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PART 2/2

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT REPORT

Accompanying the document

Proposal for a Regulation

of the European Parliament and of the Council on measures to reduce the cost of deploying gigabit electronic communications networks and repealing Directive 2014/61/EU (Gigabit Infrastructure Act)

{COM(2023) 94 final} - {SEC(2023) 96 final} - {SWD(2023) 47 final}

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GLOSSARY

Term or acronym	Meaning or definition
5G	Next generation (5th) of wireless/mobile technologies
B2B	Business to business
BCO	Broadband Competence Offices
BCRD	Broadband Cost Reduction Directive
BEREC	Body of European Regulators for Electronic Communications
COCOM	Communications Committee
DESI	Digital Economy and Society Index
DSB	Dispute Settlement Body
ECN	Electronic Communications Networks
EECC	European Electronic Communications Code
EMF	Electromagnetic Field
ERDF	European Regional and Development Fund
FTE	Full-Time Equivalent
FTT C/H/B	Fibre To the Cabinet/Home/Building
FWA	Fixed Wireless Access
LTE	Long-Term Evolution
NGA	Next Generation Access
NRA	(Telecommunications) National Regulatory Authorities
P2P	Point to Point
REFIT	Regulatory Fitness and Performance Programme
RoW	Rights of Way
SAWAP	Small area wireless access points
SMP	Significant Market Power
RRF	Recovery and Resilience Facility
VDSL	Very high-speed digital subscriber line
VHCN	Very High Capacity Networks

1.1 INTRODUCTION

1.2 Purpose of the evaluation

The review of the Broadband Cost Reduction Directive[1] (**BCRD** or **the Directive**) is one of the actions announced in the Commission's Communication 'Shaping Europe's Digital Future'[2] as part of the initiatives which would contribute to achieving the aim that "technology works for people".

It aims to assess the appropriateness of the current rules and whether they have contributed to the objective of lowering the cost of deployment of (fixed and mobile) high-speed electronic communications networks ("ECN")[3].

Different to other legislative tools that are part of the regulatory framework for electronic communications, the Directive imposes obligations on undertakings present in other network industries (namely gas, electricity, heating, sewage, water and transport) owning physical infrastructure suitable to host ECN elements as well as on electronic communication providers irrespectively of whether they hold significant market power ("SMP").

This evaluation constitutes the basis for the impact assessment of a potential revised legislative instrument, in a back-to-back process. The revised instrument should address the identified shortcomings and match the objectives of 2018 European Electronic Communications Code (**the Code** or **EECC**)[4], which improve regulatory conditions, incentivise private investments and promote connectivity and access to, and take-up of, very high capacity networks (**VHCN**)[5] by all EU citizens and businesses, as well as the new ambition set out in the Digital Compass Communication[6] and the 2030 Policy Programme "Path to the Digital Decade"[7], which provide that by 2030 all European households should be covered by a Gigabit network and all populated areas covered by 5G networks.

1.3 Scope of the evaluation

The evaluation concerns a single legislative instrument: the Broadband Cost Reduction Directive and covers all Member States during the period from the start of the application period (1 July 2016 for most provisions) until approximately mid-2021.

[1] COM 2014/61/EU
[2] COM(2020)67 final
[3] High-speed electronic communications networks are defined as electronic communications networks which are capable of delivering broadband access services at speeds of at least 30 Mbps
[4] Directive (EU) 2018/1972
[5] According to Article 2(2) of the EECC, very high capacity network' means either an electronic communications network which consists wholly of optical fibre elements at least up to the distribution point at the serving location, or an electronic communications network which is capable of delivering, under usual peak-time conditions, similar network performance in terms of available downlink and uplink bandwidth, resilience, error-related parameters, and latency and its variation; network performance can be considered. similar regardless of whether the end-user experience varies due to the inherently different characteristics of the medium by which the network ultimately connects with the network termination point;
[6] COM/2011/118 final
[7] COM(2021) 574 final

This report relies on an independent support study[8] carried out by a consortium of external contractors and on the feedback received through the consultations on the roadmap/inception impact assessment (June 2020) and on the Directive review (December 2020- March 2021), Commission workshops (January and February 2021) and the opinion of the Body of European Regulators for electronic communications (**BEREC**) of March 2021[9].

The Directive does not contain a legal obligation to review the functioning of this piece of legislation but it requires that the Commission reports on its implementation to the European Parliament and the Council by 1 July 2018. The **2018 Commission's report on the implementation of the Directive[10]** concluded that the Directive was transposed with significant delays in most Member States. The report also revealed an inconsistent implementation across the EU and persisting inefficiencies, which hinder the potential impact of cost reduction measures to foster a more efficient and faster deployment of electronic communications networks across the EU, and which would call for a review. The report also presented a number of recommendations in order to maximise its effective implementation.

Moreover, the existing instrument requires a review in light of the technological, market and regulatory developments since its adoption in 2014, notably the recent paradigm shift in terms of connectivity needs revealed by the COVID pandemic and reflected in the 2030 Digital Decade targets set out in the Digital Decade Compass Communication and the 2030 Policy Programme "Path to the Digital Decade", all of which calls for fostering a more efficient and faster deployment of Gigabit networks.

2 BACKGROUND TO THE INTERVENTION

2.1 Description of the intervention and its objectives

The Directive was adopted on 15 May 2014 in the context of the targets set in the 2010 **Digital Agenda for Europe**[11]. The objective of the Directive is to facilitate and incentivise the roll-out of high-speed electronic communications networks (**general objective - GO**) by promoting the joint use of existing physical infrastructure (**specific objective - SO1**) and lowering the costs of deployment (**specific objective – SO2**)

The key challenges the Directive seeks to address are related to:

1) inefficiencies (e.g. high sunk costs generated by civil engineering works[12] – e.g. for digging, ducting etc.) or bottlenecks (e.g. lack of information on and access to existing) concerning the use of existing physical infrastructure (such as, for example, ducts, conduits, manholes, cabinets, poles, masts, antennae, towers and other supporting constructions);
2) bottlenecks related to co-deployment (lack of information on and access to planned civil works);

[8] ICF, WIK & EcoAct study ("support study")

[9] https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/9887-berec-opinion-on-the-revision-of-the-broadband-cost-reduction-directive

[10] COM(2018) 492

[11] COM(2010)245; Bringing basic broadband to all Europeans by 2013 and ensuring that by 2020 all Europeans have access to internet speeds above 30Mpbs and at least 50% of households in the EU subscriber to internet connections above 100Mbps.

[12] The highest cost (up to 80%) in deploying new networks was (and still is) linked to civil engineering.

3) inefficiencies regarding administrative permit granting (diversity and complexity of permit granting procedures) and
4) bottlenecks concerning in-building deployment.

These bottlenecks and inefficiencies led to high costs and heavy administrative burdens for undertakings wishing to deploy networks.

Therefore the **operational objectives (OP)** of the Directive were as follows:

1) **increasing the use of existing passive infrastructure suitable for broadband rollout (OP1)**, by achieving more transparency concerning this infrastructure, as well as a more consistent and effective regulatory regime concerning access to it, regardless of the owner;
2) **increasing cooperation in civil works relevant for broadband rollout through the EU (OP2)**, in particular by ensuring transparency and by increasing legal certainty for cross-sector / cross-utility cooperation;
3) **streamlining the administrative procedures related to network rollout throughout the EU (OP3)**, mainly by increasing the transparency and coordination of the permit granting processes, while ensuring the enforcement of deadlines and
4) **increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it (OP4)**, so as to reduce the costs and burdens associated with retro-fitting.

Pursuant to its legal base, Article 114 TFEU, the Directive intends to improve the functioning of the internal market by increasing the availability of physical infrastructure intended to host elements of ECN and its efficient deployment across the EU.

The Directive provides for minimum harmonization (establishing certain minimum obligations complemented with a number of voluntary ones), allowing Member States some flexibility to reflect national circumstances.

The Directive set up a set of minimum harmonised measures comprising four main pillars (Figure 1): (i) access to existing physical infrastructure, (ii) coordination of planned civil works, (iii) permit granting procedures and (iv) requirements for in-building physical infrastructure for new buildings and major renovations. It also included provisions to ensure transparency of relevant information through Single Information Points (**SIPs**) and dispute resolution mechanisms in case agreements between parties could not be reached as well as laying down penalties for non-compliance.

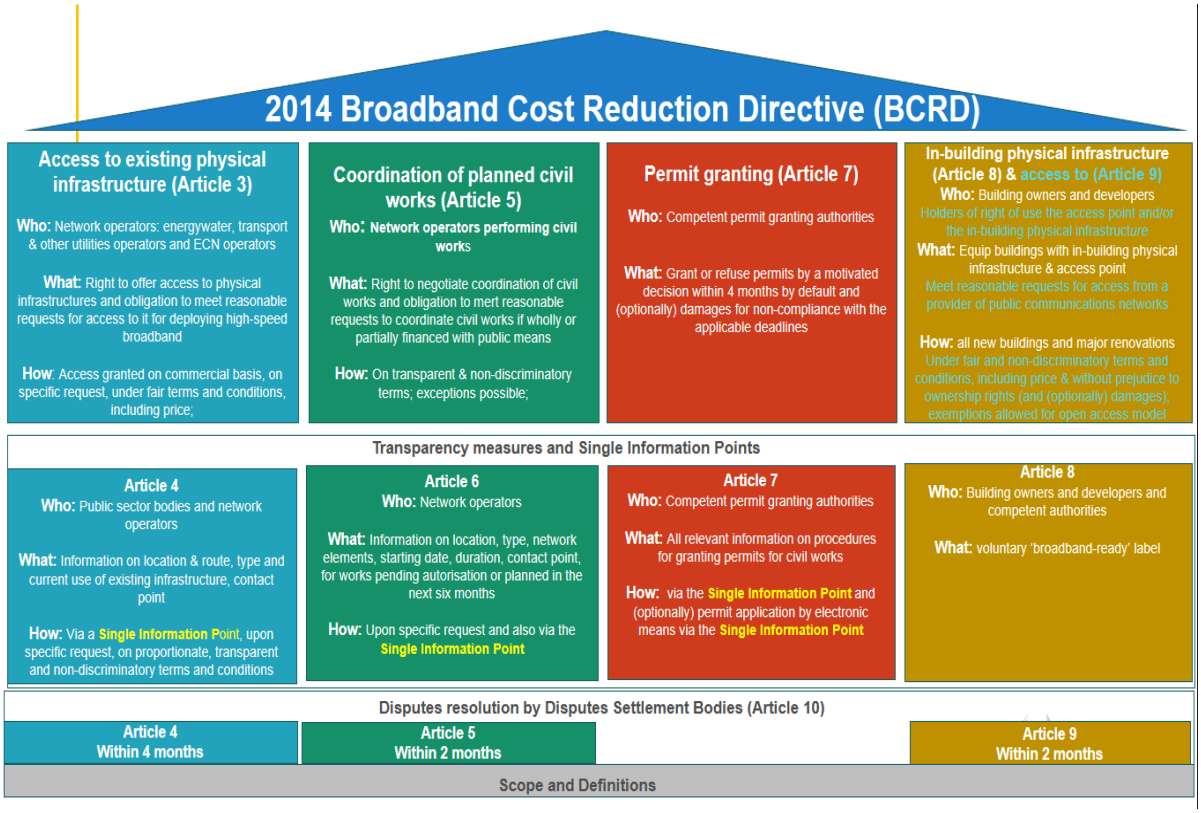

Figure 1: Schematic illustration of current Directive provisions

2.2 Background of the intervention, baseline and points of comparison

Before the Directive entered into force, the operation and provision of ECNs and services in the EU were still highly fragmented along national borders[13]. Such fragmentation represented a challenge for development and growth of European companies - telecom companies, equipment manufacturers, etc. - and an obstacle for operators wanting to reach economies of scale at European level in the face of increasingly global competition.

Prior to the Directive, various Member States had already measures at national or local[14] level aiming to facilitate cross sector network deployment[15], the access to the existing physical infrastructure[16], coordination of civil works[17] or permit granting procedures[18], in-

[13] As shown by the 2010 report on the Single Market A new Strategy for the Single Market, report by Mario Monti to the President of the European Commission, 9 May 2010

[14] For example, since 1990, City of Barcelona (Ajuntament de Barcelona) uses ACEFAT which collects a series of data related to graphic information on the location of company's network and works to be carried out. This information is used to verify projects' feasibility, proactively coordinate with other possible works, inform and consult entities that could be affected by the work, prepare the work permit submitted to the City Council, follow-up of the execution work, facilitate information to engineers and builders about existing networks in the subsoil to avoid accidents and effects on the network.

[15] For example, 2019 DESI telecom chapter for Cyprus shows use of electricity poles by ECN operators, based on commercial terms already in place prior to the transposition of the Directive.

[16] Such as Austria, Belgium, Croatia, Cyprus, Denmark, France, Germany, Italy, Lithuania, the Netherlands, Poland, Portugal, Romania, Slovenia, Spain; However, only a few Member States imposed symmetric obligations concerning duct access (France, Lithuania, Malta, The Netherlands, Portugal) or even fewer across sectors (France, Germany, Lithuania, Portugal). For example, utility poles were already in widespread use in rural areas of Portugal and France before the Directive. Concerning electricity infrastructure, a prominent

building infrastructure[19] or implemented local or central physical infrastructure atlas or infrastructure register[20]. Some of these measures were broader (e.g. more information on existing physical infrastructure) or stricter (e.g. shorter deadlines) than the measures provided by the Directive. However those practices were scarce and dispersed.

Differences in regulatory requirements sometimes prevented cooperation across utilities and raised barriers to entry for new network operators and new business opportunities, hindering the development of a single market for use and deployment of physical infrastructures for high-speed electronic communications networks. ECN operators had reported various difficulties, including: administrative burdens linked to long-lasting and diverse permit granting procedures, high fees for permits and access to physical infrastructure, lack of relevant and adequate information on existing physical infrastructure and planned civil works, lack of electronic procedures for permit granting, difficulties in accessing building infrastructure and legal uncertainty due to lack of clear pricing and cost sharing rules. This resulted overall in a slower, more costly and less efficient deployment of ECNs. The Directive aimed to address these challenges.

The timely deployment of fibre and 5G networks is crucial for European competitiveness and a major enabler for future digital services. Substantial investments[21] at EU, national, regional and local levels are necessary to achieve the ambitious 2030 connectivity targets which would benefit all EU citizens and businesses, a significant portion of which is represented by the cost of civil engineering works. Adding to the current national and EU funding resources, including through the **Recovery and Resilience Facility (RRF)**[22], it is crucial to ensure a reduction of the cost of new network deployments.

In September 2020, the Commission adopted the **Connectivity Toolbox Recommendation**[23] calling on Member States to boost investment in very high-capacity broadband connectivity infrastructure to address the increased connectivity needs which were evidenced by the

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example of a significant cooperation is in France where an electricity network operator reported in a workshop organized by the European Commission in 2014 that 37% of the 550,000km of optical fibre in France had been deployed using its pole infrastructure. Denmark (DESI telecom 2018) also uses a long standing scheme of infrastructure sharing of masts and poles, mainly based on industry agreements and reciprocity. In Latvia (2020 DESI telecom reports) some fibre installation projects in infrastructures were negotiated based on mutual interest before BCRD transposition and the Latvian Electronic Communications Law mandates (2019 DESI telecom report) the sharing of underground cable ducts and manholes since already 2014.

[17] Such as Belgium, Portugal, Slovenia and to a certain extent Sweden; In some Member States (France, Latvia, Malta, Poland, Portugal, Slovenia, Spain) national law provided for some elements of coordination of civil works, in particular in case of works carried out on public roads (Malta, Poland, United Kingdom).

[18] Such as Austria, Cyprus, France, Italy, Poland, Portugal, Slovenia and Spain

[19] For example, standards for in-building infrastructure predate the Directive in France, Spain and Portugal;

[20] Austria, Belgium, Cyprus, Czech Republic, Germany, Denmark, Estonia, Finland, France, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, United Kingdom

[21] According to Commission's Communication 'Shaping Europe's digital future', the EU has an investment gap of EUR 65 billion per year. The Commission's staff working document SWD(2021)247 accompanying the Commission Decision establishing the 2030 Policy Programme "Path to the Digital Decade" COM(2021)574 also shows that there is a considerable consensus among market analysts and experts on this issue, putting the figure on the investments needed for the European Gigabit Society interim targets (by 2025) in the range of EUR 345 to 360 billion for the EU-27, with about one third of this figure potentially coming from already expected private funding, and therefore leaving an investment gap of about EUR 250 billion. (See: Ferrandis-et-al.pdf (econstor.eu))

[22] Member States are planning to invest about EUR 14bn (for 25 endorsed RRF related plans) into connectivity deployment, including for supporting the 5G roll-out, especially in rural areas.

[23] C(2020) 6270 final

COVID 19 pandemic. The aim of the Recommendation was for Member States to develop a Toolbox of best practices for reducing the cost of deploying ECN and for a more efficient access to 5G radio spectrum, therefore partly building on the implementation of some of the Directive provisions. In March 2021, Member States agreed on a Union Toolbox of 39 best practices (22 of them closely linked to the Directive provisions). Shortly after, all Member States provided the Commission with their national roadmaps for the implementation of the Connectivity Toolbox. In April-June 2022 Member States reported on their implementation.

Figure 2 provides a schematic overview of the intervention logic and evaluation criteria, including the needs, problems and issues preceding the Directive, its objectives, the desired outputs and results and impacts. This schematic overview will be used for the evaluation of the Directive in the following sections.

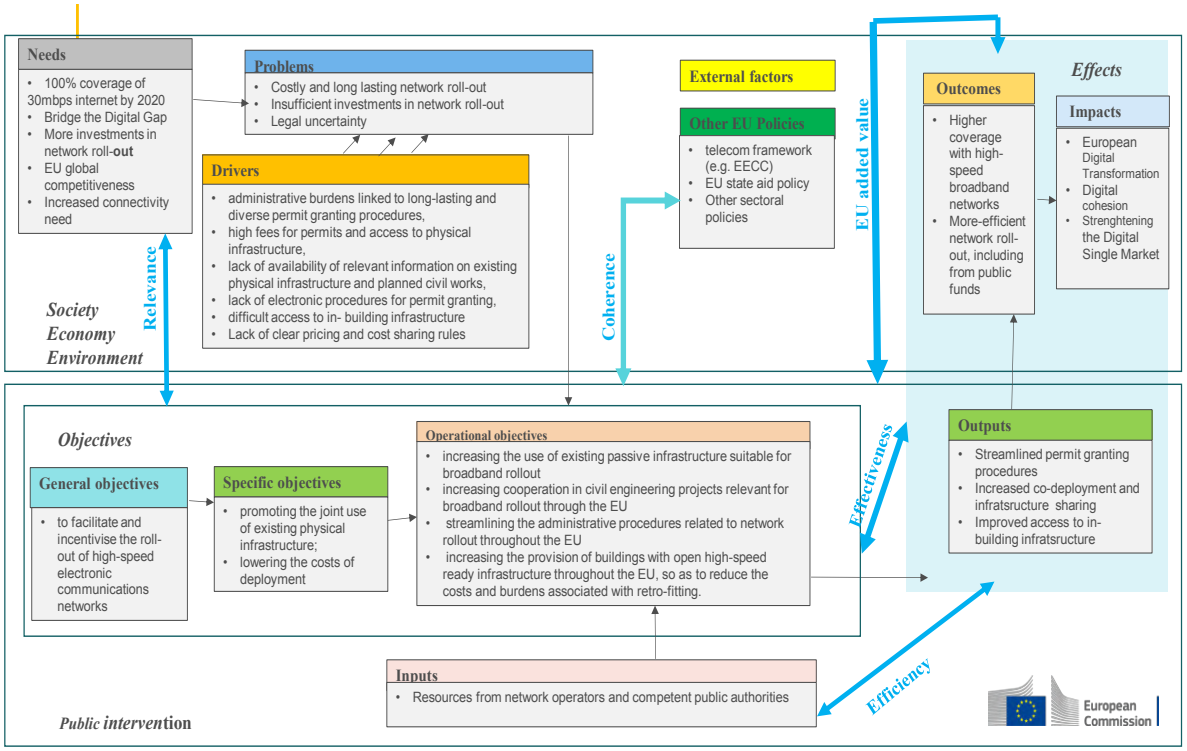

Figure 2: Intervention logic and evaluation criteria

3 IMPLEMENTATION / STATE OF PLAY

3.1 Transposition

The Directive had to be transposed by Member States by 1 January 2016, to become applicable in all Member States from 1 July 2016[24].

All Member States except Italy were late with the transposition, prompting the Commission to send letters of formal notice for non-communication in March 2016. The Commission subsequently sent reasoned opinions to 19 Member States in September 2016. In July 2017, the Commission referred two Member States (Belgium[25] and Slovakia[26]) to the European

[24] The number of transposition measures varies between Member States, from one measure (Germany, Ireland, Cyprus, Italy, Romania) to 16 measures (France, The Netherlands, Lithuania) or even 33 measures (Belgium).
[25] EU case law C-543/17, Commission v Kingdom of Belgium

Court of Justice (**CJEU**) for non-communication of measures transposing the Directive and called on the CJEU to impose daily penalty payments on them from the day of the judgement until national law transposing the Directive was in force. In January 2018, the Commission decided to refer three other Member States (Bulgaria, Slovakia and The Netherlands) to the CJEU and asked for financial penalties to be imposed pursuant to Article 260(3) of the Treaty on the Functioning of the European Union (**TFEU**). However, following notifications on full transposition by those Member States, the Commission closed the case for Slovakia in January 2018, for Bulgaria in May 2018 and for the Netherlands in July 2018. In July 2020, the CJEU declared that the Kingdom of Belgium had failed to fulfil its obligations under Article 13 of the BCRD and ordered the Kingdom of Belgium to pay daily penalties for this failure until it had complied with its obligations. The Kingdom of Belgium complied with the order of the CJEU in 2020.

On 7 April 2017, the Commission received one complaint related to transposition of the Directive in Bulgaria[27] that was closed on 28 April 2017 as Bulgaria brought an end to the infringement of EU law by adopting various legislative changes.

3.2 Implementation

All Member States made good progress as regards the implementation of the Directive. Some Member States have also implemented the voluntary provisions of the Directive or have adopted national measures going beyond its provisions, as presented below.

No infringement procedure has been launched for incorrect implementation of the Directive. Judicial proceedings based on a request for a preliminary ruling[28] concerning the interpretation of Article 8(3) of Directive 2002/19/EC on access to, and the interconnection of, electronic communications networks and associated facilities (Access Directive) and Article 1 (subject matter and scope), Article 3 (access to existing physical infrastructure) and Article 4 (transparency concerning physical infrastructure) of the Directive are pending. The Commission continues to monitor compliance of national measures with the Directive.

3.2.1 Access to existing physical infrastructure (Article 3)

Article 3 of the Directive requires Member States to ensure that network operators meet reasonable requests for access to their physical infrastructure (such as ducts, poles and masts) for the deployment of high-speed electronic communications networks under fair and reasonable[29] terms and conditions, including price. Access may only be refused under certain conditions, one of which involves the provision of alternative wholesale electronic communications services on fair and reasonable terms. If agreement cannot be reached, disputes may be referred to a dispute settlement body (DSB).

In principle, all Member States have implemented this article, but only a few have also provided for the right of public ECN operators to offer access to their physical infrastructure

[26] EU case law C-605/17, European Commission v Slovak Republic
[27] CHAP 2017/1211 (BG)
[28] EU Case law C-243/21, Toya, referred by Sąd Okręgowy w Warszawie.
[29] According to Recital 19 of the Directive, the access provider should have "a fair opportunity to recover its costs incurred in providing access to its physical infrastructure" (see recital 19)

for the purpose of deploying networks other than ECNs[30]. Some of the most extensive applications of the provisions on access to physical infrastructure can be seen in Poland, Germany, Hungary, Romania, Denmark (especially in relation to wireless infrastructure, e.g. access to masts) and Portugal. Although it is often used for the deployment of FTTH and fibre backhaul (e.g. Italy[31]), in some countries (e.g. Austria, Hungary, Lithuania, Portugal and to a lesser extent Spain), the Directive-based access has been used to access support structures for the deployment of wireless infrastructure such as base stations, and this is considered an important use case for the Directive-based access by many ECN operators[32]. The ***DESI telecom reports*** also report increasing[33] use of infrastructure sharing for wireless network[34].

Some of the Member States also went beyond the scope of access provisions of the Directive and adopted measures on pricing methodology (in legislation or guidelines)[35], reference offer[36], access to assets owned by non-network operators (e.g. municipalities)[37] or access to non-network elements (e.g. public buildings, street furniture)[38]. It is worth noting that some Member States distinguish between pricing for physical infrastructure owned by ECN operators and owned by operators of other networks than ECNs[39]. Some Member States have also clarified the interpretation of provisions on access to physical infrastructure such as those regarding the "fair and reasonable" pricing principle through dispute settlements[40].

3.2.2 Coordination of civil works (Article 5)

Article 5 of the Directive requires Member States to ensure that network operators performing, directly or indirectly, civil works financed by public means meet reasonable requests to coordinate civil works for the purpose of deploying high-speed electronic communications networks. To this end, Article 5 confers on any network operator the right to negotiate agreements on the coordination of civil works with undertakings providing or authorised to provide ECNs.

[30] Such as Bulgaria, Cyprus, Denmark, Estonia, Germany, Finland, Luxembourg, Slovenia and Spain
[31] Italy (2020 DESI telecom) reports extensive use of existing passive sharing agreements, concerning about 22000 towers.
[32] Interviews conducted by the consultant in this context of the support study, Q1 2021
[33] Denmark reports (2021 DESI report) having implemented most of the recommendations from the European Connectivity Toolbox, and is currently considering further implementation measures in civil works, mast sharing, and duct sharing.
[34] For example, Ireland (2019 DESI telecom) uses a 'mosaic' agreement that involves sharing 2000 sites, including site equipment, power supply, towers and transmission. Furthermore, in the Netherlands (2019 DESI report) passive sharing of site locations and antennas is regularly applied in order to increase rollout efficiency and improve coverage in places like tunnels.
[35] For example, non-binding provisions in case of Finland, Germany, Italy and Poland and binding provisions in case of Austria, Denmark, Hungary Portugal, Romania
[36] Such as Poland and Portugal that mandated them, while reference offers have been also published in France and Italy by energy companies
[37] Such as Denmark, Finland, Germany, Hungary, Italy, Poland, Portugal, Romania, Spain
[38] Such as Denmark, Germany, Hungary, Portugal
[39] Such as Czech Republic, Germany, Italy, Poland and Romania (the pricing for public utilities should takes account of tangible and intangible benefits)
[40] Such as Austria, Cyprus, Czech Republic, Germany, Italy, Lithuania, Romania and Poland;

All Member States have implemented this article, but only a few established rules for cost sharing principles[41] or procedures[42] for civil works coordination. About half of Member States[43] have extended obligations to meet requests for co-ordination of civil works to privately financed network operators (in such cases the exemptions are also applied to both publicly and privately financed civil works), while about two thirds of Member States provide for exemptions from the obligation to meet requests for coordination of civil works based on insignificance importance[44], critical national infrastructure[45] or urgent repair[46]. Any exemption from the obligation provided for in this Article has to be notified to the Commission.

3.2.3 Transparency concerning physical infrastructure (Article 4) and planned civil works (Article 6)

Article 4 of the Directive requires all network operators to provide a minimum set of information in response to a reasonable request made by an ECN operator. This information must be provided within two months of receiving a written request, and network operators must also meet reasonable requests for on-site surveys of specific elements of their physical infrastructure.

Member States may also require public sector bodies to make available the information they hold via a Single Information Point (SIP) by electronic means. Although optional, this provision of the Directive has prompted most countries[47] to implement it or to further develop SIPs that were in place previously. Most SIPs go beyond the minimum requirements of the Directive (to cover information which is directly provided by network operators[48], including more information[49] on or even beyond the existing physical infrastructure[50]). Geo-referencing is also foreseen in some Member States (e.g. Austria, Germany, Poland and Portugal). Particularly extensive SIPs have been deployed in Slovenia, Finland, Poland, Germany,

[41] Some Member States have introduced rules for cost apportioning for coordinated civil works: Cyprus, Denmark, Finland, Germany, Hungary Portugal, Slovakia and Sweden.
[42] At least six Member States have established more detailed procedures to facilitate co-ordination of civil works than those which are provided for in the BCRD, such as Lithuania (interested parties have to register on the DSB's website to participate in development), Slovakia, Czech Republic and Cyprus, Sweden and Belgium, either in the context of the BCRD or based on national measures predating the BCRD, respectively; Moreover, Finland, Cyprus, Hungary, Czech Republic and Denmark have established rules to support co-ordination of deployment for wireless infrastructure;
[43] Such as Ireland, Slovenia, Estonia, Finland, Slovakia, Cyprus, Hungary, Luxembourg, Romania, Denmark, Belgium, Portugal;
[44] Such as Germany, Greece, Hungary, Italy, Poland, Portugal and Slovenia
[45] Such as Austria, Cyprus, Germany, Greece, Italy, Poland, Portugal, Slovakia, Spain and Sweden
[46] Such as Denmark, Romania;
[47] Such as Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden
[48] Such as SIPs in Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden
[49] Information about spare capacity within existing physical infrastructure is provided within the SIPs in Poland, Hungary, Portugal and Cyprus.
[50] For example, SIPs in Austria, Belgium and Romania cover the location of cables and dark fibre deployed by operators that do not fall within the scope of the definition of physical infrastructure, according to the Directive; In Germany and the Czech Republic, the SIP also contains information about other facilities which could be used to host small cells;

Portugal, and Bulgaria. At the same time, a few countries have SIPs still under development[51] or decided not to implement a SIP[52]. However, for some of the Member States that did not implement this provision, for example Denmark, the concerned information is available via multiple information systems rather than a "single" information point. Furthermore, in a few countries, for example Germany, public sector bodies have to provide the same information as network operators if they own or operate a network.

While about two thirds of the Member States require network operators to make available information regarding planned civil works via a SIP, about half of the Member States have operational SIPs concerning planned civil works. Therefore, SIPs for civil works co-ordination are still under development or are not present in some Member States[53]. Most of the SIPs for planned civil works have been made operational in the context of the implementation of the Directive and improvements to the SIP platforms have also been made in countries where these had existed prior to the Directive, such as Sweden and Belgium. However, SIPs on civil works co-ordination contain for the most part only the minimum information and typically do not require operators to notify planned works proactively. Moreover, about half of the Member States[54] have introduced exemptions for civil works of insignificant value or for critical national infrastructure. All exemptions have to be notified to the Commission.

About half of the SIPs used to provide information about civil works co-ordination are the same as those used for information about existing physical infrastructure. To this aim, in about one fifth of Member States[55] the SIP contains more contextual info like maps and in about one third of Member States[56] the SIPs also provide information on planned civil works that network operators pro-actively made available. These include countries where civil works co-ordination is in more widespread use.

In a few Member States[57], the obligation to provide information via the SIP on planned civil work coordination applies only to publicly funded operators.

3.2.4 Permit granting procedures (Article 7)

In almost all Member States, the competence to grant civil works permits lies with local authorities.

Pursuant to Article 2(10) of the Directive, 'permit' means an explicit or implicit decision of a competent authority following any procedure under which an undertaking is required to take steps in order to legally carry out building or civil engineering. Therefore, procedures and costs for permit applications also relate to obtaining of rights of way (RoW).

The vast majority of Member States have implemented SIPs which contain information about permit granting procedures, but these have in some cases been implemented in a minimum

[51] Such as Croatia and Spain
[52] Such as Greece, Denmark and France
[53] Such as Ireland, Denmark, Poland and Romania
[54] Including Belgium, Czech Republic, Finland, Germany, Greece, Ireland, Lithuania, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden
[55] Such as Lithuania, Finland, Belgium, Italy, Portugal
[56] Such as Belgium, Bulgaria, Finland, Greece, Lithuania, Poland, Portugal, Slovenia and Spain
[57] Such as in Austria, Czech Republic, Lithuania, Spain and Sweden

fashion e.g. by providing links to relevant information elsewhere. The option to make permit or RoW application submissions via electronic means has been introduced in a significant number of Member States[58], and is planned in the coming years also for Italy, Slovenia and Czech Republic. Some municipalities in Sweden also offer the option for applications to be submitted by email. However, only a few Member States have opted for 'one-stop-shop'[59] (i.e. dispatching the requests to the relevant authorities and communicating single permit) or even for digital platforms (SIPs) [60].

Deadlines for the granting of permits have been set in many cases below the 4 months provided for in Article 7 of the Directive.

However, when looking at actual implementation, in most Member States, not all permits are granted within the maximum four months deadline (and procedures are longer and more complex for wireless than for fixed infrastructures) and timelines for permit applications have not been enforced in all Member States. Most countries use some measures to facilitate the timely granting of permits, either through compensation for damages[61] or – in some countries[62] - through tacit approval if a decision has not been made within the deadline (although these are often specific to certain type of permits (e.g. fixed or wireless only)). However, measures to enforce the overall four months deadlines seem to be missing in some countries[63]. While several different authorities are involved in granting the RoW, the summary report of best practices, shows that a few Member States[64] already implemented a tacit approval procedure with a deadline of 1-4 months. A one-stop-shop procedure with a single decision also applies in some Member States as far as the competences for granting RoW and granting permits lie within the same authority. In some Member States building permits and RoW can be applied for in parallel while in other Member States acquiring RoW is a precondition for civil construction permits[65]. In addition, in some Member States (e.g. Austria), RoW in public properties are free of charge.

3.2.5 In-building physical infrastructure (Article 8) and access to it (Article 9)

Provisions regarding in-building have been generally implemented by Member States and a few Member States built on in-building infrastructure measures pre-dating the Directive[66]. Few Member States have introduced high-speed broadband-ready labels[67], an optional measure under Article 8 of the Directive. Few Member States also mandate standards for in-building physical infrastructure[68] or even for the wiring that should be deployed inside the

[58] Such as Lithuania (since 2004), Ireland, Estonia, Cyprus (for fixed networks only), Hungary, Denmark, Portugal, Belgium (not limited to ECN), Malta, Romania, Croatia, Finland, Latvia and Luxembourg;
[59] Such as Cyprus and Greece (but only for wireless networks) and Hungary;
[60] Such as Bulgaria, Cyprus, Denmark, Ireland, Luxembourg and Lithuania
[61] Such as Hungary, Czech Republic, Romania (failure to comply with the permit deadlines constitutes contravention), Bulgaria, Croatia, Lithuania, Malta, Netherlands, Poland, Slovenia and Latvia.
[62] Tacit approval applies for certain types of permits in Austria, Ireland, Lithuania, Poland, Spain, Germany, Greece, Cyprus, Portugal, France and the Netherlands; It is worth noting that Luxembourg provides for the principle of "tacit refusal" if a decision is not granted within a certain time.
[63] No measures to facilitate enforcement with deadlines were reported in Slovenia, Slovakia, Sweden, Denmark, Belgium, Italy and Malta.
[64] Germany (construction and maintenance of public ways), Portugal.
[65] For example Romania (however, overall timeframe is below the default deadline of four months).
[66] Such as Austria, Cyprus, Finland, France, Italy, the Netherlands, Poland, Portugal, Slovenia and Spain
[67] Such label is operational in Poland, France, Spain, Portugal and Italy.
[68] Such as Lithuania and Romania.

duct[69], thus covering elements that go beyond the physical infrastructure. More than half of the Member States[70] have introduced exemptions for single dwelling units or where the costs incurred would be disproportionate.

In most Member States transposition of Article 9 has not gone beyond the minimum requirements of the Directive. Some countries including Germany, Hungary and Lithuania have established rules (through legislation, guidelines or dispute resolution) regarding the conditions of access to in-building infrastructure as a result of the Directive, while other countries including France, Spain and Poland have measures in place which pre-date the Directive[71].

3.2.6 Competent bodies and other horizontal provisions (Article 10)

As regards the institutional set-up, in most Member States, the tasks of the DSB were fully[72] or partially[73] assigned to the National Regulatory Authorities (NRAs) and to other bodies in two Member States[74]. The tasks of the SIP were assigned fully[75] or partially[76] to the NRAs in about half of Member States while in the other half of Member States[77] other bodies were put in charge for performing the function of the SIP, such as ministries, energy agencies, utility and road planning/ mapping or local authorities[78]. In addition to the progress mentioned in 3.2.1-3.2.6, further progress and ongoing efforts have been reported in the context of the implementation of the Connectivity Toolbox[79].

3.3 Evolution of the Sector

The European Commission's Digital Agenda (DAE) Scoreboard of 2013 shows that, prior to the adoption of the Directive, 54% of EU citizens had broadband available at speeds greater than 30 Mbps. 36% of EU citizens were accessing the internet via a portable computer or other mobile device (access via mobile phone was up to 27% in 2012) and the 4th generation mobile (LTE) coverage reached 26%. However, only 2% of European homes had ultrafast broadband subscriptions (above 100 Mbps), far from the EU's 2020 target of 50%.

The Directive has applied as of 1 July 2016. The 2017 DESI telecom report showed (for 2016) that, as regards connectivity, 74% of EU homes subscribed to fixed broadband, and over one third of these connections were high-speed. The number of high-speed subscriptions went up by 74% in two years. 4G mobile networks cover on average 84% of the EU's population (as the average of each mobile telecom operator's coverage within each country).

[69] Such as Cyprus, Czech Republic, Finland, France, Italy, Luxembourg, Poland, Portugal and Spain.
[70] Including Belgium, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia and Slovenia.
[71] Ibid
[72] Austria, Bulgaria, Croatia, Cyprus, The Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia ,Lithuania, Romania, Slovakia, Slovenia, Spain, Sweden. Portugal;
[73] Belgium Luxembourg , The Netherlands, Poland
[74] Denmark, Malta
[75] Cyprus, Finland, Germany, Ireland, Sweden
[76] The Czech Republic, Hungary, Lithuania, Luxembourg, Portugal , Romania , Slovakia , Slovenia;
[77] Austria, Belgium (each Region, as well as the Federal State, has its own SIP), Bulgaria , Croatia , Denmark , Estonia, France , Greece , Italy , Latvia , Malta , The Netherlands , Poland and Spain ;
[78] See in the Summary report of Member States' best practices of December 2020 (Question 11)
[79] https://digital-strategy.ec.europa.eu/en/library/connectivity-toolbox-member-states-implementation-reports

Since the application of the Directive, Member States have made progress towards achieving the connectivity objectives of the European Gigabit Society (see Figure 3).

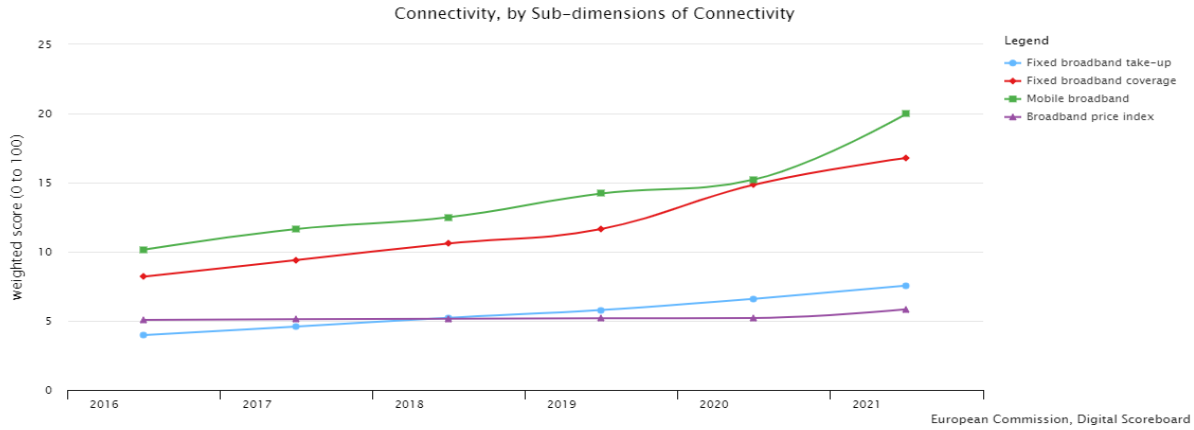

Figure 3: DESI Connectivity indicator, by sub-dimensions

The 2021 DESI report shows that, overall, broadband connectivity has improved both from the demand and the supply side. The next generation access (NGA) coverage reached 87% of EU households, while fixed very high capacity networks (VHCNs)[80] are available to 59% of households. Malta, Denmark, Luxembourg and Spain lead on VHCNs with coverage of at least 90% of homes. Across the EU, 77% of households had a fixed broadband subscription in 2020, compared to 70% five years ago. Since the adoption of the Directive, seven times more households are taking up broadband services of at least 100 Mbps, reaching the level of 34% of households in 2020.

DESI 2021 also reveals important differences between EU Member States, as well as between urban and rural areas. Figure 4 shows Member State's performance as regards the connectivity dimension.

[80] VHCNs are provided either on FTTP (Fiber to the Premises) or DOCSIS 3.1 (Data Over Cable Service Interface Specification) cable networks.

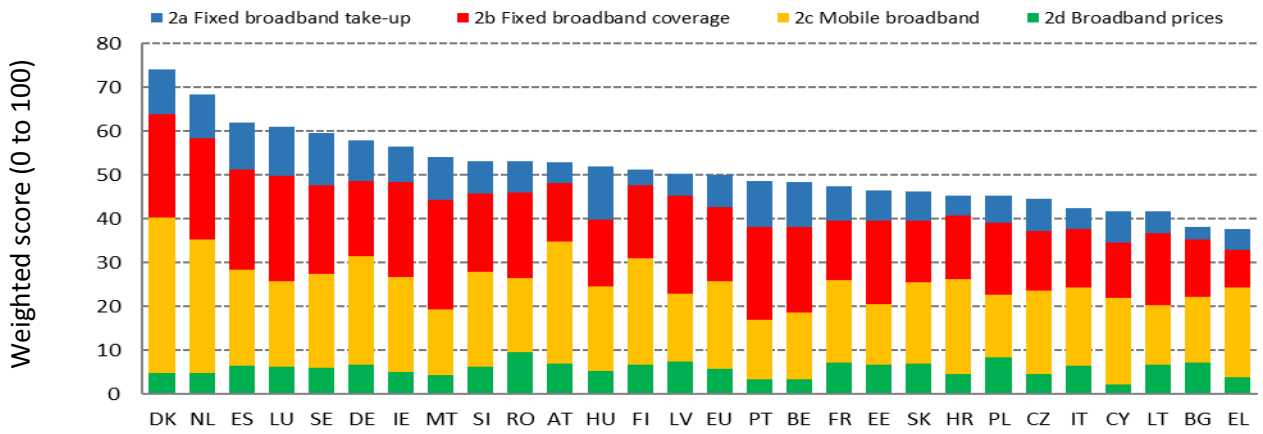

Figure 4: 2021 DESI connectivity dimension across the EU (Source: DESI 2021, European Commission)

In rural areas, only 60% of households have access to a fast broadband connection of at least 30 Mbps[81] and the coverage of households with VHCN reaches only 28% of the households (Figure 5).

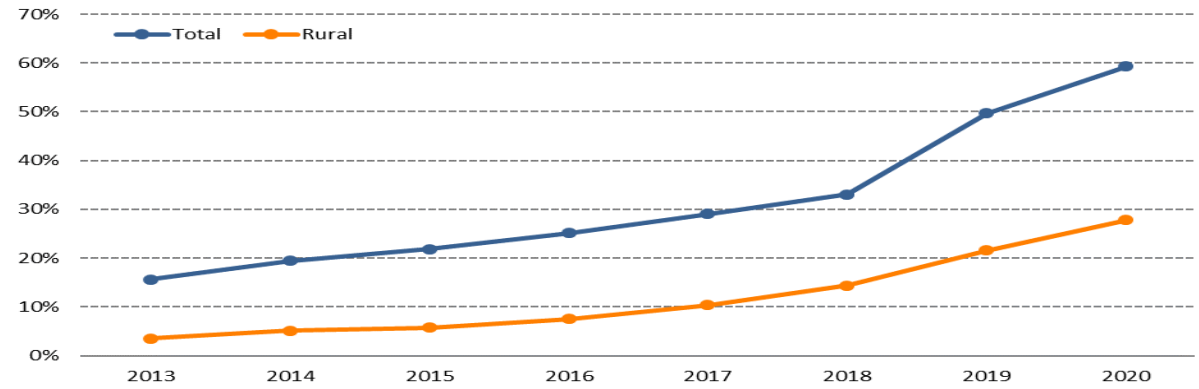

Figure 5: Fixed very high capacity network (VHCN) coverage at EU level (% of households), 2013-2020. (Source: IHS Markit, Omdia and Point Topic, Broadband coverage in Europe studies.)

As regards mobile connectivity, 4G (LTE) is almost ubiquitous with 99.7% of populated areas covered by at least one operator in the EU. Moreover, the gap between rural and overall 4G coverage almost closed, as rural coverage of 4G stood at 98.6% in 2020.

By the end of August 2021, 25 of the 27[82] Member States had assigned spectrum in the 5G pioneer bands[83]. Following the spectrum assignments, 13 Member States[84] started commercial 5G network deployments by mid-2020. A number of regional agreements for 5G corridors for automated driving have also been signed.

[81] Next generation access (NGA) technologies (VDSL, VDSL2 vectoring, FTTP, DOCSIS 3.0, DOCSIS 3.1).
[82] Estonia and Poland have not yet assigned any 5G spectrum.
[83] 700 MHz band: 60 MHz (703-733 & 758-788 MHz), 3.6 GHz band: 400 MHz (3,400-3,800 MHz) and 26 GHz band: 1000 MHz within 24,250-27,500 MHz.
[84] Highest coverage levels were recorded in the Netherlands and Denmark (80% of populated areas each), followed by Austria (50%), Ireland (30%) and Germany (18%).

4 ANALYSIS AND ANSWERS TO THE EVALUATION QUESTIONS

This section follows a bottom-up approach, analysing first the operational objectives, most of which are sub-categories of the specific objectives, which then feed into the general objective (see section 2.1).

4.1 Effectiveness

4.1.1 Effectiveness as regards the operational objectives

Evaluation question: To what extent has the Directive met all its operational objectives (OP1-OP4)?

The **2018 Commission's report on the implementation of the BCRD** highlighted the improvements in access to physical (including in-building) infrastructure and the information relating to them since the Directive was applied. The report also indicated limited progress in supporting coordination of civil works, easing the process of applying for civil works permits or facilitating access to buildings for the installation of in-building infrastructure. The progress registered since then is shown in Figure 6.

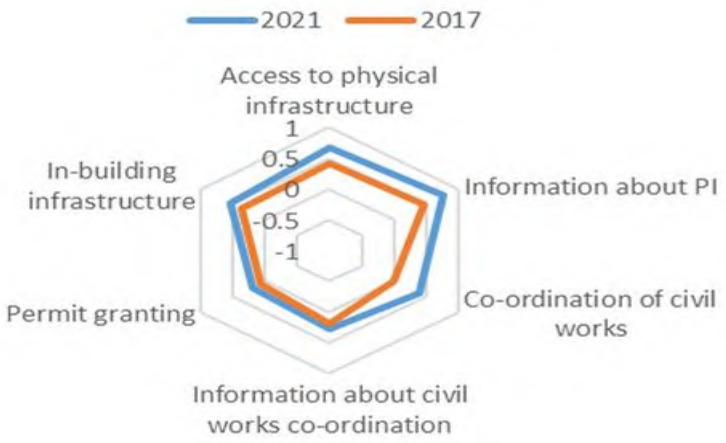

Figure 6: ECN operator views on the practical outputs of the Directive between 2017 and 2021 (Source: Responses to online survey carried-out under the ICF, WIK & EcoAct study)

4.1.1.1 Increasing the use of existing physical infrastructure suitable for high speed broadband rollout (OP1)

This **operational objective** (**OP1**) is to be achieved with clear rules regarding **access to existing physical infrastructure** and related **transparency** measures.

The Directive has resulted in increased access to existing physical infrastructure but unequal across the EU. The uneven progress could trigger increased costs or problems, with impact on the functioning of the internal market. For example, since the transposition of the Directive, increased use of duct and pole access resulted in Hungary, Poland, Finland, Lithuania and Germany (Figure 7). The 2019 DESI telecom report for Italy also reports significant re-use of existing physical infrastructure made possible by the Directive, in the context of the Italian ultra-broadband plan. Where there is no ubiquitous SMP-based access due to the lack of ducting (e.g. Germany), where the existence of a patchwork of different operators in different

areas (e.g. Lithuania, Hungary, Slovakia and Poland) or where SMP obligations on the wholesale local access markets have been withdrawn (e.g. Romania, Bulgaria) the access to physical infrastructure under the Directive has been effective. However, shared use of ducts pursuant to the Directive covers from up to 1% of the total length of the reach of the incumbent network in Germany and Finland, 2.3% in Hungary, 4% in Estonia[85] to up to 20%[86] (Poland and Italy)[87]. The Directive-based pole access is more used than the Directive-based access to ducts, ranging from about 10% of the total length of the incumbent aerial network (e.g. Hungary and Poland), to about 70% or more for some operators deploying FTTH in rural areas with public support.

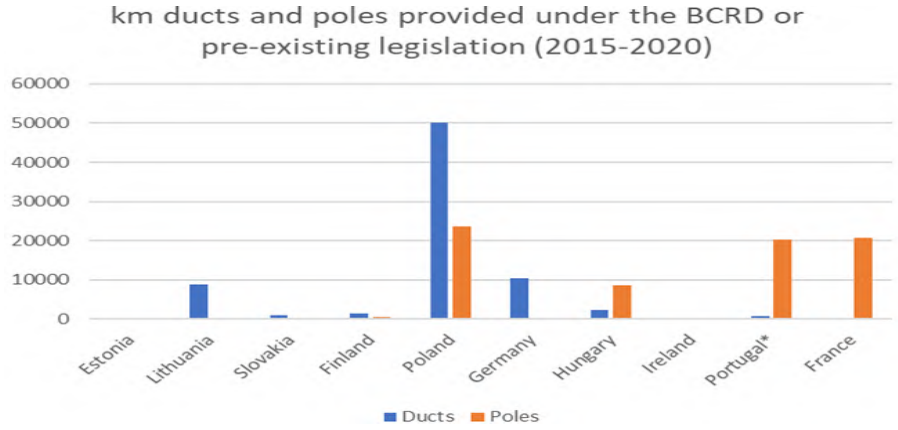

Figure 7: Estimates of km access to ducts and poles provided under the Directive or pre-existing legislation 2015-2020 (source the ICF, WIK & EcoAct study) [88]

On the other hand, in Member States where SMP-based access is effective (e.g. France and Portugal) or where there is widespread availability of dark fibre (e.g. Sweden), the access to physical infrastructure for the purposes of deploying high speed broadband under the Directive remains limited. Therefore, the shared used of existing physical infrastructure between ECN operators varies between Member States and depends, among others, on the availability and quality of the existing physical infrastructure.

As regards sharing of physical infrastructure with different utilities, Croatia reported (2019 DESI telecom) the use of physical infrastructure (poles) of the electrical distribution networks by telecom operators for deployment of high-speed networks. Various countries such as Lithuania (2020 DESI telecom), Poland (2020 DESI telecom), Romania (2020 DESI telecom) and Hungary (2020 DESI telecom) report bottlenecks and long-lasting disputes related to access to energy utilities infrastructure. However, sharing of physical infrastructure with gas,

[85] Responses by DSBs to the *questionnaire* provided within the framework of the ICF, WIK & EcoAct study, Q1 2021

[86] Information from DSBs and stakeholders based on *interviews* within the framework of the ICF, WIK & EcoAct study

[87] A city in Spain complains that the access obligation in Spain is not symmetric (municipalities cannot access telecom networks) and this undermines their ability to reach agreement on fair terms.

[88] However, DSB reported figures may not include all granted access to physical infrastructure that was provided on a commercial basis as a result of the Directive. Moreover, data from network operators may not be representative because responses from a limited number of network operators may not reflect the total access to physical infrastructure granted.

water and sewerage networks is less used[89] by **ECN operators** as less suitable for their needs than the infrastructure of electricity or transport infrastructure companies. Nevertheless, there are also Member States (e.g. Italy[90], Denmark) where fibre deployments have largely been driven by access to physical infrastructure of local energy utility companies.

Overall, where effectively applied, these provisions of the Directive have led to nearly 100,000km of re-use of duct and aerial infrastructure across the EU, to cost savings of up to 10-30% of deployment cost and have enabled a proportional expansion in coverage and accelerated the VHCN deployment by some months[91].

Despite these positive outcomes, further challenges to ECN network deployment include the fragmentation of the rules on the authorisations necessary to access infrastructure at municipal level, the lack of coordination between competent authorities, the different types of taxes that operators are required to pay to local authorities for network deployment (2020 DESI for Portugal) as well as excessive fees for access to masts (2019 DESI telecom Poland).

Various Member States reported an increased number of disputes on access to existing physical infrastructure (representing 73% of all Directive disputes in five years). The binding decisions of the DSBs provide guidance to market participants beyond a specific case, for example by setting references for fair and reasonable terms and access conditions. ***BEREC*** also recalls the importance of an effective sanction regime (as in Article 11 of the Directive) for the effectiveness of the dispute resolution. However, in some cases (e.g. in Italy), an established 'mediation rule' – providing clarifications on the application of the Directive – has been effective in helping parties to reach voluntary access agreements without the DSBs.

Finally, the Directive provides measures as regards the institutional independence of the DSBs from network operators. However, in some Member States national legislation includes access to the physical infrastructure owned or controlled by public authorities. ***BEREC*** recalls that in Spain, 60% of the disputes solved by the DSBs concerned public administrations. Thus, the political and functional independence of the DSBs is essential to guarantee fair and efficient dispute settlement.

In light of the above, it could be concluded that the Directive has introduced a more consistent and at least partially effective regulatory access regime to physical infrastructure.

Evaluation sub-question: To what extent the transparency on existing physical infrastructure improved since the application of the Directive?

[89] In Italy, public institutions and private companies which manage infrastructure for services such as electricity (including public lighting) and transport fall within the scope of the legislation, even if they do not operate these networks. The Netherlands (2018 DESI telecom) also reports high speed broadband deployment using cross-sectoral existing infrastructure (such as pipe bands), while sharing of infrastructure for railway (ducts) occurs only incidentally. Large sewage systems such as those in Paris have been used to deploy FTTH. The WIK VVA (2018) study on implementation and monitoring of the BCRD also cites the use of smaller sewers in Germany and Austria. Furthermore, in rural areas fibre is also laid in the pumped sewerage. However, non-telecom providers have some concerns on their ability to benefit from profits from the provision of physical infrastructure for high speed broadband deployment.

[90] According to the ICF, WIK & EcoAct study, the deployment of FTTH in Italy has relied on access to infrastructure from energy/utilities companies (access conditions including regulated wholesale prices established by the DSB)

[91] ICF, WIK & EcoAct study, Evaluation report, section 1.2.1.

Information on existing physical infrastructure could be gathered either via the SIP or from the public sector bodies or network operators, upon written request. In all Member States, competent bodies ensuring the SIP function concerning existing physical infrastructure gather data from multiple sources and sectors. In some cases, they also integrate it into a repository and make it available via digital platforms with enhanced features, such as the provision of a graphic presentation of the data, the possibility to choose between several scales, or to export and print out the data, or to search, zoom and outline map. However, where SIPs contain only the minimum information and limited features, their effectiveness remains limited.

As the use of SIP is not mandatory for requests regarding physical infrastructure (Articles 4(1) to 4(4) of the Directive), the SIP might not possess complete and comprehensive minimal information to ensure transparency on existing physical infrastructure[92]. Infrequent updates rendering the information out-of-date, absence of information from important stakeholders including in some cases utilities and/or public authorities, lack of information about masts and poles in some countries, and/or difficulties with the presentation of information also reduce the effectiveness of transparency measures and of the SIPs[93]. Thus, some **ECN operators** prefer using local contacts for obtaining the relevant information.

Notwithstanding these concerns, it is generally agreed that the transparency and ease of accessing information about existing infrastructure is a pre-requisite for gaining access to it. While in 2018 there was a particularly high number of requests for information about existing physical infrastructure in Portugal and a considerable number of them in Austria, Italy, Germany and France[94], it reached thousands (e.g. Germany and Slovenia), tens of thousands (e.g. Finland) or even hundreds of thousands (e.g. Belgium and Sweden – where SIPs preceded the Directive)[95] in 2020. At the same time, in some Member States, the use of the SIP is low[96]. However, few formal requests for information to the SIP does not necessarily mean ineffectiveness or low demand, as this also happens where the SIPs provide advanced features and make the information publicly available.

A common feature of the SIPs in Finland, Germany, Portugal and Slovenia is that they cover information concerning masts and towers alongside ducts and poles. The German SIP includes information on fibre and radio links and in Portugal information on available capacity is optionally included. These SIPs (except Finland) are also amongst the few displaying additional information beyond the minimum required (e.g. geo-referenced information), and in all cases apart from Slovenia are integrated with SIPs for the co-ordination of civil works. The more comprehensive information the SIP makes available, the more transparency on existing physical infrastructure is ensured and triggers the SIP's more intensive use (e.g. more than 35,000 requests to SIP for existing physical infrastructure in Finland in 2018 and 2020, respectively). However, the lack of information regarding physical infrastructure suitable for installing new base stations appears to be a significant challenge.

As there are a number of countries where the SIPs are still under development, and others where the national administration chose not to implement a SIP (see section 3.2.3), this might

[92] See also the BEREC opinion of March 2021 on the revision of the Broadband Cost Reduction Directive
[93] According to stakeholder interviews carried out under the ICF, WIK & EcoAct study
[94] According to 2018 Report on the implementation of the Broadband Cost Reduction Directive and the 2017 BEREC report on the implementation of the Broadband Cost Reduction Directive
[95] ICF, WIK & EcoAct study, Evaluation report, section 4.3
[96] For example, in Czech Republic, Slovakia and Romania

have limited or impeded the access to the information on existing physical infrastructure. However, while network operators in Italy and Portugal consider that the SIP in their country has facilitated the use of access to existing physical infrastructure, operators in Germany and Austria consider that it has had a limited effect. When information on existing physical infrastructure is not made available via the SIP (by public sector bodies or network operators), effective access to information on existing physical infrastructure has to be provided upon written request[97].

The evidence shows that the ease of accessing information about existing infrastructure has improved since the implementation of the Directive. The Directive has thus been at least partially effective. Furthermore, **BEREC** considers **NRAs** the best placed to perform the functions of the national SIP. Some **ECN operators also** argue that when the SIP is operated by another entity than the NRA (see section 3.2.6), it offers limited added informational value and introduces an additional layer of complexity.

Disputes concerning transparency on existing infrastructure represent about 15% (shared with the ones on transparency on civil works) of all disputes opened between 2015-2020, showing that there are still concerns[98] as regards the access to information on existing physical infrastructure. This significant increase also shows a higher demand for such information.

In light of the above, it could be concluded that the transparency on existing physical infrastructure has improved since the application of the Directive.

However, many **ECN operators** still consider that Directive-based access has not sufficiently been granted, disparities persist as regards terms and conditions for access and that a harmonized level of incentives for broadband rollout is not achieved (high deployment costs[99], complex and long procedures for gaining access to physical infrastructure under fair and reasonable terms and conditions, including price). The lack of or insufficient mapping of physical infrastructure available, including in the case of publicly owned infrastructure or subsidized ECNs, the insufficient digitalization of procedures to get access, high cost of access (e.g. access to utilities' physical infrastructure) are also limiting the effectiveness of the Directive with regard to this operational objective.

Overall, access to existing physical infrastructure suitable for high speed broadband rollout has increased since the Directive. However, as there are still challenges with regards to access to the existing infrastructure and related information, we could conclude that the Directive was partially effective with regard to this operational objective (OP1).

[97] However, there is no reliable information able to evaluate the effectiveness of successfully reached (without DSBs) access to information on the existing physical infrastructure upon written requests

[98] The 2017 BEREC implementation report of Broadband Cost Reduction Directive indicated that the disputes on"transparency concerning physical infrastructure" (Art. 4) represented 1% of the total number of disputes resolved by the DSBs

[99] According to the ICF, WIK & EcoAct study, civil works represent around 70% of the total capital expenditure (CAPEX) required in deploying FTTH. In-building infrastructure also represents a substantial proportion of the costs of deploying FTTH, accounting for between 10-15% of the cost per household. High costs are also a significant challenge hampering the deployment of "full 5G".

4.1.1.2 Increasing cooperation in civil engineering projects relevant for broadband rollout through the EU (OP2)

This operational objective (**OP2**) has to be achieved by **ensuring transparency** and by **legal certainty for coordination of civil works (including cross-sector/ cross-utility).**

The Directive introduced clear obligations as well as procedures and deadlines for the coordination of civil works. It facilitates network **operators other than ECN** to also coordinate civil works.

Positive results are reported in particular in Member States where procedures for co-ordination of civil works are in place (see section 3.2.2) and where **ECN providers** have made significant use of this possibility. Many requests for coordination of civil works were noted in Belgium and Slovenia, where advanced and efficient transparency measures are in place. Figures regarding jointly-deployed new networks vary across Member States and operators. For example, it amounted to less than 5% of total new infrastructure deployed in Austria and France, 10% in Sweden and 10-90% in Slovenia. Some **local authorities** (e.g. City of Stockholm) report that 50% of all civil works are already co-deployed, but only 10% of fibre civil works are co-deployed. However, on one hand these outcomes might not be solely triggered by the Directive. On the other hand, these countries are at the forefront of best practices in civil works coordination, with some municipalities actively encouraging coordinated deployment. Where effectively applied, these provisions of the Directive had led to cost savings of up to 10-30%, and enabled a proportional (10-30%) expansion in coverage[100].

However, the usage of co-ordination of civil works for the deployment of high speed broadband as well as progress in easing the process of applying for civil works in many Member States are still limited. Nearly half of the respondents to the ***public consultation*** (mostly **ECN operators)** consider that provisions on coordination of civil works have been less effective. One cited reason for low effectiveness is the absence of a public body responsible for the overall coordination of civil works in a territory. The limited effectiveness is also due to cumbersome coordination procedures that differ from one area or local authority to another, lack of clear specification of the upfront costs for coordination, not enough easy-to-use information as regards publicly financed civil works, too short notice period prior to the execution of civil works as well as the diversity of technical requirements (e.g. due to the different depth, size of trenches and security concerns). These are also confirmed by the latest ***DESI telecom reports***[101]. While some **ECN operators** perceive the obligation as coercive, without properly rewarding the achievement of the levels of ambition in network roll-out, some **public authorities** point to the lack of awareness about these obligations.

The disputes concerning coordination of civil works represent about 9% of all disputes between 2015 and 2020 and they are reported in particular in Austria, Germany, Finland,

[100] ICF, WIK & EcoAct study, Evaluation report, section 4.9

[101] For example, the 2020 DESI report for Luxembourg shows that the incumbent operator is relying increasingly on opportunities for co-deployment with other infrastructure providers, which results in less predictability as to where exactly new fibre lines will be available and by when. The 2019 DESI report for Netherlands reports that civil works procedures relating to the deployment of networks (timing, coordination etc.) often differ between local authorities and this could be a hindrance for a swift rollout of fibre networks.

Sweden and Slovenia. Moreover, given the limited time offered to join planned civil works, the dispute resolution process may not be sufficiently agile to timely address such issues.

In light of the above, it could be concluded that the Directive has introduced a consistent regime for coordination of civil works, however with limited effectiveness and uptake so far.

Evaluation question: To what extent the transparency on civil works improved since the application of the Directive?

As regards the availability of information on planned civil works, low progress is reported following the Directive. A significant number of works were notified to SIPs in Belgium, Finland, Slovenia, Slovakia and Sweden. Some advanced municipalities (e.g. City of Stockholm) report long time use of online tools where all planned excavation works are notified in advance. At the same time, the number of notifications is still relatively low in Germany, Portugal and Lithuania.

The limited transparency may be linked to the way this provision has been implemented (i.e. with minimum information and often upon request). The timing of information and short notice periods for participation in co-ordination of civil works are critical for the transparency on planned civil works. **BEREC** also recalls[102] that the Directive does not impose a digital register of planned civil works by network operators that are fully or partially financed by public means. Thus, it might be difficult for a network operator to identify planned civil works that can be of interest and suitable for coordination. However, higher take up of civil works co-ordination is noted where there is pro-active notification of planned civil works.

Low requests for coordination of civil works might also be due to concerns about the associated burdensome procedures and costs (and potential delays) for civil works coordination. However, demand might be limited in some countries, even with more pro-active implementation, as alternative options (e.g. self-build or access to existing physical infrastructure, where available) seem more attractive to operators in many countries as a means of reducing the cost of high speed broadband roll-out.

In light of the above, it could be concluded that the transparency on civil works coordination has improved since the application of the Directive. Proactive notification of civil works by all network operators as well as more comprehensive SIPs on civil works facilitate the take-up of civil works coordination provisions.

Overall, while cooperation in civil works relevant for broadband rollout has increased through the EU since the introduction of the Directive, it remains uneven and limited. We could conclude that the effectiveness of the Directive with regard to this operational objective (OP2) is limited.

4.1.1.3 Streamlining the administrative procedures related to network rollout throughout the EU (OP3)

This operational objective (**OP3**) is to be achieved mainly by **enhancing coordination of the permit granting processes and related information**, while **ensuring the enforcement of deadlines.**

[102] BEREC opinion on the revision of the Broadband Cost Reduction Directive of 11 March 2021.

While the transparency on permit granting procedure has increased, the coordination of the permit granting processes (e.g. with regard to RoW or among various competent authorities) is still scattered. Permit granting practices and fees still vary widely, with significant variations in the actual timeframes for permits between countries and even between permits for wireless and fixed network deployment (section 3.2.4.). Timeframes of up to 6-8 months to receive a permit for fixed network deployment are reported in certain countries (i.e. Portugal, Spain and Italy[103]), but also delays of up to a maximum of 24 months for wireless infrastructure (Figure 8). Croatia also reports (2020 DESI telecom) a long-lasting permit-granting process for the roll-out of ECN infrastructure (usually taking 1-2 years), more stringent requirements in the spatial plans adopted by 428 municipalities and excessive right-of-way fees charged by local municipalities. This clearly shows that more could be done to enforce the timelines for permit granting processing in all Member States.

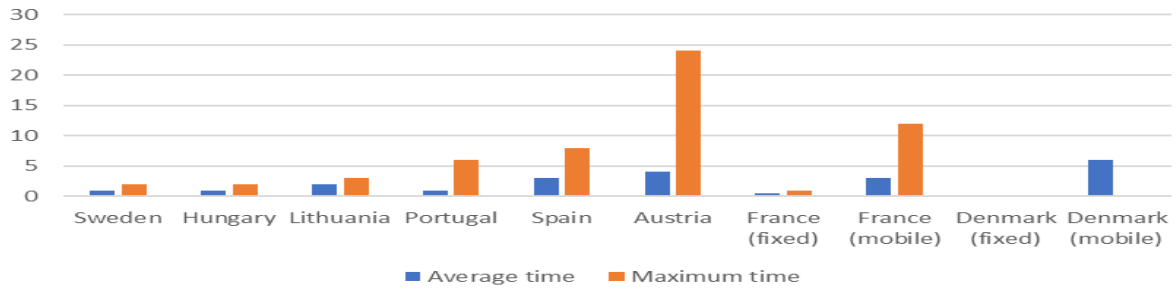

Figure 8: Average and maximum time to obtain permits for civil works (months) – operator perspective; (Source: WIK ICF questionnaire ECN operators Q1 2021)

In many cases, procedures for the deployment of wireless infrastructure became longer and more complex than those for fixed infrastructure. This may be due to the greater public scrutiny to which masts and antennas may be subject to (i.e. due to their visual impact and concerns over electromagnetic emissions (EMF)) as well as to greater number of permits, consultation processes and bodies involved other than local authorities. High (sometimes non-cost based) fees imposed by competent authorities together with lengthy EMF authorisations or local restrictions (e.g. in sensitive areas such as old historical city centers) appear to be the most important persisting barriers for mobile networks' deployment. This is also reflected in the last ***DESI telecom reports***[104].

Overall, the lack of harmonization, notably at national level, and the burdensome local planning and permit procedures requiring operators to deal with multiple authorities are delaying ECN roll-out. Moreover, as in most of the Member States permits are issued by local authorities, operators cannot gather all the necessary permits at a single entity or from a

[103] ICF, WIK & EcoAct study, Evaluation report, section 4.6

[104] For example, in Bulgaria (2020 DESI telecom), Luxembourg, Netherlands, Romania, Sweden and Italy long, complex and cumbersome permit-granting procedures, fragmentation and lack of streamlined procedures for local authorisation/granting permits or rights of way remain significant obstacles to ECN roll-out. The last four DESI reports for Cyprus, Ireland and Netherlands also show concerns as regards procedures and delays for granting permits for antenna masts and reluctance from local authorities to install additional antennas. Similar situation is in Greece where permit granting procedures (both for fixed and mobile networks) remain the main obstacle for network rollout. To address this, competent authorities are preparing a new one-stop-shop system to manage and coordinate the permit granting procedures, to facilitate the co-investment and the cross-/intra-sector synergies. Ireland also reports (2020 DESI telecom) that for the market players, one of the main challenges for the commercial launch of 5G is access (including cost of access) to sites and to public land.

single authority. Therefore, **ECN operators** consider that the variety of rules and processes, the optional nature of electronic processes, in some cases the exclusion of other permissions (beyond civil works permits) from the targeted timeframes, the possibility to extend the timeframes and the lack of mandatory provisions to enforce the deadlines (section 3.2.4) have contributed to low effectiveness of the Directive in this regard.

Furthermore, the low effectiveness of these Directive's provisions might also be linked to the need, fees and time to obtain RoW that delay network deployment in many cases. Delays in obtaining permits and RoW can add one to two years to the timing for the deployment of wireless VHCN in particular as well as (in some cases) costs associated with the process of obtaining permits and other permissions that can amount to 10-20% in the case of base stations. Furthermore, high costs to obtain permits and/or RoW for mobile sites (of between €12,000 and €23,000) have also been reported[105]. To address these concerns, some countries have established detailed rules or guidelines e.g. concerning the fees that may be charged – especially by public sector bodies and/or road operators (section 3.2.4).

However, the Directive has paved the way for national legislations going beyond its provisions that simplify and streamline the permit granting procedures (via fast-track procedures, permit exemptions, electronic submission of building permits applications, tacit approval of the applications, etc.) and that have reduced, in some countries[106], the established deadlines, in particular for fixed networks. At least one third of the Member States use tacit approval, permit exemptions (e.g. replaced by a notification) or streamlined or fast track (reduced procedures and deadlines) permit granting procedures. It is also expected that the Connectivity Toolbox will further spread and increase the use of some of these best practices.

While some stakeholders (both **public authorities** and **ECN operators/business associations**) consider that the Directive has indirectly had a positive impact on local permit granting procedures and has accelerated the deployment of high speed broadband networks by reducing cost and time expenses, nearly half of respondents to the ***public consultation*** consider the Directive ineffective in reducing the time and costs of permit granting.

In light of the above, we could conclude that despite some improvements in terms of transparency and accelerated permit procedures, the Directive was rather ineffective as regards the operational objective of streamlining the administrative procedures related to network rollout throughout the EU (OP3).

4.1.1.4 Increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it (OP4)

The progress made in ensuring that suitable in-building infrastructure became available in new and majorly renovated buildings is visible. However, the access to the in-building infrastructure is not yet satisfactory. The last several ***DESI telecom reports***[107] highlight some persisting challenges related to the access to in-building infrastructure.

[105] ICF, WIK & EcoAct study, IA report, section 4.1.3

[106] For example, Italy adopted the Simplification Decree in 2019 and Sweden, by ordinance, made the permit granting procedure shorter and more efficient, with particular positive effects in sparsely populated areas. Furthermore, some countries, including Sweden, Hungary and Lithuania also benefit from rapid procedures.

[107] For example, the 2018 DESI telecom for Latvia highlights that the requirements for permission by all individual owners of multi-flat buildings make very difficult or even impossible for network operators to obtain

Regarding the equipment of new and majorly renovated buildings with high-speed-ready in-building physical infrastructure, effective implementation of the provisions appears to be linked to the definition of standards setting out what is meant by high-speed-ready in-building infrastructure, and the associated access point, and mechanisms to monitor and enforce adherence to these standards. The rules for in-building infrastructure (including standards) in place in countries such as France, Spain and Portugal are seen as effective. Moreover, they are essential components in the **strategies for FTTH deployment** in those countries.

Standards and certifications are not required by the Directive, but more than one third of Member States have developed such standards (see section 3.2.5). In most of these cases the standards and the associated certification of in-building infrastructure have included standards for the installation of in-building wiring to be deployed within the duct and have paved the way towards the introduction of high-speed broadband-ready labels. However, few Member States have applied this option and there is limited data on their take-up. Moreover, the reference to "high-speed ready" physical infrastructure could be understood as referring to physical infrastructure suitable for the deployment of copper or coaxial cable termination, with the risk that the physical infrastructure installed would not be suitable for fibre termination[108]. In addition, the lack of awareness of the construction sector regarding their related obligations is limiting the effectiveness of these measures.

The access to in-building infrastructure improved following the implementation of the Directive. However, unsuitable installed infrastructure or the terms and conditions, including unreasonable prices of access, the diverse ownership of in-building infrastructure and a lack of compliance by building owners with obligations to allow access to ECN operators for the purpose of installing in-building infrastructure remain key concerns for **ECN operators**. Due to challenges in implementation, the Directive was only partially effective in ensuring effective access to in-building infrastructure. The absence of more guidance on conditions for access to in-building physical infrastructure is a shortcoming of the Directive. To ensure transparency and a clearer framework for access to in-building infrastructure, the Italian NRA is drafting guidelines on access to in-building infrastructure[109].

Where effectively applied, the Directive had led to cost savings of up to 10%[110], and enabled a proportional expansion in coverage. However, the potential benefits of this measure have not been fully realised. Some **ECN operators** still allege unjustified refusals for access to the in-building infrastructure as well as a high number of long-lasting disputes with the owners of

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access to physical infrastructure of these buildings. Poland also reports many decisions of the Polish NRA concerning access to in-building physical infrastructure (e.g. 30 decisions concerning access to in-building physical infrastructure which were not any operator's property; controversy on Polish NRA intentions to regulate 6 cases of access to in-building cabling through individual decisions addressed to the largest cable operator, laying down access conditions) and long-lasting negotiations with building owners who typically ask for compensation for providing access to their buildings in DESI telecom for 2018 and 2019, respectively. 2019 DESI telecom for Hungary also stresses that local building regulations continue to discourage installation of new cables in-buildings.

[108] Which present certain requirements regarding in particular the maximum cable bend

[109] https://berec.europa.eu/eng/news_and_publications/whats_new/8165-berecs-opinion-on-the-revision-of-the-broadband-cost-reduction-directive

[110] ICF, WIK & EcoAct study, Evaluation report, section 4.9

the existing in-building infrastructure[111]. However, the disputes regarding access to in-building infrastructure represent only 3%[112] of all disputes opened between 2015-2020.

In light of the above, we could conclude that the Directive was effective as regards the provision regarding in-building infrastructure, but only partially effective as regards the access to it. Thus, the Directive is only partially effective as regards OP4.

As on overview of all operational objectives (OP1-OP4), the biggest improvements associated with the Directive relate to access to and information about physical infrastructure (OP1). Much smaller improvements are observed regarding information about civil works co-ordination (OP2), permit granting (OP3) and access to in-building infrastructure (OP4). The processes for permits represents the area causing most problems for operators and where the least progress has been made following the Directive.

4.1.2 Effectiveness as regards the general and specific objectives

Evaluation question: To what extent has the Directive met its general and specific objectives? (see section 2.1.)

Evidence indicates that the implementation of the Directive facilitated the roll-out of very-high speed electronic communication networks by creating a stable regulatory framework.

It has notably led to cost savings for some **ECN operators** and significantly reduced implementation time of **end-users** connections including due to, in some Member States, well-advanced or partially digitalized permit application/issuing. The Directive has enabled the acceleration of deployment of high speed broadband, in most cases, by "some months", although e.g. even by half a year or more in Italy. The Directive has also had a moderate impact on cost savings for **ECN operators** (10-30% from the access provisions of the Directive, up to 10-30% from coordination of civil works and up to 10% from in-building infrastructure (and access to it) provisions). Some **public authorities** also acknowledge benefits such as cost savings associated with the development of the ECN infrastructure[113], an increase in projects through cooperation agreements, improvement of the infrastructure cadastre and burden reduction through simplified (and in some cases digital) procedures. Overall, where effectively applied, the Directive is linked to nearly 100,000km of re-use of duct and aerial infrastructure[114] between 2016 and 2020. However, this still constitutes a relatively limited proportion of the available physical infrastructure (section 4.1.1.1). Therefor, the Directive helped, to a limited extent, to expand high-speed broadband networks.

However, only 20% of respondents[115] to the ***public consultation*** consider the Directive effective in facilitating the roll-out of high-speed electronic communication networks at a lower cost (while 26% remained neutral and 43% consider it ineffective). The **ECN**

[111] According to stakeholders feedback to the Roadmap/Inception IA

[112] In only a few countries: Poland, Hungary and Germany. Poland registers the most of such disputes (e.g. the Polish NRA (UKE) issued about 300 decisions which grant access to the buildings in 2019 and 2020).

[113] For example, one public authority quantifies them at 12% of project costs due to the introduction of co-location or co-utilisation as award criteria for using EU or public funds.

[114] Figures are available for only a few countries. However, according to the ICF, WIK & EcoAct study, the Directive is estimated by DSBs to have been linked to nearly 100,000km of re-use of duct and aerial infrastructure in Poland, Germany, Hungary, Finland, Slovakia and Italy.

[115] 6% business associations of ECN operators, 44% company/business organisations (ECN) and 38% public authorities;

operators consider the effectiveness of the Directive limited because of legal uncertainties (e.g. regarding terms and conditions for access, including pricing, or on cost apportioning for coordinated civil works), higher civil engineering and deployment costs and delays (in case of co-deployment), lack of obligation for the administrations to digitalize their procedures or to coordinate their decisions, insufficient enforcement measures as well as the loss of some investment incentives for the first movers. Network o**perators other than ECN** report no cost savings due to the Directive.

As regards the governance and institutional aspects of the Directive, the general view is that the **NRAs** are best placed to perform the functions of the national DSB. The NRAs have a good understanding of the overall EU regulatory framework for ECN and can rely on their sound experience gathered in access disputes related to SMP-regulation. However, the dispute settlement mechanisms could be improved, as there are challenges associated with it, in particular as regards the timely adoption of the decision (see Annex III, add_3).

The choice of a directive as a legal instrument to regulate the measures to reduce the cost of deploying ECNs seemed appropriate. In the ***public consultation***, most **public authorities** (81%) shared this view, while the views from **ECN operators** and their **associations** are more mixed, with 40% of them supporting the use of a Directive and 30% disagreeing (and more than 27% being neutral). During ***consultation activities*** various stakeholders also called for enhanced governance of the legal instrument with the aim to increase its effectiveness, including by means of a regulation or a directive with maximum harmonization (39% and 25% of respondents to the relevant question, respectively), while 47% of respondents are in favor of using a directive with minimum harmonization (similar to the current Directive)

The Directive provided flexibility to the Member States to take into account their varied national circumstances while at the same time failing to achieve a certain level of effective harmonization. Moreover, the implementation of the Directive is under the responsibility of several public authorities and no authority has the overall competence to monitor the implementation, potentially limiting its overall effectiveness. As showed above, the progress is unequal across the EU and between the pillars of the Directive (e.g. more progress as regards access to the physical infrastructure and the related transparency obligations and less on coordination of civil works). The patchy outcomes (in terms of coverage with high-speed broadband networks and more-efficient network roll-out, including from public funds) and outputs (in terms of streamlined permit granting procedures, increased co-deployment and infrastructure sharing and improved access to in-building infrastructure) would suggest that at least for some aspects using a regulation might ensure a better enforcement and thus make the legislative instrument more effective. However, some **business associations** of ECN operators that call for more harmonized rules also urge to avoid excessive regulation and obligations on network operators.

Despite some progress, as the overall outputs, outcomes and effects of the Directive are limited and uneven, it can be concluded that the Directive has not achieved its full potential in terms of effectiveness. However, the Directive has set-up a strong framework that can be strengthen with the necessary requirements to reduce the current market fragmentation and divergences of interpretation by competent authorities.

4.2 Efficiency

4.2.1 Efficiency in regard to the operational objectives

4.2.1.1 Increasing the use of existing physical infrastructure suitable for high speed broadband (part of OP1)

Evaluation question: To what extent do the benefits outweigh the costs of access to physical infrastructure (PI) measures? (relates to OP1);

The benefits and costs linked to the use of access related provisions of the Directive vary between categories of stakeholders.

ECN operators do not report significant changes in administrative costs triggered by the use of access provisions. They typically employ 1-2 FTEs to deal with access requests (see also Annex IV). However, their benefits from using the Directive-based access provisions are important: cost savings of 10-30% of project cost for high speed broadband, acceleration of project roll-out by some months and proportional coverage increase[116] (see section 4.1.1.1). **BEREC** notes[117] that in case of mobile infrastructure sharing, passive sharing enables 10-20% cost savings, large scale radio access network (RAN) sharing could reach 25-30% cost savings and full consolidation could lead to over 40% cost savings. Overall, for **ECN operators** the benefits of access provisions outweigh the costs[118], but this may vary by Member States and by type of operator. For example, ECN operators without their own extensive duct and pole networks could make substantial net gains from effective implementation of the Directive-based access provisions, at relatively limited cost. One factor that impacts the cost and benefits for ECN operators is the lack of guidance on the application of the 'fair and reasonable' principle and of stronger enforcement of the prescribed deadlines for dispute settlement (four months). These led to longer dispute settlements, unpredictable outcomes and eventually delayed access.

Network operators other than ECN consider that **the costs outweigh the benefits**, in particular where the other network is not suitable for ECN rollout (e.g. sewage, in certain conditions) and the obligation to provide access becomes burdensome (e.g. potential risk of deterioration of the network and maintenance conditions due to shared use). They also expect appropriate compensation for the provision of wholesale access.

The public authorities/DSBs consider that the **benefits outweigh the costs** in relation to access provisions**.** The benefits for the DSBs include a unified legal tool that network operators can refer to when resolving questions and settling disputes around sharing of physical infrastructure without requiring a binding decision from the DSB and thus reducing the associated costs. However, the costs of the DSB associated with access-related disputes resolution is increasing, at least in some Member States. For example, the ***DESI reports*** show disputes on cross-sectoral access requests (including pricing) in Cyprus, Romania, Poland and Greece. Spain also reported in 2018 (2018 DESI telecom) that dispute settlement under Directive is becoming a prominent function within its **NRA**. The total current cost of all

[116] ICF, WIK & EcoAct study, Evaluation report, section 4.9
[117] BEREC opinion on the implementation of the Broadband Cost Reduction Directive of 11 March 2021.
[118] ICF, WIK & EcoAct study, Evaluation report, section 4.2.2

dispute resolutions concerning access to physical infrastructure is estimated at around 70 FTEs across the EU as a whole (on average ~2.5 FTEs per DSB)[119].

As regards the cost-savings for public authorities, they may be significant. For example, in the ***public consultation***, one **public authority** reported them at 12%[120] of project costs due to the introduction of co-location or co-utilization as award criteria for using EU or public funds. Thus, access provisions may significantly increase the efficiency of public subsidies.

Increased high-speed broadband coverage and accelerated project rollout by few months mean potentially new customers and shorter times for the provision of services to consumers. Therefore, the **customers/citizens** also benefit from access provisions of the Directive.

Overall, the provisions on access to existing infrastructure outweigh the costs and bring particularly significant benefits to both ECN providers, public authorities/DSBs and end-users. However, greater attention to establishing principles for access conditions, including price may further increase its efficiency.

Evaluation question: To what extent do the benefits outweigh the costs of transparency measures concerning physical infrastructure? (relates to OP1);

ECN operators need information on existing physical infrastructure of network operators in order to be able to use it. However, the eventual benefits of having access to this information depends on its completeness and accuracy. The administrative costs for **network operators** depend on whether they are required to pro-actively notify information to a SIP, and (if not) on how many individual requests they make or receive. The administrative burden of handling information requests outside a SIP can in particular be higher in cases where **network operators** receive a large number of requests. For example, a **mobile network operator** employed three FTEs to handle more than 200 requests for information about its existing infrastructure within the previous three years[121].

Making the relevant information available via the SIP promotes access to existing infrastructure and potentially reduces the **DSBs**' burden with disputes settlement in this regard. A centralized platform for this information, such as the SIP, has the advantage that operators planning to roll-out an ECN do not need to know beforehand whose physical infrastructure is relevant in the area of interest. Uniform procedures across the different national administrative levels (national, regional and local) as well as single information platforms play a significant role in reducing administrative burden for both **network operators** and **public authorities**.

Meanwhile the cost of updating the SIP, where one exists, may depend on the format and the level of detail required and frequency of updating. An **alternative ECN operator** reported three FTEs to maintain information about existing infrastructure on a comprehensive SIP, while a major **energy company** and supplier of access to physical infrastructure to ECN operators about five FTEs.

[119] ICF, WIK & EcoAct study, Evaluation report, section 4.2.2
[120] More than EUR 167 million savings reported in Austria for projects of EUR 1,3 billion due to co-location or co-utilisation
[121] ICF, WIK & EcoAct study, Evaluation report, section 4.3.2

As regards the cost of establishing and maintaining a SIP from the perspective of the **body undertaking this task**, this ranges from around EUR 150,000 to EUR 2,8 million, with a higher initial investment for the set-up, while annual maintenance requires from around EUR 50,000 to around EUR 1.2 million and/or between 5-15 FTEs, depending on the scope and complexity of the SIP[122]. Gathering or provisioning of information could be improved by automating the information supply and by using electronic interfaces.

The **ECN operators** and the **DSBs (**mainly **NRAs)** consider that the benefits of these provisions outweigh the associated costs. However, **for network operators other than ECN** (which may be subject to access requests, but which do not benefit from reciprocal access possibilities) the costs seem to outweigh or balance the benefits.

We could thus conclude that, overall, the benefits of requirements to provide information about existing physical infrastructure outweigh the cost, in view of their importance for facilitating ECN deployment.

Looking more broadly at the overall impact of these provisions (access to and information about the existing physical infrastructure (OP1)), we could consider the operational objective (OP1) efficient (except for networks operators other than ECN).

4.2.1.2 Increasing cooperation in civil works relevant for broadband rollout through the EU (OP2)

Evaluation question: To what extent do the benefits outweigh the costs of increasing cooperation in civil works relevant for broadband rollout through the EU? (relates to OP2)

The coordination of civil works presents three main benefits: cost reduction, more sustainable network deployment and low burden on citizens. Data gathered from various consultation activities (e.g. ***public consultation***, ***interviews, case studies, surveys[123], workshops***) indicate that for **ECN operators** the cost savings resulting from successful coordination in civil works, in comparison with fully independent deployment, is estimated at about 10-30%[124] for fixed networks, more than 30% for mobile networks and up to 50% when utilities consider telecoms in their infrastructure plans (larger ducts). However, the exact amount of cost savings is difficult to quantify because it depends on various factors, such as the number of involved undertakings and technical parameters (e.g. topology, trench depth, trench profile in case of underground deployment).

The coordination of civil works also triggered an increase in NGA deployment of around 10%[125], under certain specific national circumstances. At the same time, the administrative burden of these provisions is not significant for **ECN operators**. This has led many Member States to extend the obligation for civil works coordination to all network operators (including privately financed ones).

Coordination of civil works **between ECN operators** is the least burdensome, due to technical and technological favorable conditions. Lower efficiency is seen in coordinating

[122] ICF, WIK & EcoAct study, Evaluation report, section 4.3.2.
[123]Within the framework of ICF, WIK & EcoAct study.
[124] At the highest end, cost savings regarding ECN deployment due to successful coordination are estimated at about 30% in Slovenia.
[125] ICF, WIK & EcoAct study, Evaluation report, section 4.4.

civil works with gas, water and heating networks, due to the differences in the type/timeframe of deployment and the subsequent requirements for maintenance. However, benefits are noted where portions of gas or sewage networks and ECN backbones were subject to coordination of works for long stretches (e.g. in Netherlands, Belgium, France, Germany). For short segments and small civil works, especially in rural areas, less efficiency is noted.

As regards fixed networks, the benefit of digging once is important, in particular for **public authorities, including NRAs** (provided that this does not delay the roll-out of the network). However, the high cost of coordination (due to considerable differences in timing of work projects, little interest of operators of various types of network infrastructure and unclear conditions for cost sharing) limits the eventual cost-savings for **ECN operators.** For mobile networks, significant cost savings might be also obtained in case of coordination between roll-out of fibre and 5G network deployment (notably in high-density urban areas) as well as to putting additional capacity in place that would support a future 5G backhaul network.

While the obligation to coordinate civil works appears appropriate and proportionate**,** some **ECN operators/business associations** allege increased administrative costs for coordinating that eventually can turn the business case negative, in particular in rural areas. For example, in some cases, if cost-savings from coordination of civil works could amount to 30%, this also reduced returns by 50% due to increased competition. Thus, some **ECN operators** even consider that in such cases coordination of civil works is inefficient.

In addition, for **network operators other than ECN** the interpretation of the term "*civil works that are partly or wholly financed through public funds*" resulted in some economically inefficient parallel expansion of telecom infrastructures (especially in case of companies in which the public sector has a stake), legal uncertainty and delays for projects supported by public funds. **Network operators other than ECN**, such as water and sewage utilities, acknowledge eventual cost-savings as well, which might be passed to their customers in the form of lower charges and/or to shareholders.

Public authorities report a slight increase of administrative costs, mainly due to a limited increase of the number of disputes concerning civil works (e.g. in Germany, Finland, Sweden and Slovenia), which notably concern the price setting (e.g. in Germany). It is generally agreed that **national and local administrations** play a key role in fostering a more efficient coordination. Guidance/rules on cost-apportioning or procedures for civil works coordination, where available, reduced the number of disputes and their associated costs.

Overall, the benefits of the Directive's provisions on coordination of civil works outweigh the costs and bring particularly significant benefits to public authorities, ECN providers and end-users. However, greater attention to rules on cost sharing for coordinated civil works may further increase its efficiency.

Evaluation question: To what extent do the benefits outweigh the costs of transparency measures concerning planned civil works? (relates to OP2);

A unique information repository (populated by **network operators** and **public bodies**) appears[126] to be the best mechanism for ensuring the most appropriate and efficient access to relevant information regarding planned civil works (and existing physical infrastructure). In

[126] According to 66% of respondents to the ***public consultation***

at least one third of Member States a common platform has been used for civil works co-ordination and for information about existing infrastructure. This integration requires higher investments, due to increased complexity, but diminishes the overall cost associated with transparency obligations (than having separate systems) and made them more efficient. The costs for the co-ordination part are likely to be minor compared with the elements of the SIP associated with existing physical infrastructure.

As regards separate SIPs for coordination of civil works, Member States that implemented them provided similar figures as for the SIPs for existing infrastructure (e.g. EUR 14,500 for set-up and one FTE for maintenance in Slovenia and EUR 1.2 million and four FTEs in Belgium, respectively[127]). In Slovenia only the minimum information is required to be made available via this SIP, although all operators (and not just publicly financed operators) must provide information. Instead, the Belgian SIP for co-ordination of civil works is relatively extensive with significant additional information beyond the minimum required in the Directive and requires proactive notification by all network operators (private and public).

ECN operators did not generally report administrative costs associated with the provision of information for the co-ordination of civil works (no specific procedures). Thus, the benefits of provision on information about planned civil works marginally outweighed the costs.

Various **local and regional authorities** have already invested in online tools for facilitating and enabling co-ordination of civil works (some of them predating the Directive). The living in EU forum facilitates the exchange of best practices on such platforms among interested local and regional authorities. This will further increase the efficiency of such tools.

Overall, the benefits resulting from expanded co-deployment of high speed broadband seem to outweigh the costs of more pro-active (but more costly) transparency measures, in particular in those countries where there is more widespread demand for civil works co-ordination.

Looking more broadly at the overall impact of provisions on coordination of civil works and information about planned civil works, we could consider this operational objective (OP2) efficient.

4.2.1.3 Streamlining the administrative procedures related to network rollout throughout the EU (OP3)

Evaluation question: To what extent do the benefits outweigh the costs of streamlining the administrative procedures related to network rollout throughout the EU? (relate to OP3)

The multitude of authorities competent for granting permits and multiplicity of permits and fees needed for ECN deployment increase significantly the costs associated with permit granting, for both **ECN operators** and **competent public authorities**.

The obligation to make available to the public all relevant information concerning conditions and procedures applicable for granting permits for civil works is part of transparency obligations that all competent public authorities have. Various **local and regional authorities** already implemented permit granting systems, covering more sectors than just ECNs. Therefore, most of SIPs for permit granting provided for by the Directive (limited to the ECN

[127] ICF, WIK & EcoAct study, Evaluation report, section 4.5.2

permit granting procedures) have been implemented in a minimum way, by providing links to the information elsewhere. A single digital platform (where implemented[128]), provides a single point of contact for the submission of permit applications by electronic means as well as information about the status and delivery of permit applications – "one-stop-shop" electronic system. However, **BEREC**[129] considers not very efficient for permit granting authority to have a dedicated SIP to ECN operators. A few **local authorities** expressed the same view during ***consultation activities***.

While such systems require an important cost in set-up fees[130], the digital systems facilitating permit granting have led to more efficient handling of permit applications and, consequently, contributed to faster ECN roll-out. Moreover, even if handling permit applications within a shorter timeframe requires additional resources for competent **public authorities** (in particular **local authorities**), significant cost savings could be achieved by **local authorities** due to electronic systems for permit granting once in place. This could also provide greater accessibility and transparency for ECN operators in the context of reviewing permit applications. For example, in case of the Irish nationwide electronic system managing permit application procedures for road works, the turnaround time for applications was within 30 days for the majority (80%) of permits, with an overall average of 17 days in 2019. In Lithuania each permit application costs EUR 100 on average when using the electronic permit application system.

The cost to **ECN operators** of handling permit applications varies from one FTE for a small scale ECN operator to 15 FTEs for a large one[131] and could be higher in the absence of such electronic systems for permit granting. For **ECN operators** the preparation time (staggering amount of documents) are hidden costs that could represent a significant part of the total cost of the project, while also impacting the scarce resources from the administrative side (in particular for **SMEs**).

Framework agreements at local level (e.g. one permit coverings all permits needed for small works in a certain area during a period of time) are used in some countries (e.g. Germany, Ireland, Netherlands), saving the daily workload of **competent public authorities** and freeing their resources for more complex permits. Moreover, tacit approval for certain types of permit applications adopted by some Member States also reduces the administrative costs to **local authorities**, because they are no longer required to issue an administrative decision. Furthermore, permit granting exemptions not only contribute to speed up the deployment of new ECN but also fully eliminate the permit fees and the administrative burden associated with permits. In addition, Member States have also identified[132] as efficient best practice to

[128] The ICF, WIK & EcoAct study, section 1.2.5 and section 3.6.2, shows such systems fully in place in Bulgaria, Denmark, Greece, Lithuania and Latvia and partially in place in Belgium, Cyprus, Croatia, Finland, Italy and Netherlands.

[129] The BEREC opinion recalls that in three Member States the NRAs are involved in the permit granting

[130] For example, the ICF, WIK & EcoAct study shows that the system in Belgium, which also covers information and procedures for the co-ordination of civil works is reported to have cost EUR 1.2 million in set-up fees.

[131] According to ICF, WIK & EcoAct study, a leading operator in a medium size country reports using 16 FTE to handle 3,800 planning applications per annum, while a mobile operator reported 15 FTE for 1,000 planning applications

[132] Summary report of best practices in implementation of the Connectivity Recommendation. Furthermore, while Member States did not identified the tacit approval of permits as a best practice of the Connectivity Toolbox, they agreed to consider the introduction of tacit approval for rights of way , for instance whenever they are about to amend the relevant law for rights of way, for minor cases (Best practice number 6 of the

tacitly consider the application complete when the competent authority has not raised objections within a short deadline (e.g. one month from receipt).

'Broadband Competence Offices' (BCO), which are based in local authorities and provide a local point of contact for ECN operators and the public regarding broadband related issues (e.g. Ireland, Hungary, Finland, Portugal) are also seen as efficient tools for making permit granting procedures less burdensome.

While permit fees represent revenues for permit granting authorities, permit fees should not exceed the administrative costs. In the Connectivity Toolbox summary report, Member States also regard as best practice if any fees are proportionate and only cover administrative costs. However, the permit fees and rules vary across the EU and nationally, increasing the burden on **ECN operators** that have to adapt to various regional/local rules. For example, some Member States have established fixed fees for certain kinds of permits, while others do not charge any fees for certain permits (either in general or with regard to VHCN). In one Member State, certain municipalities switched with regard to their fees for civil works permits for fibre network in rural area from calculation fees based on the linear metre deployed to a calculation based on the home connected. The ***DESI reports*** also confirm that **ECN operators** have an increased burden due to the need to adapt to various local/regional rules (e.g. 2018 DESI Belgium, 2018 DESI Poland, 2020 DESI Italy, 2019 and 2020 DESI The Netherlands, 2020 DESI Romania). In Croatia (2020 DESI Croatia), **ECN operators** also report more stringent requirements in spatial plans as well as excessive RoW fees charged by municipalities. Even if, when brought before courts, the courts ruled in favour of **ECN operators**, court proceedings were time consuming and triggered additional costs to them.

Overall, despite some progress and some established best practices, the permit related provisions of the Directive had limited efficiency.

4.2.1.4 Increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it (OP4)

Evaluation question: To what extent do benefits outweigh costs of increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it?

The average reported cost of deploying in-building infrastructure to make a building "high-speed broadband ready" (or FTTH-ready) is estimated at €100-€150 per house served[133]. However, the requirement of a broadband-ready building seems outdated and **ECN operators** generally call for 'fibre-ready' for new or majorly renovated buildings. This would ensure that all network operators are able to serve customers without the need to deploy costly multiple fibre infrastructures within the building.

As regards the access to in-building infrastructure, some **ECN operators** argue that in the absence of guidance on technical and economic access conditions, **infrastructure owners** (e.g. **property owners**) are imposing excessive access prices and burdensome procedures that reduce the effectiveness of in-building provisions. However, only few disputes were

Connectivity Toolbox). However, the implementation reports of the national roadmaps implementing the Connectivity Toolbox show limited implementation or slow progress on this.

[133] According to survey carried out under the ICF, WIK & EcoAct study

opened on this subject between 2015 and 2020 across the EU, most of which were closed in that period. This implied only minimum administrative cost on the part of **DSBs**. These disputes were raised mainly in a few countries (Poland, Denmark, Hungary, Germany, Finland and Slovenia) and implied considerable resources and associated cost for both the **DSBs** and the **ECN operators** concerned. However, this burden might be partly due to the lack of knowledge of the provisions of the Directive by the **building and construction sector** (e.g. in Austria, Poland). Sometimes the in-building infrastructure does not technically allow access to at least two additional operators (e.g. Slovenia) or is not suitable for fibre termination[134]. However, the costs with settlement of the related disputes could be avoided through mediation processes provided for by some NRAs (e.g. Italy). In addition, providing additional clarity regarding in-building infrastructure access conditions could make the relevant provisions more efficient, due to fewer or more efficient disputes.

Where **ECN operators** have been able to benefit from access to in-building infrastructure, they report cost savings of up to 10%[135] of project deployment cost. Thus, most **ECN operators** consider that the benefits of this provision outweigh the costs.

The **consumers** benefit from access to in-building infrastructure provisions by avoiding multiple payments for in-building infrastructure rollout, increased competition and quality of broadband services[136] and reduced set-up costs for subscription to a full fibre connection.

Building owners should also benefit from minimised disruption, although in cases where the in-building infrastructure is owned by a **building manager** or **ECN operator**, they may not be able to benefit from charges for their in-building assets.

In light of the above, we could conclude that the provisions of the Directive related to provision and access to in-building infrastructure (linked to OP4) were efficient. However, making them more future proof by promoting higher standards (e.g. fibre ready in-building infrastructure) could further increase their efficiency.

C**oncerning operational objectives OP1, OP2 and OP4**, dispute settlements under the Directive are becoming a prominent function within the NRAs/competent bodies in some Member States[137]. However, this comes with increased administrative costs for both the **DSBs** and network operators involved.

Evaluation question: How the efficiency of the dispute settlement body/process influenced the overall efficiency of the operational objectives OP1, OP2 and OP4?

The average of concerned staffing per DSB is around 3.5 FTEs. Extrapolating to the EU, the total staffing EU-wide would reach 94.5 FTE. The total cost of the DSB function EU-wide is estimated at approximately EUR 5 million[138](see also Annex III, add_4).

[134] Which present certain requirements regarding in particular the maximum cable bend
[135] Although this may have derived in several cases from infrastructure including wiring required under legislation which pre-dates the BCRD
[136] See for example WIK (2015) Competition and Investment: an analysis of the drivers of superfast broadband https://www.ofcom.org.uk/__data/assets/pdf_file/0022/76702/competition_and_investment_fixed.pdf, WIK, IDATE, Deloitte (2016) Regulatory, in particular access, regimes for network investment in Europe
[137] See 2018 DESI telecom chapter for Spain
[138] According to ICF, WIK & EcoAct study, section 4.9.2

It should be also noted that, besides requiring additional resources, **ECN operators** and **network operators other than ECN** including utilities and transport organisations might also potentially experience delays due to dispute settlements. For **SMEs** the costs seem to outweigh the benefits as regards their interaction with the DSBs (see Annex III, add_5).

However, **BEREC** and **DESI telecom reports** show that a conciliation process (before the dispute settlement process of the DSB and in some cases mandatory) helps parties to reach a bilateral agreement, before or even within dispute settlement proceedings before the DSB. Such a conciliation mechanism has been identified as best practice in the Connectivity Toolbox (together with national guidelines)[139]. The binding decisions of the DSB also provide guidance to market participants, thus facilitating future successful negotiations and reducing the burden of disputes settlement.

Overall, the dispute settlement mechanism is not considered very efficient, in particular by ECN operators. However, development of advanced digital platforms for SIPs, together with guidelines, for example, on terms and conditions for access, including pricing, or on cost apportioning for civil works coordination could significantly reduce the number of disputes and therefore the associated costs[140].

4.2.2 Efficiency in regard to the general and specific objectives

Evaluation question: To what extent has the intervention been efficient as regards its general and specific objectives?

The replies to the ***public consultation*** show that stakeholders have a rather balanced view as regards the efficiency of the Directive (Figure 9). However, while most of respondent public authorities consider that **the benefits** brought by the Directive **are higher than or equal the incurred costs,** the views from **ECN operators** and their **business associations** are mixed. A **small and medium enterprise (SME)** respondent estimates that the yearly costs incurred are much higher than the cost-savings it (see section 4.2.1.4).

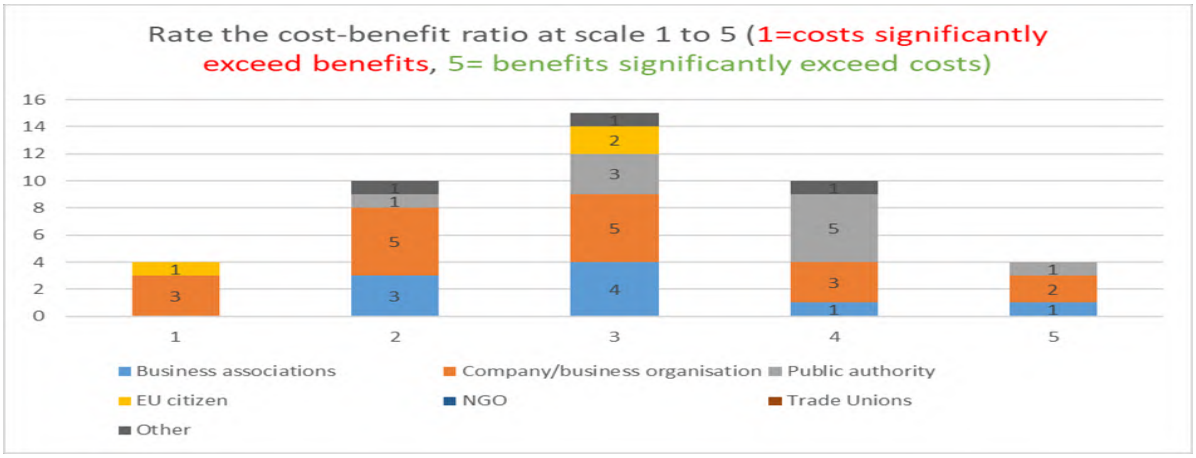


Figure 9: The perception of respondents to the public consultation as regards the efficiency of the Directive (source: ***EC public consultation***)

[139] By mid-July 2022, five Member States reported having implemented this best practice (no 19) of the Connectivity Toolbox, five reported on-going related measures, ten took no measures because already implemented prior to the Connectivity Toolbox and three discarded it.
[140] 2020 DESI telecom chapters for Germany,

Even if only partially effective in supporting increased broadband deployment, the benefits of the Directive are likely to outweigh the costs, as Member States often pursued minimal transposition in cases where the Directive provisions were optional (e.g. some measures on transparency of existing physical infrastructure, rules on civil works co-ordination, etc).

The benefits reported by **ECN operators** include cost savings for roll-out of both fixed and mobile network deployment (including for 5G backhaul) through shared costs and infrastructure, business development (including through access to third party infrastructure), improved transparency on existing physical infrastructure (including via the SIP) and easier permit processes. The associated costs reported by some **ECN operators** include internal costs related to its implementation (e.g. documentation, pushing information to the SIP; handling access requests, costs due to planning of civil works and their coordination), costs of RoW, more expensive digging and installation teams (when coordinating civil works with utility infrastructure), costs due to deterioration of co-shared network and maintenance conditions, costs linked to lengthy and burdensome permit granting and dispute settlement procedures as well as reporting obligations. To illustrate some of these, Table 1 shows the estimated costs to network operators associated with access to physical infrastructure, information systems and planning applications.

Table 1: Estimated costs to network operators associated with access to physical infrastructure, information systems and planning applications

	Access to PIA (FTEs)	Information on existing / planned works (FTEs)	Planning applications (FTEs)
ECN operators	0-2 FTE	0-3 FTE	1 (small scale) – 15 (incumbent)
Major utility or transport network	10-20 FTE (if significant requests)	5 FTE (with SIP)	

Source: ICF, WIK & EcoAct study, responses by network operators to WIK ICF questionnaire Q1 2021

Based on the assumptions shown in the Table 2 regarding the number of FTEs for different types of network operator in connection with Directive-based access and associated information provisions, the total administrative costs to network operators of the Directive can be estimated at around EUR 2.5 million per country and around EUR 68 million in total across the EU.

Table 2: Estimated administrative costs to network operators associated with the Directive

Type of operator	FTE	No. Per MS	Total FTE Per MS
Small ECN operator	1	3	3
Medium ECN operator	3	3	9
Large ECN operator / incumbent	5	1	5
Small utility	2	3	6
Large utility	25	1	25
Total FTE per Member State			48
Cost per FTE (ISCO 2)			€52,126
Total cost per MS			€2,502,032
Total for 27 MS			€67,554,856

Source: ICF, WIK & EcoAct study

Besides requiring additional resources, ECN operators and **network operators other than ECN** including utilities and transport operators might also experience delays (e.g. linked to notification of planned civil works). Some **ECN operators** also allege disproportionate market dynamics and disincentives for first movers (e.g. **SMEs**, **local operators**) who fear devaluation of their business case due to increased competition through access to their physical infrastructure or coordination of civil works (see section 4.2.1.2), in particular where duplicating the network is not economically viable (e.g. in some areas in Germany).

The benefits perceived or reported by **public authorities** include the high coverage achieved, improved cooperation among stakeholders, better coordination of network deployment (including due to the SIP) and better use of available public funds as well as increased possibilities for co-location and re-use of existing infrastructure. The costs for **public authorities** include: costs due to co-ordination by administrative bodies, structures and systems, set-up and maintenance of the Single Information Point (SIP) (between EUR 150 000 and EUR 2.8 million in set-up fees and between 5-15FTEs or around EUR 0.5 million per year /Member States recurrent costs for maintenance[141]), increased cost of mapping, increased dispute settlements and their associated costs (the total cost of the DSB function across all 27 Member States would be approximately €5m, for an estimated total staffing EU-wide of 94.5 FTEs[142]), expensive and lengthy planning of civil works by **public companies** (i.e. conducting market research, project financing and implementation planning), monitoring and enforcement related costs. The **Broadband Competence Offices (BCO),** working closely with **local and regional authorities**, also report costs due to multiple tasks assigned to the competent local authorities and the increased risk of misuse of funds by the **ECN operators**, in case of late responses from the BCOs.

Network operators other than ECNs report costs when aiming to equip underserved areas also with optic fibre network. Such costs are due to fees and duration of permit granting procedures, lengthy civil works' planning process, costs and loss of opportunities due to incorrect or delayed/inappropriate provision of information, uncertainty due to unclear

[141] According to ICF, WIK & EcoAct study, section 4.9.2
[142] According to ICF, WIK & EcoAct study, section 4.9.2

provisions for cost apportioning as well as deterioration of the network and maintenance conditions due to shared use.

Finally, **consumers and SMEs** as consumers of public utility and transport services benefit in a variety of ways from the Directive. Specifically, where the Directive-based access is relevant and is effectively applied and exploited by ECN operators, it accelerates the availability of high-speed broadband and/or lower retail charges for high-speed broadband as well as potentially lowering retail prices for utility services. The same benefits, but on a smaller scale, relate to co-ordination of civil works. Provisions on in-building infrastructure and associated access could also accelerate the availability of high-speed broadband, reduce the costs of getting connected and promote competition. Streamlined processes for permit granting could also accelerate the deployment of fixed and wireless networks, bringing benefits in terms of higher quality and increased choice for consumers.

In light of the above, we could conclude that the Directive was efficient as regards its general and specific objectives, but to a lesser extent than expected. The benefits could have been more important and the progress more uniform across the EU in terms of more ECN roll-out, cost reduction for ECN deployment and increased joint-use of existing physical infrastructure. The progress is uneven and the costs of ECN deployment could have been further diminished through clear guidelines (e.g. on fair and reasonable terms and conditions for access or cost-apportioning for coordinated civil works) – thus reducing the disputes that DSBs are called to settle or through more transparency and streamlined (and electronic) permit granting procedures – thus reducing the administrative burden.

4.3 Relevance

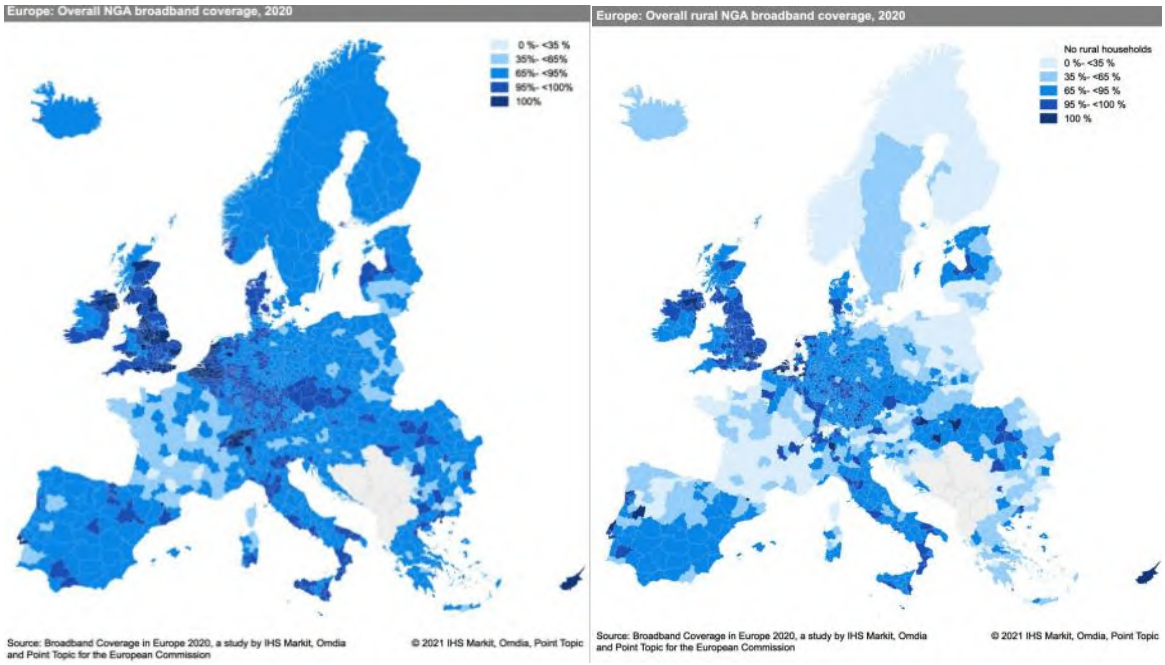
4.3.1 Relevance of the general and specific objectives

Evaluation question: To what extent did the general and specific objectives of the Directive remain relevant over the implementation period?

High quality connectivity supports the development of a more competitive and efficient economy. The reasons rely on the effect of digitalization in business models and the opportunities brought by the new technologies (e.g. fibre, Internet of things, artificial intelligence).

As section 3.3 shows, there is still a big digital connectivity gap between urban and rural areas across the EU. Figure 10 shows the gap in NGA coverage between total and rural ECN roll-out.

Figure 10: Next generation access (NGA) broadband coverage in the EU (% of households), 2020, total versus rural



The 2020 and 2021 ***DESI telecom reports*** for EU countries show that COVID-19 heavily affected the well-functioning of our societies and praised how advanced ECNs enabled continued e-education, e-health, and teleworking or social entertainment and relationships. During the crisis, the demand for access to advanced ECNs increased, in terms of use, higher quality of services and categories and number of users. COVID-19 pandemic has also affected vulnerable groups, widening social inequality and digitalisation gaps. It continues to be relevant and important to ensure that advanced digital connectivity is deployed everywhere, notably very high capacity networks (VHCNs), including 5G, to support a stronger and more resilient digital transformation and economic recovery.

Most of respondents to the ***public consultation***, ranging from **network operators** to **public authorities,** agree that high quality connectivity played – and plays – a vital role in the current COVID-19 crisis and the economic recovery. COVID-19 crisis has increased data consumption patterns and needs due to telework and home-schooling and **ECN operators** report having experienced an increase in demand for internet access and on data traffic.

The EU's multiannual financial framework for 2021-2027 provides for a long-term budget of EUR 1 074.3 billion for the EU27. Together with the Next Generation EU recovery instrument of EUR 750 billion, it will allow the EU to make available EUR 1.8 trillion of funding over the coming years to support recovery from the COVID-19 pandemic and the EU's long-term priorities across different policy areas. At least 20% of each national Recovery and Resilience Plan's allocation has to support the digital transformation. This means around EUR 140 billion to invest in key initiatives at the heart of European digital strategies. However, for digital infrastructure and networks alone, the EU has an investment gap of EUR 65 billion per year[143].

[143] Commission's Communication "Shaping Europe's digital future", COM/2020/67 final

The high costs of rolling out networks and the uncertainty concerning returns on investment are factors deterring investments. This is particularly relevant in rural and sparsely populated areas, where rollout necessarily involves higher costs. Physical infrastructure still constitutes a very significant proportion of the total cost of deploying fixed and mobile/wireless networks (up to 80%[144]). **ECN operators** estimate that for fixed networks, the costs linked to physical infrastructure is in the range of 60%-80% and for mobile networks in the range of 40%-60% of total deployment costs. Therefore, despite the mobilized national and EU funding resources, it is crucial to further reduce the cost of network roll-out, including for fibre and 5G networks, by sharing costs and infrastructure.

We could thus conclude that the general objective and specific objectives of the Directive to facilitate and incentivise the roll-out of high-speed electronic communications networks by promoting the joint use of existing physical infrastructure and lowering the costs of deployment remain highly relevant.

4.3.2 Relevance of the operational objectives

As shown in section 2.1, the operational objectives of the Directive aim at addressing the key challenges to fast and efficient ECN rollout that were hindering it when the Directive was adopted. Despite good progress in some areas (see section 4.1), these challenges still persist. Therefore, the subjects covered by the Directive remain important factors influencing the timely and efficient deployment of VHC networks.

Many respondents to the ***public consultation*** (from almost **all categories of stakeholders**) confirm the relevance of Directive's objectives although it varies significantly per area of the Directive and per category of stakeholders. For **ECN operators** the most relevant provisions relate to permit-granting procedures, access to in-building infrastructure and information about existing physical infrastructure. **ECN operators** also consider provisions on access to existing physical infrastructure (in particular from ECN and energy operators) as well as co-ordination of civil works and fees for permits relevant in reducing ECN rollout costs. For **public authorities** the most relevant provisions are those on access to physical infrastructure, followed by provisions on in-building infrastructure and access to it and on civil works co-ordination while permits were still considered relevant, but less so than the other provisions.

Moreover, according to ***DESI 2021***, new entrant **network operators** continued to slightly gain market share and held 61% of fixed lines in 2020. The market share of incumbents is the highest in Luxembourg (63%), Cyprus (55%), Latvia (55%) and Austria (54%) and the lowest in Romania (17%) and Czech Republic (22%). New entrants gain market share in cable, FTTH/B as well as in the NGA technologies (Figure 11). Therefore, absent SMP-based regulated access (should the conditions for imposing them not met anymore), the Directive becomes even more relevant, as alternative operators, in particular new entrants, are likely to most benefit from its provisions .

[144] According to various studies OECD 2008, WIK 2008, Francisco Caio 2008, Analysys Mason 2008

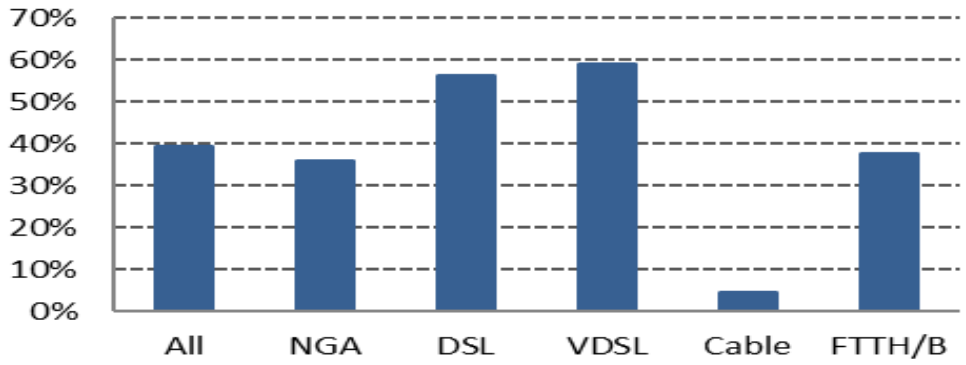


Figure 11: Incumbent operator market share by technology in the EU (% of subscriptions), July 2020 (source: DESI 2021 telecom chapter)

The relevance of each of the four operational objectives of the Directive is analyzed below.

4.3.2.1 Increasing the use of existing physical infrastructure suitable for broadband rollout (OP1)

Evaluation question: To what extent did the objective of increasing the use of existing physical infrastructure suitable for broadband rollout remain relevant over the implementation period?

Access to and use of existing physical infrastructure for laying the cables and installing antennas remains a challenge for many operators. The challenge most frequently **ECN operators** face relate to duct access, accessing facilities for the hosting of base stations or are associated with gaining access to buildings and land under the control of public authorities as well as public infrastructures such as street furniture. Thus, mechanisms to access to physical infrastructure and resolve disputes remain important for the ECN deployment today.

Access to the existing physical infrastructure not only substantially reduces the cost but increases also the speed of deployment of ECN since civil works and construction of masts, which are very time-consuming, are not necessary. However, in Member States where the SMP-based access is ubiquitous and effective, the Directive-based access seems less relevant for ECN operators.

ECN operators consider access to the infrastructure of other network operators such as water, heat and gas to be less relevant than that of energy and ECN operators. This is because water (sewers are only suitable in some cases, depending on technical conditions e.g. size of pipe or the sewage channels like the location of entry points to buildings[145]) and electricity networks (but poles) are not always suitable for the installation of telecom networks[146].

At the same time, the Directive does not cover all elements that are considered relevant for **ECN operators**, such as access to public facilities including buildings, land and street furniture that may be suitable for the installation of wireless infrastructure. As the Directive

[145] An organisation representing water and waste companies in a Member State considers there should not be a requirement to install telecom networks inside water / sewage pipes since this can create problems in cleaning or repairing the pipeline. Moreover, waste water can in some cases damage telecom infrastructure.
[146] According to the interviews conducted under the ICF, WIK & EcoAct study as well as the public consultation.

does not cover the access to these elements is available could make it less relevant over time, as access to facilities such as rooftops or street furniture become increasingly important in the context of 5G small cell deployment and fixed wireless access (FWA) technology.

Evaluation question: To what extent the transparency on existing physical infrastructure suitable for broadband rollout is still relevant?

The lack of information about the availability of existing infrastructure to deploy ECN networks remains a challenge. Most **ECN operators** consider the following information relevant for network deployment if constantly updated through the SIP:

- information on physical infrastructure from public bodies, ECN operators and network operators other than ECN, as well as on other elements and facilities suitable to install network elements;
- information on public buildings or facilities that are not part of a network (e.g. administrative buildings, communal centres), on private buildings or facilities other than residential and that are not part of a network (e.g. shopping centres, sports facilities, industrial plants/business facilities);
- information on acquisition and construction of sites for the deployment of mobile base stations, in progress or planned.

While geo-referencing physical infrastructure would be highly relevant, ***BEREC*** though cautions that access to existing public physical infrastructure might be harmful to both network safety and security, and national security[147].

Furthermore, some information about the existing facilities for the deployment of small area wireless access points (SAWAP) to which public authorities have to grant access to ECN operators is also relevant for **ECN operators**. Moreover, linking the SIP with other data or processes increased its relevance for ECN operators[148]. The provision of additional information (compared to the minimum information according to Art. 4(1)) to the SIP by all telecom operators, utility companies and other owners of physical infrastructure would further increase the Directive's relevance.

It is worth noting that the Directive does not require the inclusion of information about infrastructure which is not part of a network. Access to such infrastructure may be needed for the deployment of future networks, including 5G, in which case the provision might not meet all the current and future needs of network operators.

Therefore, the transparency of existing physical infrastructure remains highly relevant.

In light of the above, we could conclude that that operational objective of increasing the use of existing passive infrastructure suitable for broadband rollout (and its transparency) remains relevant. However, there is room for improvement, as the Directive does not cover some elements that are considered relevant for ECN roll-out

[147] As information on infrastructure location could be perceived as sensitive (commercial and security concerns), systems are however often at least user id and password protected.

[148] For example, in Austria, the SIP is heavily used because applicants for state aid for broadband roll-out must prove whether there is any physical infrastructure suitable for sharing in the area of application. Some ECN operators might be willing to transfer data to the SIP to avoid providing the same data on request to other ECN-operators, which might be more costly.

such as access to other elements and facilities (not controlled by network operators) that may be suitable for the installation of network elements.

4.3.2.2 Increasing cooperation in civil projects relevant for broadband *rollout through the EU (OP2)*

Evaluation question: To what extent did the objective of increasing cooperation in civil projects relevant for broadband rollout through the EU remain relevant over the implementation period?

In some countries, challenges remain in making use of co-ordination of civil works, such as denial of opportunities to co-ordinate, excessive charges and complex procedures. The lack of guidance on cost apportioning for coordinated civil works (see section 3.2.2) and potential delays in network roll-out have also contributed to reluctance of some ECN operators for coordination of civil works. If these challenges are addressed, the interest in civil works co-ordination could increase in future. Thus, the provisions regarding civil works coordination as well as a mechanism to resolve potential disputes in this field remain relevant. Furthermore, the fact that about half of Member States have voluntarily extended the obligation to meet requests for co-ordination of civil works to privately financed civil works projects (see section 3.2.2) shows that there is a significant interest in coordination of civil works and that this operational objective remains relevant.

As regards the kinds of networks that are relevant for co-ordination of civil works[149], co-ordination alongside the deployment of other ECN, alongside co-ordination with transport links such as roads and railways and co-ordination with electricity networks (including public lightening) are most relevant for **ECN operators**. This is also confirmed by some **DESI reports**. For example, Malta (2020 DESI telecom report) is currently in the process of implementing the government's EUR 700 million plan to upgrade all the roads within 7 years. In this context, the coordination of civil works between transport and ECN networks could lead to significant cost savings due to cross-sector synergies.

Fewer synergies are associated with co-ordination of ECN rollout with gas pipelines and water networks rollout, due to differences in the type/timeframe of deployment and the subsequent requirements for maintenance while the network is in operation. However, this coordination has already proved relevant where portions of e.g. gas and ECN backbones were subject to coordination of works for long stretches. For short segments and/or small civil works and in particular in rural areas, the relevance seems lesser, due to higher costs of coordination and management and longer time of deployment. However, **operators of other networks than ECN** see more opportunities for co-ordination with these sectors (as well as synergies with transport networks and electricity) (see Figure 12).

[149] According to Article 2(1)(a) of the Directive, these networks are gas, electricity (including public lightning, heating, water(including disposal and treatment of waste water and sewage, and drainage systems) as well as transport networks (including railways, roads, ports and airports).

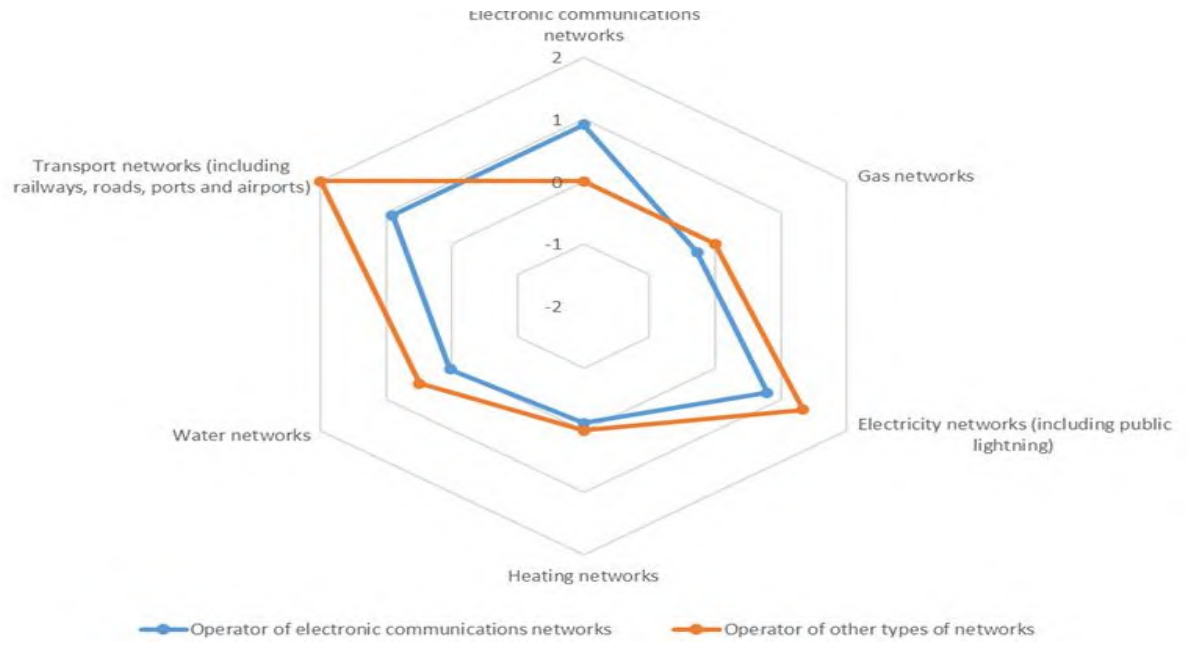


Figure 12: To what extent is it relevant for the deployment of ECNs to coordinate civil works with the following types of networks? (scale from -2 not relevant at all to 2 very relevant) *(Source: The ICF, WIK & EcoAct study & responses to the public consultation)*

As regards the fixed networks, coordination of civil works is relevant (for network operators, public authorities and EU citizens) for reducing the digging in pavement (digging once principle) as well as the environmental impact of ECN roll-out. The relevance of civil works coordination of is even higher in countries that have limitations against opening the roads too often (e.g. Luxembourg, Belgium). As regards the mobile networks, the coordination of civil works with transport networks (including railways, roads, ports and airports) is suitable and relevant for the deployment of wireless/mobile networks along the main transport paths, in accordance with related coverage obligations. 5G corridors represent a clear example of relevance of such coordination.

***Evaluation question*: To what extent the transparency on planned civil works is still relevant?**

Timely information on planned civil works is considered relevant by all stakeholders. The extent to which lack of information about planned civil works presented a challenge for network operators varies, according to national circumstances. For example, in Italy and Germany in particular, this remains a challenge, which should be addressed – not only to reduce deployment costs, but also to reduce interruption of works in cases where projects address the same areas simultaneously. Having access to the planned or ongoing civil works facilitates a better planning of civil works, thus reducing delays in network deployment and disturbance for **local communities**. Therefore, the provisions of the Directive on information related to planned civil works continue to be relevant, at least in countries where they are used by ECN operators and/or other options (e.g. access to existing physical infrastructure) are limited. These provisions could become more relevant in more countries, if more Member States pursue a proactive notification of civil works to the SIP and if they establish procedures and rules regarding cost sharing for civil works co-ordination (measures which may have contributed to greater uptake of co-ordination in Belgium and Sweden).

However, there are risks of potential delays and potential challenges with confidentiality of deployment plans. In addition, the relevance of civil works co-ordination (and associated information) needs to be weighed against other options that may be available for network deployment. For example, SMP-based access to physical infrastructure could be used to access the existing infrastructure of incumbent operators and other solutions such as micro trenching could simplify or lower the cost of the deployment process. Thus, the relevance of these provisions may vary from one country and/or type of operator to another.

Extending this obligation to public and private stakeholders, has increased the relevance of these provisions, fact confirmed by more extensively used SIPs in these case[150]. For example, in Poland the use of the SIP has significantly increased since the data transfer of information already available in electronic format became obligatory (2020). In Czech Republic, part of the action plan on non-subsidy measures for deploying electronic communication networks is to create a database containing planned civil works. However, during ***consultation activities*** some stakeholders (both **ECN operators** and **public authorities**) argue that providing the information regularly to the SIP and irrespective of a request might be disproportionate.

Therefore, the transparency of planned civil works remains highly relevant.

Overall, in light of the above, we could conclude that the operational objective of increasing cooperation in civil works relevant for broadband rollout through the EU (OP2) remains relevant.

4.3.2.3 Streamlining the administrative procedures related to network rollout throughout the EU (OP3)

Evaluation question: To what extent streamlining the administrative procedures related to network rollout throughout the EU is still pertinent?

Permit granting procedures, permit granting fees and the RoW influence the timely and efficient deployment of ECN. **ECN operators** consider that these issues, relevant at the time of the adoption of the Directive, are still very relevant today. Such are measures streamlining the administrative procedures related to network rollout throughout the EU, mainly by ensuring the enforcement of deadlines and increasing the transparency as regards permit granting procedures. These measures are relevant because they address important challenges for ECN rollout, which include: the complexity and length of permit granting procedures to deploy or upgrade ECNs, the multiplicity of permits needed, the lack of coordination between competent authorities, lack of electronic means/procedures for permit applications and the non-respect of the four months deadline to grant ECN deployment related permits, including those for RoW.

For **ECN operators** what is most relevant for supporting the deployment of fixed networks is duct sharing, while for the deployment of wireless networks seems to be the timely delivery of the administrative permits and the RoW to install facilities on or over public or private property. Moreover, addressing problems resulting from the varying practices at local level concerning permit granting procedures and fees remains very relevant. This perspective is

[150] BEREC's opinion on the revision of the Broadband Cost Reduction Directive of 11 March 2021.

also reflected in various ***DESI country reports*** that show that fragmented, non-uniform permit procedures (including at national level) hinders the speed of ECN rollout.

As section 4.1.1.3 shows, addressing these persisting challenges could further accelerate the ECN rollout by some months and reduce the associated cost, which is very relevant for all ECN operators, the competent public authorities and eventually the consumers/EU citizens.

Although the Directive does establish deadlines for granting permits and improves the degree of transparency as regards permit granting procedures (see section 3.2.4), the Directive does not fully address the procedural complexity in permit granting or fees and does not appropriately and explicitly address some issues around RoW (but more generally within the definition of 'permit'[151]), which **ECN operators** consider very important to enable fixed and wireless deployment[152]. Thus, while the current provisions of the Directive are relevant for certain of the key problems the ECN operators face, they have insufficiently addressed the others. The current Directive is therefore not as relevant to all current needs of **ECN operators** as it could be, and significant loopholes could emerge if it is not updated.

The provisions of the Directive on transparency on permit granting related fees and procedures and provision of electronic services for handling permit requests are also relevant for **permit granting authorities**. The digitization of permit granting procedures, including the electronic application for permits, where available (see section 3.2.4), is of relevance for the digital transformation of public authorities.

Overall, we could conclude that the operational objective of streamlining the administrative procedures related to network rollout throughout the EU remains highly relevant. Moreover, the review of the Directive could improve the relevance of these provisions, by better addressing some of the above mentioned persisting barriers in network roll-out.

4.3.2.4 Increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it (OP4)

Evaluation question: To what extent increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it is still pertinent?

The in-building infrastructure and the access to it remains an important bottleneck for the deployment of new ECNs and its importance is likely to further increase. **ECN operators** continue to highlight significant issues associated with accessing in-building infrastructure. Specific problems reported[153] include the price of access and physical accessibility of in-building infrastructure. These problems are likely to continue to be relevant and may expand as more houses are built and renovated (and must thus be equipped with in-building infrastructure), and as commercial deployments of FTTH expand.

For example, trying to address the difficulties with in-building broadband roll-out, as revealed by numerous disputes concerning the access to in-building infrastructure, Poland

[151] Article 2(10) of the Directive: " permit" means an explicit or implicit decision of a competent authority following any procedure under which an undertaking is required to take steps in order to legally carry out building or civil engineering works;
[152] According to the interviews conducted under the ICF, WIK & EcoAct study
[153] In the context of the ICF, WIK & EcoAct study surveys

(2020 DESI report) amended the so-called 'Megaustawa'(4) ('Mega-law') in 2019 to improve the rules for access to buildings.

Two thirds of respondents to the ***public consultation*** (mainly **ECN operators/ associations** and **public authorities**) also consider that these provisions are at least moderately relevant. Less relevance seems to be reported in Spain and Portugal, where similar measures preceded the Directive, or in countries like Denmark and Malta, which do not so see an issue with in-building infrastructure or in countries that did not applied these provisions[154].

Therefore, the operational objective of increasing the provision of buildings with high-speed ready infrastructure throughout the EU and access to it (OP4) remain relevant.

Evaluation question: To what extent the role of the DSBs remains still pertinent?

In addition, **for three operational objectives** (**OP1, OP2 and OP4**), having a mechanism to resolve potential disputes in their field remains relevant, as denial of opportunities to use the existing physical infrastructure or co-ordinate civil works, excessive prices and complex procedures reduce the willingness of ECN operators to collaborate with each other and, therefore, need to be addressed further.

This view is also reflected in the last ***DESI reports*** (since 2018) that show an increased number of disputes in various areas (e.g. access to existing physical infrastructure, coordination of civil works, access to in-building infrastructure). The competent bodies (e.g. DSB) are thus called either to solve them in a case-by-case basis or to issue guidelines that bring some needed clarifications allowing to reduce the number of disputes. Moreover, complex, burdensome and non-uniform (including at national level) administrative procedures are pointed out in various **DESI telecom reports**.

Therefore, the role of competent bodies provided for in Article 10 of the Directive remains relevant, including for deepening the Digital Single Market.

4.3.3 Continued relevance of the current objectives against new needs

Evaluation question: How well do the (original) objectives of the Directive still correspond to the new needs within the EU?

Comparing the Directive objectives and the current needs and problems in the area of ECN rollout, there are new challenges coming from the evolving EU digital transformation.

The Directive's overarching objective is to facilitate and incentivise the rollout of high-speed electronic communications networks (broadband access services at speeds of at least 30Mbit/s). In the meantime, the EECC adopted in 2018 refers to "very high capacity networks (VHCN), including fixed, mobile and wireless networks" and more recently the "2030 Digital Compass: the European way for the Digital Decade" Communication adopted in March 2021 refers to Gigabit-capable networks.

EU's digital transformation needs a fully functioning Digital Single Market and secure and performant sustainable digital infrastructures are a cardinal point of the Digital Compass 2030. In order to address the connectivity needs of EU post-COVID-19, massive investments

[154] In the context of the ICF, WIK & EcoAct study survey

into connectivity infrastructures are needed. While the EECC already provides measures to incentivize ECN investments, this Directive complements it, by making these investments more efficient.

The need for Gigabit-capable technologies has become even more critical in the wake of the COVID-19 pandemic which has seen bandwidth consumption increase by up to 60%, as a result of practices such as home working[155]. In this context, the review of the scope of the **general and specific objectives** of Directive to promote deployments of Gigabit capable networks, in particular VHCN, could make its provisions more relevant and future oriented. While this view is supported by many respondents to the ***public consultation***, ***BEREC*** recommends caution when considering to limit the scope to VHCN because of methodological reasons that could lead to increased disputes before the DSBs.

As regards the **operational objectives** of the Directive, its provisions have been relevant mainly to install modern (mainly fibre) infrastructure as well as partial fibre networks such as FTTC/VDSL (through access to existing physical infrastructure and coordination of civil works provisions). The reference to high-speed broadband ready in the context of in-building infrastructure may have been interpreted as also relevant to certify buildings equipped with copper as "high speed ready". Moreover, under the existing provisions, based on the "availability of viable alternative means of wholesale physical network infrastructure suitable for the provision of high-speed electronic communication networks", an operator might reject access to an operator wishing to install FTTH, because it could offer FTTC/VDSL-based wholesale access. However, looking to the current (and future) connectivity ambitions, the current operational objectives might need to be updated.

Both the EECC and the 2030 Digital Compass aim to equip Europe with appropriate tools to lead the 5G race for the benefit of its international competitiveness. 5G will enable industrial transformation through wireless broadband services provided at Gigabit speeds. Furthermore, the Commission "European Data Strategy" Communication adopted in February 2020 foresees that the global data volume will reach 175 zettabytes and data processing model will change to 80% smart connected objects and 20% centralised computing facilities by 2025. The successful and efficient rollout of highly secured and state-of-the-art fibre and 5G network are highly relevant for future digital services and at the heart of the industrial data wave. In this context, the Directive objectives (updated in scope) remain highly relevant.

Moreover, the EU Strategy on adaptation to climate change of February 2021 and the European Green Deal Communication of 2019 also foresee to forge a climate-resilient Europe where the green and digital transformation of the EU strengthen each other. Secure and highly-performant fixed and mobile electronic communications networks are at the heart of this twin green and digital transition. The measures of the Directive already contribute to sustainability (e.g. by avoiding duplication of physical infrastructure and civil works). Furthermore, performant ECN have a strong enabling effect for sustainability of other sectors and more synergies between ECN and transport or energy networks are expected to further multiply in the years to come.

[155] https://www.oecd.org/coronavirus/policy-responses/keeping-the-internet-up-and-running-in-times-of-crisis-4017c4c9/

In light of the above, we could conclude that the objectives of the Directive remain highly relevant, but the review of its scope to Gigabit imperative is needed to better align it with the current EU ambitions and make it future-proof.

4.4 Coherence

4.4.1 Coherence with other EU policies

Evaluation question: To what extent is the Broadband Cost Reduction Directive coherent with other EU policies which have similar objectives[156]?

Since the Directive was adopted, the Commission has increased its ambition in terms of connectivity questioning whether the current scope of the Directive (i.e. high-speed electronic communications networks)[157] is still coherent with the new connectivity targets (e.g. with the EECC which puts emphasis on the more advanced concept of VHCN or the "Path to the Digital Decade" policy programme which refers to Gigabit connectivity).

As regards the *coherence of Directive with the EECC*, most stakeholders agree that the Directive and EECC are complementary, reinforcing each other (e.g. the Directive also provides for access to infrastructure of network operators other than ECN) and both are essential for boosting network deployment as they facilitate network investments, provide a more favourable regime for wholesale only undertakings, ease the permit granting procedures as well as the availability of transparent information. However, some respondents to the ***public consultation*** (**ECN operators** and **public authorities**) and *stakeholders' feedback* ***to the Roadmap/Inception Impact Assessment*** consider that the Directive and the EECC are partially overlapping (e.g. in relation to access to in-building infrastructure: Article 9 of the Directive and Article 61(3) of the EECC) and consider that the Directive would have weakened the SMP regime (Article 3 of the Directive and Article 72 of the EECC) as regards duct and pole access. Also some incumbent operators expressed concerns about being subject to obligations under two regimes concerning access to their physical infrastructure.

Differences in scope (VHCN versus high-speed ECNs and the level of ambition for reaching Gigabit Society targets), in terms and definitions used, in requirements related to infrastructure mapping or in impact on fibre expansion related investments (in particular by public utilities), in timeframes of permit granting (4 months deadline provided for in Article 7 of the Directive and 6 months deadline for RoW provided for in Article 43 of the EECC) were noted during ***consultation activities (****section 4****)***.

There are also parallels on civil works coordination and network sharing (Article 5 of the Directive and Article 44 of the EECC) and synergies on information gathering (Article 4 and Article 6 of the Directive and Article 22 and Article 57(4) of the EECC). Article 3 of the Directive and Article 44 of the EECC do not overlap but are complementary, as obligations provided for in Article 44 of the EECC are linked to exercising RoW or rights of access to

[156] In particular with: the 2009 electronic communications regulatory framework and its successor, the EECC, , in particular provisions on access (Significant Market Power and non- Significant Market Power), as well as on small-area wireless access points, rights of way and rights to install facilities, dispute resolution, co-location and sharing of network elements and associated facilities; sector-specific EU Law on other network industries, in particular, in the energy and transport sectors; Competition policy and state aid; other EU policies

[157] An electronic network which is capable of delivering broadband access services at speeds of at least 30 Mbps

facilities under the scope of Article 43 EECC. More specifically, while the Directive grants a general right for ECN operators to benefit from physical infrastructure on reasonable request, sharing of network elements under Article 44 EECC is at the discretion of the Member State concerned and may be granted only under more limited circumstances[158]. As regards the timeframe for permit granting (Article 7 of the Directive) and RoW (Article 43 of the EECC), there is scope to improve coherence thereof. There is scope to clarify the relationship between Article 9 of the Directive and Article 61(3) of the EECC, especially in cases where Member States take advantage of the potential exemption to the obligation to provide access to in-building infrastructure (Article 9(4) of the Directive), but there is no incoherence between Article 9 of the Directive and Article 61(3) of the EECC, as the scope of the provisions is different. More specifically, a key difference would be that Article 61(3) of the EECC is optional for NRAs (NRAs "may" impose obligations), while Article 9 of the Directive imposes an obligation on holders of the right to use an access point and in-building infrastructure to make access available under fair and non-discriminatory terms and conditions on reasonable request.

Article 4 of the Directive is complementary with EECC measures streamlining the deployment of small area wireless access points (SAWAP) by excluding facilities meeting certain characteristics from the need for town planning or other individual prior permits (Article 57 of the EECC). However, more clarity is needed as regards the relationship between the Directive and Article 57(4) of the EECC as well as the Commission Implementing Regulation 2020/1070 on small-cells, on access and information to support the installation of SAWAP. ***BEREC*** also stresses that the Directive and Article 57 EECC differ with regard to which organisations have to provide access to their physical infrastructure. The Directive demands this from network operators, while Article 57(4) of the EECC from public authorities (irrespective of whether they are network operators). In addition, Article 57(4) of the EECC refers to facilities which are not network elements (and thus not covered by Article 3 of the Directive) and thus it does not appear to be incoherent with the Directive.

The term 'physical infrastructure' is not defined in the EECC and that of 'associated facilities' also includes physical infrastructure as defined under the Directive, but not restricted to the latter. ***BEREC*** considers that the physical infrastructure of Article 57(4) of the EECC is not fully consistent with the definition of the term 'physical infrastructure' in the Directive because: (i) Art 57(4) includes any physical infrastructure suitable to host small-area wireless access points regardless whether it is part of a network; (ii) street furniture as e.g. light poles, street signs, traffic lights are not an element of a network (unless they would be part of the definition of a transport network) and (iii) are not intended to host other elements of a network. Furthermore, while ***BEREC*** is of the opinion that a parallel access regime to dark fibre under Directive seems not proportionate as regulatory instruments from the EECC (SMP regulation and the symmetric regulation in Article 61(3)) are best placed to provide such access for interested ECN operators, it considers that information on dark fibre available via the SIPs may be useful in light of national circumstances (e.g. in case access to dark fibre is possible based on SMP regulation, to be taken into account when planning civil works (to avoid breaking cables)).

[158] In the context of exercising rights to install facilities, only following a period of public consultation and only in specific areas where sharing is considered necessary to pursue objectives of protecting the environment, public health, public security or to meet town and country planning objectives

As regards the *coherence of Directive with sector-specific EU law on other network industries*, it appears that shared use and construction are rather limited. One area where **some utilities** and **municipalities** claim that there is a lack of coherence is the differential treatment of ECN providers compared with other utilities and, in particular, their right to accelerated permit granting, access existing physical infrastructure and civil works co-ordination, when these advantages may not be available to network operators in other industries. Furthermore, the respondents to the ***public consultation*** argue that the obligation to separate communications networks into their own company has slowed down the process of co-deployment. **Operators of other networks** note a lack of clarity as regards the treatment of cost-savings and profits arising from collaboration under the Directive when network operators are subject to price controls applied in another network industry. From this perspective, only a few Member States (Portugal, Italy, Germany, Spain, Poland, Estonia and Lithuania) provided guidance concerning the treatment of cost reductions or revenue gains arising from collaboration with ECN operators.

As regards the *coherence of the* Directive *with competition policy and state aid*, some **ECN operators** state that EU competition law, in particular State Aid procedures, would suffer from a lack of emphasis on FTTH/B, same as the Directive. Some **ECN operators** regret that the RAN sharing model is not explicitly mentioned by the Directive as they consider it one of the key solutions to support more cost efficient roll out of mobile networks. Reasons for providing access are complementary, as the State Aid guidelines require widely available access to publicly funded infrastructure while the Directive focuses on the roll-out of ECN.

As regards the *coherence of Directive with other EU policies*, **ECN operators** and **competent public authorities**, including ***BEREC,*** welcome the Recommendation (EU) 2020/1307 on a common Union toolbox and the subsequent Connectivity Toolbox. On the one hand, it is pointing to the need to reduce the environmental footprint of networks and, on the other hand, the 39 best practices agreed by the Member States on 25 March 2021 are expected to contribute to the timely deployment of 5G and fibre networks. The replies to the ***public consultation*** also mention the Directive (EU) 2018/844 on energy efficiency that has introduced the concept of Smart Readiness Indicator[159], supported by a voluntary scheme provided for in the Delegated Regulation (EU) 2020/2155[160], as well as several related mandates on standardisation that the Commission had addressed to CEN, CENELEC and ETSI[161]. A few **representatives** of **ECN operators** also stress that Recommendation on Relevant Markets (RRM), published by the Commission in December 2020, will decrease the number of markets susceptible to regulation and serve as a key policy harmonisation tool.

Overall, the Directive is generally coherent with other EU policies. However, there is place for enhanced coherence between the Directive and the EECC (including as regards changing its scope to VHCN and related definitions).

[159] The smart readiness indicator covers features for increased energy savings, benchmarking and flexibility, and enhanced functionalities and capabilities provided by more interconnected and intelligent devices. It also includes, where possible, additional information on inclusiveness and connectivity.
of the building, on interoperability and cybersecurity of systems, and on data protection

[160] The Regulation (EU) 2020/2155 is supplementing the Directive (EU) 201/31/EU on the energy performance of buildings by establishing an optional common EU scheme for rating the smart readiness of buildings

[161] M/480, M/490 and M/495

4.4.2 Internal coherence

Evaluation question: To what extent is the intervention coherent internally?

The Directive is for the most part internally coherent and the various provisions complete and reinforce each other to achieve the common objectives of facilitating and incentivising the roll-out of high-speed electronic communications networks by reducing deployment costs and administrative barriers. For example, provisions on access to existing physical infrastructure are complemented with provisions on access to in-building infrastructure to ensure that ECN operators can efficiently reach end-users.

However, various stakeholders consider that the provisions of Article 5 are not fully aligned with those in Article 3 in the sense that Article 5 does not allow for refusal in case of the availability of viable alternative means of wholesale physical network infrastructure. Thus the Directive do not address situations where co-ordination of civil works might result in unviable overbuild. While this is not an incoherence between Article 4 and Article 6 as they differ in scope (transparency on infrastructure sharing and transparency on civil works, respectively), a potential mutual reinforcement of these provisions through a better alignment, might provide the network operator with a simplified set of rules.

BEREC also supports better alignment of the Directive provisions on coordination of civil works with the ones on access to the existing physical infrastructure, including for preventing the risk of unviable overbuilding. Less and simpler rules will increase legal certainty and diminish the number of disputes, as operators might reach agreements without the DSBs.

Overall, the Directive is coherent internally. However, a slightly better alignment of various provisions of the Directive might provide with more uniform and simple applicable rules.

4.5 EU-added value

Evaluation question: What is the additional value resulting from the Directive, compared to what could reasonably have been expected from Member States acting at national and/or regional levels?

Digital connectivity is essential for the development of the Digital Single Market, enabling SMEs and other businesses to develop and offer digital services as well as enabling consumers to access digital services across the EU. Disparities (the 'digital infrastructure divide') between and within regions (e.g. in terms of levels of infrastructure endowment) prevent them from reaping the benefits of the EU digital transformation.

The Directive is among the instruments that could help to overcome the overall challenge to meet the European Gigabit Society targets, in particular in rural areas or areas where such services cannot be offered commercially, together with the Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks, and the co-investment provisions of the EECC (Articles 76 and 79).

While some Member States benefited from similar measures prior to the adoption of the Directive (section 2.2), the benefits of accelerated ECN roll-out would have been limited at national or even regional/local level. The Directive built on these existing best-practices and

leveraged them at EU level to reduce the above-mentioned disparities (by increased high-speed ECN coverage – see section 4.1.1.1), raise standards (e.g. for in-building physical infrastructure – see section 4.1.1.4) and create synergies with other networked sectors like transport or energy (see sections 4.1.1.1 and 4.1.1.2). Thus, by setting common European objectives and rules facilitating and incentivizing the efficient rollout of performant ECN network, the Directive has brought regulatory stability and certainty for efficient deployment of ECNs, spearheading all Member States towards the European Gigabit Society.

The Directive's measures on access to and transparency of existing physical infrastructure are considered to have an important EU-added value (e.g. efficient procedures, a minimum set of transparency obligations), while for the ones concerning the coordination of civil works and its transparency the EU-added value is limited, due to uneven effectiveness across the EU. As regards the Directive's measures on permit granting procedures, overall, there is an EU added-value as the Directive brings common rules, reduces administrative costs (where effectively implemented) and provides clarity, legal stability and predictability. The EU added value of in-building infrastructure and access provisions is also real, although there is a need to address some challenges e.g. in relation to standardisation.

The Directive has led to greater cost reduction opportunities in a number of Member States. These are greater than it would have been possible without the Directive, due to the cumulative effect of all its measures. The Directive has also contributed to the further elaboration of measures in countries which already benefited from legislation pre-dating the Directive in some respects, such as Portugal and Spain. In all those cases and countries where the Directive has played a role in expanding high-speed broadband, which include in particular Germany, Finland, Italy, Lithuania, Romania, Bulgaria and Hungary (including for wireless deployment), the Directive has contributed to tackling the digital divide and bringing economic and societal benefits from wider availability of high-speed broadband.

However, when it comes to the ease of doing business across the EU or boosted economies of scale for companies with cross-border operations, **ECN operators** consider that the Directive has delivered less EU-added value than expected. For example, i**nterviews and case studies**[162] found that, the EU-added value of Directive's provisions on access to existing physical infrastructure was diminished because information which would be useful for the deployment of wireless networks, such as the location of masts and antennas, has not been comprehensively addressed e.g. via SIPs in all countries.

The Directive also created a common framework that allows Member States to learn from each other's best practices and accelerate together the ECN roll-out across the EU. Several **ECN operators** and **public authorities** praise the Connectivity Toolbox Recommendation that has led Member States to agree on 39 best practices boosting investment in very high-capacity broadband connectivity infrastructure, including 5G, most of them triggered by the implementation of the Directive, as part of the Connectivity Toolbox. It seems unlikely that the progress, including the identified best practices, along with the associated cost-saving benefits would have occurred to the same degree in the absence of the Directive.

The flexibility of the Member States to elaborate on exemptions in cases where a full implementation of all provisions would be unduly burdensome is valuable. However, the

[162] Carried out under the ICF, WIK & EcoAct study.

considerable scope for exclusions or exemptions across a wide set of circumstances and Member States and the lack of up-front guidelines or common principles on various measures provided by the Directive diminished considerably its' EU added value.

The Directive's general objective is to facilitate and incentivise the roll-out of high-speed electronic communications networks. A recent JRC study[163] shows that after full implementation of the appropriate policies, the EU economy could be expected to enjoy up to EUR 110 billion of additional GDP per year thanks to actions in completing the Digital Single Market. A significant fraction of this potential can be found at the level of network infrastructures: different regulatory approaches to network rollout increase the cost of access to national markets, prevent the exploitation of economies of scale at services and equipment level and hinder the development of innovative services which could emerge on very high-speed networks running in a seamless fashion across borders. Another recent report[164] shows that promoting internet connectivity- **notably through the deployment of wireless high-speed broadband and faster roll-out of fixed high-speed broadband -** at EU level could bring potential efficiency gain of €58 billion per year[165]. The Directive is called to bring its contribution to this outcome. Vice-versa, a low effectiveness of the Directive might partly jeopardize the above-mentioned efficiency gain. Looking wider, the study estimates **the cost of non-Europe** (non achievement of Digital Single Market) at EUR 110 bn/year, while for overall EU digital economy it would amount to EUR 178 bn/year.

Overall, the Directive is seen to have provided EU-added value through regulatory stability and certainty and only partially through more simple and efficient administrative procedures. It has brought less added-value as regards the ease of doing business across the EU or boosted economies of scale for ECN operators with cross-border operations.

5 CONCLUSIONS

5.1 Summary of the evaluation

The present evaluation report is part of the fitness check that aims at assessing the Directive as a whole, while carrying out evaluations for its objectives. It examines whether progress towards the objectives is on track or if there is a case for making any changes. The findings of the analysis are subject to some limitations, as explained in Annex II.

The review of the Directive should, on one hand, address the deepening of the digital divide resulting from the COVID-19 pandemic crisis and, on the other hand, contribute to efficiently achieving the connectivity objectives of the "2030 Digital Compass: the European way for the Digital Decade". The results of the evaluation report need to be interpreted in this context.

[163] JRC Working Papers on Territorial Modelling and Analysis No 02/2018, European Commission, Seville, 2018, JRC 113746.

[164] Europe's two trillion euro dividend: Mapping the Cost of Non-Europe, 2019-24 (europa.eu).

[165] According to the above-mentioned study, estimates locate the potential long-term boost to EU GDP from European-level policies to promote improved internet connectivity - notably through the deployment of wireless high-speed broadband and faster roll-out of fixed high-speed broadband - at about 0.8 per cent of GDP after full running-in over 30 years. Assuming a positive impact of 0.4 per cent of GDP over the next decade, the boost to the European economy would be in the order of €58 billion per year.

5.1.1 Effectiveness

The Directive built on similar existing measures in some Member States, while taking into consideration the national (including local) circumstances and the starting point of each Member State. The Directive allowed flexibility to the Member States not to implement certain measures or to apply exemptions. However, due to variable implementation across the EU, the Directive has been only partially effective with respect to both general and specific objectives.

While overall the Directive has had a positive effect on the deployment of high-speed broadband (nearly 100,000 km of re-use of duct and aerial infrastructure), this constitutes a relatively limited proportion of the available physical infrastructure (section 4.1). However, where effectively applied, the Directive can accelerate deployment of high-speed broadband projects by some months, save between 10-30% in deployment costs and proportionally increase network coverage**.** Thus, by supporting further the deployment of high-speed broadband networks, the Directive has contributed to reducing the digital divide.

The biggest progress relates to access to existing physical infrastructure and the related transparency measures while there has been less progress as regards permit granting, coordination of civil works and access to in-building infrastructure. Moreover, the outcome is uneven across the EU and, even in areas of action with more effectiveness, it does not fully satisfy the imperative of faster and more efficient ECN roll-out. Persisting barriers for ECN rollout, the lack of uniform and digitalized administrative procedures or insufficiently effective SIPs still hinder the potential impact of cost reduction measures to foster a more efficient and fast deployment of electronic communications networks across the EU.

5.1.2 Efficiency

The Directive brings benefits to public authorities, ECN operators and, indirectly, to consumers. Despite the administrative costs incurred by ECN operators and competent public authorities, the benefits outweigh the costs. However, for operators of other networks than ECN the associated costs outweigh the benefits. Thus, even if only partially effective, the Directive was efficient, but to a lesser extent than expected.

The provisions on access to existing physical infrastructure have resulted in cost-savings of 10-30% of the deployment costs, the ones on coordination of civil work of about 10% (sometimes up to 30%) for fixed networks and more than 30% for mobile networks (but with potential delays and risk of unviable duplication of infrastructure) and the ones on in-building infrastructure of about 10%. However, the benefits are patchy and rely on specific national circumstances, thus limiting the overall efficiency of the Directive (section 4.2). Permit granting procedures are mainly inefficient due to the multiplicity of permits and fees needed for ECNs deployment. This increases significantly the costs associated with permit granting, for both ECN operators and competent public authorities.

The Directive has to a certain extent enabled a decrease in administrative burden, due to e.g. established timeframe for permit granting or the increased use of electronic platforms, albeit there is still room for improvement. In particular, clarification of certain measures as regards access to physical infrastructure and coordination of civil works could further increase the efficiency of the Directive, by potentially reducing the number of dispute settlements or make

them more efficient. Digital systems facilitating permit granting provided for by the Directive as well as tacit approvals or permit exemptions could lead to more efficient handling of permit applications and, consequently, to more efficient ECN rollout.

5.1.3 Relevance

Civil works remain a significant part of the total costs of ECN deployment. For fixed networks, the costs linked to physical infrastructure are estimated at 60%-80% of the total cost of deployment, while for mobile networks in the 40%-60% range. In addition, there is still a big digital connectivity gap between urban and rural across the EU and the COVID-19 pandemic widened social inequality and digitalisation gaps. Despite the mobilized national and EU funding resources to digital connectivity infrastructure, it is crucial to further reduce the cost of network rollout, including for fibre and 5G networks. The Directive should thus increase the efficiency of unprecedented investments in digital connectivity across EU, as foreseen for the current decade.

The general and specific objectives of the Directive - to facilitate and incentivise the roll-out of high-speed electronic communications networks at a lower cost, by promoting the joint use of existing physical infrastructure and by enabling a more efficient deployment of new physical infrastructure - remain valid and even have an increased relevance in light of-the COVID-19 pandemic crisis. The objectives of the Directive have been to a large extent appropriate for meeting the current needs within the EU so far, but they do not fully reflect the new needs emerging from recent EU policy developments and Commission priorities for the future, in particular ubiquitous coverage with "Gigabit-capable" broadband and 5G networks.

The Directive is to a certain extent adapted to subsequent market developments and technological advances, but further adaptation in specific areas are needed. For example, the increasingly important needs for access to facilities such as rooftops or street furniture in the context of 5G deployment trigger further reflection on how to boost the Directive's relevance. Furthermore, the major renovation wave by 2030 triggered by the Green Deal objectives is also a huge opportunity for high performant in-building infrastructure, including fibre ready.

5.1.4 Coherence

As regards **internal coherence**, the main pillars of the Directive form a rather coherent package, albeit some technical alignments may be necessary. Certain provisions of the Directive might be better aligned for both access to existing physical infrastructure and coordination of civil works.

With regard to **external coherence**, the Directive is quite coherent with other EU policies and legislation, in particular with the EECC, EU competition policy and state aid and relatively less with other sector specific EU law on network industries. However, the Directive does not always reflect more recent legislative developments after its adoption, including from new Commission's priorities. One clear example is the scope of the current Directive (high-speed electronic communications networks, e.g. networks of at least 30 Mbps) while the new provisions of the EECC put emphasis on the more advanced concept of VHCN. Furthermore, the 2030 Policy Programme "Path to the Digital Decade" requires that

the Commission and the Member States work together to achieve that, by 2030, all European households are covered by a Gigabit network, with all populated areas covered by 5G.

5.1.5 EU added value

Overall the Directive has a visible EU added value as it brings common rules facilitating more efficient investments in high-speed broadband infrastructure, reduces administrative costs (where effectively implemented) and provides clarity, legal stability and predictability. However, the voluntary character of many provisions as well as considerable scope for exclusions or exemptions diminished considerably its EU added value.

All in all, this evaluation report mainly reconfirms the findings of the 2018 Commission's report on the implementation of the Directive but also shows further progress, mainly concerning the access to physical infrastructure and information provision since the Directive started to apply. However, less progress has been made in supporting the coordination of civil works, easing the process of applying for civil permits or facilitating access to building for the installation of in-building infrastructure.

5.2 Lessons learnt

Lesson learnt: The flexibility conferred by the minimum harmonisation nature of the Directive (with voluntary measures and exemptions) has led to uneven progress across the EU.

The minimum harmonisation character of the Directive, with many voluntary provisions as well as considerable scope for exclusions or exemptions has led to a patchy implementation of the Directive. Some Member States implemented the minimum while others went beyond. Some provisions have been more intensively applied than others and outcomes are variable, with considerable scope to refocus and improve the Directive. Although some progress can be expected from the implementation of the Connectivity Toolbox, there is little evidence that, under the current rules, the foreseeable progress across the EU would significantly boost investment in very high-capacity broadband connectivity infrastructure, including fibre and 5G. Moreover, despite the observed progress, the efficient achievement of 2025 (intermediate) and 2030 Digital Decade connectivity targets is at risk.

Lesson learnt: The uneven progress and persisting challenges are hindering the efficient ECN rollout, with impact on the functioning of the internal market.

The uneven progress observed impedes the development of the Single Market. Persisting barriers still hindering the efficient ECN rollout are: the high deployment costs for both FTTH and mid-band 5G and the complex and lengthy procedures slowing down deployments. These problems result from persisting challenges to access existing physical infrastructure or to locate and access sites for wireless deployment, lack of or incomplete information about physical infrastructure and planned civil works, limited co-ordination of civil works, risk of unviable overbuild (potentially deterring investments in rural areas), high complexity, timeframes and cost to obtain permits and RoW and lack of suitable (or access to suitable) in-building infrastructure and fibre wiring.

As large parts (13%) of the EU are still not covered by high-speed broadband infrastructure due to excessive costs of rollout, citizens and consumers in those areas will not benefit from access to advanced connectivity and to digital services. It is likely that the resulting patchwork of rules at national and sub-national levels will persist or accentuate and, as such, will increase the fragmentation of the internal market, which will in turn slow down development and growth of European companies and EU global competitiveness.

Lesson learnt: Transparency is a pre-requisite for a more efficient rollout of ECNs.

The lack of transparency on available suitable existing infrastructure has a significant impact on the cost and time of deployment since it reduces the effectiveness of the actual access to physical infrastructure. While transparency on physical infrastructure has significantly improved since the application of the Directive, the most significant challenge relates to obtaining information about public infrastructure or facilities for hosting fixed and wireless network elements, the exact location of physical infrastructure (geo-referencing) and the extent to which such information is complete and up to date. The lack of information about planned civil works is also challenging the efficient ECN rollout, as this limits the opportunities for timely and efficient coordination thereby and might even trigger interruption of works in cases where projects address the same areas simultaneously. Proactive notification of civil works have led to greater uptake of civil works co-ordination.

Lesson learnt: More clarity or guidance on some provisions of the Directive as well as enhanced, fully digitized information platforms/ SIPs, including for permit granting, could significantly reduce the administrative burden associated with network rollout.

The provisions on access to physical infrastructure (and the associated information) have led to disputes, notably regarding the terms and conditions under which such access should be granted. The risk of legal uncertainty, delays and eventually higher deployment costs associated with long lasting disputes, was mitigated in some countries by more clarity and guidance on, for example the "fair and reasonable" access conditions, including pricing. In case of coordination of civil works, in addition to the above-mentioned risks, ECN operators are less willing to engage in coordination, in particular where this might put at risk the financial viability of the project. Similarly, more clarity and guidance on e.g. apportioning of costs for coordinated civil works proved efficient where such guidelines had been issued.

Furthermore fully digitized information platforms/ Single Information Points, including for permit granting, improved transparency and reduced the administrative burden associated with network roll-out for both network operators and the competent public authorities. However, while these platforms might be already in place or required by other digital transformation related initiatives (e.g. e-government), setting-up of such platforms requires initial investments as well as further administrative costs for their maintenance and operation.

Lesson learnt: A monitoring system for the implementation of the Directive could further increase its effectiveness.

Last, despite good cooperation with Member States as regards the implementation of the Directive within COCOM[166], there are no monitoring arrangements (e.g. a set of indicators)

[166] The Communications Committee (COCOM) has been established under the Framework Directive 2002/21/EC and assists the Commission in carrying out its executive powers under the regulatory framework for

to track progress and impacts resulting from the implementation of the Directive. A defined monitoring system could help Member States and the Commission to keep good track.

5.3 Next steps

Overall, the Directive has contributed to the further development of the Digital Single Market and is broadly fit for purpose, as its objectives remain relevant. However, some of its provisions need revision and/or update, clarifications, further streamlining and simplification, as well as adjustments to reflect recent legislative developments, further be aligned to current and future needs and EU priorities and to market and technology developments (Figure 13).

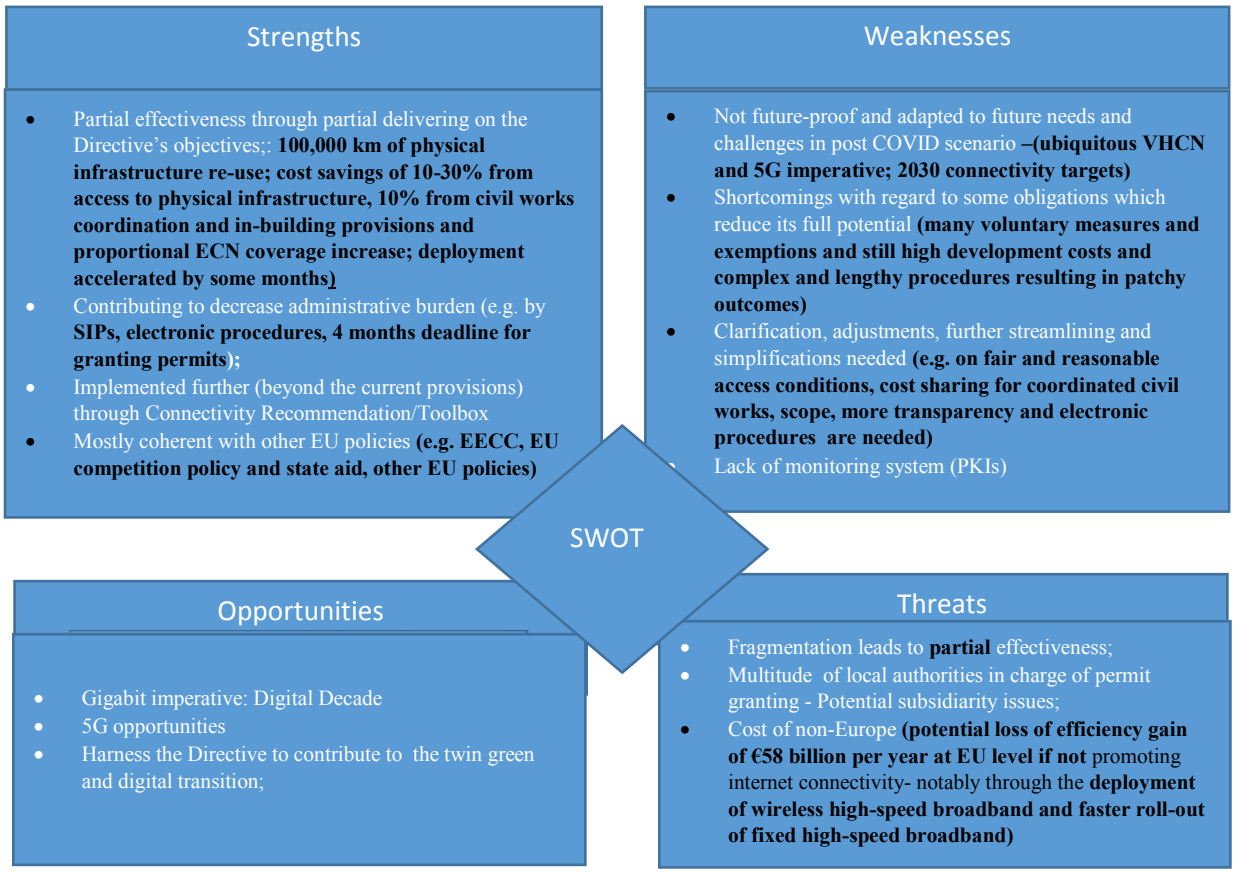


Figure 13: SWOT analysis for the Directive

Building on the identified strengths and using the current and future opportunities, the review of the Directive is called to further facilitate and incentivise the rollout of increasingly performant electronic communications networks. The above five lessons learnt should serve to reduce the current weaknesses of the Directive and mitigate the current or future threats. The results of this evaluation will feed into the Impact Assessment for the Directive's review.

electronic communications, the Regulation 733/2002 on the .eu Top Level Domain, the Decision 626/2008/EC on mobile satellite services, and the Regulation 731/2012 on roaming. The committee exercises its function through advisory and examination procedures in accordance with the Comitology Regulation 182/2011 and under the regulatory with scrutiny procedure in accordance with the Council Comitology Decision 1999/468/EC. The committee furthermore provides a platform for exchange of information on market developments and regulatory activities.

A secure, resilient and reliable connectivity infrastructure is the foundation of the EU digital transformation. Stimulating economic growth and boosting investment in the real economy is at the heart of the Commission's priorities. Taking into consideration the unprecedented financial support for the EU digital transformation by 2030, **ensuring an incentivising regulatory environment while cutting costs through more efficient procedures is not only a challenge but also a duty for the Commission, Member States and all responsible stakeholders.**

ANNEX I. PROCEDURAL INFORMATION

1. LEAD DG, DECIDE PLANNING/CWP REFERENCES

The review of the Broadband Cost Reduction Directive is one of the actions announced in the Commission's Communication 'Shaping Europe's Digital Future' as part of the initiatives which would contribute to achieving the aim that "technology works for people" and was part of the Commission's Work Programme 2020.

Directorate General Communication Networks, Content and Technology (CNECT) is the lead DG for this evaluation, and in particular Directorate B 'Connectivity', Unit B1 – Electronic Communications Policy.

The process of the review was started in March 2020 and the DECIDE reference is PLAN/2020/7443.

2. ORGANISATION AND TIMING

In accordance with the Better Regulation Guidelines, an Inter-service steering group (ISSG) was set up with representatives from various Directorates General and services of the Commission[167]. The ISSG is composed of representatives of Commission Directorate-Generals for Competition; Economic and Financial Affairs; Energy; Environment; Climate action; Internal Market, Industry, Entrepreneurship and SMEs; Legal Service; Mobility and Transport; Regional and Urban Policy; Secretariat-General.

The ISSG steered and monitored the progress of the exercise, ensuring the necessary quality, independence and usefulness of the evaluation. These services with a policy interest in the review of the Broadband Cost Reduction Directive have been associated in the development of this analysis and has provided support through the main steps of the process.

The ISSG met (online) for the first time on 29 April 2020, where it provided support for the preparation of the consultation of the Roadmap/Inception impact assessment and the draft Consultation strategy. Shortly after the ISSG was consulted on the draft terms of reference for the support study. In July 2020, the ISSG was consulted on the draft questionnaire for the wide public consultation covering both backward and forward-looking aspects and its members were informed of the outcome of this exercise (factual summary report). ISSG members were invited to participate and were informed of the outcome of the different consultation activities which were run during the first semester of 2020 (Commission and support study workshops). On 2 December 2021, the ISSG met (online) and discussed the draft evaluation SWD and accompanying support study and comments were received by 9 December 2021. This evaluation report has dully addressed the various remarks made.

The evaluation and impact assessment for the Broadband Cost Reduction Directive's review are carried-out in a "back-to-back" process. Therefore, the evaluation report is annexed to the Impact Assessment for the review of the Broadband Cost Reduction Directive. The scrutiny

[167] Ares(2020)1969081

of the impact assessment report by the Regulatory Scrutiny Board took place on 16 March 2022.

3. EXCEPTIONS TO THE BETTER REGULATION GUIDELINES

As the support study was designed on the basis of previous Better Regulation rules (launched in October 2020) and the **evaluation** report was submitted to the ISSG prior to the publication of the new Better Regulation rules of 25 November 2021, a derogation has been granted for using the previous Better Regulation rules. No other derogation from the usual procedure laid down in the Better Regulation Guidelines was requested.

4. CONSULTATION OF THE REGULATORY SCRUTINY BOARD (RSB)

The upstream meeting of the Regulatory Scrutiny Board (RSB) of 18 November for impact assessment report gave the RSB members the opportunity to make suggestions also on the evaluation report (e.g. lessons learnt). This report has dully addressed the various remarks made, as appropriate. It is worth noting that no further RSB comments came out from the scrutiny of 16 March 2022.

5. EVIDENCE, SOURCES AND QUALITY

The variety of views which have been collected through the extensive consultation activities contributed to the objectivity and independence of the evaluation, and allowed to cross-check data. We have used various sources for evidence gathering, namely:

- **implementation reports**: implementation, monitoring and screening exercises run by DG CONNECT regularly; annual reports issued by DG CONNECT covering market and regulatory developments in electronic communications such as the Digital Economy and Society Index (DESI).
- 2018 Commission report on the implementation of the Broadband Cost Reduction Directive.
- **dedicated support** study supporting the findings of this fitness check: *Support for the evaluation of current measures at European and national level to reduce the cost of deployment of electronic communications networks and for the preparation of an impact assessment to accompany an EU initiative to review Directive 2014/61/EU*[168]*,*
- The objective of the support study is to support the evaluation of the Directive by assessing the effect of measures adopted under this Directive (including optional measures and measures going beyond scope of Directive), taking into account the effect of other measures related to the reduction of the cost of high-speed broadband deployment adopted at national level. The support study also supports the preparation of an impact assessment to accompany a possible Commission initiative for the review of the Directive by contributing to the problem definition and assessing the impact of a number of policy options and refining them as necessary. To this end, the support study conducted targeted consultations consisting of surveys, interviews, case studies and workshops. The support study also took into consideration the results of the open public consultation and, eventually, the roadmaps developed by Member States for the implementation of the Common Union Toolbox of best practices to foster connectivity

[168] VIGIE 2020-0647/ ICF, WIK & EcoAct study.

that Member States submitted between April and November 2021 and their implementation reports submitted between April and July 2022.

- **literature review**: several reports[169] and studies[170] related to the Broadband Cost Reduction Directive were reviewed and an extensive literature review was carried out.
- **stakeholders' consultations**:
  - stakeholder feedback for the Roadmap/Inception Impact Assessment (19 June 2019- 17 July 2020);
  - public consultation (02 December 2020 – 02 March 2021) covering both backward and forward looking aspects. A factual report was published and the detailed analysis of the responses was done using stakeholder mapping[171];
  - online participatory workshops on network deployment: drivers and barriers for network deployment on 27 January 2021 (summary report) and on institutional aspects of BCRD on 22 February 2021 (summary report);
  - BEREC's opinion on the revision of the Broadband Cost Reduction Directive covering both backward and forward looking aspects;
  - targeted consultation of local and regional authorities (2nd meeting of Committee of the Regions-European Commission Broadband Platform of 15 June 2021, online workshop with Living-in.EU signatories of 28 October 2021 (event report). This was carried out as not sufficient representativeness of sub-national authorities was ensured through the rest of the consultation activities and in order to have more robust and comprehensive data;
  - bilateral meetings, including with market stakeholders and their associations.

[169] 2020 Summary Report of Best Practices - Outcome of phase 1 of the work of the Special Group for developing a common Union Toolbox for connectivity (link); Member States roadmaps for the implementation of the Connectivity Toolbox and their related implementation reports; 2018 European Commission report on the implementation of the Broadband Cost Reduction Directive (link); 2017 BEREC report on the Implementation of the Broadband Cost Reduction Directive (link); BEREC report on pricing for access to infrastructure and civil works according to the BCRD (link);

[170] Study on implementation and monitoring of measures under the BCRD (SMART 2015/066); White paper on EU broadband Plan challenges and opportunities, Analysis Mason 2019 (link);

[171] The open public consultation, covering both the evaluation (backward looking) and the impact assessment (forward looking), was addressed to the following categories of stakeholders: (1) electronic communications network operators; (2) physical infrastructure operators; (3) other network operators (energy, transport, water); (4) competent authorities dealing with permit granting procedures for civil works and/or access to public property or other elements; (5) competent authorities in charge of DIRECTIVE transposition, implementation and enforcement, in particular the tasks of dispute resolution and single information point; (6) property owners and managers; (7) suppliers of electronic communications equipment and related services; (8) undertakings in the building and civil works sector; (9) stakeholders with a general interest in the deployment of very high capacity networks (VHCN) and services, including citizens, social and economic organisations/groups and non-governmental bodies; (10) stakeholders with an interest in environmental protection, including citizens, social and economic organisations/groups and non-governmental bodies; (11) experts, including academia and think tanks.

ANNEX II: METHODOLOGY

This evaluation was coordinated by the EC's Directorate-General Communications Networks, Content and Technology with the support of a Steering Group (with representatives of Commission Directorate-Generals for Competition; Economic and Financial Affairs; Energy; Environment; Climate action; Internal Market, Industry, Entrepreneurship and SMEs; Legal Service; Mobility and Transport; Regional and Urban Policy; Secretariat-General). The Group steered and monitored the progress of the exercise, ensuring the necessary quality, independence and usefulness of the evaluation.

The evaluation took place between June 2020 and February 2022 and drew from the data sources and methods as described below. The evaluation is based on the five Better Regulation standard evaluation criteria: effectiveness, efficiency, relevance, coherence (with EECC and new connectivity ambition) and EU added value.

Evidence gathering

- **implementation reports**: implementation, monitoring and screening exercises run by the EC's Directorate-General Communications Networks, Content and Technology (DG CONNECT) regularly; annual reports issued by DG CONNECT covering market and regulatory developments in electronic communications such as the Digital Economy and Society Index (DESI),
- **the 2018 Commission report on the implementation** of the Broadband Cost Reduction Directive;
- a supporting **study** (thereafter "support study") supporting the findings of this fitness check: "Support for the evaluation of current measures at European and national level to reduce the cost of deployment of electronic communications networks and for the preparation of an impact assessment to accompany an EU initiative to review Directive 2014/61/EU"- (VIGIE2020-0647)[172]. The support study has evaluated the Directive and how it has been applied across the EU in line with the principles established in the Better Regulation[173] toolbox. As many of the measures in the Directive are voluntary, the support study has placed particular focus on assessing to which extent Member States have gone beyond the minimum requirements of the Directive (by implementing voluntary measures or going beyond the remit of the Directive), and assessed to what extent additional measures may increase its effectiveness, in which circumstances and at what cost.
- **literature review**: several reports[174] and studies[175] related to the Broadband Cost Reduction Directive were reviewed and an extensive literature review was carried out.

[172] Study in support for the evaluation of current measures at European and national level to reduce the cost of deployment of electronic communications networks and for the preparation of an impact assessment to accompany an EU initiative to review Directive 2014/61/EU.
[173] https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en
[174] 2020 Summary Report of Best Practices - Outcome of phase 1 of the work of the Special Group for developing a common Union Toolbox for connectivity (link); Member States roadmaps for the implementation of the Connectivity Toolbox and their related implementation reports; 2017 BEREC report on the

- stakeholders' consultations:
  - stakeholders' feedback[176] to the Roadmap/Inception Impact Assessment (19 June 2029- 17 July 2020);
  - the public consultation (02 December 2020 – 02 March 2021); A factual report was published and the detailed analysis of the responses (synopsis report can be found in Annex II of the Impact Assessment SWD) was done using stakeholder mapping (see Figure 14);
  - the online participatory workshops on network deployment: drivers and barriers on 27 January 2021 (summary report) and on institutional aspects on 22 February 2021 (summary report);
  - BEREC's opinion on the revision of the Broadband Cost Reduction Directive; and
  - targeted consultation of local and regional authorities.

Deviations from the Roadmap

Compared to the published Roadmap for this initiative, the launch of the public consultation was in the fourth quarter of 2020 rather than in the third. Such short delay allowed to take account of the Connectivity Recommendation of September 2020. Moreover, the support study was also launched slightly later than foreseen, in November 2020, and incorporated the assessment of the summary report of best practices published in December 2020, the March 2020 Connectivity Toolbox as well as the roadmaps for implementation of Connectivity Toolbox that Member States provided between April and November 2021. Since April 2022 Member States also shared their implementation reports on the measures in the Connectivity Toolbox.

Collation/Triangulation of evidence

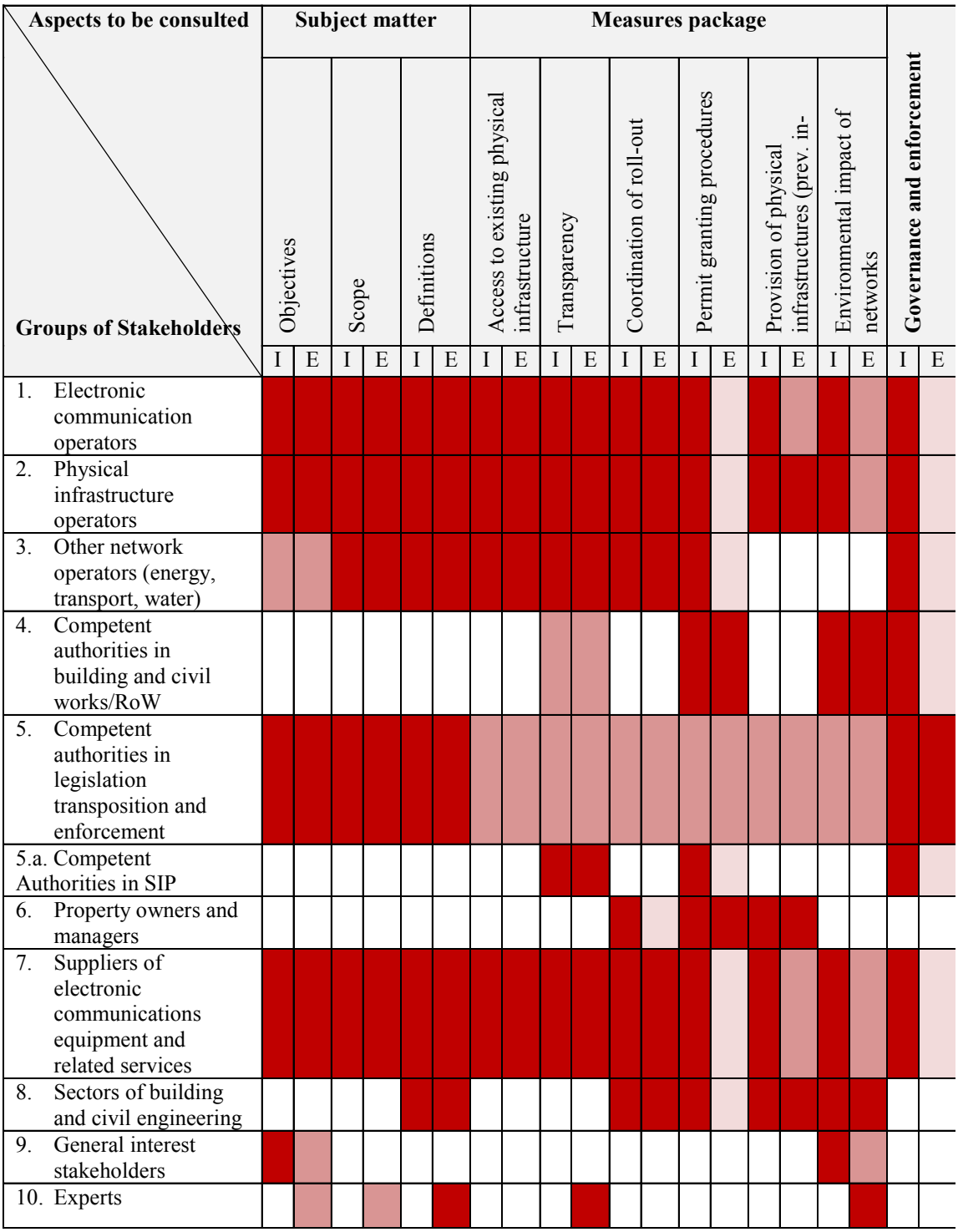
The evaluation covered the implementation of the Directive in all 27 Member States since the deadline for its transposition in January 2016. The consultation activities aimed at collecting the views of stakeholders as shown in the stakeholders consultation matrix below (Figure 14), which depicts the stakeholders considered as having an interest and experience in each of the aspects to be consulted.

Implementation of the Broadband Cost Reduction Directive (link); BEREC report on pricing for access to infrastructure and civil works according to the BCRD (link);

[175] Study on implementation and monitoring of measures under the BCRD (SMART 2015/066); White paper on EU broadband Plan challenges and opportunities, Analysis Mason 2019 (link);

[176] 22 contributions were received (eight from business associations, six from company/business organisations, four from NGOs, three from public authorities and one EU citizen), from nine Member States, plus United Kingdom.

Figure 14: Stakeholders consultation matrix



I= Level of interest in the aspect to be consulted

E= Level of expertise in the aspect to be consulted

High	Medium	Low	Not applicable

The evaluation was done based on the Directive's main pillars (see Figure 1) and horizontal provisions. In the support study, this was done based on some quantitative but mostly on qualitative analysis of data gathered through **questionnaires**, **case studies**, **interviews**. The methods used depended to a large extent on the nature and aim of the provisions analysed: while for certain Directive objectives the interest is to quantify the results (e.g. cost savings for roll-out of electronic communication networks), for other specific or operational objectives a qualitative assessment (e.g. transparency and permit granting procedures) was more appropriate. The Directive's efficiency was assessed on a **cost-benefit balance analysis** that quantified, where data was available, the main costs and benefits. Some network operators and public authorities provided some quantitative data, but the collection of quantitative data proved to be difficult as a large part of stakeholders did not provide it or simply did not have it. Thus, careful consideration was given to complementary use of qualitative and quantitative methods.

Evidence gathered was triangulated with various implementation reports and pre-existing specific studies and arguments of different stakeholder groups were **compared against each other** and, where possible, **against information from independent third parties or official statistics**. Attention was also paid to how the evidence corresponds to the responses obtained in the stakeholders consultation activities (**stakeholders' feedback to the roadmap/inception impact assessment, workshops, public consultation**), as mapped per category of stakeholders. Moreover, the findings of the evaluation are also building on the experience (and data sets) formed throughout the Commission internal monitoring (e.g. requests for information to the Member States via Communications Committee[177] (COCOM), yearly country missions, DESI reports) and enforcement exercises (additional information required from the Member States within the conformity check exercise). Triangulation is contributing to the robustness, objectivity and independence of the evaluation findings provided in this evaluation.

Limitations

While the evaluation is based on extensive consultation activities with stakeholders and the public consultation, it faced some limitations in the data collection, the impact of which was mitigated wherever possible.

A lack of comprehensive available evidence, including historical data, and low quality of information in some cases prevented a comprehensive quantitative analysis of the changes introduced by the Directive. For example, only few stakeholders provided quantitative data on costs and benefits of implementing the Directive rendering more difficult to quantify and monetise its impact. The evaluation has relied mainly on the support study and on stakeholder consultations.

The public consultation (the 96 responses covered 22 Member States, United Kingdom, Norway and China) and the support study online questionnaire (responses from DSBs and other competent authorities covered 21 Member States and Norway) did not cover all

[177] Article 118(1) of the Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (European Electronic Communications Code (EECC)); OJ L 321/36 of 17.12.2018

Member States. This data shortage has been mitigated, wherever possible, with review of past studies and Commission reports (DESI). In addition, the work of the Connectivity Special Group has also been a useful complement.

Limited evidence on the actual impacts of the Directive was available in Member States which have experienced delays in implementation. At the same time, the risk of drawing invalid conclusions has been mitigated by the online surveys and in-depth interviews carried out by the contractor of the support study as well as stakeholders consultation activities and data gathering through DESI reports.

It has been sometimes difficult to isolate the results and impact of the Directive from previous national measures or by reference – strictly speaking to the minimum provisions therein. It is therefore difficult to precisely estimate the Directive's unique impact on EU wide efficient roll-out of electronic communications networks since its adoption.

In addition, the causality and attribution are challenging to prove or quantify, as the increased roll-out of electronic communications networks at a lower cost is not solely due to the Directive but to various other complementary EU legislation (EECC (and the framework in place before) contains measures e.g. for limiting charges to administrative costs, access obligations for operators designated with Significant Market Power (SMP)[178] or symmetric obligations for access to wiring and cables and associated facilities inside buildings; or EU broadband state aid guidelines[179]).

Last, absent indicators and an obligation to monitor the implementation of the Directive, has made difficult to obtain comparable data sets for all Member States covering the entire period evaluated. Within the Communications Committee (COCOM), the reflection on a common set of outcome indicators for the monitoring and evaluation of the implementation of the Directive was initiated without a concrete outcome, mainly due to the difficulties signalled by the Member States in collecting the envisaged data. The Commission's 2018 implementation report on the implementation of the Directive has recommended the Member States to gather data on the scale of access to physical infrastructure under the Directive, the proportion of high-speed networks deployed in co-deployment, the timeframes for permit granting and the number of buildings certified as deployed with high speed-ready in-building infrastructure.

Based on the elements above, the evaluation has been carried out on the basis of the best available data. Whenever reliable quantitative data is lacking, this is indicated as appropriate and possibly counter-balanced with qualitative data and/or analysis.

[178] For example, Bulgaria reported (2019 DESI telecom for Bulgaria) that the number of undertakings using the ducts provided by the incumbent (BTC) increased and reached 227 (41.4 % of the total number of active undertakings) and that in one year, the revenues from ducts grew by 6 %. In Spain (2018 DESI telecom for Spain), the access to the physical infrastructure of the significant market power operator (Telefonica) has been available at cost-oriented prices since 2008.

[179] The European Commission's European 2021 Summary report of the programme annual implementation reports covering implementation of Structural and Investment Funds in 2014-2020 reports that by the end of 2020, programmes had spent EUR 6.5 billion of allocated EUR 14,4 billion supporting the digital transition in the EU. As a result, 5.5 million households had received improved broadband access and nearly 12 million households are expected to benefit from improved broadband access by the end of 2023. Evaluations show that in the long term, cohesion policy support has helped increase broadband access in some EU regions. In France, for example, ERDF support has made it possible to provide high-speed broadband services. Also in Poland, cohesion policy support has significantly improved ICT infrastructure, notably in rural areas.

ANNEX III: METHODS USED IN PREPARING THE EVALUATION

This annex provides the overall evaluation framework for the evaluation. It links with the various methodological tools used (i.e. **interviews, workshops, survey, public consultation, literature review**) and supplements Annex II (on methodology) to this report.

Objectives	Evaluation Question	Method used and data source[180]	Judgement criteria	Issues/indicator to be analysed
Criterion: Effectiveness				
General objective: facilitate and incentivise the roll-out of high-speed electronic communications networks	• **To what extent has the Directive met its general objectives?** • To what extent have the Directive physical infrastructure access provisions resulted in acceleration in NGA deployment? • To what extent has NGA deployment increased as a result of the ability to benefit from increased civil works co-ordination under the Directive? • To what extent have the Directive provisions on permit applications resulted in accelerated NGA deployment? • To what extent has NGA deployment increased as a result of the greater availability of in-building infrastructure under the Directive?	• public consultation • targeted consultation (BEREC) • Survey (support study) • questionnaire for the DSBs (support study) • quantitative data (support study) (DSBs/ECN operators)	incentivised and easy roll-out of high-speed electronic communications networks	• easier ECN roll-out • increased speed of ECN roll-out • increased ECN coverage

[180] See also stakeholders consultation matrix in Annex II, Figure 14

Specific objectives: • promoting the joint use of existing physical infrastructure • lowering the costs of deployment	• **To what extent has the Directive met its specific objectives?** • How many agreements have been made within each of the last 3 years for access to existing physical infrastructure (excluding agreements made in the context of SMP regulation)? • To what extent have the Directive physical infrastructure access provisions resulted in reduced cost of NGA deployment? • To what degree has the availability of information about existing infrastructure reduced the cost and time burden associated with deploying NGA networks? • To what extent have the Directive civil works provisions resulted in reduced cost or acceleration in NGA deployment in those areas where you made use of it? • To what extent have the Directive provisions on in-building infrastructure resulted in reduced cost for NGA deployment? • To what extent were cost-savings as a result of the ability to access existing in-building infrastructure under the	• survey (support study) • public consultation • targeted consultation (BEREC) • questionnaire for the DSBs (support study) • quantitative data (support study) (DSBs/ECN operators)	• increased joint-use of existing physical infrastructure • reduced costs of deployment	• Km of joint use of existing physical infrastructure • decreased cost of ECN deployment

	Directive?			
Operational objectives: • **OP1**: increasing the use of existing passive infrastructure suitable for broadband rollout, by achieving more transparency concerning this infrastructure, as well as a more consistent and effective regulatory regime concerning access to it;	• **To what extent has the Directive met its operational objectives (OP1)?** [add_1] • Has the ease of infrastructure access improved since the implementation of the Directive? • To what extent has improved access to information about existing infrastructure enabled greater use of access to existing infrastructure than would otherwise be the case? • Where expectations have not been met, which factors have hindered their achievement?	• public consultation • targeted consultation (BEREC) • survey (support study) • questionnaire for the DSBs (support study) • quantitative data (support study) (DSBs/ECN operator)s • case studies (support study)	• increased passive infrastructure sharing • more transparency concerning physical infrastructure • more consistent and effective regulatory regime concerning access to physical infrastructure	• km of poles and ducts of shared physical infrastructure provided under the Directive • Number of base station sites to which access has been provided under the Directive • number of requests to the SIP/year • number of requests received (by ECN operator) per year
Operational objective (OP2): increasing cooperation in civil works relevant for broadband rollout through the EU, in particular by ensuring transparency and by increasing legal certainty for cross-sector / cross-utility cooperation;	• **To what extent has the Directive met its operational objectives? (OP2)** • Has the ease of civil works co-ordination increased since the implementation of the Directive? • How many km of EC networks have been deployed with the aid of co-ordination? • What is the % of joint deployment in total deployment? • Where expectations have not been met, which factors have hindered their achievement?	• public consultation questionnaire • targeted consultation (BEREC questionnaire) • survey (support study) • questionnaire for the DSBs (support study) • quantitative data (support study) (DSBs/ECN operators) • Case studies (support study)	• increasing cooperation in civil works relevant for broadband rollout • increased transparency for cross-sector / cross-utility cooperation; • increased legal certainty for cross-sector / cross-utility cooperation;	• number of co-ordination agreements concluded under the Directive (DSB) • km of ECN networks deployed with the aid of co-ordination under the Directive (DSB) • % of joint deployment in total deployment (DSB)

Operational objective (OP3): streamlining the administrative procedures related to network rollout throughout the EU, mainly by increasing the transparency and coordination of the permit granting processes, while ensuring the enforcement of deadlines	• **To what extent has the Directive met its operational objectives?(OP3)** • Has the availability of information concerning permit application processes improved since the implementation of the Directive? • Has the process and speed of applying for a permit improved since the implementation of the directive? • What is the average timeframe for deciding on permits? What has been the maximum timeframe since the implementation of the directive? • Where expectations have not been met, which factors have hindered their achievement?	• case studies (support study) • public consultation questionnaire • targeted consultation (BEREC questionnaire) • survey (support study) • Questionnaire for the DSBs (study) • quantitative data (support study) (DSBs/ECN operators)	• streamlined administrative procedures for permit granting • increased transparency as regards permit granting procedures; • permits granted within 4 months	• average/maximum timeframe for deciding on/obtaining permits since the implementation of the Directive • % civil works permits obtained in 4 months or less in 2020
Operational objective (OP4): increasing the provision of buildings with open high-speed ready infrastructure throughout the EU, so as to reduce the costs and burdens associated with retro-fitting	• **To what extent has the Directive met its operational objectives?(OP4)** • Has the availability of in-building infrastructure increased since the implementation of the Directive? • What is the percentage of broadband-ready buildings among new and renovated buildings? (DSBs) • How many buildings have been	• survey (support study) • quantitative data (DSBs) • case studies (support study) • questionnaire for the DSBs/ECN operators (support study) • public consultation questionnaire • targeted consultation (BEREC questionnaire)	• increased provision of buildings with open high-speed ready infrastructure; • increased access to in-building infrastructure	• % of broadband-ready buildings among new and renovated buildings properly equipped with in-building physical infrastructure • number of buildings that have been awarded with the broadband-ready label (if one)/per year

	awarded the broadband-ready label (if one)?/per year • Where expectations have not been met, which factors have hindered their achievement?			
Operational objectives OP1, OP2 and OP4	• **How the dispute settlement body/process influenced the overall efficiency of the operational objectives OP1, OP2 and OP4?** [add_3]	• survey (support study) • quantitative data (ECN operators/ building operators, DSBs) • public consultation • workshops • BEREC questionnaire	• Identification of satisfaction with the governance system (DSB) established for the application of the Directive	• no of disputes settlements, per operational objective (OP1, OP2 and OP4) within the last five years • no/% of decisions taken by DSBs subject to appeal • no/% of decisions taken by the DSBs within/beyond the prescribed timeframe • average/maximum timeframe for disputes settlements, per operational objective (OP1, OP2 and OP4) within the last five years
Criterion: Efficiency				
Operational objective OP1: increasing the use of existing passive infrastructure suitable for broadband rollout, by achieving more transparency concerning this infrastructure, as well as a more consistent and effective regulatory regime concerning access to it;	• To what extent do the benefits outweigh the costs of the measures on access to physical infrastructure and information about physical infrastructure**?** • Have requirements to make available information about existing infrastructure had an impact on administrative burden (time, cost)? • To what extent do the benefits of the provisions on information about existing infrastructure exceed the costs? • Did the Directive create any additional cost and benefits for	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire • workshops/questionnaire • public consultation questionnaire (ECN operators/other network operators/NRAs) • case studies (support study)	Identification of costs and benefits generated by the access to exiting physical infrastructure and transparency related provisions of the Directive	**Costs:** • one-time cost of establishing SIP (on existing physical infrastructure), if present • annual FTE involved in maintaining the SIP, if present • no of average annual FTE for dealing with maintenance of information via a SIP if one is present • no of average annual FTE for dealing with information requests outside the scope of any SIP **Benefits:** Competent authorities: administrative burden reduction;

	the target stakeholders? • To what extent the role of the DSBs remains still pertinent, in relation to OP1?			Network operators: increased market share; administrative burden reduction (including due to digitalisation of procedures);
Operational objective (OP2): increasing cooperation in civil works relevant for broadband rollout through the EU, in particular by ensuring transparency and by increasing legal certainty for cross-sector /cross-utility cooperation;	• **To what extent do the benefits outweigh the costs of the measures on coordination of civil works and information about civil works?** • For those subject to civil works co-ordination obligations, has it had an impact on administrative burden (time, cost)? • For regulated utilities - are they able to cover your costs and make profits from civil works co-ordination for the purpose of ECNs? • Did the Directive create any additional cost and benefits for the target stakeholders?	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • case studies (support study)	Identification of costs and benefits generated by the civil works coordination related provisions of the Directive	**Costs:** • one-time cost of establishing SIP (on planned civil works), if present • annual FTE involved in maintaining the SIP, if present • no of average annual FTE for dealing with maintenance of information via a SIP if one is present • Number of average annual FTE for dealing with civil works coordination requests made or received (ECN/other network operators) **Benefits:** Competent authorities: administrative burden reduction; Network operators: increased market share; administrative burden reduction (including due to digitalisation of procedures);
Operational objective (OP3): streamlining the administrative procedures related to network rollout throughout the EU, mainly by increasing the transparency and coordination of the permit granting	• **To what extent do the benefits outweigh the costs of the measures for streamlining the administrative procedures related to ECN rollout?** • Has permit-granting provisions of the Directive had an impact on administrative burden (time, cost)? • Did the Directive create any	• survey (support study) • quantitative data (operators) • case studies (support study) • workshops • public consultation	Identification of costs and benefits generated by the permit granting related provisions of the Directive	**Costs:** Number of average annual FTE for dealing with planning applications, number planning applications handled **Benefits:** Competent authorities: administrative burden reduction; progress in digital transformation; Network operators: increased market share; administrative burden reduction

processes, while ensuring the enforcement of deadlines	additional cost and benefits for the target stakeholders?			(including due to digitalisation of procedures);
Operational objective (OP4): increasing the provision of buildings with open high-speed ready infrastructure throughout the EU, so as to reduce the costs and burdens associated with retro-fitting	• **To what extent do the benefits outweigh the costs of the measures on provision and access to in-building infrastructure?** • For building operators – are there any benefits arising from the obligation to construct in-building infrastructure? • Did the Directive create any additional cost and benefits for the target stakeholders? [add_2]	• survey (support study) • quantitative data (ECN operators/building operators, DSBs) • public consultation • workshops • case studies (support study)	Identification of costs and benefits generated by the in-building related provisions of the Directive	**Costs:** • average costs per household of deploying in-building infrastructure to make a building "high-speed-ready" • number of buildings accessed via access to in-building physical infrastructure in line with the Directive/operator **Benefits:** Competent authorities: administrative burden reduction; other Network/building operators: increased market share; administrative burden reduction (including due to digitalisation of procedures);
Operational objectives OP1, OP2 and OP4	• **How the dispute settlement body/process influenced the overall efficiency of the operational objectives OP1, OP2 and OP4?** [add_4] and [add_5 (for SMEs)]	• survey (support study) • quantitative data (ECN operators/ building operators, DSBs) • public consultation • workshops • BEREC questionnaire	• Identification of costs and benefits generated by the provisions of the Directive on DSBs	**Costs:** Competent authorities: number of full-time employees; annual administrative costs; Network operators: number of full-time employees, annual administrative costs; **Benefits:** Competent authorities: administrative burden reduction; other Network/building operators: faster dispute settlement; administrative burden reduction (including due to less or more efficient settlements);
General objective:	• **To what extent has the**	• survey (support study)	• Identification	**Costs:**

facilitate and incentivise the roll-out of high-speed electronic communications networks **Specific objectives:** • promoting the joint use of existing physical infrastructure • lowering the costs of deployment	**Directive been efficient as regards its general and specific objectives?**	• quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • case studies (support study)	of costs and benefits generated by the Directive	Competent authorities: number of full-time employees; annual administrative costs; initial and recurring technical costs associated with dispute settlement; Network operators: number of full-time employees, annual administrative costs, initial and recurring costs associated with dispute settlement; **Benefits:** Competent authorities: administrative burden reduction; increased efficiency and effectiveness; increased coverage with high-speed broadband networks; more efficient network rollout, including from public funds Network/building operators: increased market share; administrative burden reduction (including due to digitalisation of procedures);
Criterion: Coherence				
All objectives	**To what extent is the intervention coherent internally?**	• survey (support study) • public consultation • targeted consultation (BEREC) • questionnaire for the DSBs (support study) • workshops	It is ensured that the provisions of the Directive itself are coherent, and that there are no provisions that conflict or contradict each other or render each other impracticable.	• assessment of need for any corrective action • views of key stakeholders

All objectives	**To what extent is the intervention coherent externally**[181]?	• survey (support study) • public consultation • targeted consultation (BEREC) • questionnaire for the DSBs /ECN operators (support study) • workshops	It is ensured that any other EU actions complement the provisions of the Directive and do not give rise to overlapping requirements which may present relevant stakeholders with a lack of clarity about their rights or obligations.	• relevant EU actions with similar objectives • assessment of need for any corrective action • views of key stakeholders
Criterion: EU added value				
All objectives	**What is the additional value resulting from the Directive, compared to what could reasonably have been expected from Member States acting at national and/or regional levels?**	• targeted consultation (BEREC) • workshops • interviews (support study) • case studies (study) • public consultation questionnaire	• It is ensured that the issues dealt with by the Directive could not be better achieved by regulatory action at national level. • The Directive has additional value at national and European level	• cross-border activities enabled by the Directive; • national and/or European standards related to the Directive • economies of scale • easy of doing business across the EU • increased legal certainty through a consistent regulatory framework
General objective: facilitate and incentivise	Has the Directive added value/ reinforced other elements of the	• public consultation questionnaire	• It is ensured that the	• priorities of the Digital Single Market supported by the Directive

[181] With the EECC, in particular its provisions on access (Significant Market Power and non- Significant Market Power), as well as on small-area wireless access points, rights of way and rights to install facilities, dispute resolution, co-location and sharing of network elements and associated facilities; sector-specific EU Law on other network industries, in particular, in the energy and transport sectors; Competition policy and state aid; other EU policies

the roll-out of high-speed electronic communications networks **Specific objectives:** • promoting the joint use of existing physical infrastructure • lowering the costs of deployment	Digital Single Market and beyond that is, in other sectors being transformed by digitalisation (such as transport, education, health, etc.)?	• targeted consultation (BEREC) • workshops • interviews (support study) • case studies (support study)	Directive has had a positive impact on other elements of the Digital Single Market and sectors affected by digitalisation	• potential for Directive to facilitate take up of very-high speed take-up across the EU
All objectives	**To what extent do the issues addressed by the Directive continue to require action at EU level?**	• public consultation questionnaire • targeted consultation (BEREC) • workshops • interviews (support study) • case studies (support study)	• The persistence of issues addressed by the Directive still requires action at EU level	• original needs addressed by the Directive • current needs addressed by the Directive • Effectiveness of the Directive in achieving its objectives • Need for further action at EU level to address any of the issues identified in all others evaluation criteria
Criterion: Relevance				
General objective: facilitate and incentivise the roll-out of high-speed electronic communications networks **Specific objectives:** • promoting the joint use of existing physical infrastructure	**To what extent did the general and specific objectives of the Directive remain relevant over the implementation period?**	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire • workshops • interviews (support study) • case studies (support study)	The original objectives are aligned with the current needs	qualitative

• lowering the costs of deployment				
Operational objective OP1: increasing the use of existing passive infrastructure suitable for broadband rollout, by achieving more transparency concerning this infrastructure, as well as a more consistent and effective regulatory regime concerning access to it;	• To what extent did the operational objective OP1 of the Directive remain relevant over the implementation period? • To what extent the transparency on existing physical infrastructure suitable for broadband rollout is still relevant?	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • case studies (support study) • interviews (support study)	The original objectives are aligned with the new and future needs	qualitative
Operational objective (OP2): increasing cooperation in civil works relevant for broadband rollout through the EU, in particular by ensuring transparency and by increasing legal certainty for cross-sector / cross-utility cooperation;	• To what extent increasing cooperation in civil works relevant for broadband rollout through the EU is still pertinent? • To what extent the transparency on planned civil works is still relevant?	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • Case studies (support study) • interviews (support study)	The original objectives are aligned with the new and future needs	qualitative
Operational objective (OP3): streamlining the administrative procedures related to network rollout throughout the EU, mainly by increasing the transparency and	• To what extent streamlining the administrative procedures related to network rollout throughout the EU is still pertinent?	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators)	The original objectives are aligned with the new and future needs	qualitative

coordination of the permit granting processes, while ensuring the enforcement of deadlines		• workshops • interviews (support study) • case studies (support study)		
Operational objective (OP4): increasing the provision of buildings with open high-speed ready infrastructure throughout the EU, so as to reduce the costs and burdens associated with retro-fitting	• To what extent increasing the provision of buildings with open high-speed ready infrastructure throughout the EU is still pertinent? •	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • interviews (support study) • case studies (support study)	The original objectives are aligned with the new and future needs	qualitative
OP1, OP2 and OP4	**To what extent the role of the DSBs remains still pertinent, in relation to OP1, OP2 and OP4?**	• survey (support study) • quantitative data (DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • interviews (support study) • case studies (support study)	• The original objectives are aligned with the new and future needs	qualitative
All objectives	**How well do the (original) objectives of the Directive still**	• survey (support study) • quantitative data	• The original objectives are	qualitative

	correspond to the new needs within the EU?	(DSBs/ECN operators) • public consultation/ questionnaire (ECN operators/other network operators) • workshops • interviews (support study) • case studies (support study)	aligned with the new and future needs • Alignment with the latest legislative (EECC)/policy (2030 Policy Programme "Path to the Digital Decade"), market and technological developments (VHCN/FTTH)	

Additional information

[**add_1**] Alternative operators, and especially fibre focused ECN operators prefer to build their own fibre network based on SMP duct/pole access and/or own digging. There are various reasons behind this choice, including more control/security over own network, faster delivery under SMP regime (via reference offers procedures instead of long negotiations under the Directive, up to 2 years, or commercial negotiations), potentially higher prices under Directive due to the lack of Reference Offers, cheaper through alternative methods (micro trenching) or technical constraints (e.g. capacity of ducts is not always sufficient for FTTH P2P deployments). Moreover, the cross-sectoral cooperation proves not always easy, but time and cost intensive.

[**add_2**] For example, in 2019 and 2020 (till end November), the Polish DSB issued 282 decisions which grant access to the buildings. The 2019 DESI telecom chapter for Poland also shows that Polish DSB issued about 30 decisions concerning access to in-building physical infrastructure which were not any operator's property in 2018. These however imply considerable resources and associated cost on the part of the Polish DSB, as well as for the operators concerned.

[**add_3**] In some cases the dispute resolution mechanism envisaged by the Directive has proven inefficient for issuing a timely final decision on the dispute. For example, between 2015 and 2020, some dispute settlement procedures took up to 46 months in Poland, 18 in Bulgaria, 16 in Spain, 13 in Czech Republic, 11 in Germany, Netherlands and Slovenia. Some of the last DESI telecom reports also indicate that dispute resolutions took, in some cases, more than a year. While for some of these Member Sates the average time taken to resolve disputes under the Directive (between 2015 and 2020) remained within a reasonable time, for some others, the average is very high (e.g. Poland – 14 months, Spain – nine months, Denmark seven months). Moreover, in Czech Republic, Denmark, Sweden and Spain almost all disputes open between 2015 and 2020 were not resolved within the target timeframe, about three quarters in Poland and more than half in Slovenia.

Long dispute resolution periods could however also indicate the complexity of the cases or could on the other hand occur at the request of the parties if they seek to suspend the proceeding in order to seek a commercially agreed solution.

[**add_4**] Long dispute resolution periods could however indicate lack of adequate resourcing for the competent DSB. BEREC also highlights that deficient preparations of the proceedings by the parties (e.g. lack of awareness of ECN operators on provisions of the Directive) led to high burden (due to deficient information/documents submitted to the DSB) and long proceedings.

Most decisions by the DSB have not been subject to appeal, which would have meant additional costs and delays. However, a significant proportion of decisions have been appealed in Poland, Germany and the Czech Republic. In Germany, the vast majority of decisions appealed were upheld, while in Poland, the result of numerous decisions subject to appeal are still pending.

To efficiently settle the increased number of cross-sectoral disputes, many DSBs have established formal collaboration procedures, in particular with energy authorities e.g. in Poland, Sweden, Romania, Czech Republic, and Italy. In other cases, cross-sectoral

collaboration has been facilitated through regulatory authorities whose responsibilities cover different network industries. This has been implicit in cases where NRAs have responsibilities in other sectors, too (e.g. Germany, Denmark) but other forms of collaboration also proved efficient. However, for ex. BEREC favours the informal cooperation, as the decision-making process seems less complex or time consuming.

Furthermore, collaboration between the DSB and local authorities is growing. This collaboration accelerate some disputes settlement, reducing the overall associated burden.

[**add_5**] It is also worth noting that, in the ***public consultation***, an **SME** alleged excessive cost (about EUR 5 800) paid to the DSB. Similar claims appear in 2018 DESI telecom report for Latvia. Another **SME (ECN operator**) also claimed having paid excessive legal fees of EUR 35,000, probably in the context of a dispute, well outweighing the reported savings of EUR 5,000. Therefore, reducing the number of disputes or making them more efficient would also address some needs or the lack of resources that SMEs might face.

ANNEX IV: SUMMARY OF COST/BENEFITS[182]
REGULATORY COSTS

Impact of regulatory costs on different stakeholders (according to Better Regulation (Tool#58)					
Type of cost		Citizens	Consumers	Businesses	Administrations
Direct costs	Regulatory charges			○ in some cases, fees for access to the SIP (e.g. commercial SIP) - **not quantified**;	
	Administrative costs			- documentation obligations - **not quantified**; - I. information obligations (on existing physical infrastructure and planned civil works): **0-3 FTE for ECN operators** and **5FTE (with SIP) for major utility or transport network operators**; - II. handling of physical infrastructure access: **0-2 FTE for ECN operators** and **10-20 FTE (if significant requests) for major utility or transport network operators**; - III. handling of civil works coordination requests: **one FTE for small scale and 15 FTEs for the incumbent ECN operator** **I+II+III~= estimated at €2.5m/Member State and €68m in total across the EU**	- Public authorities provide, upon request, the relevant minimum information (Article 4(1)) they hold by reason of their tasks - **not quantified**;
	Compliance costs			- in some cases (e.g. geo-referencing),	- **<u>to SIPs</u>: set-up (*one-***

[182] According to ICF, WIK & EcoAct study; Some of the costs and benefits identified are not quantified either because of lack of comprehensive comparable data from all Member States or because the support study was launched prior to the publication of the new Better Regulation rules and thus some data might have not been gathered;

				increased cost of mapping certification - **not quantified**; - adaptation of network operators' systems to the requirements of the Directive (or beyond, e.g. geo-referencing)/inform the SIP about network operator's own network inventory systems - **not quantified**; - adaptation of **ECN operators** to the requirements of the Directive (in-building infrastructure provision)/- **EUR 100-150/house served** (potentially up to EUR 500 with the equipment of in-house FTTH in multi dwelling units buildings) - adaptation of **construction companies**/rules to the requirements of the Directive (e.g. in-building physical infrastructure - **not quantified**, but amounts involved are relatively insignificant in the context of a construction project	***off* between €150,000 and €2.8m)** and **maintenance costs (*recurrent*: 5-15 FTE and ~€0.5m/year/Member States);** - the cost of defining ex-ante cost-oriented prices across industries - - **not quantified**; - to ***local authorities****:* - additional resources to handle permit applications within a shorter timeframe and digitize permit applications procedures for civil works (**not only due to the Directive**, but also e-Government plans/Digital Single Gateway) - **not quantified**; - cost of coordination between competent authorities - - **not quantified**;
	Hassle costs (annoyance, waiting time)			- lengthy and protracted dispute settlements procedures - **not quantified**; - increased risk of misuse/loss of funds by the ECN companies the very late possibility of local	

				authority to respond - **not quantified;** - costs due to lack of guidance on some provisions (e.g. for cost-sharing for coordinated civil works, fair and reasonable access conditions) that lead to disputes and legal uncertainty - **not quantified**; - (in some cases) delays due to coordination of civil works **- not quantified;**	
Indirect costs	Indirect compliance costs			- shared use might deteriorate the network and maintenance conditions - **- not quantified**; -	- costs due to cooperation among various competent public authorities (where applicable)- **not quantified**;
	Offsetting				e-Government plans for electronic application for permits or transparency obligations through enhanced SIPs (e.g. digital platforms)
	Reduced efficiency, competition			- delays in ECN rollout due to coordination of civil works - **not quantified**;	
	Reduced investment, efficiency, innovation			- uncertainty for investors regarding take-up of high-speed broadband (due to co-deployment, in particular in rural areas) that potentially undermine broadband network deployment in circumstances where duplicating the network is not economically viable- **not**	

				quantified;	
Enforcement costs	Information and monitoring			- monitoring obligations – **not quantified;**	- **<u>to NRAs:</u>** monitoring obligations - **not quantified**;
	Inspections and sanctions/ Enforcement			- inspection and penalties - **not quantified;**	- **<u>to NRAs:</u>** inspections and enforcement - **not quantified;**
	Complaint handling	- longer time to get access to high-speed broadband connection- **not quantified;**	- longer time to get access to high-speed broadband connection- **not quantified;**	- lodging and handling disputes - **not quantified;**	- **<u>to DSBs</u>**: A).costs related to dispute settlement: ~3.5 FTE (***13 Member States***), meaning **94.5 FTE and €5m EU wide**[183] B). appeals to the DSBs decisions - **not quantified;**
	Adjudication/litigation	- longer time to get access to high-speed broadband connection- **not quantified;**	- longer time to get access to high-speed broadband connection- **not quantified;**	- appeals to the DSBs decisions - **not quantified;**	- appeals to the DSBs decisions - **not quantified;**

[183] On the basis of ISCO estimates of the cost of professionals (ISCO2), according to the ICF, WIK & EcoAct study, Evaluation report

REGULATORY BENEFITS

Impact of regulatory benefits on different stakeholders (according to Better Regulation (of 2020) - Tool#58)					
Type of benefits		Citizens	Consumers	Businesses	Administrations
Direct benefits	Improved well-being (health, safety, environment)	- less disturbance due to coordination of civil works - **not quantified**; - less duplication of civil works – **coordinated installation constitutes less than 5% (2 Member States), 10% (1 Member State) of the total deployment of new infrastructure or 10-90% of some ECN operators' network (1 Member State);** - less environmental impact due to co-location and shared use of physical infrastructure - **not quantified**;	- less disturbance due to coordination of civil works - **not quantified**; - less environmental impact due to co-location and shared use of physical infrastructure - **not quantified**;	- -less environmental impact due to co-deployment and shared use of physical infrastructure - **not quantified**;	***<u>to local authorities:</u>*** - reduced costs for handling permit applications via digital platforms; - less disturbance due to coordination of civil works and co-location- **not quantified**; - less environmental impact due to co-deployment and shared use of physical infrastructure - **not quantified;**
	Market efficiency (cost)savings, improved information, wider range of products/service)	- **more than 100,000km of physical infrastructure re-use** - **- not quantified**	- **more than 100,000km of physical infrastructure re-use** - faster access to high-speed broadband connection – **advancement**	- increased network coverage, with **more than 100,000km of physical infrastructure re-use**; - faster access to high-speed broadband connection – **advancement of ECN rollout by some months** - **cost savings** of between 10-30% due to access to the	- increased network coverage, with **more than 100,000km of physical infrastructure re-use**; - faster access to high-speed broadband connection – **advancement of ECN rollout by some**

			of ECN rollout by some months[184];	existing infrastructure, 10 % (sometimes up to 30%) for fixed networks and more than 30% for mobile networks due to civil works coordination and 10% due to suitable in-building physical infrastructure, **with proportional increase in network coverage[185]- not monetized** - increased access to third party infrastructure - **not quantified**; - easier permitting processes (e.g. tacit approvals) - **not quantified**; - increased transparency on existing physical infrastructure and planned civil works, including through the SIP - **not quantified**;	**months;** - better use of available public funds and cost savings/reduced subsidizes for ECN rollout – **12% of project costs due to co-sharing and/or co-deployment award criteria (1 Member State);** - better coordination of network deployment (including due to the SIP); - increased possibilities for co-location and re-use of existing infrastructure
Indirect benefits	Indirect compliance benefits		-increased synergies across networked sectors (e.g. leading to faster smart grids and intelligent transportation systems) - **not**	-increased synergies across networked sectors - - **not quantified**;	-increased synergies across networked sectors - **not quantified**; - Reduced administrative burden due to electronic procedures (for permits and SIPs), where effective - - **not**

[184] According to ICF, WIK & EcoAct study, Evaluation report, section 1.2.1
[185] According to ICF, WIK & EcoAct study, Evaluation report, section 1.2

			quantified;		**quantified**;
	Wider macroeconomic benefits	○ Increased GDP and employment -- **not quantified**;			- Increased GDP and employment -- **not quantified**;
	Other, non-monetizable benefits	- increasing digital cohesion through increased ECN coverage and thus facilitating access to digital transformation of the society - **not quantified**; - Strengthened internal market - **not quantified**;	- Strengthened internal market - **not quantified**;	- Strengthened internal market - **not quantified**;	- increasing digital cohesion through increased ECN coverage and thus facilitating access to digital transformation of the society - **not quantified**; - Strengthened internal market - **not quantified**;