertaking in an SMP decision, the undertaking is obligated to provide access based on the Joint Construction Act.

In **France**, the *Postal and Electronic Communications Code (CPCE; Code des postes et des communications électroniques)*, the *2008 Law on modernising the economy (LME; loi de modernisation de l'économie)*, subsequently modified, at the latest by the *2016 Law for a Digital Republic (loi pour une République numérique)* provides the NRA (Arcep) with legal powers to impose symmetric obligations. CPCE Article L. 34-8-3 gives Arcep the authority to specify the terms governing access to optical fibre, in an objective, transparent, non-discriminatory and proportionate manner, and in particular the location of the concentration point, to promote efficient investment and innovation, and to ensure consistency in the deployments and homogeneous coverage in the areas being served.

In **Latvia**, symmetric regulation has been mandated under the *Electronic Communications Law* since April 2014 and applies to all duct owners. An agreement has been reached among governmental institutions, the NRA (SPRK) and the industry after a series of negotiations, where all interested parties were given the opportunity to state their views. The BCRD transposition to some extent is overlapping with provisions under the *Electronic Communications Law* regarding the regulation of ducts. To avoid any misunderstanding, there is a link in the law transposing the BCRD with the provisions under the *Electronic Communication Law*.

In **Portugal**, symmetric regulation of access to civil infrastructures and in-building vertical infrastructure is imposed through the decree-Law nr. 123/2009 of 21 May, amended by Decree-Law no. 92/2017, of 31 July, which transposed the BCRD. Thus, symmetric obligations imposed under DL123 cover both horizontal (e.g. ducts, chambers/manholes, poles) and vertical (in-building) infrastructure. Regarding in-building infrastructure, the NRA (ANACOM) detailed the regulation (technical rules) through the publication of an ITED Manual. Symmetric access to optical fibre is not imposed in Portugal. ANACOM has not yet published any decision based on the BCRD in relation to deployment of NGA networks.

In **Serbia**, *Article 51 of the Law on Electronic Communications* entitles operators under certain circumstances to request shared use (including physical co-location) of network elements and associated facilities of another operator or a third party. This does not stem from the regulatory framework. The Article states that the operator shall make an agreement with another operator or a third party, holder of the right for the use of network elements, associated facilities and other property, which shall regulate in detail the mutual rights and obligations concerning shared use. In case no agreement can be reached, the NRA (RATEL) can be called upon for a decision. RATEL has not yet imposed any obligation in relation to the deployment of NGA networks.

4.2.4 Additional national legislation (i.e. other than symmetric obligations) to foster NGA deployment

20 NRAs stated that there is one or more legislative/regulatory measure other than Article 12 (3) FD in place that addresses obstacles/challenges in the context of deploying NGA infrastructure with a view to promoting/protecting competition. These instruments are discussed in more detail below:

In-house Infrastructure, Co-Investment-Rules, BCRD (other regulations than Article 9)

In **Austria**, the obligation to provide in-house infrastructure in newly built houses is stipulated by the building laws of the federal states. The Austrian Telecoms Act also provides Co-Investment-Rules based on the BCRD. No operator has yet called upon the NRA for a decision on co-investment.

In **Bulgaria** national legislation stipulates obligations for new housing developments and commercial co-investment agreements stemming from the BCRD.

In **France**, national legislation provides a framework for tenant/landlord/operator relationships to foster FTTH roll out. All new housing buildings must be pre-equipped with FTTH. FTTH lines inside multi-dwelling buildings are subject to a convention (Arcep has provided a template) between the operator that sets the realization conditions for set-up, management, maintenance and renewal operations. In addition, tenants have a right to ultra-fast broadband.

In **Germany**, regarding new housing developments and rights of access to facilities of properties, the Telecoms Act foresees that newly built houses as well as houses which undergo extensive renovation have to be equipped with high speed ready passive physical in-house infrastructure and an access point to such infrastructure. This provision does not apply to single dwelling units, historical buildings, cottages, military buildings and buildings used for national security purposes.

In **Spain**, national law from 2011 has required that all new housing developments must incorporate the infrastructure that is necessary to facilitate the deployment of NGA access networks within buildings. This regulation is a continuation of the regulation that has been in force in Spain since 1998, and according to which, the civil infrastructure available inside new housing developments had to be adapted to ensure the provision by several operators of broadband and fixed telephony services.

Wayleave rights / rights of way

The **Austrian Telecoms Act 2003** provides for wayleave rights over both private and public property, including the erection of in-house infrastructure. The NRA (RTR/TKK) can be called upon for dispute settlement by any concerned party (e.g. operator, property-owner).

In **Bulgaria**, national legislation in implementing the BCRD stipulates rights of access to facilities of property as well as right of special use under the *Roads Act*.

SMP-related measures

The following seven NRAs mentioned SMP-related measures to foster NGA-deployment:

In **Austria**, SMP-decisions of July 2017 by the NRA (TKK) concerning markets 3a and 3b, the incumbent A1 is obliged to negotiate with OLOs on reasonable request about co-investments (“*Planungsrunden*”) and to grant access to *Virtual Unbundled Local and Regional Access* over FTTC/B/H.

In **Finland**, in accordance with 21 SMP decisions in 2018, the NRA (Ficora) mandated access to fibre (local loops) based on SMP-regulation according to the *Information Security Code (917/2014)*.

In **France**, Orange has been designated as having SMP since 2004 for the physical infrastructure used for very high-speed broadband (ducts, poles, chambers, manholes). Duct and poles access have therefore been mandated as remedies for the deployment of optical local loops. Access to Orange’s civil works infrastructures (inherited from its former monopoly and not replicable) is granted on a transparent, non-discriminatory and cost-oriented basis.

In **Germany**, the NRA (BNetzA) has to take into account commercial agreements between SMP operators and access seekers when deciding which obligations need to be imposed on SMP-operators to reach regulatory goals. However, this provision does not apply exclusively to the deployment of NGA infrastructures and it has not yet been applied.

In **Malta**, the NRA (MCA) imposed ex-ante SMP-based regulatory obligations on GO that provides access seekers with access to GO’s FTTH access network infrastructure on a wholesale basis.

In **Norway**, in order to promote competition in NGA-infrastructure, the NRA (NKOM) proposed in a draft Market 3a decision to have an access obligation on the SMP-operator, both on homes-passed and homes-connected in the fibre segment.

In the **United Kingdom**, the NRA (Ofcom) has for some time imposed a duct and pole access obligation with respect to Market 3a that has most recently been re-imposed with greater degree of specification on the terms and conditions of access⁴¹. The terms of access require the primary purpose of the access request to be for the provision of Market 3a services but Market 4 services can also be offered in association.

Other Measures

The **Czech Republic** is gradually implementing the *Action plan for the non-subsidy support of NGA roll-out*, which is to tackle the obstacles identified by market players – it contains several measures on how to reduce costs and the administrative burden of NGA roll-out. This includes the revision of spectrum policy (regarding the fees for relevant frequency range allocation and extension of channel width in relevant bands), taxation matters and fees, infrastructure sharing, suspension line installation, and guidelines to building authorities regarding NGA roll-out.

In **Finland**, access is obligatory to subsidised communications networks based on *The Broadband Construction Aid Act (1186/2009)*. This has been applied and the NRA (Ficora) has given over 100 decisions with access remedies already in force.

⁴¹ <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review>

5. TECHNICAL and Economic Replicability

5.1 Key Messages

Since the report on symmetric regulation that was published last year, there seems to have been a wider use by NRAs of their powers arising from the transposition of the BCRD to impose symmetric obligations. This is consistent with the analysis undertaken by the NGN EWG in their report on pricing for access to infrastructure and civil works and it is perhaps unsurprising given how recently the BCRD has been transposed (it had to be adopted into national legislation by January 1st 2016 and to be applied by July 1st 2016).

In response to the questionnaire, of 33 NRAs that responded to questions about symmetric regulation, NRAs representing nine MSs have responded that they had imposed symmetric regulation and related obligations. Of these, NRAs from three MSs have not used Article 12(3) (DE, HU, ES) while NRAs from six MSs (CY, HR, EL, FR, IT, PL) have applied Article 12(3) FD. In all cases, symmetric regulation has been applied for the purposes of access to physical infrastructure for the purposes of NGA deployment.

In Poland, underlying national legislation provides CPs with rights of access to buildings for the purposes of both using existing infrastructure and deploying/using new infrastructure, and as a result, although technical and economic analysis can be undertaken on a case by case basis, there has been no requirement for an assessment strictly on the basis of Article 12(3).

A structured assessment of economic and technical replicability has been undertaken in only three MSs – France, Italy and Croatia. The limited use of technical and economic assessments under Article 12(3) stems mainly from the use of alternative regulatory and legislative tools to impose symmetric regulation such as planning rules providing access to buildings, and the BCRD and national legislation to facilitate infrastructure deployment. In a lot of countries, when the BCRD was transposed to national law, aspects of existing legislation that transposed the regulatory framework were often amended. This means that when NRAs invoke their powers to impose symmetric regulation, it is not clear which aspects stem from the regulatory framework, which stems from the BCRD and which stem from other laws designed to accelerate and incentivise infrastructure deployment. It also means that NRAs don't necessarily need to undertake a structured assessment of economic and technical replicability to impose symmetric obligations. Indeed, it does appear that symmetric obligations have multiple sources including the regulatory framework and that NRAs are using Article 12(3) in a more limited and targeted manner (to set access prices and conditions) in conjunction with broader obligations to impose obligations on infrastructure owners to provide fair and reasonable access that stem from the BCRD.

In the three MSs that have used a structured assessment of economic and technical replicability, there are broad similarities in approach. All have assessed technical and economic aspects together. NRAs assess the practicability of alternative infrastructure deployment and if this is deemed impractical, appropriate access and price conditions are imposed. In this respect, the approach is not dissimilar to that for imposing access to physical infrastructure under the SMP framework although the policy objectives and regulatory principles are less prescriptive.

The technical assessment focuses on constraints in accessing in-building wiring and ducts whereas economic assessment focuses on the supply side and demand parameters that determine the commercial viability of deploying alternative infrastructure. Among the factors that were assessed to determine replicability were:

- supply side parameters such as deployment/upgrade costs depending on the density of the geotype;
- demand side parameters such as take-up rates of high capacity services and the (incremental) prices that consumers would be prepared to pay;
- market structure parameters such as retail operators' eagerness for certain types of wholesale access products (e.g. in France, passive access for FTTH) and a general assessment of potential competition development on the national market;
- for a new network, new services that would emerge to run on top of it were important factors in determining the replicability of networks as well as determining access prices that did not undermine investment;
- the availability of space to deploy fibre in existing buildings and the lack of space in existing ducts;
- denial of access and administrative delays by landlords as well as difficulties to access private and public land for local access;
- planning rule restrictions that prohibit low cost deployment options such as deploying cable/wiring to the outside of buildings;
- the attainable speeds of alternative NGA technologies when compared to FTTH/B.

The interaction with the BCRD seems to be a key factor that determines the degree to which NRAs use Article 12 of the FD. The reports by the NGN EWG (Next Generation Networks Expert Working Group) in 2017 and 2018 showed that NRAs were the appointed DSBs (dispute settlement bodies) in most countries and that in 14 countries (AT, BG, CY, DK, FI, DE, HU, IT, PL, PT, RO, SI, SE, UK), the law goes beyond a mere transposition of the BCRD and that guidance on pricing going beyond mentioning "fair and reasonable" is included.

The NGN report also indicates that for about half of respondents, a well-functioning access regime to physical infrastructure was already in place before the transposition of the BCRD (either asymmetric remedies imposed under the SMP framework or symmetric obligations that were applied using the regulatory framework or through national law) – this enabled the previously applied access rules and prices to be applied for access under the BCRD. This confirms the finding from the report on symmetric obligations that was prepared in 2017 in which NRAs reported that whereas the BCRD provided broad powers to impose access to physical infrastructure, symmetric and asymmetric remedies that were imposed using powers from the regulatory framework or through national law have been used to impose targeted and deeper remedies (including access prices and conditions via a reference offer) and that the BCRD is viewed by NRAs as legislation that can use these precedents when setting prices and access conditions using the BCRD.

5.2 Country Cases

In **France**, FTTH rollout was starting in 2006 and there were uncertainties about both costs associated with deployment and expected take-up. Consequently, the NRA (ARCEP) carried

out public consultations in 2008, 2009 and 2010. A law was passed in 2008 which imposed symmetric regulation, based on Article 12 FD, and ARCEP set out the technical and economic access conditions both within the very high-density (metropolitan) areas and outside of them, (virtually nationwide (99,9 % of the territory)) where the supply side economics required infrastructure sharing between operators.

Its framework for determining the concentration point for electronic communication service providers where passive access to the network shall be granted to access seekers was based on density criteria. The aim was to ensure – regarding the density – a sufficient concentration of lines at the access point to make access economically viable for generic access seekers to ensure long term competition on the market. In the most densely populated areas (covering 6.4M homes or office units), the access point is generally located at the basement of the building. In the less dense areas (covering 30M homes or office units), the access point is outside buildings at a level that provides access to a total of at least 1,000 dwellings and professional premises. Assessing access conditions for a generic operator ensures that it is not only one single operator that can afford to replicate the network segments necessary to access the shared network segment - this allows for a competitive market to develop (and not only a duopoly).

The assessment focused mostly on the supply side and took account of the high cost of deploying optic fibre from the street to inside buildings as well as significant saturation issues to access the SMP operator's civil engineering infrastructure. When assessing technical/economic replicability, ARCEP had to estimate the supply side and demand side NGA parameters of NGA deployment/upgrade when there was very little precedence in Europe of scale NGA deployment. Determining costs, take-up and prices that consumers would be prepared to pay for a new network and for new services that would emerge to run on top of it were important factors in determining the replicability of networks as well as determining access prices that did not undermine investment. ARCEP consequently carried out multiple public consultations to eventually build a market consensus to set France's symmetric framework. The four main retail players called for ensuring a passive access to the FTTH networks so that their NGA active layer was not subject to regulatory obligations. Given the granting of passive access, the aggregation of lines at the access point was identified as the key factor that would ensure the effectiveness of such a passive access regulatory approach. The process was empirical, building on the economics and the reach of LLU.

Currently, there are over seventy operators that are regulated under the symmetric framework ranging from those operating on a national basis (Free, Orange, SFR) to local public initiative networks, most of the latter having been funded under the Government national scheme "plan France Très Haut Débit".

In **Italy**, symmetric access obligations were applied using powers from the regulatory framework (Art 12 FD, Art 5 AD). The economic replicability assessment focused on the supply side of the market. Similar to the situation in France, the NRA in Italy (AGCOM) considered the demand uncertainty of NGA broadband services as well as the high unit costs for deploying fibre in low density areas as factors that make fibre deployment through alternative infrastructure economically unfeasible. AGCOM also considered the lack of space to deploy fibre in existing buildings and the lack of space in existing ducts as factors that presented technical replicability barriers. Moreover, despite the existence of national law that obliges

landlords of buildings to accept reasonable requests for the deployment of fibre infrastructure, in practice, denial of access and administrative delays by landlords as well as difficulties to access private and public land for the local access aspect of NGA infrastructure were considered as to be pertinent factors for the assessment of replicability of NGA infrastructure.

In **Poland**, the same part of national legislation was used to transpose aspects of the BCRD and the regulatory framework that concern in-building access - symmetric obligations have been imposed based on both Article 9 of the BCRD and Article 12(3) of the FD. The underlying legislation provides communication providers with rights of access to buildings for the purposes of both using existing infrastructure and deploying/using new infrastructure. The economic and technical replicability assessment is done on a case by case basis and has been applied only for the purposes of NGA access.

Formal assessments of economic and technical replicability have been undertaken on a structural evaluation of replicability based on supply side, demand side and operational criteria. For the purposes of in-building wiring, the legislation that provides CPs with rights of access means that all requests have to be granted and in the case of disputes that the NRA has to resolve, the granting of access is almost always granted as the purpose of the legislation is to encourage access seekers to consider accessing existing infrastructure before considering accessing land/property for the purposes of new infrastructure deployment. As a result, technical and economic replicability is mostly something that the NRA has not had the need to assess.

In **Croatia**, symmetric regulation based on Article 12 FD has been imposed by the NRA (HAKOM) - the transposed legislation defines rights and conditions of access as well as the sharing of electronic communication infrastructure and associated facilities. Art 12(3) FD has been used to enable access to passive infrastructure for the purposes of deploying NGA infrastructure. HAKOM considers issues such as denial/difficulties of access to buildings/land as well as planning rules restrictions that prohibit low cost deployment options such as deploying cable/wiring to the outside of buildings as factors in its technical replicability assessment. For economic factors, it considers cost model parameters such as NGA deployment/upgrade costs as well as the forecast take-up of NGA services and the incremental revenue from users. HAKOM also takes into consideration the attainable speeds of alternative NGA technologies when compared to FTTH/B when determining its technical replicability assessment.

6. Glossary

AD	Access Directive
API	Application Programming interface
BCRD	Broadband Cost Reduction Directive
BSA	Bitstream access
CP	Communication Provider
EC	European Commission
ECC	Electronic Communication Code
ECN	Electronic Communication Network
ECS	Electronic Communication Service
EPG	Electronic Program Guide
FD	Framework Directive
FTTB	Fibre to the building
FTTC	Fibre to the curb
FTTH	Fibre to the home
MDF	Main Distribution Frame
MDU	Multiple Dwelling Unit
NGA	Next Generation Access
NRA	National Regulatory Agency
PIN	Public Initiative Network
SMP	Significant Market Power
USD	Universal Service Directive
VULA	Virtual Unbundled Local Access

7. Annexes

7.1 NRA Respondents

List of respondents to the questionnaire			
1	RTR	AT	Austria
2	BIPT	BE	Belgium
3	CRC	BG	Bulgaria
4	HAKOM	HR	Croatia
5	OCECPR	CY	Cyprus
6	CTU	CZ	Czech Republic
7	DBA	DK	Denmark
8	ETRA	EE	Estonia
9	FICORA	FI	Finland
10	ARCEP	FR	France
11	BNETZA	DE	Germany
12	EETT	EL	Greece
13	NMHH	HU	Hungary
14	PTA	IS	Iceland
15	ComReg	IE	Ireland
16	AGCOM	IT	Italy
17	SPRK	LV	Latvia
18	LLV	LI	Liechtenstein
19	RRT	LT	Lithuania
20	ILR	LU	Luxembourg
21	MCA	MT	Malta
22	ACM	NL	Netherlands
23	NKOM	NO	Norway
24	UKE	PL	Poland
25	ANACOM	PT	Portugal
26	ANCOM	RO	Romania
27	RATEL	RS	Serbia
28	RU	SK	Slovakia
29	AKOS	SI	Slovenia
30	CNMC	ES	Spain
31	PTS	SE	Sweden
32	BAKOM	CH	Switzerland
33	OFCOM	UK	United Kingdom

7.2 Questionnaire sent to NRAs

Remedies EWG: Benchmarking on technical and economic replicability assessment in the context of symmetric access

Questionnaire to NRAs

In accordance with the BEREC 2018 Work Programme, BoR_17_238 (par. 1.4), the REM EWG is working towards producing a report for CN4/P4 2018 which will set out how National Regulatory Authorities (NRAs) have assessed technical and economic replicability in the context of considering symmetric regulation. The EWG has prepared a survey, with the aim of understanding:

- NRA experience of assessing technical or economic replicability.
- How, and under which circumstances assessments have been applied.
- Any problems/issues encountered when applying these assessments
- Areas in which NRAs feel they might benefit from further guidance

The information and data you will provide will be analysed by the group's drafters and the report prepared will be adopted as a public report.

Section A aims to gain a high-level understanding of the market structure and market context within each member State. Some of this information might be the same as was provided in the response to the questionnaire on symmetric regulation that was sent out in Q4 2016. However, as the Broadband Cost Reduction Directive had only been recently transposed in many Member States when the previous questionnaire was sent out, the question is being asked again to ensure this report reflects the latest developments.

Section B aims to gain a more detailed understanding of your experience of imposing symmetric obligations and in particular how the assessment of technical and economic replicability was undertaken.

Please indicate in your response any details that are confidential and therefore not to be included in the final public report.

SECTION A

The purpose of section A is to gather a high-level understanding of the NGA market structure within each Member State. This will not lead to any comparative analysis of demand/supply side characteristics but is intended to provide some context for the imposition of symmetric regulation.

The questions below make reference to homes/households passed and take-up of services. For the avoidance of doubt, homes/households passed refers to homes/households that have NGA infrastructure deployed on the street on which the homes/households are located as well as instances in which the NGA infrastructure extends from the street into individual properties. Take-up refers to homes/households that subscribe to a service that is delivered over NGA infrastructure. Homes/households refers to any type of residential dwelling unit.

Question A1:

To the extent that the SMP provider and / or other providers in your market have deployed FTTC/VDSL, FTTH/B and/or HFC/DOCSIS 3.0/3.1 (using their own infrastructure), can you provide the coverage (% of homes/households passed but not necessarily taking NGA service) for each of:

- The SMP operator
- The cable operator using a HFC network architecture
- Other competing operators (in aggregate, but indicate the number of operators)

By coverage we mean homes/households that have NGA infrastructure deployed on the street on which the homes/households are located as well as instances in which the NGA infrastructure extends from the street into individual properties but which might not necessarily be taking or subscribing to NGA service. If there are multiple local SMP providers in your market or multiple cable operators or multiple other competing operators, please answer the question for the totality of these operators.

Network coverage by technology, by operator type (latest data available). Please specify the year that the data refers to.

	SMP operator	Cable operator	Other competing operators
FTTC/VDSL (excluding cable operators)			
HFC/DOCSIS 3.0			
FTTH/B			

Question A2:

If you have non-SMP FTTH/B and/or HFC/DOCSIS 3.0/3.1 networks/operators in your market (scale networks/operators), it would be helpful if you could provide additional detail on the largest of these (top 3 or 4 if applicable) ranked by coverage (percentage of all homes/households passed) and insert an X against the statement that applies in terms of their mass-market NGA network coverage (including only own-build FTTH/B and/or HFC/DOCSIS 3.0/3.1). By coverage we mean homes/households passed, i.e. that have NGA infrastructure deployed on the street on which the homes/households are located as well as instances in which the NGA infrastructure extends from the street into individual properties but which might not necessarily be taking or subscribing to NGA service. If you do not have the precise coverage percentage, please tick the "other" box and provide an alternative description.

The provider(s) below has / have deployed FTTH/B to:

Operator name/type	Operator A	Operator B	Operator C
Statement applying to each NGA operator (e.g. commercially funded national presence, cable operator, regional/municipality operator, etc)			
a limited extent (probably less than 20% of homes/households)			
to a reasonable extent (probably 20-50% of homes/households)			
To a significant extent (>50% of homes/households)			
To some extent but unsure of precise coverage			

If you are unable to answer question A2 or would like to provide additional information in relation to your response to A2, please provide further comments in the text box below.

Question A3:

We wish to identify the extent to which NGA network operators in your market rely on own build versus access to others' civil infrastructure for the deployment of the mass-market NGA networks. For each of the categories of NGA operator(s) (SMP and non-SMP), please insert an X against the statement that applies to your market. You can enter Xs in more than one box per operator if that is appropriate. **We are only interested in the infrastructure used for the local access segment (including in-building wiring).** Please also use the text box to provide any further details as appropriate. If you wish to fill in this table for more than one non-SMP operator (rather than answer the question for the aggregate of all non-SMP operators), please add additional columns to the table below and label these operators as A, B, C etc.

<i>Operator name</i>	e.g. Operator A	e.g. Operator B	Operator C	Operator D
Operator type	SMP operator	Alternative operator	Alternative operator	Regional or municipality funded provider
Use SMP provider's civil infrastructure				
Use own build civil infrastructure				
Use other (non SMP) operator's civil infrastructure				
Use other non-telco utilities' infrastructure				
Use a mix of own build and SMP provider's civil infrastructure				
Use a mix of own build/SMP/other				
Do not use civil infrastructure				
Unsure what infrastructure they use				

Please provide comments relating to your answers above using the text box below.

SECTION B:

We would like to understand your experience of symmetric regulation or obligations in relation to NGA deployment (access to fibre and / or access to civil infrastructure). Although symmetric regulation based on the Broadband Cost Reduction Directive (BCRD) is not in the scope of this project, some of the questions do seek to clarify the powers that have been used to impose symmetric regulation with a view to better understand why NRAs have used the powers or mix of powers that they have used to apply symmetric regulation. When answering the following questions, it would be useful if respondents could provide links to any public documents related to the following questions.

Legal aspects**Question B1:**

Have you imposed symmetric regulation and related obligations on any provider in relation to the deployment of NGA networks (e.g. access to fibre and / or civil infrastructure)? Please insert an X against the statement that applies to you. **Please only insert one X.**

Yes, have imposed under national regulation other than the transposition of the regulatory framework or the Broadband Cost Reduction Directive (BCRD)	
Yes, have imposed using powers from the regulatory framework (Article 5 AD, Article 12 FD)	
Yes, have imposed using powers from the BCRD	
Yes, have imposed under both national regulation and using powers from the regulatory framework	
No have not imposed	
Considered / tried to impose but decision was set aside (e.g. by the Court) or was put in abeyance to emergence of commercial developments	
Have not imposed but have seriously considered / currently considering.	
Other	

Please provide further reasoning in the text box below:

Question B2:

Referring to your answer to Question B1, please provide any further details on the powers you have used to impose symmetric regulation in the context of ECS (i.e. Article 5 AD, Article 12 FD, BCRD, other, a mix of powers)?

Question B3:

If symmetric obligations were imposed or preparatory regulatory analysis undertaken with a view to impose symmetric obligations based on Article 12 of the Framework Directive, were symmetric obligations also based on national law? Please provide details below (including details of any differences in the application of symmetric obligations that emanate from the regulatory framework versus those that emanate from other legislative powers).

Question B4:

In the context of deploying NGA infrastructure with a view to promoting/protecting competition, did you decide to address obstacles/challenges through other parts of the regulatory framework (other than Article 12 FD) or through other legislative/regulatory means? For example, obligations for new housing developments, rights of access to facilities of property, commercial co-investment agreements?

Remedies

Question B5:

What is the nature of the symmetric obligation (remedies) you have imposed (by National Law and / or NRA regulation) on networks? Please insert an X against the statement that applies to you (more than one X possible).

Access to civil infrastructure (i.e. ducts, poles and chambers)	
Access to dark fibre	
Access to active remedies such as Layer 2 / Layer 3 bitstream	
Other (please explain)	

Please provide further details below, including also whether the symmetric obligations (imposed by National Law and / or NRA regulation) vary by type of geography (e.g. urban / rural) and whether some of the measures (i.e. access to civil infrastructure) were implemented as an SMP obligation on the incumbent only.

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Question B6:

What is the scope of the symmetric obligations (imposed by National Law and / or NRA regulation) regarding the part of the network they apply to? Please insert an X against the statement(s) that apply to your situation. (more than one X possible).

Symmetric obligation (by National Law and / or NRA regulation) is imposed in relation to:

In-building wiring	
Local access segment	
Backhaul segment	
Other	

Please provide further details below, including also whether the symmetric obligations vary by type of geography (e.g. urban / rural).

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Question B7:

Do you specify the terms of symmetric access (i.e. price and terms of the product) ex ante and if so what are the specific symmetric obligations / pricing etc.)? If not how are these set? Please insert X against the statement(s) that apply to you (multiple Xs possible).

Symmetric pricing is set ex-ante under the regulatory framework	
Symmetric pricing is set ex-ante by other mechanism (e.g. National Law)	
Symmetric pricing is set ex-post based on dispute resolution (e.g. BCRD)	
(non-price) terms of product set ex-ante under the regulatory framework	
(non-price) terms of product set ex-ante by other mechanism	
(non-price) terms of product set ex-post based on dispute resolution	

Please provide further details / comments in the text box below.

Question B8:

Which are the obligations you have imposed? Please insert an X against the statement that applies to you (more than one X possible). If you wish to fill in this table for more operators than these, please add additional columns to the table below.

	Alternative ECS operator	Cable operator	Other
Access and use of network elements			
Transparency			
Non-discrimination			
Price control			
Cost accounting			
Accounting separation			

Please provide further details / comments in the text box below, including a synopsis of the competitive problems addressed.

Assessment framework – applying FD 12 (3)

Question B9:

If Article 12(3) of the Framework Directive was invoked to impose symmetric regulations (irrespective of whether it was accompanied by additional measures based on the BCRD or national law), can you provide a synopsis of the analysis that was used to assess economic or technical replicability?

Please specify whether the analysis applied to the economic/technical replicability of passive infrastructure or active elements or both.

Question B9(a):

If the assessment was applied to economic replicability, can you elaborate whether the assessment encompassed both demand and supply side analysis? How did you incorporate technical developments or business models that might reduce the cost of deployment or the potential emergence of new applications/services that might increase revenue per connection or connections per passed homes/households?

Question B9(b):

If the assessment was applied to technical replicability, can you elaborate whether the assessment included a consideration of accessing land or facilities or property in which third parties would not allow the deployment of ECN infrastructure?

Assessment framework – challenges/issues

Question B10:

When assessing economic/technical replicability of the network infrastructure for the purposes of symmetric regulation, have these assessments been applied in the context of anything other than NGA access (i.e. other communications services or legacy network access)? If so, can you provide details and any links to relevant public documents?

Question B11:

What other problems/issues did you encounter when assessing technical/economic replicability? For example, did you face legal issues/challenges that questioned the issues/factors listed below (irrespective of whether symmetric measures were subsequently imposed) that were included in your analysis to assess economic/technical replicability?

- Denial/difficulties of access to buildings from landlords of buildings
- Denial/difficulties of access to private or public land/properties for local access
- Planning rules/regulations that prohibit low cost deployment options (e.g. deploying cabling/wiring to the outside of buildings)
- Cost model parameters and approach that modelled the costs of NGA deployment/upgrade
- Demand side parameters that estimated the take-up of NGA services and/or the (incremental or total) revenue per user from NGA enabled services
- Estimates of the technical capabilities of alternative NGA technologies to FTTP/B regarding attainable download/upload speeds
- Other

Please provide additional comments relating to your answers above using the text box below.

Question B12:

In light of the response to the previous question, what aspects of assessing technical/economic replicability would benefit from greater guidance or from established best practices?

Procedural aspects

Question B13:

Please state whether proposed symmetric measures were submitted to public consultation, comments by the National Competition Authority and / or the EC? Can you provide a brief synopsis of the main comments received regarding the imposition of a symmetric framework and if relevant, provide a link to any public documents?

END OF QUESTIONNAIRE