

National Plan for the Development of Next Generation Networks

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1. Introduction

The objective of the National Plan for the Development of Next Generation Networks (the “National Plan”) is to define the strategic approach of the Czech Republic to the construction of Next Generation Networks (NGNs) and concurrently, through targeted support, to use the state’s influence to promote the construction of such networks while respecting the principle of technology neutrality¹. Due to their importance and scope, NGNs will ultimately positively impact the economic growth of the Czech Republic, and will contribute towards improving the competitiveness of Czech enterprises.

In the Czech Republic, investments into electronic communications networks are made, just as in other liberalised markets, by private entities based on market mechanisms and free competition, primarily in localities with good prospects for demand, while the gap in high-speed Internet access between rural and urban areas widens further. As a consequence of inadequate Internet access – even under a situation of rising demand – less populated areas of the Czech Republic could remain excluded from economic development over the long term.

Internet access has become part of everyday life for the majority of the Czech population. According to the results of a statistical survey by the Czech Statistical Office in 2015, over 3.1 million Czech households (73%) had a computer and Internet access, however this figure does not consider the quality of the connection. From the perspective of the proportion of adults using the Internet, in 2014 the Czech Republic actually exceeded the EU28 average (the Internet was used by 79.7% of the Czech population aged between 16 and 74, while the EU average was 78.0%). Over the past five years there has also been a change in the modern technologies owned by households. Desktop computers have been replaced by portable computers, which were used by over half of households in 2015. The number of households with two and more computers has doubled. Mobile telephones were not used by only 3% of people aged over 16 in 2015; 37% of users connected to the Internet through their mobile telephones.

Over three quarters of Internet users connect every day or almost every day. As regards the time spent on line, in 2015 28% of those aged 16 and over spent 1 to 5 hours a week on the Internet for private purposes. Another fifth spent 5 to 10 hours a week on the Internet. Czechs usually connect from home, from where almost three quarters of the Czech population accessed the Internet in 2015, or 97.2% of Internet users irrespective of connection quality.

The availability of a high-speed Internet connection through NGNs for individuals and enterprises is of strategic importance for sustainable and inclusive economic growth and innovation, and leads to improvements in social and territorial cohesion. The existence of a high-speed Internet connection provides socio-economic advantages and supports social inclusion and employment. The implementation of these possibilities is however very

¹ Act No 127/2005 Coll., § 5(4), on electronic communications, stipulates that in achieving the objectives set by the law, the Ministry of Industry and Trade shall abide by the principles of non-discrimination, objectivity, technology neutrality, transparency, and proportionality. It is understood that in case of any potential conflict between the individual principles, a just balance is to be sought.

Furthermore, under § 6(4) of the same Act, the Ministry of Industry and Trade and the Czech Telecommunication Office are required to reflect the need for a technologically neutral regulation; a technologically neutral regulation shall mean such regulation which does not impose an obligation to use a particular type of technology and/or which does not favour any type of technology.

dependent on blanket coverage through affordable access to high-speed Internet infrastructure and the services provided on it.

In a number of areas attractive to investors the construction of these networks is and will be implemented through investor activities in the regular commercial environment.

Mapping results to date show that no next generation access network exists in a sufficient scope or quality in some areas, nor is it probable that market entities will implement it in the coming years. Such areas are not sufficiently economically attractive from the perspective of potential investors, and therefore we cannot expect classic market mechanisms to operate in them. To introduce a high-speed Internet infrastructure in these areas, targeted investment support from public funds will have to be secured.

The National Plan will develop not only the State Policy in Electronic Communications in relation to modern digital infrastructure, i.e. to NGNs, but will also fulfil the so-called ex-ante conditionality 2.2, which is – according to European legislation² - an essential prerequisite for the implementation of specific objective 4.1 of the Operational Programme Enterprise and Innovation for Competitiveness 2014-2020 (the “OP EIC”) entitled “Increase Broadband Internet Access Coverage”.

The OP EIC was approved by Government Resolution of 14 July 2014 No 581 and by the European Commission through Decision K(2015) 3039 of 29 April 2015. Approximately EUR 521 million is allocated for specific objective 4.1 of the OP EIC, respectively for the Support Programme “High-Speed Internet” The activities of specific objective 4.1 of the OP EIC comprise in particular the modernisation of existing networks or the construction of new networks in order to meet the parameters of Next Generation Access Networks (NGAs) in localities that were identified through mapping as areas where market mechanisms cannot be relied upon. Without public aid, investments options would have been limited for various reasons.

The main objective of the National Plan is, through specific tools and measures, to support an increase in the availability of quality, reliable and high-speed Internet access in such a way that this access can be enjoyed by all households in the Czech Republic for all available services, including the collaborative consumption³ or the sharing economy. The construction of NGNs is anticipated both through investment from the private sector and also public aid, to ensure that by 2020 all citizens will have the option to access high-speed Internet (faster than 30 Mbit/s), and that at least half of households will have an option to obtain an Internet connection with 100 Mbit/s speed. At the same time, the way is paved for a connection speed of at least one order of magnitude higher.

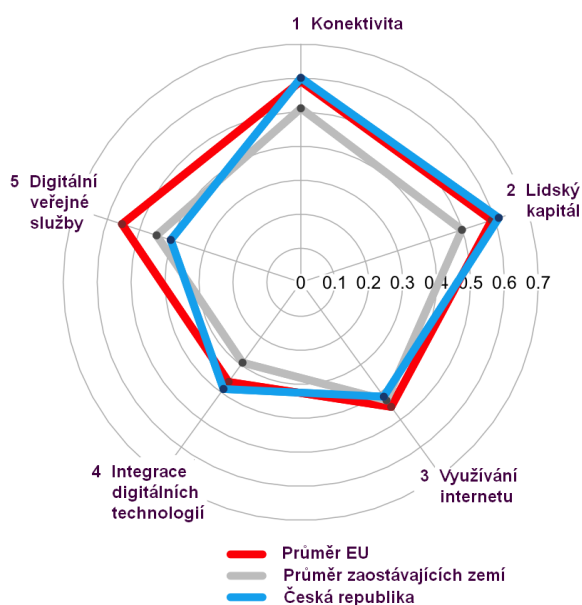
At the same time, it is necessary to remove identified barriers during the planning and construction of NGNs, in particular by reducing the administrative burden and financial costs. These barriers lie in the area of planning permission proceedings in relation to the preparation, construction and use of the networks; and also the financial costs for

² Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006

³ The term “collaborative consumption” is used to describe an economic model based on sharing, swapping, lending or renting products, in contrast to owning them. The sharing economy is a subset of collaborative consumption.

compensation for restrictions on the use of property rights, and for the use of open public space.

The digital economy includes, in addition to the availability of a quality Internet connection, other important aspects and synergies monitored within the European Union. These are in particular the proportion of citizens using modern technologies and purpose of their activities, and the integration of digital technologies into business models or e-governance, expressed for example using the so-called DESI - Digital Economy and Society Index. According to this index from 2016 the Czech Republic is ranked 17th in the EU⁴. Connectivity is the only indicator where improvement took place, with the Czech Republic ranked 15th, although even the improved position leaves much to be desired: while 98% of all households have Internet access, only 31% of them have high-speed Internet access.



Graph No 1 Graphical representation of the DESI index 2016 for the Czech Republic (Source: EC)

Although the Czech Republic ranks at or even slightly above the EU average in a number of indicators, it is not at the level of highly developed countries.

For this reason, it is necessary to first create a base, i.e. “physical” electronic communications networks, which is actually also required by the **Action Plan for the Development of the Digital Market**⁵, being coordinated by the Office of the Government through the coordinator of the digital agenda of the Czech Republic⁶. This document addresses certain aspects of the digital agenda, from ensuring the “physical” networks through the necessary legislative measures to applications and content, such as Industry 4.0. Other concepts are also utilised by the Action Plan to Support Economic Growth and Employment in the Czech Republic⁷, including its 2016 update⁸, and others, namely Education 4.0 and Work 4.0.

⁴ See <https://ec.europa.eu/digital-single-market/en/desi>
<https://ec.europa.eu/digital-single-market/en/scoreboard/czech-republic>

⁵ See the Government Resolution of 26 August 2015 No 694.

⁶ His appointment is based on Government Resolution of 18 May 2016 No 445.

⁷ See the Government Resolution of 1 December 2014 No 989.

⁸ See the Government Resolution of 25 January 2016 No 64.

The National Plan was under preparation for a long time. The first working version was presented to the professional public back on 30 September 2014. Public consultation was held at the turn of 2014 and 2015. Two interdepartmental comments procedures followed in the summer and at the end of 2015. This long preparatory period, however, contributed to ensuring that the issue in question was gradually comprehensively, openly discussed and debated by all the relevant and concerned entities.

In the first quarter of 2016, the Czech Telecommunication Office initiated, through an electronic data collection system, the acquisition of geographic data on selected parts of the network infrastructure from entities operating on the electronic communications market. The entities concerned provided, inter alia, data mapping the existence of network infrastructure enabling the provision of services determined through parameters, including investment plans for a three year period, in accordance with the objectives of the Digital Czech Republic strategic document, i.e. connections through which it is possible to provide an Internet access service with speeds in categories up to 30 Mbit/s, from 30 to 100 Mbit/s, and above 100 Mbit/s. In a geographic breakdown to address point, data were also collected about the currently provided Internet access service in the given address point through this infrastructure.

In the second quarter of 2016, in cooperation with the Platform of the Professional Public for the Development of Broadband Internet Networks organised by the Czech Chamber of Commerce and the Confederation of Industry of the Czech Republic, four working groups were established focusing on discussing certain important parts of the National Plan for the Development of Next Generation Networks, and particularly on the subsidy policy, non-subsidy support, i.e. on legislative and regulatory aspects, the wholesale offer and the definition of next generation access networks and the related technical parameters. The outputs from these working groups were incorporated into the National Plan to a reasonable extent. These working groups included over 40 experts from the commercial sector, the Ministry of Industry and Trade and the Czech Telecommunication Office.

The National Plan for the Development of Next Generation Networks is effective from the date of its adoption by the Government of the Czech Republic in 2016. Due to the timeframe of its implementation as stipulated in chapter 10.2, the validity of this document is expected to end in 2023.

2. National and European Context

The National Plan builds on the State Policy in Electronic Communications, Digital Czech Republic⁹, which inter alia highlighted the fact that electronic communications, through their networks and services, accelerate and improve the quality of communication, thus contributing towards the economic, cultural and social development of all of society.

Subsequently, the Government, through Resolution of 20 March 2013 No 203, approved the updated State Policy in Electronic Communications Digital Czech Republic 2.0, The Way to the Digital Economy (“Digital Czech Republic 2.0”). The Digital Czech Republic 2.0 document is built on three pillars, namely support for the development of high-speed Internet access networks; the availability and development of digital services; and improving digital literacy and the e-skills of the users of the networks and electronic communications services. One of the main tasks determined in this document was support for the development of high-speed Internet access networks in accordance with the objectives of the Digital Agenda for Europe, enabling an Internet connection with a transfer rate of 30 Mbit/s for all inhabitants and 100 Mbit/s for at least half of all households.

The Government also approved the Radio Spectrum Management Strategy¹⁰, which defines specific envisaged measures primarily in the medium term, which should – in accordance with European harmonisation documents – create the prerequisites to promote the fulfilment of the objectives of the State Policy in Electronic Communications Digital Czech Republic 2.0.

At European level, back in 2005 the European Commission (“EC”) through its communication “i2010 – A European Information Society for growth and employment¹¹” noted that in connection with the creation of a Single European Information Space there is a need to address at the outset four main challenges posed by digital convergence. One of these challenges was speed, i.e. “*faster broadband in Europe services to deliver rich content such as high definition video*”¹². The other challenges are as follows. Rich content will provide “*increased legal and economic certainty to encourage new services and on-line content*”; interoperability should “*enhance devices and platforms that “talk to one another” and services that are portable from platform to platform*”. The last (but not least) challenge is security, anticipating “*making the Internet safer from fraudsters, harmful content and technology failures to increase trust amongst investors and consumers*”.

This initiative was replaced in 2010 by the so-called Digital Agenda for Europe¹³, in which it is stated that very fast Internet is an essential prerequisite for reliable economic growth, job creation and access for citizens to the information and services they want. The strategy determined the basic qualitative and quantitative parameters for Internet availability with the objective of ensuring that by 2020 i) all Europeans will have access to a significantly faster Internet, i.e. over 30 Mbit/s, and ii) at least half of European households will have an available Internet connection faster than 100 Mbit/s. This general vision was also adopted by the Czech Republic in the material Digital Czech Republic 2.0. In its strategy, the EC also spoke of the use of instruments to finance the construction of high-speed connections in

⁹ The document was approved by the Government through its Resolution of 19 January 2011 No 50.

¹⁰ See Government Resolution of 3 June 2015 No 421.

¹¹ See SEC(2005) 717 (http://ec.europa.eu/ceskarepublika/pdf/com_229_i2010_cs.pdf).

¹² The texts presented in italics in this document are verbatim quotes.

¹³ See COM(2010) 245 in its final wording /2 ([http://eur-lex.europa.eu/legal-content/CS/TXT/?uri=CELEX%3A52010DC0245R\(01\)](http://eur-lex.europa.eu/legal-content/CS/TXT/?uri=CELEX%3A52010DC0245R(01))).

areas that are not interesting to enterprises and in which investment may only be sustainable over the long term with targeted intervention through the use of public aid.

In 2010 the Commission Recommendation on regulated access to Next Generation Access Networks¹⁴ was issued, and in 2013 the Commission Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment¹⁵.

In 2015 the EC issued A Digital Single Market Strategy for Europe¹⁶, in which one of the three pillars is “*Creating the right conditions for digital networks and services to flourish*”. Within the framework of this pillar the EC set itself the objective of submitting proposals in 2016 for an ambitious overhaul of the telecoms regulatory framework focusing on i) a consistent single market approach to spectrum policy and management, ii) delivering the conditions for a true single market by tackling regulatory fragmentation to allow economies of scale for efficient network operators and service providers and effective protection of consumers, iii) ensuring a level playing field for market players and consistent application of the rules, iv) incentivising investment in high speed broadband networks (including a review of the Universal Service Directive) and v) a more effective regulatory institutional framework.

It is understood that public funds to promote the construction of networks enabling high-speed Internet access must be spent efficiently, while public aid will supplement and not replace investment by market participants. Every occurrence of public aid should as far as possible avoid crowding out private investment, any reduction in commercial motivation to invest and, last but not least, any distortion of competition. For this purpose, in 2013 the EC issued its Communication - EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks¹⁷ (the “EU Guidelines”).

Finally, the issue of support for constructing networks enabling high-speed Internet access has become part of the so-called block exemptions, i.e. areas of support where it is assumed that – with the fulfilment of predetermined conditions – public aid is possible in accordance with the rules of competition, see Art. 52 of Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty¹⁸.

In connection with public aid, respectively the use of European funding instruments, a key role is played by European legislation governing the so-called European Structural and Investment Funds (ESIF). According to Art. 9 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council¹⁹ of 17 December 2013 (“the EU Regulation No 1303/2013”) it is possible to use the ESIF to support thematic objective 2 “*Enhancing access to, and use and quality of, information and communication technologies*”. According to Art. 5(2) of Regulation No 1301/2013²⁰ it is possible to support – within the framework of thematic objective 2 – the investment priority “*Extending broadband deployment and the roll-out of high-speed networks and supporting the adoption of emerging technologies and networks for*

¹⁴ See 2010/572/EU (<http://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32010H0572&from=CS>)

¹⁵ See 2013/466/EU

¹⁶ See COM(2015) 192

¹⁷ See the Commission’s Communication No. 2013/C 25/01 – EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks of 26 January 2013 (http://www.strukturalni-fondy.cz/getmedia/60643506-8c81-4f84-94e5-b3be54bf576c/Pokyny_-sirokopasmove-site.pdf?ext=.pdf).

¹⁸ See <http://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32014R0651&from=CS>

¹⁹ See <http://www.mmr.cz/getmedia/8b7d5fac-cf9d-4d06-9b83-492c3664f5a3/1303-Narizeni-o-spolecnych-ustanovenich.pdf>.

²⁰ See <http://www.mmr.cz/getmedia/56227081-fdc0-4efe-9d11-a0583c9570b8/1301-Narizeni-o-ERDF.pdf>.

the digital economy". The mentioned investment priority was taken into account in specific objective 4.1 of the OP EIC, respectively the Support Programme "High-Speed Internet".²¹

In this context it is important to draw attention to the need to fulfil the so-called ex ante conditionality 2.2, which is determined in the EU Regulation No 1303/2013 and which relates to the investment priority in question. This ex ante conditionality reads: "*The existence of national or regional NGN Plans which take account of regional actions in order to reach the Union high-speed Internet access targets, focusing on areas where the market fails to provide an open infrastructure at an affordable cost and of a quality in line with the Union competition and State aid rules, and to provide accessible services to vulnerable groups.*" The National Plan represents the fulfilment of this ex ante conditionality.

The Digital Agenda for Europe also highlighted the need for measures designed to reduce the costs of deploying high-speed connectivity throughout the EU, including the proper planning, coordination and reduction of the administrative burden. The deployment of both wired and wireless high-speed electronic communications networks requires significant investment, a large part of which is represented by costs for construction work. Reducing some of the costly construction work would make the deployment of high-speed connectivity more efficient. The main part of these costs can be attributed to inefficiencies connected with low use of the existing passive infrastructure, barriers connected with the coordination of construction work, cumbersome administrative procedures for the granting of licences, and barriers relating to the construction of networks inside buildings, resulting in significant financial costs.

Hence the adoption in 2014 at EU level of Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks²². This Directive is transposed into Czech law through a draft Act on measures to reduce the costs for deploying high-speed electronic communications networks and on amendments to some related Acts.

With the dynamic development of electronic communications, it is to be expected that objectives and principles of the State intervention to support the development of next generation access networks will evolve. The National Plan for the Development of Next Generation Networks will be updated on the basis of the most recent evidence, if necessary.

²¹ See the Government Resolution of 9 February 2015 No. 87.

²² See <http://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32014L0061&from=GA>.

3. Next Generation Networks

A Next Generation Network (“NGN”) is a packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users²³.

NGNs are made up of two levels:

- the backbone new generation networks (Core Networks)
- Next Generation Access Networks (NGAs), which provide access for users to the provided electronic communications services. The access networks include backhaul networks (Backhaul) that connect to the backbone network.

An overview of the logical structure of NGNs is provided in Annex No 1.

In the Czech Republic there are enterprises operating in electronic communications that have optical backbone networks. For illustration purposes Annex No 6 provides samples of some of these networks taken from public sources. These maps should only be seen as examples without any ambition to describe the complexity of the individual networks or their usability for connecting NGAs. The National Plan nevertheless anticipates that the existing backbone networks are usable for connecting NGAs. Even if we can expect that some backbone networks will need to be modernised or their capacity increased, State aid is not being considered for these investments as the return on investment in backbone networks is much faster than for access networks, and in addition here we are addressing primarily investments into active technologies (these are not supported for NGAs either). Backbone networks are not supported from the ESIF either.

3.1 General characteristics of NGAs

Next Generation Access Networks (NGAs) are advanced networks with at least the following characteristics:

- a) The reliable provision of services while concurrently ensuring very high speed to the subscriber with the help of a connection network of optical fibre (or equivalent technology) terminating sufficiently close to the user to ensure genuine high-speed connectivity; the requirement to use optical elements is based on the relevant EU regulations (e.g. EU Guidelines, paragraph 57),
- b) Support for the most varied advanced digital services, including a wide range of converged services consisting entirely of IP technologies,
- c) A significantly higher speed in the direction from the user to the Internet compared to basic broadband networks²⁴.

²³ Formal definition of NGN issued by the International Telecommunication Union, ITU-T Recommendation Y.2001 (12/2004) - General Overview of NGN.

²⁴ In accordance with the EU Guidelines, basic broadband networks are understood to be networks based on technological platforms such as asymmetric digital subscriber lines for electronic communications (up to ADSL2+), traditional cable networks (e.g. DOCSIS 2.0), third-generation mobile networks (UMTS) and satellite systems.

At the current stage of development of the market and technologies, the following are considered as NGAs (assuming the fulfilment of the general characteristics indicated in this chapter):

- a) Access networks from optical fibre,
- b) Advanced modernised cable networks,
- c) Some advanced wireless access networks through which users can be provided with reliable high-speed connectivity.

High-speed connectivity that differentiates NGAs from existing basic broadband networks is considered to be – in accordance with EU Guidelines and in accordance with the document Digital Czech Republic 2.0 – the reliable connection of users to the Internet with a real transmission rate of at least 30 Mbit/s in the direction towards the user.

3.2 Requirements on NGAs constructed with State aid

NGAs that can receive public aid are understood to be²⁵:

- New networks partly or fully using optical fibre as the transmission medium
- Modernised existing infrastructure of fixed access networks enabling Internet access and using optical fibre as the transmission medium, while at the level of the subscriber network it is also possible to use coaxial or symmetric metallic cable as the transmission medium, or here it is also possible to use advanced wireless technologies²⁶.

Newly constructed and existing modernised NGAs must meet the following conditions:

1. The supported construction or modernisation of an existing network must provide users with high-speed Internet access with a real transmission rate in the direction from the Internet towards the user of at least 100 Mbit/s, possibly a speed of at least 30 Mbit/s if the increase to at least 100 Mbit/s will be possible by simply changing the active elements or modernising them, and this at the latest by the end of 2020.
2. The real transfer speed in the direction from the user to the Internet must reach at least 33 Mbit/s, possibly 10 Mbit/s if the increase to at least 33 Mbit/s will be possible by simply changing the active elements or modernising them, and this at the latest by the end of 2020.
3. NGAs constructed or modernised using public aid must provide wholesale access to the “physical” infrastructure constructed with this aid and – to the appropriate extent – also to the related infrastructure without public aid and to the data flow, thereby

²⁵ During the preparation of the National Plan for the Development of NGNs, it was shown that the definitions presented in chapter 3.1 do not fully cover the requirements the state will place on NGAs newly constructed and modernised using State aid. Hence, in cooperation with the professional public and academia, the definition of NGAs – also taking into account specific objective 4.1 of the OP EIC – was expanded to include qualitative and performance parameters that NGAs implemented with public aid should meet. The determination of these parameters was based, inter alia, on the fact that in the Czech Republic there is, compared to other EU Member States, a relatively higher population density in non-urban areas. The requirement for a step change in the parameters in comparison with basic broadband networks was also respected.

In view of the anticipated need to modernise NGAs (primarily a further increase in transfer speed) in the period after 2020, solutions using optical fibre as the transmission medium appear the most promising. The achieved transfer speed compared to other technological solutions is in the order of 1000 times higher (and this when using only a single optical fibre), and it is also possible to achieve significantly higher bridging distances.

²⁶ Due to the anticipated need for NGAs in the period after 2020, solutions using optical fibre as the transmission medium appear the most promising. The achieved transfer speed compared to other solutions is in the order of 1000 times higher, and it is also possible to achieve significantly higher bridging distances.

promoting competition.

4. NGAs must have guaranteed service availability and quality (e.g. through an SLA).

Transfer speed is determined as the real data transfer rate, which is measured between the network termination points. These are understood to be on the one side the point of connection of the NGN to the public Internet, and on the other side the end point of the NGA to which the user connects. The value achieved as the proportion of the volume of data transferred between the network termination points and the time required for the transfer of this volume of data is considered the real transfer speed.

Due to the character of data communication, the transfer speed may fluctuate over time. At a connection of electronic communications networks constructed with public aid, however, the condition of a real transfer speed of 30 Mbit/s, respectively 100 Mbit/s in the direction towards the user, must be met while, however, any eventual temporary fall must not be – depending on the character of use of the connection electronic communications – larger than the usual fluctuation due to traffic on an IP network.

A similar measuring procedure for NGAs will be determined in the methodology prepared by the CTO in cooperation with the MIT, which will form part of the documentation within the framework of OP EIC calls²⁷.

3.3 Requirements for NGAs that will receive protection

NGAs that will receive protection for existing private investments from the activity of an investor that is a beneficiary of public aid for construction of a new NGA, are understood to be high-speed networks that meet the following conditions:

1. An existing network or a network whose construction is planned in the specific location in the next three years.
2. That provide the end user with a reliable high-speed Internet connection with a real transmission rate at least 30 Mbit/s in the direction towards the user.
3. That guarantee service availability and quality.

The assessment as to whether the network (according to the points 1 and 2 above) is one that will receive protection is based on the Electronic Collection of Geographic Data process carried out by the Czech Telecommunication Office in 2016, when according to the data indicated by the respective enterprise in electronic communications, the subsidy provider labels such network infrastructure as one that permits the provision to the end user of Internet access with a transfer speed of at least 30 Mbit/s in the direction towards the user.

In accordance with the contract to collect geographic data, these are in particular network solutions like FTTH, FTTB, FTTCab, xDSL, CATV and wireless networks, and potentially other equivalent technologies. The model examples, including indicative parameters, for determining the conditions for the protection of existing NGAs with model examples of indicative parameters have been prepared by the CTO and are presented in the Geographic Data Collection material, which forms part of the Electronic Data Collection for 2015.

²⁷ Other requirements for NGA quality, as well as the binding methodology, method and conditions for checking real compliance with the required parameters, the stipulation of an availability guarantee, the requisites of the wholesale offer and the related conditions, will be published in additional documents in connection with the implementation of the subsidy mechanism in particular of specific objective 4.1 of the OP EIC, respectively Support Programme “High-speed Internet”.

The value achieved as the proportion of the volume of data transferred between the network termination points and the time required for the transfer of this volume of data is considered the real transfer speed. Termination points are understood to be on the one side the point of connection of the NGN to the public Internet, and on the other side the end point of the NGA to which the user connects. Due to the character of data communication, the transfer speed may fluctuate over time, while, however, any eventual temporary fall must not be – depending on the character of use of the connection electronic communications – larger than the usual fluctuation due to traffic on an IP network.

A similar measuring procedure for NGAs will be determined in the methodology prepared by the CTO in cooperation with the MIT, which will form part of the documentation within the framework of calls relating to specific objective 4.1 of the OP EIC.

3.4 Protection for other network levels

Within the logical structure of NGNs presented in Annex No 1, the backhaul part of the network, which provides the connection to the backbone network level, is considered to be a part of NGA access network as well as the distribution and subscriber part. For this reason, similar rules also apply to the construction of a backhaul network, for example the possibility of public aid and the obligation to enable the sharing of the subsidised network in the form of wholesale offers with other network and service operators. In connection with this, it is of course necessary to answer the question of the protection of such a network that was constructed or is to be constructed in the defined area.

If backhaul or distribution NGAs were constructed without State aid and do not belong to the network operator to which the obligation of regulation and the obligation of access apply, the operation is not burdened by obligations relating to subsidy rules. However, they are also not protected beyond the framework of the Act on Electronic Communications. This applies generally, as the protection of NGAs indicated in the preceding chapter applies to the protection of current private investments from the activity by the investor who is the beneficiary of the public aid to construct new NGA networks.

The construction of new NGAs (and the modernisation of existing ones) may receive State aid only if the result is the option to provide functioning high-speed Internet access for the end user. This also opens up the possibility of secondary protection for backhaul and distribution NGAs already existing in the area in the form of a commercial commitment by the aid beneficiary that it will use – for the construction (modernisation) of its NGAs – an existing optical network if its use is offered to it by its current operator/owner and both entities agree on the conditions for its use.

Although public aid for the construction of a backhaul network as part of an access network will only be provided in essential cases, rules will be determined for drawing public funds envisaging the highest possible level of protection for these networks in accordance with EU Guidelines. To use the subsidy to construct a backhaul network will be only possible under the condition that there is no useable backhaul network in the defined intervention area (including affordability) with sufficient capacity and an available access point and that no such network is planned to be built in the next three years.

The subsidy programme administrator will include special regulation in this area applying in particular to eligible costs, the project assessment criteria and the transparency of the whole implementation process into the guidelines for the aid beneficiary or other documents that form part of the call. Furthermore, it will be necessary to make inquiries during public

consultation relating to the mapping of areas of intervention in the form of a questionnaire for the purpose of establishing the availability of existing backhaul networks in areas of intervention in order to eliminate potential negative impacts on competition.

The backhaul network issue is an important aspect which is to be discussed when preparing the action plan (chapter 6.6.1) in connection with the need to carry out a complex analysis and a mapping of these backhaul networks.

4. Analytical part

4.1 Analysis of the state of coverage of the Czech Republic by NGNs

It is essential that public funds be spent prudently and that public aid supplements and does not replace investment by market participants. Any public intervention should prevent the emergence of risks of crowding out private investment, negative changes to commercial motivation to invest and ultimately a distortion of competition. An essential condition for demonstrating the suitability of a measure in the form of public aid is detailed mapping and analysis of coverage by NGAs.

From the perspective of the development of this strategic document, it is essential to mention the first mapping, within the framework of which the CTO performed - between June and October 2013 - a survey of the penetration of infrastructure for providing high-speed Internet access services in the Czech Republic. The pivotal part of this survey was a questionnaire survey performed from 23 July 2013 to 13 September 2013.

The objectives of this survey were in particular to map the level of the existing penetration of the infrastructure in question, including the outlook for its construction over the next three years, and to label territorial units in the Czech Republic as so-called white, grey or black areas, where the colour of the area indicates the number of different infrastructures - according to the classification in the EU Guidelines²⁸ - capable of providing high-speed Internet access services, and to indicate whether in a given territorial unit any eventual public aid for the construction of infrastructure is compatible with the internal market, i.e. whether this eventual public aid would undermine the existing competitive environment.

A breakdown into so-called basic settlement unit²⁹ ("BSUs") was selected as the most suitable level of geographical breakdown of the Czech Republic for the purposes of labelling territorial units as white, grey or black areas. This breakdown is used primarily by the CSO, and so there exist suitable maps for a graphical interpretation of the results, and it is also sufficiently detailed to ensure that excessive distortion of reality can be avoided when applying the results to a territorial unit.

The results of the mapping for the indicated period, meaning the indicative identification of white, grey and black areas across the whole Czech Republic as well as the individual regions in the form of a table and a map with an accompanying text summary, were submitted by the CTO on 5 December 2013 for public consultation. The CTO thus submitted the new maps together with the accompanying materials on 11 April 2014 to a second round of public consultation. Based on additional data and comments received during the second round of public consultation, the CTO supplemented the indicative maps as well as the related tables. According to the established methodology, the CTO reflected the acquired opinions and comments into the mapping results on 1 July 2014³⁰. 9 762 BSUs were thus labelled white from the total number of 22 427, or 43.53%. 5 561 BSUs were labelled grey and the remaining 7 104 BSUs were labelled black.

The protection of NGA networks is discussed in chapters 3.3 and 3.4.

²⁸ The criteria for colour allocation (white, grey or black) to a given BSU were, in principle, identical to those for evaluation of the given BSU in 2016, as they were based on the same EU Guidelines of 2013.

²⁹ Act No 89/1995 Coll, § 2(t), on State statistical service, defines a basic settlement unit as a unit representing a part of municipal territory with unambiguous territorial technical and urbanistic conditions or a catchment territorial grouping of a residential or recreational nature.

³⁰ Detailed results of the mapping in the Czech language are available on the CTO website (<http://www.ctu.cz/pruzkum-nga>).

4.1.1 Map of coverage in 2016

With effect from 1 January 2016 the system of annual electronic data collection performed by the CTO will also include forms for collecting geographic data about selected parts of network infrastructure, in particular data (starting with data for 2015) mapping the existence of network infrastructure enabling the provision of services determined through the parameters in accordance with the objectives of the strategic document Digital Czech Republic 2.0, meaning electronic communications connections on which it is possible to provide an Internet access service with speeds in categories up to 30 Mbit/s, from 30 to 100 Mbit/s, and over 100 Mbit/s. Using the geographic breakdown, data are also collected about the actually provided Internet access service in the location in question using this infrastructure, except address points. In this connection it is important to add that the qualitative parameters of the provided service need not always correspond to the potential of the infrastructure through which the service is provided.

The data about network infrastructure are collected broken down into separate technical solutions. What is decisive is the actual ability of the electronic communications networks to achieve the relevant speed in the direction towards the user on the number of electronic communications connections presented by an enterprise.

This collection also considers the so-called available electronic communications connections, generally defined not only as the existing state of the electronic communications networks, but also with regard to the potential for its easy completion or upgrading in accordance with the requirements for the qualitative parameters of the provided services. It is a general guideline, and the assessment of such potential is fully the responsibility of the enterprise completing the form. Only the enterprise is able to consider - when completing the form - how many additional electronic communications connections with the required parameters it is capable and willing to construct over the next three years. When providing the number of available electronic communications connections, it is not possible to assess only the actual capability of the access part of the network to provide a service with the given parameters – it is also important to assess the relevant connectivity in that part of the backbone connection to ensure that the end users are genuinely able to consume services of the given quality. The enterprise is responsible for the correctness of the data provided. In the event of doubt, the CTO (and also the OP EIC Managing Authority) may check the correctness of the data, including through an on-site inspection if required. The OP EIC Managing Authority may also apply tools, including those indicated in point 65 of the EU Guidelines.

To increase the efficiency of the process of mapping the coverage of the Czech Republic with high-speed Internet access networks, a two-stage model was selected based on data from previous network mapping performed by the CTO in 2013 and after expert consultation to localise areas where it is possible to provide support for the construction of NGAs and also effectively ensure protection for existing private investments into the construction of high-speed networks.

The first step involves the mapping of existing networks down to the level of individual address points in each basic settlement unit. If, in such BSU, there is the possibility of high-speed Internet access for less than 50% of the address points, that BSU will be labelled a “white BSU”. The value of 50% was discussed at national level by the working group for mapping. The professional public and the MIT participated in this working group, headed by the CTO. The Ministry of Industry and Trade applied the level of parameter as per the EU Guidelines.

The objective for Internet access coverage on the territory of the Czech Republic (in the defined timeframe, under comparable conditions pertaining to price and quality) is to enable 100% of all households to access the Internet, as adduced in chapter 1.

The collection of data concerning the level of coverage of the territory of the Czech Republic, both the present-day level and the level planned to achieve within the next three years, was carried out in early 2016. Collected data show that a vast majority of areas (see the map of coverage) do not reach the expected future coverage level of 100%.

To indicate localities where it is obvious that a sustainable economic model to provide high-speed Internet services under the conditions which would be normal on the rest of the territory of the Czech Republic, is impossible to set up, a coverage criterion of 50% Internet access options for the given area by the end of 2018 was chosen. At the same time, it was conceived that by then Internet access networks would have been built everywhere where a sustainable economic model can be reasonable expected to function. It is crucial to emphasize that the 50% coverage criterion is far from the desired target situation.

It is also necessary to point out that the aforementioned set level of evaluation criterion was later confirmed as justified by the assessment of data collected by mapping, i.e. data concerning investment plans announced by entrepreneurs for the period until the end of 2018. It is obvious that **these plans go significantly beyond both the current level of investment** and the level of investment made in the last few years (2010-2015), **yet these investments are insufficient to increase the Internet access availability in the indicated areas above the set level (50%)**. This is also confirmed by current trends – according to publicly available information (Czech Statistical Office, Czech Telecommunication Office) on the rising number of end users broken down by individual technologies in last few years. This finding is further confirmed by the typical level of investment into ICT infrastructure in relation to the income for provided services.

That the suggested level (50%) of the evaluation criterion is appropriate, can be also supported by the results of a sensitivity analysis showing the dependence between the proportional coverage level of white BSUs and the total amount of the subsidy required, see Tables 6 and 7, a Graphs 11 and 12.

With regard to the fact that there are approximately 2.9 million address points in the Czech Republic, it was necessary to ensure the effective processing of the input data, to analyse them, and to perform public consultation to aggregate these data into a specific coherent area including a quantity of address points. The chosen assessment of the coverage with granularity to BSU appears to be - due to their number of around 22,000 - a reasonable compromise enabling the relatively easy processing and assessing of the data, yet earmarks relatively small areas with logical association of address points. Territorial units selected in this way are also supported in the CSO system³¹.

From the above it follows that it is only possible to receive support for the construction of NGAs providing a connection for address points that are not yet covered by NGAs and where there is no plan to construct them in the following three years, and which are also in white BSU territory. Every address point with an implemented or planned NGA is subject to investment protection. The parameter of 50% for colouring an BSU can thus be considered a tool that will enable the effective use of the mapping results, their analysis, and determination of areas of intervention.

³¹ See https://www.czso.cz/csu/rso/zsj_rso

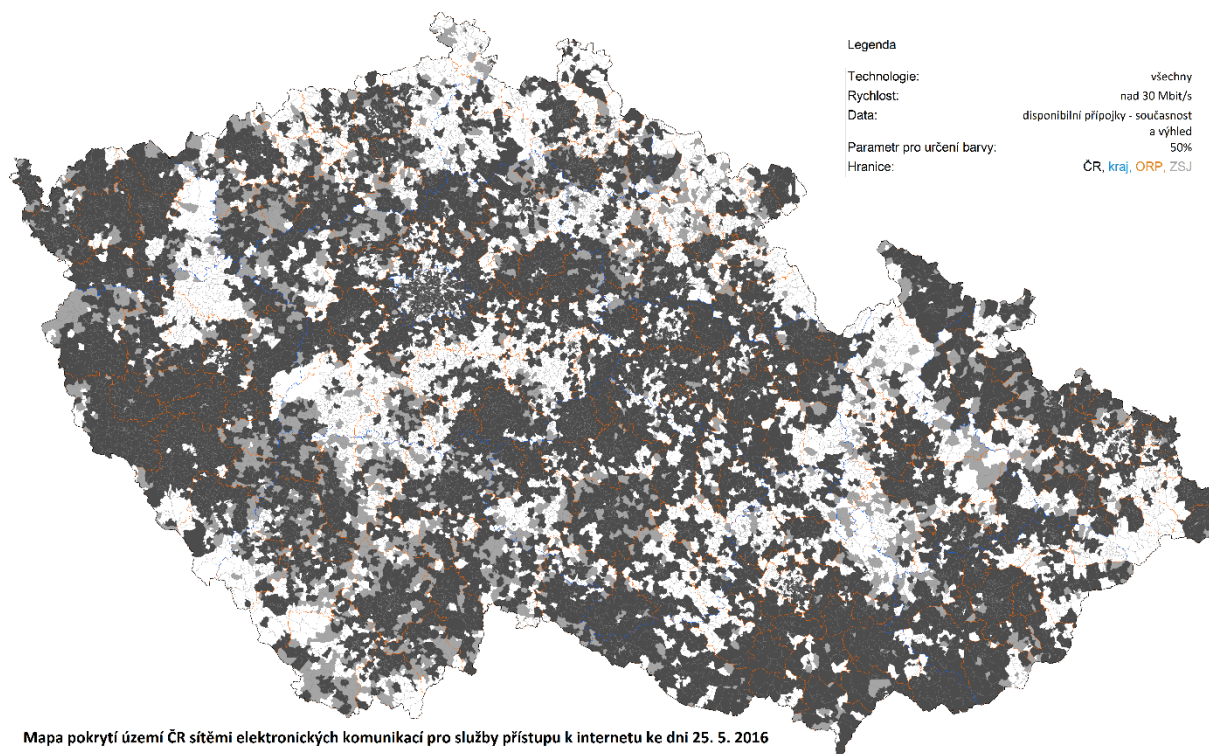
In the second step so-called areas of intervention are then determined, i.e. a set of white BSUs (for more see chapter 6.4) into which public aid may be directed. The mapping results, similarly to the determination of the areas of intervention, will be subject to collective or, if necessary, individualised public consultations.

When calculating the colour of each BSU, the ratio of address points in which at least one available electronic communications connection is indicated to all the address points in the BSU is thus primarily calculated. If the ratio is less than 50%, the BSU is assessed as white. If the ratio is 50% and over, the number of enterprises that indicated a non-zero number of available electronic communications connections in the given BSU is investigated. If there is a single such enterprise, the BSU is assessed as grey, in other cases as black. In this connection it is important to emphasise that in the case of the coverage of a single address point by more than one enterprise, this address point was only included in the calculation once.

Mapping is a dynamic process and therefore for the purposes of this document, and mainly for the economic analysis, the data submitted by the Czech Telecommunication Office to the Ministry of Industry and Trade on 31 May 2016 and fixed as of 25 May 2016 is used as the base, in which out of the total number of 22 439 BSUs, 6 642 are white, or 29.60%. 2 611 BSUs, or 11.64% of the total number, are grey, and the remaining 13 186 BSUs are black, which is 58.76% of the total number of BSUs.

In this connection it is essential to take into account that when averaging the coverage of the 6 642 white BSUs it was found that at the current time the average coverage percentage hovers around 7% and when taking into account business plans around 20%, which is significantly less than the selected threshold of 50%.

The public consultation on the data collection was opened for comments in the period from 28 July 2016 to 30 September 2016³².



³² An on-line application for this public consultation is available at www.verejnakonzultace.cz.

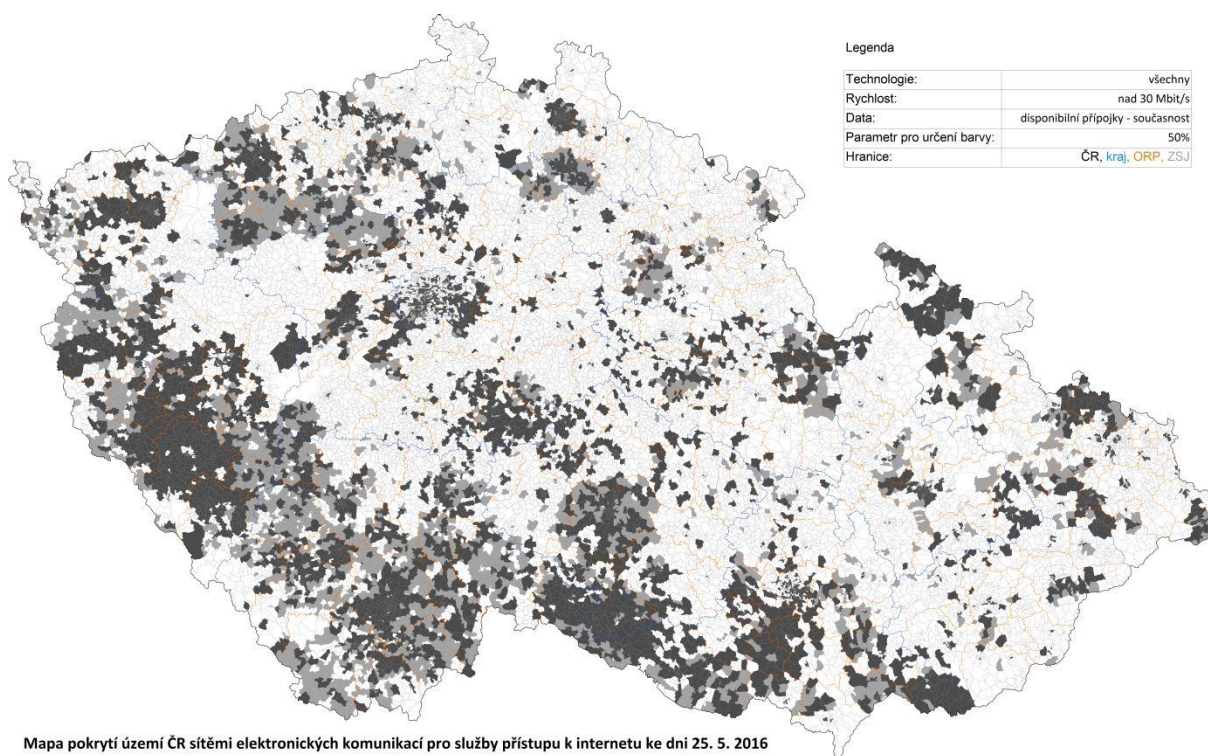
Image No 1 Map of the coverage of the Czech Republic with electronic communications networks for Internet access services as of 25 May 2016 (present with operators' plans for a three-year period), CTO.

Region	White BSUs	Percentage of the number of BSUs	Grey BSUs	Percentage of the number of BSUs	Black BSUs	Percentage of the number of BSUs	Total BSUs
Prague Capital City	227	24.78%	54	5.90%	635	69.32%	916
Central Bohemia Region	1 252	35.05%	400	11.20%	1920	53.75%	3 572
South Bohemia Region	608	23.78%	591	23.11%	358	53.11%	2 557
Plzeň Region	311	16.72%	239	12.85%	310	70.43%	1 860
Karlovy Vary Region	120	14.65%	74	9.04%	625	76.31%	819
Ústí Region	608	33.26%	258	14.11%	962	52.63%	1 828
Liberec Region	427	39.07%	94	8.60%	572	52.33%	1 093
Hradec Králové Region	671	43.88%	214	14.00%	644	42.12%	1 529
Pardubice Region	334	25.69%	60	4.62%	906	69.69%	1 300
Vysočina Region	480	27.21%	159	9.01%	125	63.78%	1 764
South Moravia Region	475	29.97%	102	6.44%	008	63.60%	1 585
Olomouc Region	420	36.36%	150	12.99%	585	50.65%	1 155
Zlín Region	235	24.79%	75	7.91%	638	67.30%	948
Moravian-Silesian Region	474	31.33%	141	9.32%	898	59.35%	1 513
Total	6 642	29.60%	2 611	11.64%	13 186	58.76%	22 439

Table No 1 Colour assessment of BSUs in individual regions, data as of 25 May 2016, CTO.

The mapping results confirm that in the Czech Republic there are localities in which there are no NGAs in a sufficient scope or quality, and no plans for their construction over the next three years.

For the sake of completeness, it is appropriate to refer to the following map, which shows the current deployment of NGAs (according to data as of 25 May 2016), i.e. without planned investments, while grey and black BSUs make up approximately 39% of the total number. From this we can deduce that over the next three years up to 30% of the total number of BSUs will be covered by NGAs based on the planned investments of enterprises in electronic communications.



Mapa pokrytí území ČR sítěmi elektronických komunikací pro služby přístupu k internetu ke dni 25. 5. 2016

Image No 2 Map of the coverage of the Czech Republic with electronic communications networks for Internet access services as of 25 May 2016 (current state without taking into account planned investments), CTO

In relation to the facts stated above, it is necessary to note that mapping of address point coverage can be methodologically biased by the fact that any building with a street number and a registration number, i.e. including buildings not intended for living. The mapping process outlined in the first step and the colouring of individual BSUs are thus to be seen as indicative only, also reflecting the fact that the protection of investments applies to current and planned NGA networks regardless of whether the available NGA connection is situated in a place intended for living or not. To identify the intervention areas, the places with addresses located in white BSUs will be adjusted, if necessary, based on the publicly available and relevant information, so that such places that are not covered under the OP EIC objectives are excluded.

4.1.2 Public consultation

A key aspect of the provision of public aid through specific objective 4.1 of the OP EIC is a verification of the mapping results in public consultation, the objective of which is to reduce to a minimum any disruption of competition with existing providers and with entities that have prepared investment plans for the following three-year period, and to fix the “white”, “grey” and “black” areas obtained as a result of the mapping. The mapping results that will be associated with the following determination of areas of intervention and the call within the framework of the OP EIC, will be publicly available on the website of the MIT as well as through a link from the website of the CTO. Each entity will be able to comment on the colour of the given area through a collective, or if necessary, individualised public consultation.

The collective public consultation on the areas of intervention will take place always before each individual call of specific objective 4.1 of the OP EIC. Such public consultation will include a definition of the areas of intervention that will be proposed by the OP EIC Managing Authority. The proposal for the areas of intervention will be based on the output of the consultation concerning NGA mapping.

It is anticipated that enterprises that hold the relevant authorisations to perform activities connected with the construction and/or operation of public electronic communications networks and which operate or want to begin operating in the area in question will primarily participate in the public consultations. The public consultation will, inter alia, also be available to the local government of the municipalities in question, however it is important to emphasise that these consultations are by their nature open to anybody. It is understood that the results of the public consultation may change the maps that were the subject of that public consultation.

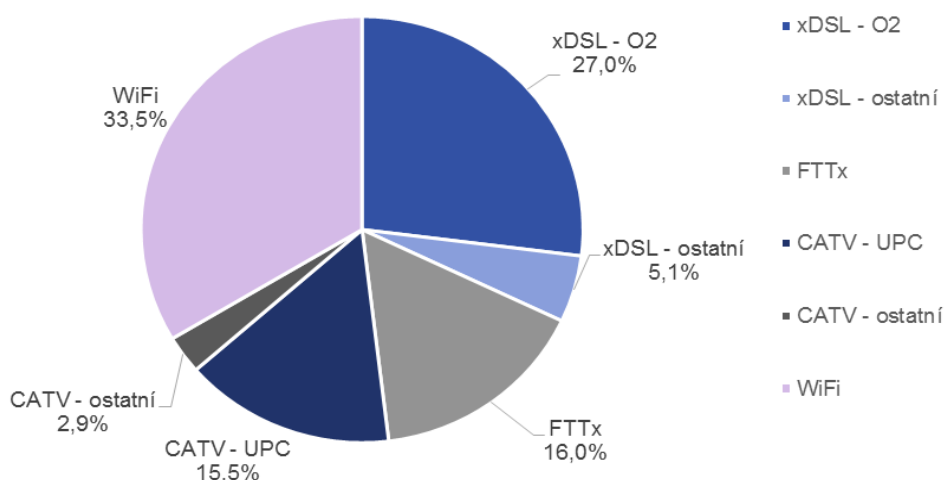
Within the framework of the overall preparation of this document, there is also public consultation to fix whole maps of the Czech Republic that will then be the subject of smaller public consultations relating to the individual areas of intervention. These smaller consultations will be announced for the area in which the subsidy competition will take place. The area of intervention will be created according to the rules for the creation of areas of intervention, and enterprises will have the possibility to comment in more detail on the individual facts both at the present time and also for the three-year outlook.

The mapping of areas of intervention will take place in cycles, while the first round of calls will be focused only on white areas.

4.2 The development of NGNs in the Czech Republic and abroad

If we look at the market share in terms of the number of accesses by individual technological solutions, the situation on the retail market for high-speed Internet access changed only minimally in 2015³³; with only a slight growth in market share for access through optical networks from 11% in 2014 to 12% for 2015. Wireless networks in free bands (labelled as “WiFi” in the graph below) and xDSL access remained the most widespread technological solutions for access to the Internet, with market shares of 26.8% and 24.1% of all networks. Graph No 2 below provides the shares of the individual technologies within the framework of fixed electronic communications networks.

Podíl širokopásmových přístupů dle jednotlivých technologických řešení k 31.12. 2015

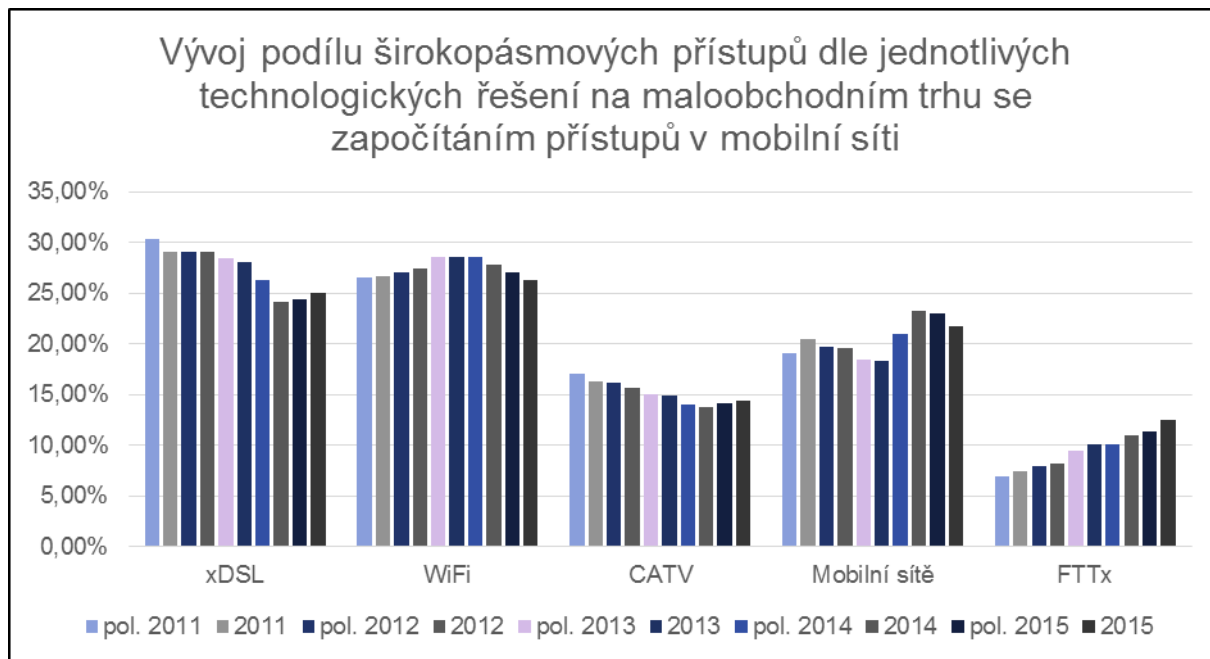


³³ See the Annual Report of the Czech Telecommunication Office for 2015, and the EC's Digital Economy & Society Index

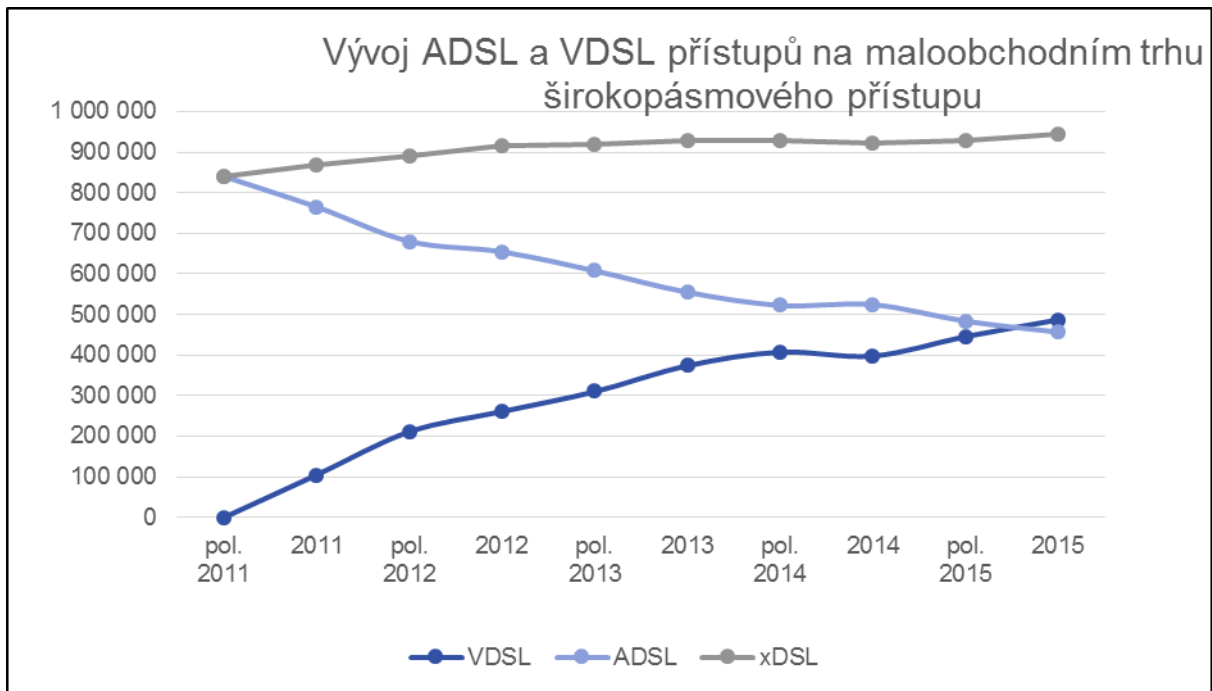
Graph No 2 The shares of high-speed access by individual technology solutions in fixed networks as of 31 December 2015, CTO

The retail market for high-speed access also shows a significant dissemination of Internet access through cable television networks (CATV), which have a market share of 18.4%. This fact shows the persistent important level of competition at infrastructure level, which the CTO considers a positive element supporting competition on the retail market for high-speed access.

The present shares of different technologies on the retail market for Internet access and the long-term development are documented in the following Graphs No 3 and 4.

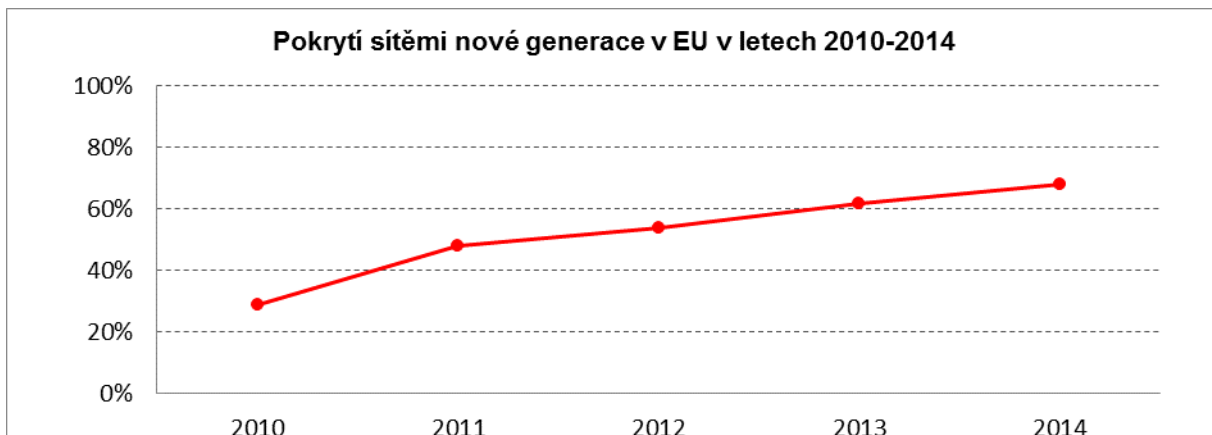


Graph No 3 The development of the share of high-speed access by individual technological solutions on the Czech retail market, including mobile network access, CTO



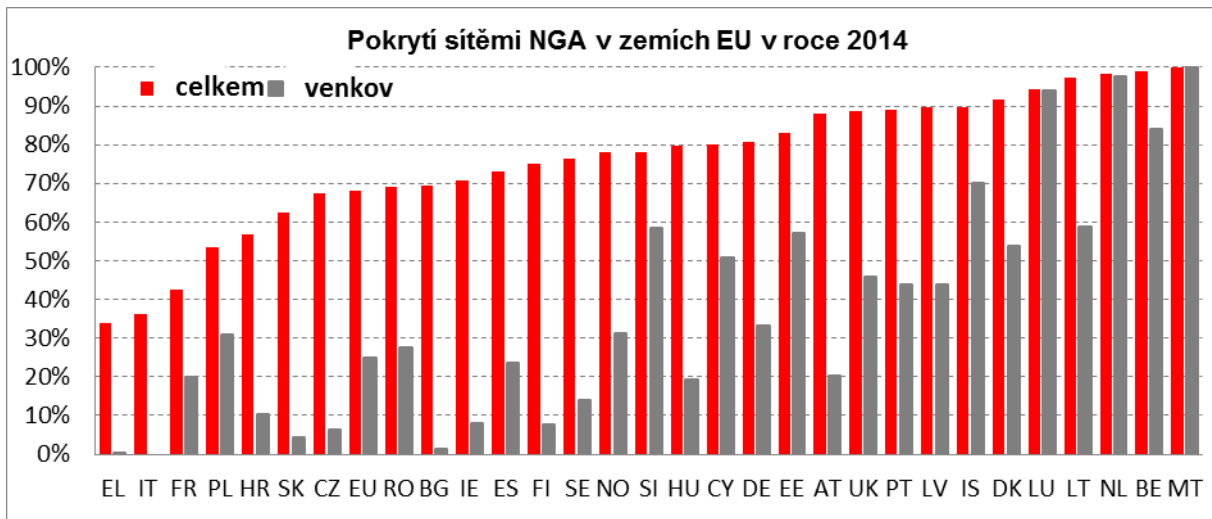
Graph No 4 The development of ADSL and VDSL access on the Czech retail market for high-speed access, CTO

For comparison, it should be noted that at European level the availability of NGAs reached almost 70% as of the end of 2014, while FTTP technology posted significant progress: from 10% in 2011 to 19% in 2014, yet FTTP coverage is still low in general.



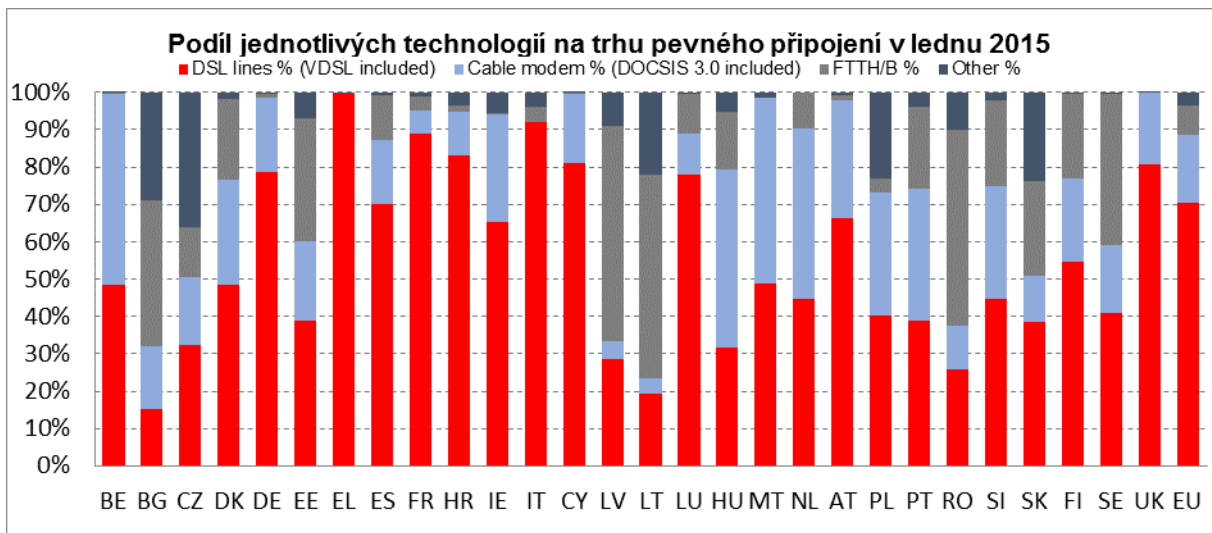
Graph No 5 Development of the coverage of European households by NGAs (VDSL, Cable TV, FTTP) from 2010 to 2014 (Source: IHS, VVA and Point Topic)

The following graph shows that NGAs have limited availability in rural areas. Only 25% of European households in rural areas are covered, and this primarily through VDSL.



Graph No 6 Coverage of households in individual EU Member States with NGAs (VDSL, Cable TV, FTTP) in 2014, with highlighting of rural areas (Source: IHS and VVA)

The following graph documents the specific situation in the Czech Republic in terms of the use of various technologies according to their market share, in particular the type of WiFi in the section labelled “Other”.



Graph No 7 Share of individual technologies on the fixed connection market in January 2015 (Source: Communications Committee of the European Commission)

4.3 Analysis of barriers and costs to the construction of NGNs

The development of NGNs is a complex problem that has previously faced a number of barriers in the Czech legal environment. Some of these barriers are systematic in nature and their solution will require interdepartmental cooperation, while others are specific and hence open to concrete corrective measures. The purpose of this chapter is to identify the barriers falling into the two areas described above so that in the subsequent chapters of this document suitable steps and measures may be proposed to remove them.

The resolution of certain barriers to the development of electronic communications networks is currently the subject of the transposition of Directive 2014/61/EU, which is transposed into

Czech law by the Act on measures to reduce the costs for deploying high-speed electronic communications networks.

The barriers in some regions include insufficient development of backhaul networks, which do not meet the conditions to form a base for the construction of local NGAs. Without sufficient-capacity backhaul networks connecting local access electronic communications networks with backbone connections, achieving the objective of the full coverage of 100% of households with access to high-speed Internet in the areas concerned will not be possible. Backhaul networks were therefore placed into this programme to promote the construction (modernisation) of NGAs in the Czech Republic as part of the NGAs.

With regard to the fact that the development of NGNs is not possible without substantial private investment, it is necessary in the interest of their construction to support the profitability of such investments. We currently see the low stimulation of demand for services using high-speed Internet access as a systemic deficiency in this regard. Yet the interest of end users in the mentioned services could be ignited by the thorough computerisation of contact between private entities and public administration, and support for the use of electronic communications services also in other branches (health, education, etc.). These barriers are addressed by the Government's Action Plan for the Development of the Digital Market, and hence this document does not contain a proposal for a solution to this issue.

A number of barriers to the development of NGAs fall within the area of communication and education. The construction of electronic communications networks is complicated by the lack of a communication platform including representatives of local government, public administration and network operators focusing on issues related to the development of electronic communications networks, and insufficient sharing of experience, which leads to a fragmentation of approaches to the construction of these networks and the slow introduction of new approaches by local government. In relation to municipalities and regions, there is also a lack of wider promotion of support for the construction of electronic communications networks by the central government. Properly targeted promotion would increase the awareness of the benefits of the availability of high-speed Internet access from the perspective of the economy and the quality of life of citizens, and of measures and procedures to promote the construction of electronic communications networks. It is also important to mention the fact that dialogue between the central government, local government and representatives of enterprises in the area of electronic communications and the ICT industry has in the past come up against various barriers. The complexity of the issue of the development of NGNs requires a permanent constructive dialogue and strengthening of cooperation between these entities.

In connection with the barriers mentioned above, there are a number of specific barriers, in particular of a legislative and regulatory nature, which can be thematically divided into the following two areas, while the order of the individual items does not correspond to the severity of the identified deficiencies. A proposal of measures is provided in chapter 6.2 of this document. An overview of the barriers follows:

4.3.1 Barriers to the planning and construction of networks

- a) The impossibility of concluding other types of contract (except easement contracts) in particular on land with a higher number of co-owners, resulting in the impossibility of constructing electronic communications networks.

- b) A lack of coordination of the structures of different investors in a given locality (the issue of so-called “overlying”, technical standards, the need to change or renew a land use decision, protection and safety zones).
- c) Unresolved possibility for sharing passive infrastructure suitable for establishing electronic communications networks (lack of awareness about the existence of usable passive infrastructure, the absence of conditions for its sharing, etc.).
- d) Unreasonable requirements for the subsequent treatment of surfaces of the land in question over and above what is essential (the original or an appropriate state).
- e) Disproportionate deadlines for the occupancy proceedings for electronic communications networks structures (this also applies for other utilities).
- f) The placement of internal communications lines and the conditions for their potential sharing are not adequately addressed in the applicable legislation and technical standards.
- g) The complexity and slowness of the process for expropriating property rights necessary for the placement of electronic communications networks (in particular the demonstration of public interest, the unique nature of the technical solution, the scope of documents required).

4.3.2 Financial barriers

- a) The one-time compensation for the establishment of easements is not demanded as standard by property owners according to a unified methodology. In particular, the demands of government authorities, local government and enterprises with state or local government ownership often exceed the market value of the property. In addition to one-off financial compensation unreasonable requirements are often exercised in the form of non-monetary performances, e.g. returning the surfaces of the land in question beyond the framework of restoration to their original (or a corresponding) state.
- b) The amounts of fees demanded for the use of open public space does not correspond to the level of temporary aggravation of the use of the open space in question for the needs of electronic communications networks in the public interest.
- c) The legislation regarding responsibility for municipal management does not adequately enable municipalities to require a one-time compensation for the establishment of an easement for a lower price.
- d) The long periods for the tax depreciation of constructed networks reduces possibilities for private investment.

4.4 Investment models for support and business models for the development of NGAs

4.4.1 Investment models and the selected investment model for the development of NGAs

The selection of the most appropriate investment model is crucial for the fulfilment of the determined objectives; its determination was based on the material Guide to High-speed

Broadband Investment (the “Guide for Investment”³⁴, prepared by the EC, which contains relevant investment models based on public data about projects from all over Europe. In this material the indicated investment models present a wide range of possibilities for combining public and private investments. Each model is applicable under different circumstances depending on the scope of the required infrastructure, the specific objectives, according to the type of Managing Authority, the level of risk of the individual participating parties etc. The indicated material recommends the following five investment models.

Bottom-up Model – this is based on an initiative by the local community and includes a group of end users who are organised into a commonly owned and democratically controlled group and are able to oversee the construction and operation of their own local networks.

Private Design, Build and Operate (DBO) Model – this is built around the existence of a Managing Authority that issues means (often in the form of subsidies/public aid) to the private sector for the purpose of support during the expansion of their networks. The public sector does not have any specific role in the ownership or operation of the network, but may impose obligations determining access to financial resources.

Public Outsourcing Model – within the framework of this model there is a single contract that covers all aspects of the construction and operation of the network. The main characteristic of this model is that the network is operated by the private sector, but the public sector retains the ownership and a certain level of control over the network.

Joint Venture Model – a partnership between the public and private sector is the arrangement through which the ownership of the network is split between the public and private sector. The construction and operating obligations are as a rule carried out and secured by the private sector.

Public Design, Build and Operate Model – in this model, the public sector owns and operates the network without participation from the private sector. All the aspects of the development of the network are managed by the public sector, which may operate the whole network or may provide wholesale access with private entities then offering retail services.

With regard to the situation in the Czech Republic, the *Private Design, Build and Operate Model* was selected when drawing up the OP EIC as the most appropriate investment model. This model should ensure the development of NGAs in specific localities throughout the whole country, and will also eliminate the state’s risk connected with the construction and operation of these networks. It will use the already created, institutionally secured implementation mechanism, and respect the fact that in the Czech Republic there is no public institution specialised in the planning, construction, development and operation of electronic communications networks. One advantage of the selected model is the fact that in connection with the support the state may determine some conditions, e.g. wholesale access to the supported network.

The updated material from the EC (Guide for Investment) speaks of the following investment models:

- a) Direct investment: the publicly run municipal network model (also known as Public DBO, though it can include PPP elements),

³⁴ Guide to High-speed Broadband Investment, See http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=12881

- b) Indirect investment: the privately run municipal network model (also known as public outsourcing, or concession model),
- c) Support of community-led initiatives: the Community broadband model,
- d) Operator subsidy (also known as gap-funding or private DBO).

In this breakdown, the investment model – subsidies to operators to build a network – provides the broadest set of benefits for the current situation in the Czech Republic in relation to the building of access networks, and therefore appears the most appropriate investment model.

The main advantages stemming from the use of this investment model are:

- Directing investments into areas that are currently not commercially interesting to existing potential investors. In this way the amount of private investments into the building of access networks will also be strengthened,
- Limiting the level of public aid to the electively necessary amount, while one of the assessment criteria for investor selection will be the amount of public aid needed,
- The possibility to regulate the prices of wholesale services at the level of what is achieved in commercially interesting areas by not including public aid in the calculation of their costs,
- Strengthening the competitive environment as networks built partially using public aid will also have to be equipped to provide wholesale services
- Transferring risk to the public aid beneficiary, because the state as public aid provider is not directly involved in the deployment of the networks,
- A relatively simple contractual arrangement between the beneficiary of the public aid and the donor, and therefore the possibility of relatively rapid project implementation.

The fact that the state will not receive financial revenues from the project, which could then be reinvested into the building of future networks, may be considered a disadvantage.

Another reason for selecting the *Private Design, Build and Operate Model* investment model is the fact that it will enable a specific investor to be selected for each area of intervention based on a selection procedure in which the amount of public aid required will be taken into account. The required subsidy amount will be one of the assessment criteria in the selection procedure. This will contribute to creating a competitive environment and an optimised use of public funds.

The investment model was already selected in the process of drawing up the OP EIC and adopted by Government Resolution of 14 July 2014 No 581. It was approved by the European Commission's Decision C(2015) 3039 of 29 April 2015.

Public Outsourcing Model will also be supported, if possible and at the same time in compliance with the rules and objectives of the subsidy programme. NGA networks will be built by municipalities, mostly by “overlying” while building other infrastructure (waterworks, sewage systems, public lighting, pavements, etc.). This synergy will lead to significant total cost savings. Municipalities will be the network builders and owners, with network management provided exclusively by private sector in the vast majority of cases. Thus the wholesale access to the supported network will be guaranteed.

In future, the use of other investment models as well cannot be excluded.

4.4.2 Business models for providing services to end subscribers with NGA parameters

There are currently a total of 2308 entities registered for the purpose of providing Internet access services in the Czech Republic³⁵. These entities are primarily private enterprises. To secure their declared objectives, meaning the provision of Internet access services to end users, they use all the relevant business models described in the Guide for Investment.

In connection with the selected investment model, therefore, two business models - and potentially their combination - come into consideration, namely:

- *Active-layer open model (ALOM)*, where one business entity builds, owns and operates both the passive and active layer. Therefore, this entity acts as the provider of the passive (“physical”) network and also operates the active layer of this network and provides services to end subscribers. This entity places active equipment in all access nodes and builds an open, operator-neutral network over which all service providers can deliver their services to all end users.
- *Vertically integrated model* – this basically differs from the ALOM model by the operator being the business entity, while with the ALOM model this may be an association of business entities. The fundamental difference compared to the ALOM model is the possibility of providing data flow (bitstream) in addition to the services mentioned for the ALOM model.

This document does not limit the possibility of use of individual business models or their variants or combination, with the exception of two reservations tied to the exercise of the public aid option for building NGAs. The first reservation is the obligation to provide - within the framework of supported projects - available high-speed Internet access at the quality declared for the NGA for all end users in the area in question. The second obligation is to provide - within the framework of supported projects - wholesale access to such available high-speed Internet access.

³⁵ As of August 2016.

5. Objectives, visions and priorities for the development of NGNs

High-speed Internet infrastructure is an important means of communication in a modern economy and one that is indispensable in an information society oriented towards services with high added value. Activities by and between companies, the authorities and education facilities may be performed more effectively through innovative network solutions. Also, citizens can more easily participate in the development of the information society.

Information and communication technologies significantly contribute towards increasing the gross domestic product and lead, if used effectively, to increasing productivity. The differences in the performance of economic markets and states can to a significant extent be explained through the investments made into these technologies, and into their research and use. The competitiveness of an information society is founded on the use of modern ICT services, as well as on competence in the creation of digital content and its dissemination through digital media.

Investments into communication infrastructure are performed by private entities based on market mechanisms, primarily in regions with high demand potential, while the gap in high-speed Internet access between rural and urban areas widens further. As a consequence of inadequate Internet access – even under a situation of rising demand – less populated areas of the Czech Republic could remain excluded from economic development over the long term.

Strategic objectives:

- a) The building of a sufficiently developed and available full-scale technological base in the form of NGAs enabling high-speed Internet access in the Czech Republic, including in localities that lack this infrastructure and where it cannot be anticipated that it will be built through the action of market mechanisms under commercial conditions. While building, setting conditions in order to enable reaction to the expected substantially higher demands of high speed and latency in real time and with minimum additional costs.
- b) Facilitating the development of small businesses for the population as well as for the business sector.
- c) Improving the living and economic conditions for the local population and local businesses through the retention and improvement of the provision of services with added value.
- d) Improving the availability of supply of modern and advanced digital services and applications, in particular in the areas of communication, entertainment, business, education, health and work from home.
- e) The creation of reliable high-speed Internet access at reasonable prices.
- f) Improving competitiveness and employment in rural areas.
- g) The availability of information and communication technologies with the objective of enabling all citizens to be part of the information society, not only in relation to the local government and public administration³⁶.

³⁶ The Government adopted the Strategic Framework of the Development of Public Administration in the Czech Republic for 2014 -2020 by its Resolution of 27 August 2014 No 680.

Operational objectives

- a) Creation of a transparent and effective subsidy mechanism for extending NGAs into areas in which public aid is possible (so-called white areas).
- b) Using resources from the ESIF, increasing the availability of high-speed Internet connections by at least 500,000 households³⁷ through the establishment of new NGAs or the modernisation of existing inadequate infrastructure.
- c) Reduction in administrative and construction costs when building NGAs through legislative measures.
- d) The proper transposition and implementation of Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks.

³⁷ According to the OP EIC adopted by the Government Resolution of 14 July 2014 No 581.

6. Measures to achieve the objectives

In general, it is possible to promote the introduction of NGNs on the one hand through the removal of legislative or regulatory barriers and on the other through the provision of public aid under determined conditions.

6.1 Transposition of Directive 2014/61/EU

The objective of the implementation of Directive 2014/61/EU is to determine certain minimum rights and obligations valid throughout the EU with a view to facilitating the introduction of high-speed NGAs and cross-sectoral coordination.

There is general agreement that construction work represents the dominant part of total costs for the deployment of networks, irrespective of the technology used, while with some technologies this share is estimated to be up to 80%.

Barriers to investment and access to the market may be reduced through the enabling of more intensive use of existing network infrastructures, strengthening cooperation during the planning of construction work, streamlining the procedures for granting permits, and removing barriers for electronic communications networks prepared for high-speed connectivity built into buildings.

The transposition of this directive therefore focuses on the removal of:

- a) Inefficiencies or barriers in the area of the use of existing “physical” infrastructure (for example ducts, conduits, shafts, cabinets, poles, masts, antennae, towers and other supporting constructions),
- b) Difficulties in sharing passive infrastructure suitable for the establishment of electronic communications networks (insufficient awareness of the existence of usable passive infrastructure, the lack of conditions for its sharing),
- c) Barriers in the area of the concurrent introduction of high-speed electronic communications networks,
- d) Barriers relating to the introduction of high-speed electronic communications networks installed in buildings.

If the above indicated problems are addressed together, the result will be a set of coherent and mutually reinforcing measures.

The draft of the Act on measures to reduce the costs for deploying high-speed electronic communications networks determines the obligation to enable access to “physical” infrastructure for the purpose of building elements of high-speed electronic communications networks under fair, reasonable and non-discriminatory conditions, unless there are reasons for rejecting applications. During the performance of construction work, the investor must comply with an application from an authorised entity for the conclusion of a contract to coordinate construction work with the objective of building elements of any high-speed electronic communications networks, and this under fair, reasonable and non-discriminatory conditions.

The operator or owner of an access point or “physical” infrastructure inside buildings will have an obligation to make this access point or “physical” infrastructure available for the purpose of building high-speed electronic communications networks, and this based on an

application from the operator and also under fair, reasonable and non-discriminatory conditions, including prices, unless there are reasons for rejecting such application.

By law, an authorised entity will have the right to the provision of a set of minimum data about the “physical” infrastructure of obligated entities, and this within the scope of its planned project to construct high-speed electronic communications networks, and also the right to information about ongoing or planned construction work.

6.2 Additional legislative and other measures

In order to remove barriers when building electronic communications networks, the implementation of other measures indicated below, is also anticipated. These measures will be defined in more detail in the action plan, including their timeframe and the lead manager.

6.2.1 Corrective measures in the area of network planning and construction

To solve the issues adduced in chapter 4.3.1, the following measures are suggested:

- a) An amendment to § 104 of Act No 127/2005, on electronic communications, which will also enable the conclusion of other types of contracts enabling the placement of elements of electronic communications networks on land; see chapter 4.3.1(a).
- b) Legislative measures to enable the addressing of barriers to the coordination of structures of different investors (the issue of so-called “overlying”, technical standards, the need to change or renew a land use decision, protection and safety zones); see chapter 4.3.1(b).
- c) Intensification of communication and greater public education among government authorities, local government and network operators for the purpose of spreading information and sharing tried-and-tested practices and experience in the area of support for the construction of NGNs. Recommendations for the building of protectors, raceways and other passive elements suitable for the construction of shared infrastructure, e.g. owned by the municipality or part of the reconstruction of public roads and open spaces. Recommendations relating to the amounts of fees demanded for the use of open public space, which take into account the level of the temporary aggravation of the use of the open space in question; see chapter 4.3.1(c),(d) and (e).
- d) An amendment to Act No 183/2006, on town and country planning and the building code (the Building Act), which will accelerate occupancy proceedings for electronic communications networks structures; see chapter 4.3.1(b) and (e).
- e) An amendment to Act No 184/2006, on removal or restriction of property rights to land or to a building (Expropriation Act) as amended, with the objective of simplifying the process of expropriation of property rights necessary for the placement of electronic communications networks (in particular the demonstration of public interest, the unique nature of the technical solution, the scope of documents required); see chapter 4.3.1(g).
- f) An amendment to Act No 416/2009, on the accelerated construction of transport, water and energy infrastructure (in adequate connection to Act No 127/2005, on electronic communications); see chapter 4.3.1(d) and (f).

- g) An amendment to § 103(1)(e) point 10 of the Building Act with regard to the definition of electronic communications networks connections, which should be enshrined in the Act on measures to reduce the costs for deploying high-speed electronic communications networks; see chapter 4.3.1(g).
- h) The preparation of legislative measures to make technical infrastructure (owned by the state and local government) available under determined conditions to other investors in electronic communications; see chapter 4.3.1(b) and (c).
- i) The development of standards and the relevant technical standards for the building and use of shared networks; an amendment to § 102 of the Act on Electronic Communications, which defines the width of the protective zone (i.e. narrowing it) for electronic communications networks; see chapter 4.3.1(a) and (c).

6.2.2 Measures to correct financial barriers

To solve the issues adduced in chapter 4.3.2, the following measures are suggested:

- a) The creation of a uniform methodology for the one-time compensation for the establishment of easements – property owners as a rule demand this as a contractual price, while there is no unified methodology. In particular, the demands of government authorities, local government and enterprises with state or local government ownership often exceed the market value of the property; see chapter 4.3.2(a) and (c).
- b) An amendment to Act No 151/1997, on property evaluation and amending certain other acts (Property Evaluation Act), and follow-up comments on the valuation of rights corresponding to easements; see chapter 4.3.2(a) and (c).
- c) A legislative measure that will determine the upper limit of compensation for the establishment of an easement and concurrently determine that the value of any non-monetary performance to the benefit of the owner of the property concerned burdened by an easement will be included in the amount of the one-off compensation for the establishment of the easement; see chapter 4.3.2(a), (b) and (c).
- d) An amendment to § 39 of Act No 128/2000 Coll., on municipalities, and to § 35 of Act No 131/2000 Coll., on the Capital City of Prague, enabling the provision of rights for the building of electronic communications networks at reduced prices; see chapter 4.3.2(a), (b) and (c).
- e) A legislative measure to clarify the inclusion of active elements of electronic communications networks into the first depreciation group, and a change to the placement of underground lines of electronic communications networks into the 3rd depreciation group. Exemption of the free establishment of an easement for the placement and operation of public electronic communications networks from income tax; see chapter 4.3.2(d).
- f) The unification of the method for the calculation of the fees for the use of open public space, e.g. with the use of pricing maps, etc.; see chapter 4.3.2(b) and (c).
- g) The preparation of principles for financial participation by the owner of the land for cases where restoration is demanded over and beyond the original state. In addition to the one-off financial compensation, unreasonable demands are often made in the form of non-monetary performances, e.g. returning the surfaces of the land

concerned to a state over and beyond their original state (or a corresponding state); see chapter 4.3.2(a).

6.3 Subsidies

In general, it can be stated that the Czech Republic will base its determination of a subsidy programmes in the area of the development of NGAs on the EU Guidelines and Regulation No 651/2014, which in accordance with Articles 107 and 108 of the Treaty declares certain categories of aid as compatible with the internal market.

In case of OP EIC, the EU Regulation No 651/2014 includes certain categories of aid in the so-called block exemption, newly including “*aid for broadband infrastructures*”.

Art. 52 of Regulation EU No 651/2014 then determines specific conditions under which public aid for NGAs is compatible with the internal market and exempt from the notification requirement. This involves in particular the following aspects:

- a) *The investment shall be located in areas where there is no infrastructure of the same category (either basic broadband or NGA network) and where no such infrastructure is likely to be developed on commercial terms within three years from the moment of publication of the planned aid measure, which shall also be verified through an open public consultation.*
- b) *The aid shall be allocated on the basis of an open, transparent and non-discriminatory competitive selection process respecting the principle of technology neutrality.*
- c) *The network operator shall offer the widest possible active and passive wholesale access, according to Article 2, point 139 of this Regulation, under fair and non-discriminatory conditions, including “physical” unbundling in the case of NGA networks. Such wholesale access shall be granted for at least seven years and the right of access to ducts or poles shall not be limited in time. In the case of aid for the construction of ducts, the ducts shall be large enough to cater for several cable networks and different network topologies.*

Specific objective 4.1 of the OP EIC *Increase Broadband Internet Access Coverage* is also based on these aspects. The main target group is residents and entrepreneurs who do not have the possibility to use high-speed Internet access with a speed of at least 30 Mbit/s. The aid beneficiaries are entities operating in electronic communications (SMEs). The target territory is areas that lack infrastructure meeting parameters NGA in a sufficient scope or quality and where it is unlikely that this infrastructure will be built within three years under commercial conditions from the publication of the planned measures. The allocation for this specific objective is EUR 521 million, or approximately CZK 14 billion.

More details are set out in the support programme called “High-Speed Internet” approved by the Government Resolution of 9 February 2015 No 87.

To reduce the risk of delays in the deployment of broadband services in connection with planned investment into NGAs, it is possible to apply tools inter alia indicated in point 65 of the EU Guidelines. These tools may be applied during the public consultation for the given areas of intervention before the announcement of OP EIC calls.

The evaluation criteria for the selection of applicants will be based on the Methodological Guidelines for Managing Calls, the Assessment and Selection of Projects in the

Programming Period 2014–2020 and other valid EU Guidelines. The criteria will be used to assess both the readiness of the applicant for implementation, and also the need for and relevance of the project, including technological feasibility, the economy of the budget and other specific criteria. The general principles for assessment are based on the need to meet the monitoring indicators given by the OP EIC, and hence the greatest emphasis will be placed on the number of connected households at the most efficient cost. Points will also be awarded for areas made up of over 75% of defined white areas. Points will also be awarded to NGAs under construction that have higher parameters, cover a higher percentage of the territory, and are more cost efficient. The economy of the projects from the perspective of usual prices and also a well presented and a competitive environment promoting the wholesale offer will also be very important. Emphasis will be placed on these principles during evaluation. The issue of how to award points will be addressed in a document called “The Evaluation Criteria for the Selection of Applicants”, which will be published as an Annex to a call under the specific objective 4.1 of the OP EIC. This document will favour neither qualitative nor economic criteria for NGA network construction, but both parameters should be balanced.

The OP EIC Monitoring Committee will decide on the exact wording of the criteria in accordance with the process for selecting operations in the funding period 2014-2020.

The principles for the implementation of the subsidy mechanism are presented in Annex No 2. The principles and conditions for wholesale offers of access to NGAs built using subsidies are presented in Annex No 3.

In other subsidy programmes dedicated to the support of NGA network development, which have not been adopted by the Government, regions and municipalities as well as the organisations and interest groups established or managed by regions or municipalities and dedicated to the development of NGA networks, can also qualify as subsidy beneficiaries.

In order to ensure the development of digital services for citizens related to the digitisation of public administrations, it appears appropriate to set a requirement to connect all objects of public interest located in the area of intervention to NGA network infrastructure as a condition for all publicly supported projects. Objects of public interest include buildings serving as seats of public authorities and organisation of national strategic interest (schools, libraries, healthcare centres, etc.). The list of address points related to the objects of public interest shall be published and updated by the Ministry of Interior, while also enabling a remote access to the list and its updates published on its websites. This condition can be applied to subsidy programmes already adopted by the Government and dedicated to the support of NGA network development, as long as the condition complies with the programmes’ rules and objectives and it is approved by competent authorities.

6.4 Plan for investments into electronic communications networks

Public aid should be directed primarily to localities for which economic models for building NGAs without this support would fail. The optimal definition of the supported territory will lead to the highest possible coverage of today’s white areas, and concurrently to an increase in coverage to the whole of the Czech Republic.

To achieve a blanket increase in the coverage of territory through an offer of high-speed Internet access, respectively to eliminate as many white areas as possible in all regions of the Czech Republic, for the use of public aid it is appropriate to map out the unavailability of infrastructure over the smallest possible territorial units so that it will be possible to address the support to the highest number of specific white areas.

Unlike mapping, where it is suitable to break down addressing data about coverage, the technology used and the specific parameters into as small territorial units as possible, i.e. BSUs, for the purpose of public aid such territorial definitions are unsuitable, as in the actual definition of basic settlement units the urban-architectural principle dominates completely complying with statistical and registration purposes.

As regards the size of an individual supported territorial unit, the state's objective is to set such rules for public aid that motivate private investors to invest into areas that would otherwise be economically uninteresting for them. By setting a minimum level of penetration and including the level of penetration as one of the assessment criteria for selecting projects, the state will, in accordance with European documents, guarantee the achievement of a "step change"³⁸ in coverage throughout the defined territory. At the same time, it is necessary to take into account the network nature of the electronic communications sector, the need for blanket coverage of the populated territory, and the advantages arising from this. Last but not least, it is important to emphasise that the result of the implemented public aid should primarily serve end users. The aims and conditions of this support must correspond to this.

An appropriate compromise for determining the **size of the supported territory, or areas of intervention**, appears to be an aggregate of several BSUs that can take advantage of synergic network conditions. For the purpose of public aid this will take into account the network links between neighbouring BSUs and concurrently such breakdown will also be acceptable for smaller business entities operating in electronic communications. To ensure maximum openness to competition, under conditions equal for all enterprises, it will be possible to submit joint projects based on consortia, associations of several business entities, or based on mutual commitments of such entities implemented in the form of commercial contracts or preliminary contracts.

Based on coverage maps resulting from public consultation, the OP EIC Managing Authority will determine a set of areas of intervention that will apply for a specific round of a call from specific objective 4.1 of the OP EIC. To determine the areas of intervention the following **rules** have been set:

- a) An area of intervention may only be defined from so-called white BSUs, which may be grouped into larger territorial units so that the grouping is logical, transparent and promotes the efficiency of construction and operation of the supported NGAs. White areas determined in this way should be contiguous. A definition where there is one or more black or grey areas between individual white areas is possible only if cost-effectiveness allows.
- b) An area of intervention will be defined according to specific local demographic, geographic, territorial administrative and other conditions under the principles of economic efficiency, promotion of competition and the future development of services in relation to the fulfilment of OP EIC monitoring indicators.
- c) When defining areas of intervention, the conditions in the EU Guidelines and the conditions in the National Plan and in the document Digital Czech Republic 2.0 will be taken into account in particular.
- d) The sizes of areas of intervention will be proposed so that
 - The mean value of the number of white address points in an area of intervention is between 2000 and 4000. These are average values that arose from discussions with the professional public and that reflect the average value (although it is clear that the market is significantly fragmented into a large number of entities with differing needs). With regard to the effective management of entrusted funds, it is necessary

³⁸ See Paragraph 51 of the EU Guidelines

to seek a balance between the optimum size of an area and the costs for building the network, when a large number of small areas increases construction costs per unit yet areas that are too large will restrict competition.

- The anticipated average investment demands of a project are approximately CZK 30 million (without VAT) for the absolute share of private investment in the total value of a project. These are average values that arose from discussions with the professional public and that reflect the average value (although it is clear that the market is significantly fragmented into a large number of entities with differing needs). The originally valid and Government-approved programme determines the level of subsidy (and thus also co-financing) at a higher level (amount for a project CZK 1 million to CZK 200 million). The OP EIC Managing Authority will treat areas of intervention individually according to the coverage maps, and will thus always define the individual areas of intervention for a given subsidy project, while this definition of an area of intervention on which the subsidy demands per project will be based will always be subject to public consultation.
- e) When determining areas of intervention, the long-term sustainability of the operation of the constructed NGAs will be taken into account.
- f) The scope of State aid per area of intervention cannot exceed CZK 200 million without VAT.
- g) When determining specific areas of intervention, a suitable solution will be proposed that effectively combines the parameters indicated above.
- h) The determined areas of intervention will be subject to public consultation.

With regard to how so-called white BSUs are defined and in connection with protection for existing and planned investments, it is understood that costs for the connection of “non-white” address points, i.e. with an NGA, if they appear in an area of intervention (see chapter 4.1.1) cannot be included into eligible costs from which the amount of subsidy will be determined.

Regional Development Strategy

The Regional Development Strategy³⁹ takes into account several indicators (GDP, unemployment, indebtedness per citizen, material need benefits, net migration per 1000 population) and defines 57 economically troubled regions that represent in total 2 621 740 inhabitants - or 24.8% of the inhabitants of the Czech Republic - covering an area of 24.7% of the Czech Republic. In accordance with this strategy, it is possible to **give preferential treatment to areas of intervention in the indicated regions** during the implementation of the subsidy mechanism of specific objective 4.1 of the OP EIC.

To document the appropriateness of the preferential treatment of such areas of intervention, the presented Regional Development Strategy was used and an indicative analysis prepared of the current situation in the regions concerned, in which their current development state is taken into account. The results of this analysis are presented in the following table.

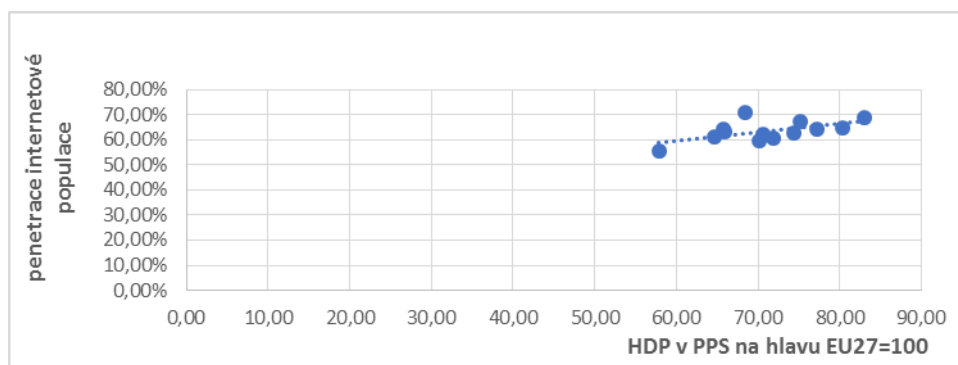
	Number of inhabitants	Average gross wage	Unemployment (15-64)	GDP v PPS per capita 2014/RISY	Percentage of inhabitants belonging to the Internet population 10+	Assessment of regions without Prague	Ranking of regions without Prague
	CSO 12/2015	CSO 11/2015	CSO 11/2015	EU27=100	NetMonitor 01/2016	worse situation = lower number	worse situation = lower ranking
Prague Capital City	1 264 708	33 343 CZK	4.20%	173.40	77.17%	not assessed	not assessed
Central Bohemia	1 323	25 987	5.41%	77.20	64.34%	3.61	12

³⁹ See Government Resolution of 15 May 2013 No 344

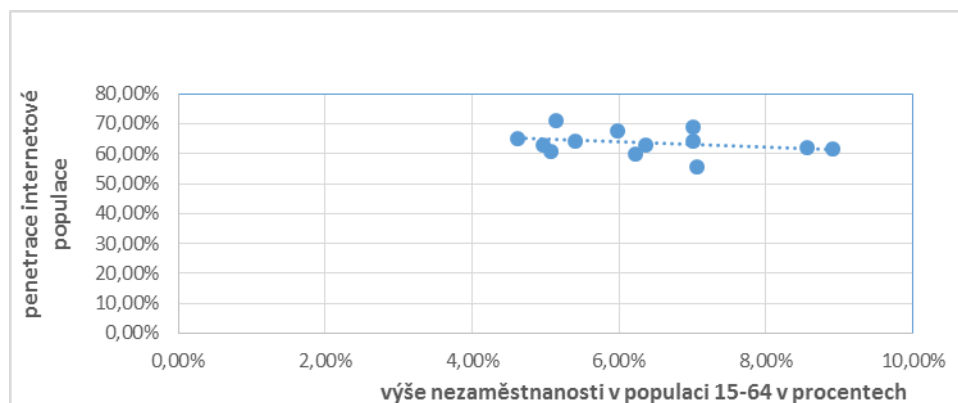
Region	355	CZK					
South Bohemia Region	637 472	23 407 CZK	5.07%	71.90	60.81%	3.45	8
Pišeň Region	576 186	24 945 CZK	4.62%	80.30	64.87%	3.75	13
Karlovy Vary Region	297 867	22 149 CZK	7.06%	57.90	55.77%	2.93	1
Ústí Region	822 808	23 411 CZK	8.91%	64.70	61.41%	3.01	2
Liberec Region	439 233	24 118 CZK	6.36%	65.90	63.04%	3.27	6
Hradec Králové Region	551 172	23 490 CZK	4.96%	74.40	62.79%	3.53	10
Pardubice Region	516 148	23 060 CZK	5.14%	68.50	71.08%	3.53	9
Vysočina Region	509 394	23 433 CZK	6.22%	70.10	59.79%	3.26	5
South Moravia Region	1 173 948	25 122 CZK	7.01%	83.10	68.99%	3.54	11
Olomouc Region	634 966	22 901 CZK	7.01%	65.80	64.32%	3.18	4
Zlín Region	584 750	22 648 CZK	5.98%	75.10	67.47%	3.43	7
Moravian-Silesian Region	1 214 113	23 628 CZK	8.56%	70.60	62.14%	3.12	3

Table No 2 Interrelationships between selected indicators for individual regions in relation to the Regional Development Strategy (MIT from CSO, EU and NetMonitor sources)

The relationships between the level of coverage of the territory by Internet access, the GDP per capita of the regions, respectively the level of unemployment in the regions, are shown in the accompanying graphs. These graphs show that a higher level of Internet access penetration contributes towards lowering unemployment and increasing GDP per capita. This generally known fact, which features in many studies (for example ITU - The Impact of Broadband on the Economy/2012) is confirmed here on data obtained from the national statistics published by the CSO.



Graph No 8 Relationship between GDP and penetration of the Internet population



6.5 Impacts of the selected investment model

The selected investment model (*Private Design, Build and Operate Model*) described in chapter 4.4 will affect not only the fulfilment of the state policy, but also - from the perspective of the impact of this policy and thereby the selected investment model - the relevant part of the private sector that will participate in the construction of electronic communications networks in the Czech Republic.

It should be noted that the **emphasis that the state places on the development of NGNs**, or networks capable of achieving not only today's required speeds of 30 Mbit/s or 100 Mbit/s, but rather preparing the conditions for speeds of one order of magnitude higher, is **inter alia reflected in the increased interest from the private sector in the building of high-speed networks**.

6.5.1 The share of private investment in the building of NGAs

The mapping results presented in chapter 4.1.1 show that in its plans the private sector declared the intention to cover up to 30% of the total number of BSUs with NGAs. From the current course of public consultation, one can infer that this interest will continue to grow. This is documented by the desire of the sector to build as many connections as possible through its own resources and primarily obtain from the state assistance in the form of the removal of barriers to construction, which will be the focus of chapters 4.3 and 6.2.

The plans declared by the entrepreneurs active in the sector of electronic communications, acquired while carrying out the mapping in 2016 and converted into finances, demonstrate the intention to invest into NGAs at least **CZK 58 billion, of which almost CZK 17 billion in backhaul networks**. Due to the absence of concrete data, which are the subject of individual business plans and therefore are understandably trade secrets, the indicated amount is a qualified expert estimate for technologies based primarily on optical networks and is something of a lower limit. Nevertheless, this is still an impressive figure that demonstrates that **these investment plans anticipate a substantial increase in the investment activities of the private sector in this area**.

The business plans will have to adapt to the developing market demands. The annual collection of the relevant ESD data by the Czech Telecommunication Office will then convert these visions and plans into coverage maps, leading to a gradual clarification of what market forces can do and where state intervention is necessary. Before launching each call, an identification of the intervention areas will be conducted based on the current state of mapping and a related public consultation will be held.

6.5.2 The share of public aid in the building of NGAs

Due to the fact that the building of high-capacity electronic communications networks is a key prerequisite for the building not only of a digital economy, but also for the development of the information society as a whole, the state's task is to support the construction of NGAs where this is not economically viable for enterprises.

The mapping presented in chapter 4.1.1 showed that there are such places in the Czech Republic, and the mapping that will be carried out in the coming years will show eventual changes in the specific focus of public aid, while business entities focus in their plans on the almost 30% of BSUs in which there are around 1.2 million permanently occupied dwellings, corresponding to a situation with a predominance of multi-dwelling buildings. Intervention of the State in the form of public aid should - according to the mapping results from the start of 2016 - also apply to 30% of BSUs, however with far less dense development and which are more difficult to serve, and so will apply to around 360,000 permanently occupied dwellings located primarily in single-dwelling buildings. This is based on the priorities of the Government's Action Plan for the Development of the Digital Market and on a phenomenon of our time, namely the continuously increasing share of work from home, which is also starting to manifest itself in the Czech Republic, it is in the interest of the state to also cover such areas with access networks of the required quality. The performed economic analysis did not take into account the average coverage percentage, which hovers at around 7%, and around 20% if business plans are included, and which was calculated by using the data obtained from mapping. The reason for this is the need to manage a comprehensive network.

In the context of the above, it is of course essential to state that public aid serves more or less as an incentive for the private sector as **private investment into these areas is also anticipated** and should, based on the economic analysis, be **at least around CZK 6 billion** according to a qualified expert estimate, including investments planned by operators at 13% of the current situation. In addition, business models of competitors that will be able to ensure not only the construction of NGAs, but also their long-term operation, are included.

Although the state is not a business entity, in the economic analysis performed subsequently to the mapping it was necessary to consider aspects that occur during the preparation of a business plan, to determine whether funds considered for public support (ESIF) will be sufficient and also whether it is realistic that NGAs built with public aid will be viable, meaning that the enterprises operating such networks will be able to operate them.

Besides, calculations were intentionally carried out for Internet access services only, including wholesale access. A minimalistic economic analysis concerning revenues did not take into account the possibility to use other potential business models, including the option to introduce promising electronic communications services. The justification is that it was needed to examine whether the worst case scenario of investment with public aid is viable.

A. Analysis input data

Therefore, to verify the scope of investment necessary to cover the whole of the Czech Republic with NGAs:

- sets of available demographic data were used, including information about the density and structure of settlements together with detailed information about the character of the residential developments; these data were used to calculate an average distance of 2 700 m from a backbone network access point (with limit values of 30 m and 13 km), while the weighted average distance taking into account the number of dwellings in the given BSUs was 1 300 m from a backbone network access point,
- the individual characteristics for the calculation of the investment demands were set incorporating the information obtained from the analysis of the average investments into FTTH (respectively FTTN) electronic communications networks, within such a

scope as to enable a guarantee of meeting the conditions for the recognition of the network as an NGA according to the parameters specified in this document,

- data⁴⁰ obtained through the data collection by the CTO from January to the end of March 2016 and submitted after verification on 31 May 2016 with fixation as of 25 May 2016 were used,
- data and information submitted by enterprises under trade secrets were used.

The model BSU consists of blocks of flats and family houses, as shown in the following image No 3.

It is true, however, almost without exception, that single-dwelling developments predominate in white areas, often scattered over a fairly large area or over difficult terrain. In such cases a public aid solution is appropriate because it will help to accelerate the return on the enterprises' investments.

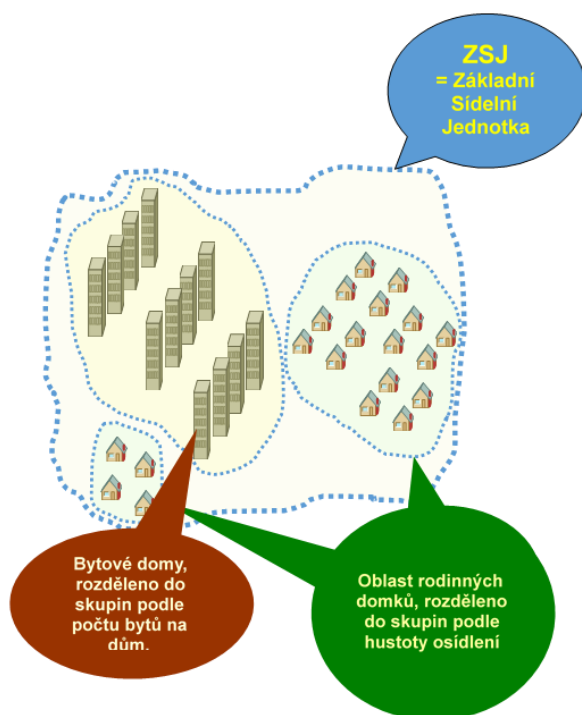


Image No 3 Model BSUs

It should be noted that the financial analysis considered the FTTH and FTTN technologies as these are the most expensive technologies in terms of investment costs and most demanding in term of return on investment. As the financial analysis also needed to demonstrate that the constructed NGA networks could be managed sustainably, cheaper technologies needn't be addressed.

Due to the outlook for the need for speeds of 100 Mbit/s, respectively 1 Gbit/s and higher, it is from today's perspective unrealistic to consider - for backhaul electronic communications networks - any other than primarily optical technologies. For electronic communications connections ("connections") this analysis focused - for the reasons given below - on FTTH, FTTB, FTTN and FTTCab technologies (for an explanation of these terms see Annex 7 explanation of terms and abbreviations).

⁴⁰ These data are trade secrets and it is difficult to publicly manipulate them even in aggregated form, and so the sector was not invited to these calculations. However, comments from enterprises operating in electronic communications were fully used during the calculation and analysis.

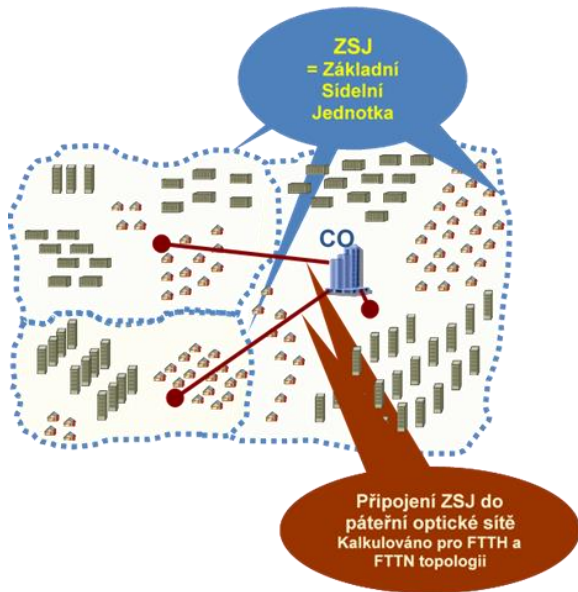


Image No 4 BSUs with a backhaul electronic communications network

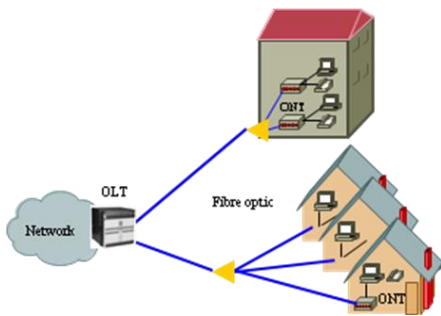


Image No 5 Structure of a network FTTH

The structure of a FTTH network indicated in the lower part of image No 5 and the structure of a FTTB network in the upper part of image 5 enables ensuring long-term sustainability of investment through a simple change of the active network elements at the FTTH central point and at the terminal points of the FTTH network. Due to the minimal difference between the indicated technologies they are referred to as FTTH networks in the text below.

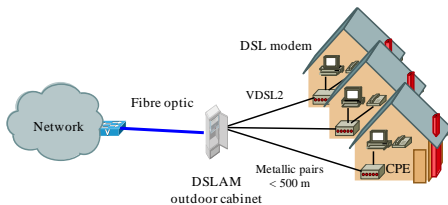
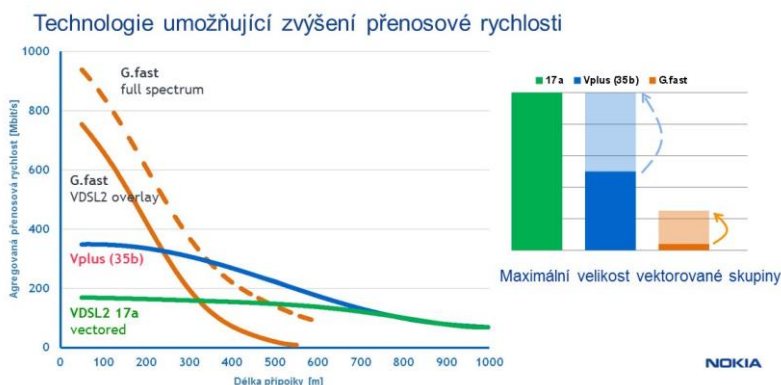


Image No 6 Structure of a FTTN, respectively FTTCab network

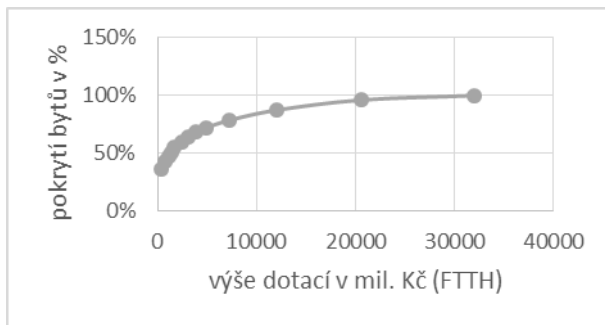
The structure of a FTTN network, where metallic lines are used for the section of the connection from the central point to the terminal point of the network, which have limited access speed possibilities in combination with currently available technologies, given the combination of the length of the metallic lines and the technology used. To a certain extent it is possible with the use of other new technologies to accelerate access speed, as is clear from the following image.



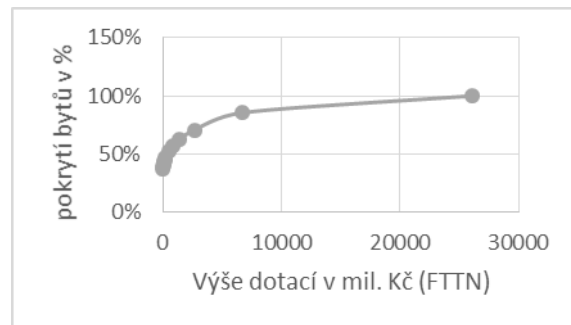
Graph No 10 Technology improving the performance of metallic lines depending on distance from the network terminal point, NOKIA 2016

From the characteristics of the indicated technologies and the calculations presented above it is clear that

- FTTH technology is most demanding in terms of investment, yet provides significantly more options for increasing the speed of data flows in the future than FTTN technology,
- FTTH technology is currently significantly cheaper to operate than FTTN technology,
- Although FTTN technology is cheaper in terms of investment, it however suffers from capacity constraints and is significantly more expensive to operate than FTTH technology.



Graph No 11 Percentage of coverage of dwellings with FTTH technologies depending on subsidy amount, MIT



Graph No 12 Percentage of coverage of dwellings with FTTN technologies depending on subsidy amount, MIT

When setting the necessary level of public support for investment, it was understood – in accordance with EU Guidelines – that subsidy funds will only be used for passive infrastructure, i.e. optical cables, switchboards, the construction parts of cabinets including electrical connections and residential wiring and all connected construction and installation work. From another perspective, these parts are usually assessed as long-term investments, whose lifespan as a rule exceeds ten and more years.

The above presented two model cases used for the analysis concurrently assume that NGAs will be built using the synergy effects arising through the connection of neighbouring BSUs into larger units. Although the analysis is based on data about individual BSUs, the data derived from it cannot be used directly for the preparation of project investment plans for the individual areas. A more accurate calculation of costs, which can be used to prepare specific investment or project plans for a specific area, can only be prepared within the framework of the creation of project documentation for a specific territory, i.e. area of intervention. The models used in this document therefore do not anticipate which model will be selected by an aid applicant in its project.

B. Used models for investment demands and conditions for return on investment for NGA projects

The used model for investment demands and return on investment for NGA projects is composed of several modules:

- An estimate of the costliness of construction of optical cables for both cabling variants for the BSUs, including the related costs for construction work.

- An estimate of the costliness of construction of internal wiring in the connected buildings, including the related costs for construction work.
- An estimate of the costs for the connection of BSUs to the backbone optical network, including the related costs for construction work.
- An estimate of the costs for the relevant technology and the related installation of that technology.
- An estimate of the operating costs connected with the operation of the relevant parts of the network.

A more detailed description of the modules is presented in Annex No 5.

Based on the outputs from the indicated modules, an economic model of the costs of construction and operation of the NGAs was prepared, the result of which is the outputs presented below in the text.

The total investment into NGAs is split into active elements and passive infrastructure. For active network elements the normal return on investment of three years is applied. For passive network elements the normal return on investment of ten years is applied.

The indicated outputs, together with rental income - which is calculated as the average revenue per participant - then form the inputs for the economic analysis of return on investment.

Return on investment was calculated for the variant of the lease of the constructed networks. In accordance with the principles presented in Annex No 3 of this document, the prices were calculated for the wholesale offer prepared based on the cost-oriented calculation of wholesale prices. The calculation at the level of wholesale prices is performed with the prerequisite that the constructed and operated part of the electronic communications networks may be - and in many cases will be - leased to services operators according to the gradually growing use of the installed capacities. The price set at CZK 350 per month is based on the presented assumptions as well as on the principles of pricing/costing. It was also correlated with the current level of available retail offers of Internet access service operators, which for access - irrespective of whether it meets the conditions for NGA access - hovers between CZK 345 and CZK 757 per month for an end participant, as indicatively presented in the Annual Report of the Czech Telecommunication Office for 2015⁴¹.

When predicting anticipated network use, it is important to take into account the territory in which that network is being built. In this case the so-called “white address points” where there is no other NGA were taken into account, although there are also individual address points with different colouring in the defined “areas of intervention”. It is important to note that the average coverage of the presented areas with NGAs hovers around 7% at the current time and 20% if the plans for private investments for the next three years are taken into account. The usability of new NGAs in this case is related not to all the address points (or households) in the BSU concerned, or the whole area of intervention, but rather to the number of originally white address points covered by the new NGA construction. This parameter largely determines the sustainability of the projects, and so several variants ranging from the most favourable to the least favourable have been examined.

As regards FTTN-type electronic communications networks, a model solution has been prepared for the bitstream lease variant.

⁴¹ The Annual Report of the CTO for 2015 presents retail prices for Internet access from many operators on page 29 - see <https://www.ctu.cz/sites/default/files/obsah/stranky/75201/soubory/vyrocnizprava-2015.pdf>

Another condition that must be met is ensuring the sustainability of the constructed investment. When assessing the sustainability of the investment it is essential to take into account both the possible income from its operation – in this case characterised in particular by the monthly payments for each individual operated electronic communications connection – and in particular the essential operating costs connected with the operation of the technology concerned, including energy and maintenance costs.

6.5.3 Results of the analysis of the need for investment funds for the construction of NGAs in the Czech Republic

The analysis of the financial demands represented by the construction of NGAs, as already mentioned, was carried out for the case of the implementation of completely or primarily optical networks of the FTTH or FTTN type in areas defined as white. A total of around 360,000 permanently occupied dwellings were identified for the purpose of this analysis. This calculation is based on the data on coverage acquired by mapping conducted by CTO and on CSO data regarding the number of permanently occupied dwellings in each BSU. No current NGA networks or NGA networks to be built in white areas in the near future on commercial basis were included in the calculation. When any new telecommunication infrastructure is built, it is done across the board. Nevertheless, the costs of non-white address point coverage shall not be included as so-called “eligible costs”.

In the following years, the precise coverage of permanently occupied dwellings will be further enhanced through coverage data acquired by mapping conducted by CTO and through CSO data regarding the number of permanently occupied dwellings in each BSU; therefore the strategic objectives of OP EIC to cover 500 thousand households is not questioned.

From the results we can clearly infer that

1. **Parts of white BSUs cannot be completely covered by FTTH-type or FTTN-type NGAs, as some parts of such networks will - from the economic perspective - fall into categories where even with the eventual use of 100% of the subsidy they will not be viable with the given income.** The most optimistic variant envisages coverage of around 87% of permanently occupied dwellings through these technologies in areas identified as white.

In the performed analysis, the considered target use of the newly constructed networks by end participants played an important role, and so the information obtained from the calculation of costs for the construction of FTTH or FTTN networks was applied to the anticipated coverage (utilisation) by the Internet access service.

In the most optimistic variant of the analysis, which counted on 70% use of the newly constructed FTTH-type networks within five years, it was found that it would be possible to construct available connections for 314,000 dwellings using this technology. More information relating to the results is presented in Annex No 5.

When considering a lower percentage use of constructed available connections, it was found that there would not be a large difference even with the 30% target use of constructed capacities with FTTH technology as presented by the regular business community the construction of 275,000 available FTTH-type connections would be economically feasible.

An analysis of the use of FTTN-type networks with a target network utilisation of 70% showed that the construction of 306,000 available connections is sustainable, however

when examining the impact of 30% utilisation the higher operating costs reduced the number of available connections with sustainable operation to 242,000.

Coverage of 314,000 dwellings with FTTH technology would require total subsidies of around CZK 12.1 billion.

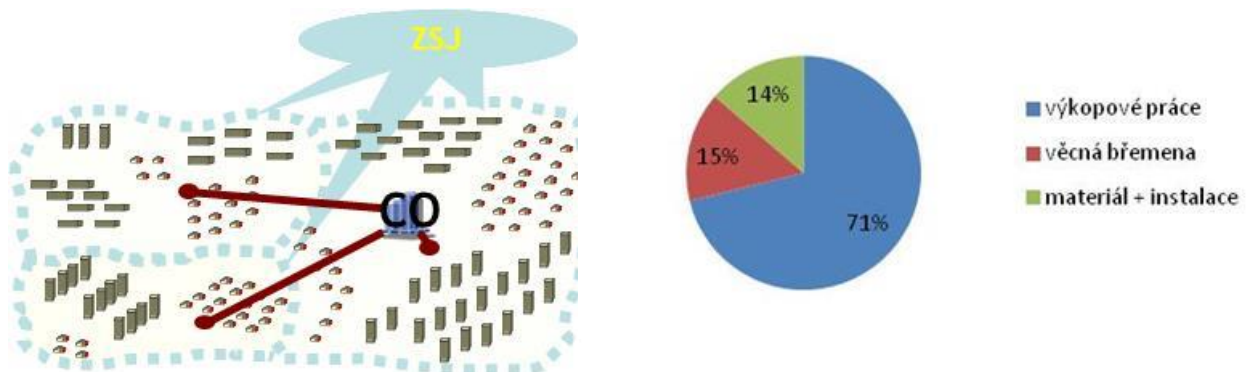
2. **Coverage of the remaining number of dwellings** (60,000 to 100,000 permanently occupied dwellings) must be implemented with the use of public aid through a different suitable technology, respectively a **combination of various technologies, including wireless**, which will be capable of ensuring the economic sustainability of the investment while retaining an acceptable quality of services.
3. The economic analysis also showed that the **share of subsidy** in the construction of NGNs will most probably be between **50% and 75%** at an acceptable level of return on investment.

In the case of the coverage of territory with very unfavourable conditions, the OP EIC Managing Authority is exceptionally able to accept even a higher subsidy level if this is shown to be absolutely necessary. In any case, the subsidy level is one of the selection criteria and will be proposed by the applicants themselves.

It is anticipated that in order to achieve full coverage of permanently occupied dwellings, including those that are most demanding in terms of investment, the total allocation determined for specific objective 4.1 of the OP EIC will be used.

In the unlikely case of insufficiency of the allocated subsidy funds, other resources will be sought at national level.

4. The results presented in points 1. and 2. of this chapter show that there is no single best solution, and therefore it will be necessary to seek an optimal technical solution for each individual area of intervention. It was also shown that the construction of NGAs and their subsequent operation is a business opportunity not only for large players on the market, but also for SMEs.
5. **The analysis of investment costs** confirmed that it is not the new technologies but rather the construction work that makes up the largest share of costs in the construction of NGAs, which is demonstrated below in image No 8 showing the ratios of the relevant costs to the average cost for the construction of backhaul NGAs. The solutions outlined in the text of chapter 6.2 are thus essential to ensure that both the wholesale and also primarily the retail price of Internet access can be reduced, which is one of the important factors to achieve higher overall usage of the constructed NGAs.



6.6 Monitoring and implementation

6.6.1 National Plan Implementation

The MIT will initiate the implementation of measures to remove barriers for the planning and construction of electronic communications networks consistently with the objectives identified in the National Plan, together with the public authorities listed in chapter 10.1 and professional associations, in particular the umbrella associations of operators of electronic communications networks or other relevant bodies. The process of implementation of each measure (especially those adduced in chapter 6.2 of the National Plan) and its timeframe will be specified in an action plan to be presented to the Government by 31 March 2017. While drawing up the action plan, new measures, not mentioned in the National Plan, may be added based on the discussion with relevant bodies.

The action plan will include an overview of individual measures to remove the barriers for planning and construction of electronic communications networks, especially those adduced in chapter 6.2 of the National Plan, and a proposal for their implementation. The Plan will also appoint the lead manager, including potential cooperation, and set the timeframe for the implementation of the measures.

MIT shall present to the Government, on a yearly basis, a report on activities conducted in order to achieve the objectives set by the National Plan, including the implementation of the Plan.

6.6.2 Monitoring the implementation of public support

Responsibility for the systematic and continuous monitoring of the subsidy mechanism in the area of public support for the building of NGAs is borne by the MIT as the OP EIC Managing Authority. It will closely cooperate with the Agency for Enterprise and Innovation and with the CTO, which will annually update the information and will identify the BSUs that could receive this support regularly for the MIT once a year after the completion of the collection and verification of statistical data. For this reason, the CTO has introduced regular annual updating of the existence of NGAs, including the collection of data and the creation of maps showing the state of completion of NGAs by the private sector with an outlook for the coming three years.

The starting point for setting up the OP EIC monitoring system is the intervention logic of the programme, which - based on a situation analysis and the identification of problems/needs and their causes - will define the strategy of the programme and define the individual specific objectives. For the purpose of OP EIC monitoring an integrated set of indicators (common and specific) has been proposed that are mutually logically interrelated. As part of the monitoring of the programme, the Managing Authority will monitor whether the relevant activities/measures are implemented and whether the implementation of the programme is in accordance with expectations. At the same time, the values of the result indicators will be monitored and also whether they are moving in the desired direction (falling or rising). The main tool for OP EIC monitoring will be the unified information monitoring system, and progress in the implementation of the programme will be regularly reported through annual reports on OP EIC implementation, which will also include the development of the values of the indicators. An assessment of the state of OP EIC implementation and its financial and material progress will be the subject of regular meetings of the OP EIC Monitoring Committee.

6.7 Public sources of funding for NGAs

Experience from previous building of NGAs in the Czech Republic, confirmed by findings from abroad, show that this is a very financially demanding activity. The establishment of new networks made up in part or in whole of optical cables for high-speed Internet access enabling the determined transfer speed, i.e. 30 Mbit/s respectively 100 Mbit/s, as well as the modernisation and expansion of existing infrastructure and the building of so-called passive infrastructure require high investment from the contractor. According to available data, excavation work accounts for the largest costs, while more funds must be invested in the building of the actual connections for households, project preparation and documentation, the resolution of ownership, easements, linkages with other infrastructure etc.

It is clear that in this connection a private investor must assess the return on the invested funds. From the nature of things, this is very low in particular in sparsely populated rural areas. We cannot therefore anticipate that the objectives presented above will be met only through the operation of market forces without further intervention.

To achieve the objectives determined in the Digital Agenda for Europe document and in connection with it also in the State Policy in Electronic Communications “Digital Czech Republic 2.0 – The Way to the Digital Economy” it is therefore essential to diversify the necessary funds and - alongside private investments – also support the construction of NGNs from public funds, both European and national.

One of the European sources considered was the so-called “Connecting Europe Facility” (CEF) defining the rules for the financing and implementation of European projects in energy, transport and telecommunications networks. During negotiations on the EU budget, however, the originally proposed funds for the telecommunications part of the CEF were reduced from EUR 9.2 billion to EUR 1 billion for projects throughout the EU. With regard to the amount of funds and the number of states in the EU and their size, we can anticipate that this tool will not be used in the Czech Republic.

The primary source of European funds will therefore be the allocation from the European Regional Development Fund in the EU Cohesion Policy programming period 2014-2020 to the Operational Programme Enterprise and Innovation for Competitiveness 2014-2020. Within the framework of the total amount of funds allocated for OP EIC, i.e. EUR 4,316,062,617, the amount EUR 743,657,589 has been approved for priority axis 4, of which EUR 521,380,364, i.e. approximately CZK 14 billion, for the actual specific objective 4.1 “Increase Broadband Internet Access Coverage”.

Funds from the so-called auction of frequencies were considered as a national source of funding for the development of NGAs. Through Government Resolution of 23 May 2012 No 370 the Government took note of the ongoing information about the current state of progress in the management of selected parts of the radio spectrum with a view to supporting the provision of high-speed Internet access services in the period until 2012, and charged the Minister of Industry and Trade in cooperation with the Chairman of the Council Czech Telecommunication Office to ensure the drafting of a programme of support for projects aimed at building NGAs, and the conditions for its management and funding, including an analysis of the possibility of using part of the revenues from the auction of frequencies to finance this programme. A final amount of CZK 8.5295 billion was obtained through the auction to allocate radio frequencies in the 800 MHz, 1800 MHz and 2600 MHz bands, which ended at the start of 2014, which after the payment of allocations became revenue for the

state budget. Through a decision at Government level the programme for the support of projects focusing on the building of NGAs was not implemented in this form.

7. SWOT analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Growing interest from the population in new forms of digital multimedia services (so-called “<i>digital hunger</i>”) and year-on-year growth in the size of the electronic communications market • Continuous reduction in prices for the technologies with a continuous growth in the volume of transmitted data and transfer speeds • Developed competition on the Czech electronic communications market following successful market liberalisation • Through public aid it is possible to expand the number of localities interesting to investors and increase investor involvement, and thereby reduce the costliness of investment and shorten the return on investment period <ul style="list-style-type: none"> • Available flexible and skilled workforce using ICT on a daily basis as a tool to substantially increase the efficiency of work activities • Support for the construction sector and other industries • The current offer of high-speed Internet access in rural areas is insufficient, thus this will allow the development of electronic communications networks providing high-speed Internet access for citizens and businesses in these areas. 	<ul style="list-style-type: none"> • Insufficient level of investment in local networks in localities associated with high investment costs and low return on investments • Lack of practical experience in preparing and using a "wholesale offer" of access to electronic communications networks • Missing banking sector programme for financing long-term investments in high-speed electronic communications access networks designed in particular for SMEs • Investors' weaker position in high-speed electronic communications networks compared to property owners for the preparation and implementation of construction work related to the necessary constitutional protection of private property • Difficulties with reconstructing the existing copper subscriber network to operate modern multimedia services, in particular with regard to the expected future growth requirements on the speed of data flows • Low willingness of private entities to make long-term investments in electronic communications networks for the new generation of communications, resulting from the long return on investment period, which is also linked to the difficult to exercise public interest attribute • Delays in the introduction of new services in the field of e-government, the Internet of Things, smart transport or multimedia services can suppress the population's interest in high-speed Internet access.

OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • The creation of new jobs and strengthening modern types of work, e.g. work from home • The development of the digital economy will positively affect reductions in the end price of technologies and applications • Growth in the number of simple mobile terminals • Major assumptions relating to the onset of the Internet of Things • Growth in demand for electronic services by households and corporate participants • Increase in the competitiveness of providers of advanced digital services on a market defined by equal conditions of technological neutrality • Increase accessibility to public funding for the construction of high-speed electronic communications networks • Reduction in investment costs for electronic communications networks enabling high-speed Internet access by reducing the administrative workload • Construction of electronic communications access networks will increase readiness for the arrival of new technologies and services, e.g. IoT, M2M • Significant reduction in the gap in access to high-speed Internet access between rural areas and the rest of the country • Elimination of difference in quality of life between regions, thereby increasing the competitiveness of regions and the CR as a whole and also on foreign markets • Use of existing building projects in infrastructure (water, sewers, roads) and the implementation of smart grids with the objective of using synergies • Developing the population's digital skills 	<ul style="list-style-type: none"> • Insufficient level of digital literacy and skills in the population and inadequate defence against cyber crime • Lack of experience with subsidy programmes for the construction of electronic communications networks and the consequent risks • Offer of cheap services built on technologies that are not able to achieve the parameters of NGA networks, which overrides the interest of users in new services with significantly higher value and greater potential • Insufficient and ineffective measures to reduce the investment demands of electronic communications structures • Unbalanced demands from local authorities in relation to the "physical" construction of electronic communications networks in some regions • Incorrect assessment of the quality of the existing and considered (three-year period) offers of Internet access services in different locations as a consequence of incomplete or incorrect data from the owners or operators of networks • Underestimation of the financial costs for construction of high-speed NGAs • Insufficient design and implementation capacities for the implementation of forward-looking plans.

- | | |
|---|--|
| <ul style="list-style-type: none"> • Implement legislation to reduce the cost of investment in infrastructure and high-speed electronic communications networks. | |
|---|--|

8. Vision for the development of NGNs after 2020

The basic condition for the provision of public aid is the sustainability of the project for at least seven years from the completion of construction within the framework of the project, which will go beyond 2020. Due to the fact that the largest part of the investment will be made before the commencement of operation and over the coming years we can anticipate investment only in the modernisation of existing systems and the replacement of active technologies, we can justifiably anticipate that enterprises operating in electronic communications will retain the operation of the constructed system significantly longer.

Due to anticipated scientific and technical developments we can expect the introduction of other technologies suitable for future NGAs.

Generally, it can be stated that for any planning period all the technologies that meet the technical parameters for the defined period should be supported, and this will concurrently also be supplemented by the principle of technological neutrality. It is however logical that when selecting appropriate technological solutions, the economic aspects of these solutions will also be taken into account, and this not only from the immediate perspective but also from the perspective of continuity from projects from the previous period and suitability for use in the next period.

It is certain that opinions regarding the technical solutions will change under the influence of technological development and changes in the demands of users. Already today we can anticipate that projects will be prepared using optical fibre as the transfer medium at least for the period between 2020 and 2030, yet it is not clear what technology it will be. It is also not clear what other technologies will come into use.

A suitable investment model will be selected according to the possible variants of the technical solution and their investment requirements. The extent to which the state will participate in the funding also depends on a political decision made based on deeper analyses of future development, which however cannot be included in this document. It is however very clear that the coordination of investment activities between the private and the public sectors will be emphasised to a greater extent. An essential prerequisite is the creation of favourable economic, legislative, financial and budgetary conditions not only to ensure the efficient construction of new and the modernisation of existing systems, but to ensure the sustainability of the investments in the future.

It is necessary to take into account the basic principle of the development of electronic communications – namely that there is no definitive solution. Consequently, an approach that sets final objectives is completely wrong. In accordance with the development of opinion on the necessary technological parameters for electronic communications networks, we can anticipate dramatically growing demands for volumes of transferred data and the number of elements connected to electronic communications networks. It currently seems that the coming period will involve a continuing trend towards the unification of the environment based on the Internet protocol.

The emerging trend of the development of communication between electronic devices, labelled M2M (also called the Internet of Things, or IoT) will take over the role of initiator of growth in the number of Internet access points in the near future.

As regards the growth of demand for transferred volumes of data, applications connected with the transfer of data from multimedia linear or non-linear services will predominate. This situation is reflected primarily in solutions preferring non-symmetric transfer capacities, which primarily require support for the transfer of information in the direction from the network to the end user. In the future, however, we can on the contrary expect pressure for greater symmetry in the transfer of information. This will be caused primarily by the possibilities for interactive applications and the use of central data storage, including the growing use of cloud applications. Plans for NGAs determine a minimum speed of 100 Mbit/s for 2020. Nevertheless, we are already seeing demand for transfer speeds in the order of Gbit/s. Such information should stimulate us when selecting the topologies and technologies for building NGAs to ensure that the eventual additional demands for the necessary growth in transfer speed can be relatively easily satisfied with the efficient use of investments that we are considering making in the near future.

We can anticipate that alongside the growing scope of services built around the use of network applications, demands on their availability and reliability will also increase.

9. Citizen awareness and cooperation with the professional public

General information on the issue of the development of NGNs is available on the MIT website⁴², and also on the Czech Telecommunication Office website⁴³. Information relating to the subsidy mechanism via the OP EIC is available on the website of the Agency for Enterprise and Innovation in the support programmes section⁴⁴ and also in the part of the MIT website focusing on the OP EIC⁴⁵.

Following the decision of the Government on the National Plan for the Development of Next Generation Networks and on the resolution of some matters relating to the OP EIC, there is a plan for the MIT - together with the CTO and professional associations, respectively associations of electronic communications networks operators - to set up a common platform for the purpose of the continuous improvement of the process of NGA construction. Further, the platform will identify negative influences throughout the process and prepare proposals for streamlining, meaning that the platform will, inter alia, focus on technical/operational, economic/investment and implementation aspects.

In accordance with the recommendations of the European Commission, the provision of advice for the implementation of measures for the development of high-speed networks is being considered in the Czech Republic within the framework of the implementation of the OP EIC on a similar principle to that abroad, the so-called "Broadband Competence Offices" (BCO). From the perspective of the Managing Authority it would be superfluous to create a new agency, yet it would be appropriate to incorporate these services into the existing network of regional branches of the Agency for Enterprise and Innovation (AEI). Talks will be held with the European Commission regarding this matter in order to ensure the optimum functionality of BCOs in the Czech Republic with sufficient technical and expert resources. The presented regional offices of the AEI should then operate as single points of contact supporting the implementation of measures for the development of high-speed electronic communications networks within the framework of programmes of the European Structural and Investment Funds (ESIF).

⁴² <http://www.mpo.cz>.

⁴³ <http://www.ctu.cz>.

⁴⁴ <http://www.czechinvest.org/programy-podpory>.

⁴⁵ <http://www.mpo.cz/cz/podpora-podnikani/oppik/>.

10. Competency matrix and implementation timeframe

10.1 Competency matrix

Ministry of Industry and Trade

- Ensures the preparation of legislation for services and electronic communications networks, with the exception of implementing legislation, as this the Ministry of the Interior, the Czech Telecommunication Office and the Office for the Protection of Personal Data are authorised to issue,
- Submits to the Government a draft national policy for electronic communications and monitors its implementation, in this case the National Plan for the Development of Next Generation Networks,
- Promotes free competition in the provision of networks and the provision of electronic communications services,
- Promotes equal conditions for all business entities in electronic communications,
- Is the Managing Authority for the Operational Programme Enterprise and Innovation for Competitiveness, within which support for the development of NGAs will be implemented.

Czech Telecommunication Office

- Is the sectorial national regulator for services and electronic communications networks,
- Provides the mapping of white, grey and black areas, based on which localities that could be eligible for public support are identified,
- Cooperates in the formulation of conditions for wholesale access, including price setting conditions,
- Within its competence, ensures that there is no distortion or restriction of competition in electronic communications,
- Provides effective management and efficient use of radio frequencies and numbers,
- Within its competence, removes barriers to the provision of electronic communications networks, associated facilities and complementary services, and the provision of electronic communications services,
- Sets rules so that under comparable conditions there is no discrimination among enterprises providing networks or providing electronic communications services,
- Takes into account the need for technologically neutral regulation; technologically neutral regulation is understood to mean regulation that does not impose an obligation to use a specific type of technology or that favours any type of technology.

Ministry of Regional Development

- Is the central government authority in matters of land use planning, land use decisions and building regulations,
- Carries out methodological activities, directs and unifies the performance of state administration and the practice of land use planning and building authorities in the field of land use planning and land use decisions,
- Manages the area development policy in the field of land use planning and building regulations, which is approved by the Government.

Ministry of the Interior

- Performs a coordinating role for information and communications technologies in the field of e-government,
- Provides non-public electronic communications networks for the Police of the Czech Republic, the integrated rescue system and local government authorities,
- Coordinates and creates conditions to support the development of e-government,
- Coordinates and creates the conditions to support the development of electronic commerce,
- In cooperation with other government authorities, prepares a strategic framework to ensure the effective use of spatial information in the public administration agendas (GeoInfoStrategie),
- Publishes and updates the list of address points related to the objects of public interest (see chapter 6.3)

Ministry of Finance

- Ensures the valuation of rights corresponding to easements,
- Provides a methodology for valuing easements, which is also used for valuing easements needed for the construction of electronic communications networks.

Agency for Enterprise and Innovation

- Is a contributory organisation under the MIT that promotes the competitiveness of the Czech economy through support for SMEs, acts as the Intermediate Body for the provision of support to enterprises from European Union funds according to a directly applicable European Union regulation,
- Participates in the assessment of project applications through expert assessors,
- Cooperates in the monitoring of the subsidy process and the provision of information.

Office for the Protection of Competition

- Has authority in the field of the protection of competition,
- Has oversight in public procurement,
- Monitors and coordinates public aid.

Local governments

Local governments have participated on the development of next generation networks systematically and they will continue to have a major impact on planned projects (in relation to land-use plans, proceedings concerning property rights, coincidence and coordination of construction and others).

10.2 Implementation timeframe

The timeframe for the implementation of the individual measures will be clarified and updated according to its content and method of implementation.

The framework deadlines based on the timetable set by the Monitoring Committee of the Operational Programme Enterprise and Innovation for Competitiveness⁴⁶ and on this strategic document are as follows:

2016 - MIT

Complete the steps leading to the launch of the Support Programme
“High-Speed Internet” and make the first call by 31 December 2016
Public consultation for areas of intervention before
the announcement of the first round of calls by 31 December 2016

2017

Calls - MIT

Commence acceptance of preliminary aid applications
and acceptance of aid applications (full) by 31 January 2017
Planned date for termination of acceptance of preliminary aid applications by 31 March
2017
Planned date for termination of acceptance of aid applications by 30 June 2017

Mapping

Regular collection of statistical data 2017, CTO January to 31 March 2017
Steps leading to verification and inclusion of data into mapping, CTO March to 31 July 2017
Public consultation on mapping as well as on mapping
areas of intervention, MIT with support from CTO 1 August to 15 September 2017

Projects - MIT

Preparation of second call September to 31 December 2017
Assessment and start of implementation of projects
from the first OP EIC call 1 July to 31 December 2017

Presenting the action plan to the Government – MIT by 31 March 2017
Report to the Government – MIT by 30 June 2017

2018

Mapping

Regular collection of statistical data 2018, CTO January to 31 March 2018
Steps leading to verification and inclusion of data into mapping, CTO March to 31 July 2018
Public consultation on mapping as well as on mapping
areas of intervention, MIT with support from CTO 1 August to 15 September 2018

Projects - MIT

Preparation of third call September to 31 December 2018
announcement of second OP EIC call January 2018 – June 2018
Implementation of projects from the second OP EIC call 1 September to 31 December 2018
Report to the Government – MIT by 30 June 2018

⁴⁶ See <http://www.mpo.cz/dokument166283.html>

2019

Mapping – CTO

Regular collection of statistical data 2019 January to 31 March 2019

Steps leading to verification and inclusion of data into mapping March to 31 July 2019

Projects - MIT

announcement of third OP EIC call January – June 2019

Implementation of projects from the third OP EIC call 1 September to 31 December 2019

Report to the Government – MIT by 30 June 2019

2020

Mapping – CTO

Regular collection of statistical data 2020 January to 31 March 2020

Steps leading to verification and inclusion of data into mapping March to 31 July 2020

Projects - MIT

Implementation of OP EIC projects 1. January to 31 December 2020

Report to the Government – MIT by 30 June 2020

2021

Mapping – CTO

Regular collection of statistical data 2021 January to 31 March 2021

Steps leading to verification and inclusion of data into mapping March to 31 July 2021

Projects - MIT

Implementation of OP EIC projects 1. January to 31 December 2021

Report to the Government – MIT by 30 June 2021

2022

Mapping – CTO

Regular collection of statistical data 2022 January to 31 March 2022

Steps leading to verification and inclusion of data into mapping March to 31 July 2022

Projects - MIT

Implementation of OP EIC projects 1. January to 31 December 2022

Report to the Government – MIT by 30 June 2022

2023

Mapping – CTO

Regular collection of statistical data 2023 January to 31 March 2023

Steps leading to verification and inclusion of data into mapping March to 31 July 2023

Projects - MIT

Implementation of OP EIC projects 1. January to 31 December 2023

Report to the Government – MIT by 30 June 2023

11. Conclusion

Developed states place great emphasis on economic development, which is today inconceivable without modern information and communications technologies, while an essential part of the development of the digital economy is the existence of a reliable and fast Internet connection. This does not only apply to enterprises, but also to households, on the one hand because modern enterprises are making use of new forms of work, and on the other because people of all social groups need to communicate with each other, with the authorities and with other institutions using modern means. Through the Internet they also connect to sources of information that they use for education, entertainment and in many other situations in their lives.

The objective of the National Plan is to create conditions for the coverage of the whole of the nation with NGAs. The tools for this purpose are the removal of legislative and other barriers and public aid in this area.

The transposition of Directive 2014/61/EU is of key importance for removing legislative barriers to the development of NGNs. One can assume that the effective implementation of this directive will significantly help not only the development of modern high-speed electronic communications networks as such, but also the digital economy as a whole, which will also have a synergistic effect for all branches of the economy.

Public aid will be used - taking into account the principle of technological neutrality and the state of development of the market and technology - for the construction of NGAs from optical fibre, from advanced modernised cable networks and from some advanced wireless access networks. Public aid will be directed towards those areas where market mechanisms are failing.

The determined objective is to ensure that by 2020 all inhabitants of the Czech Republic will have the possibility to use high-speed Internet access with a speed of over 30 Mbit/s in the direction towards the user and that half of all households will have at least 100 Mbit/s with the fulfilment of other essential conditions. It is necessary however to realise that the electronic communications market will not stop at these speeds today. Preference will be given to solutions that will enable future further increases in transfer speed with low investment costs.

The key conclusions are:

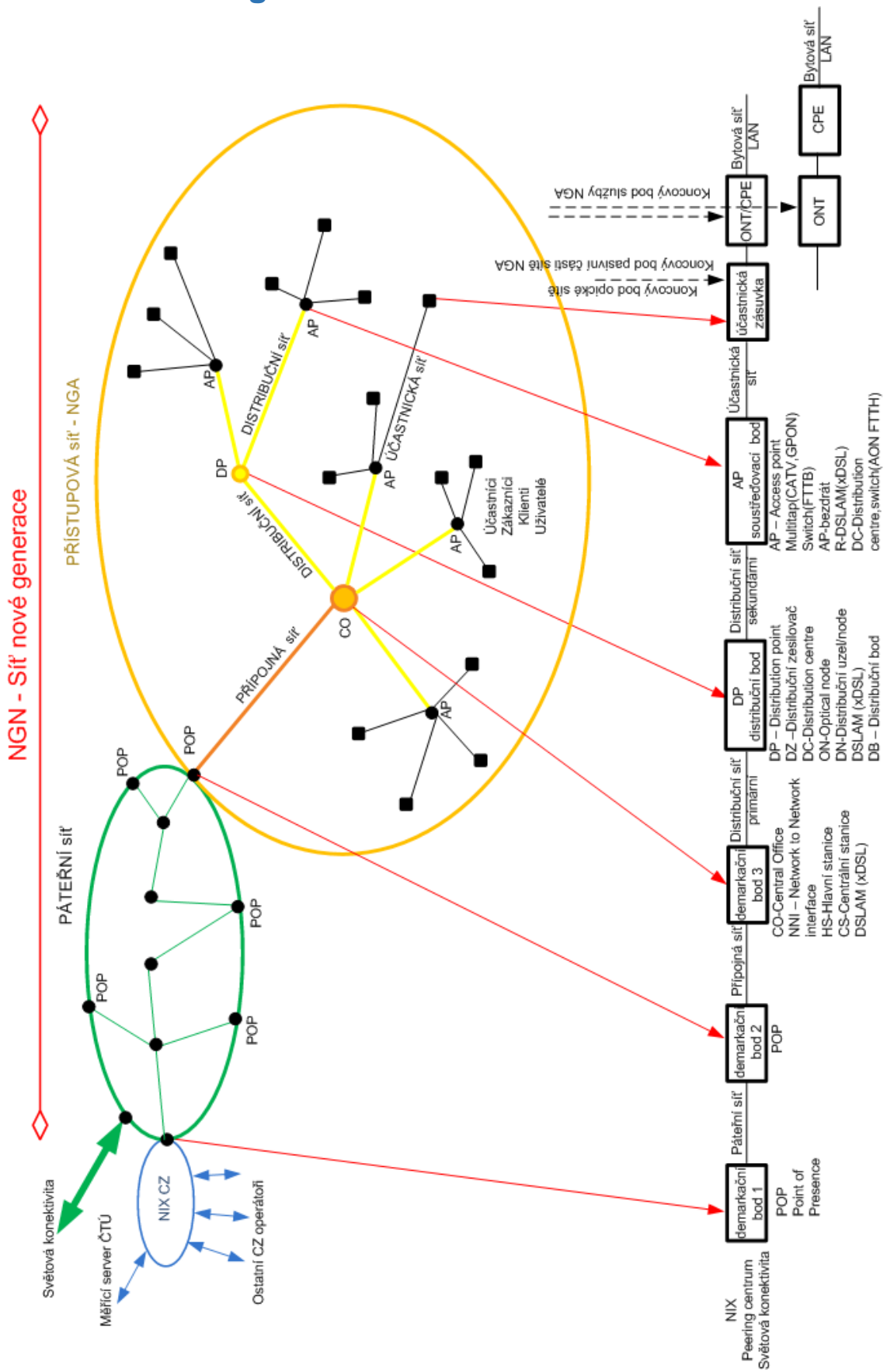
- a) Enterprises in electronic communications are governed by economic aspects and focus their investment into modern solutions according to the level of stability and return on investment, i.e. without putting capital into unattractive areas. One can assume that there is no prospect for compensation for the availability of broadband Internet connection services in these unattractive areas through market forces themselves, and therefore public intervention through European Structural and Investment Funds programming period 2014-2020 is justified.
- b) Continuing cooperation with the electronic communications sector to create a favourable legal environment enabling a reduction in the necessary investment costs, and thereby encouraging investment itself, is equally important.
- c) It is also essential to help remove regulatory and administrative barriers to the construction of electronic communications networks to support private investment.

- d) Mapping the coverage of the Czech Republic with NGNs is an essential tool for examining both the current and future capacities of electronic communications networks, and hence its expansion to include more aspects will be discussed, among other the issue of so-called backhaul networks.

The Ministry of Industry and Trade will inform the Government annually about activities directed towards fulfilling the National Plan. The first report will be submitted by 30 June 2017.

An action plan on measures to remove barriers to the planning and construction of networks will also be prepared in cooperation not only with the concerned government authorities but also with professional associations, respectively associations of electronic communications networks operators. This action plan should be presented to the Government by 31 March 2017.

Annex No 1 Logical structure of a NGN



Annex No 2 Principles of implementation of the subsidy mechanism

A Call and submission of applications

- Call and submission of preliminary applications

The call for the submission of preliminary aid applications for a specific area of intervention will include a definition of the period in which preliminary applications will be accepted through the portal of the Structural Funds Monitoring System, where an applicant can find all the necessary instructions and information.

List of required documents:

- Simplified economic evaluation form,
- Balance sheet and profit and loss statement, if it already has this legal obligation,
- Declaration of an aid application.

- Aid application, i.e. full application

An aid application for a specific area of intervention can be submitted by applicants who have preliminary aid applications approved. The period in which aid applications will be accepted will be defined in the call. These processes will also be performed electronically through the portal of the Monitoring System for Programming Period 2014 – 2020.

The basic required documents include a feasibility study and other documents that will be required within the framework of the publication of the full call and will be contained in the Handbook, which will form an annex to the call.

A project manager will be allocated to each project.

B Selection of projects

- Procedures

Two opinions by internal assessors will be created for each application for the provision of aid for a specific area of intervention that passes through the formal check - in the case of specific technologies and requirements of the internal assessors, it is possible to request an expert external independent opinion, which will serve as the basis for the internal assessors to make their decision. In the event of a significant difference in the assessments of the internal assessors, an internal arbiter will decide on the result of the assessment through a third opinion. The selection committee will be presented with a list of recommended and not recommended projects, and will then vote on them as a whole and approve the proposal, or return it for another assessment (only in the event of serious irregularities in the previous assessment). If a project is approved, a Decision on the Provision of Aid for a Specific Area of Intervention - an integral part of which will be binding Conditions for the Provision of Aid - will be issued in an administrative procedure by the Programme Manager. The procedure is fully in accordance with the methodological guidelines for the management of calls, assessment and selection of projects in Programming Period 2014–2020 (according to the Unified Methodological Environment of the MRD), and similarly corresponds to other

methodologies at the level of ESIF programme centrally applied in the Czech Republic to the area of subsidies from ESIF funds, which the MIT must comply with. At the same time this procedure is also in accordance with EC Communication 2013/C 25/01.

- Evaluation criteria for the selection of applicants

The assessment of projects will take place based on pre-determined criteria for the selection of applicants. These criteria are published together with the call for the submission of projects and are approved by the OP EIC Monitoring Committee, which discusses the individual calls before they are announced. The criteria are composed of so-called binary criteria (only whether the applicant has met them or not is assessed) and points criteria (points are awarded according to the degree of fulfilment).

- Selection of most appropriate applicant

The selection committee selects the applicant that was awarded the most points by the internal assessors out of the group of applicants for a specific area of intervention.

C Decisions and conditions for the provision of public support

Decisions and conditions for the provision of support are issued to applicants that succeeded in the selection for the given area of intervention. The Decision will include the identification of the aid beneficiary, the amount and the level of the subsidy, the implementation location and the list of address points of residential buildings in which there already exists a different NGA, and for which no public support can be obtained.

Annex No 3 Principles and conditions of wholesale offers of access to NGAs built with the use of support

One prerequisite for drawing subsidies and one of the basic requirements for a potential beneficiary is the provision of wholesale access to electronic communications access networks built with the use of a subsidy, and this based on a mandatorily published wholesale offer. Therefore, in accordance with the requirements of the applicable European documents⁴⁷ and with regard to the national conditions within the framework of the preparation of the subsidy programme and the related concrete calls, the programme administrator will set specific conditions for such wholesale access. In addition, the indicated main principles and basic conditions for the creation of wholesale offers will be elaborated in detail in the individual calls announced within the framework of the subsidy programme. For this purpose, the OP EIC Managing Authority will concurrently prepare and provide to aid applicants the specific guidelines for the creation and publication of the wholesale offer in the form of a “manual”.

Effective wholesale access for third parties to electronic communications networks constructed with public aid must be provided under non-discriminatory and transparent conditions. These conditions must take into account the principle of technological neutrality and proportionality. Wholesale access must also be offered through published reference offers to all qualified candidates, meaning enterprises operating in electronic communications, for the purpose of the possibility of further resale or the provision of publicly available services to end subscribers.

Conditions for the provision of wholesale access

Wholesale access to electronic communications networks constructed with public aid will be offered for at least seven years, while in the case of passive infrastructure (e.g. ducts, protectors, masts and towers) this wholesale access will have no time limit.

Wholesale access based on the obligations determined in the subsidy conditions must be also provided to connected electronic communications networks built without public aid, while respecting the principle of proportionality. Wholesale access may be provided in the form of access to the data flow (bitstream), “physical” or virtual unbundling of the subscriber line and its sections, access to passive infrastructure (associated facilities), and in particular to ducts, protectors, masts and towers, and access to unilluminated optical fibre. In all cases, when permitted by the technological solution for an electronic communications network constructed with public aid (with regard to economic suitability), there will be an obligation to provide “physical” access to subscriber line or its sections. Where essential for the effective use of the provided access a collocation service will form part of this.

The requirements for the wholesale offer will take into account the character of the network from the perspective of the technology used and the corresponding technical possibilities for the implementation of specific wholesale products and their economically justified suitability.

⁴⁷ EU Guidelines and Commission Regulation on regulated access to Next Generation Access Networks

Through the “manual”, the subsidy programme administrator will set specific requirements for the indicated mandatory types of access for individual technological solutions for electronic communications networks constructed with public aid, such as:

- Active optical networks (point-to-point, P-P): access to passive infrastructure (ducts and protectors), access to unilluminated optical fibre, “physical” access to subscriber line and its sections, virtual access to subscriber line (VULA), bitstream.
- Passive Optical Networks (point-to-multipoint, P-MP): access to passive infrastructure (ducts and protectors), access to unilluminated optical fibre, “physical” access to subscriber line (using WDM), virtual access to subscriber line (VULA), bitstream.
- FTTCab + vectored VDSL: access to passive infrastructure (ducts and protectors), access to unilluminated optical fibre, virtual access to subscriber line (VULA), bitstream.
- Advanced cable networks (standard DOCSIS 3.X and higher): access to passive infrastructure (ducts and protectors), virtual access to subscriber line (VULA), bitstream.
- Wireless networks: access to passive infrastructure (masts and towers), bitstream, including the replacement of virtual access by this option.

In the case of other than the technologies indicated here, an obligation of access that the technology concerned enables will apply proportionately. More strictly defined delivery points for individual types of access will be set in the “manual”. In the case of the wholesale product bitstream, one additional operator must also be present at the locality of the transfer point in addition to the enterprise that received the subsidy. Such transfer point must be placed at least at regional city level.

If, on a given electronic communications network constructed with public aid, an offer of more than one type of wholesale product will be required, effective migration between the individual wholesale offers must be enabled. This will have no effect on the principle of provision of “physical” access whenever the technological solution (with regard to economic suitability) for the electronic communications network constructed with public aid permits.

Although the EU Guidelines allow - for the needs of the wholesale offer - differentiation between areas with differing characteristics (e.g. different population density, level of competition, fragmentation of territory etc.), in the Czech Republic this possibility will not be used due to the practically identical character of the areas eligible for targeted support. The scope of the requirements relating to access will be set uniformly across the whole of the territory of the Czech Republic.

Another aspect related to wholesale offers and the provision of access is the earmarking of available capacity for other entities in the case of the building of passive infrastructure and unilluminated fibre. The administrator of the subsidy programme will set the requirement for the reservation of available capacity through the conditions of the subsidy calls in such a way that it supports the possibility of the building of at least one additional fully-fledged electronic communications network.

Non-discrimination in the provision of access

An aid beneficiary may not, when providing wholesale services, differentiate between individual wholesale partners in terms of conditions, quality or the possibility of ordering wholesale services.

A subsidised entity must provide services and information to other enterprises under the same conditions, including prices and the quality of the services, with the same periods, using the same systems and processes and with the same level of reliability as it provides or will provide for its own services. Parties interested in wholesale services will be allowed to use the same systems and receive information under exactly the same conditions as they are provided for the retail services of the aid beneficiary. This requirement meets the requirement for equality of access in the case of a vertically integrated enterprise.

Transparency of information when providing access

To ensure the maximum possible level of transparency and non-discriminatory access to all interested parties, wholesale offers will be mandatorily published through a public draft contract in the form of so-called reference offers available to all potential applicants for wholesale services.

An aid beneficiary will therefore indicate in the reference offer the terms and scope of the conditions for wholesale access according to the “manual”, which the subsidy programme administrator will publish at the latest when announcing the call. The subsidy programme administrator will apply - to a reasonable extent - the requirements arising from measure of a general nature No OOP/7/07.2005-12, determining the scope, form and method of publication of information relating to access to a network or interconnection of electronic communications networks, as well as the requisites, scope and form of the reference offer of access or interconnection, as amended, and measure of a general nature No OOP/8/07.2005-11, determining the requisites and conditions of a reference offer for access to subscriber line.

The subsidy programme administrator will also set requirements for the contractually arranged quality of provided wholesale services (SLA) and the corresponding sanctions. The objective is to ensure that a properly set SLA and the related sanctions contribute towards ensuring the necessary level of quality of the wholesale services used by the authorised interested party in the offers of services for a retail participant. The minimum mandatory scope of the SLA will therefore contain the deadline for the establishment of the wholesale service for all types of wholesale services, the reliability parameters for the wholesale service, the deadlines for removing defects and the reliability parameters for the operation of the systems for ordering wholesale services. An aid beneficiary will also be able to offer additional SLAs over and above this framework.

For the purpose of supporting the competitive environment and with the objective of providing wholesale partners with space to properly prepare offers for their retail services in a given locality, there will be an obligation to provide information about wholesale services offered on newly built networks in advance. This will be - in accordance with EU Guidelines - determined as six months before the anticipated commencement of provision of services on an operating network constructed using a subsidy.

Setting maximum wholesale prices

- a) **Wholesale prices for services of access to passive infrastructure and for services of access to optical and metallic lines**

Wholesale prices for services of access to passive infrastructure and for services of access to optical and metallic lines provided within the framework of mandatory wholesale offer will be cost oriented.

The calculation of cost-oriented prices will be performed by the aid beneficiary and published in its reference offer. These prices may only include effectively and efficiently incurred costs related to the acquisition and operation of elements of electronic communications networks and a reasonable profit, derived from the currently valid WACC value specified by the CTO. The calculation may not include cost items which are not objectively necessary for the provision of the services presented above.

b) Wholesale prices for other (i.e. active) access services

If a subsidy beneficiary is a vertically integrated operator that provides its own retail services in the subsidy area, it will set wholesale prices for services of active VULA access at a maximum corresponding to the prices set using the “retail minus” method, while the size of the margin will be set by the subsidy programme administrator in cooperation with the CTO. The “retail minus” method is applied to the basic (cheapest) retail product for Internet access⁴⁸.

Other operators (subsidy beneficiaries) that do not provide their own retail services in the subsidy area will set wholesale prices at a maximum of the prices in the mandatory reference offer of the operator with significant market power on relevant market No 3a – Wholesale local access provided at a fixed location⁴⁹. If there is no determined operator with significant market power on the market (and there is no mandatory reference offer) then the other operators will set a price for the VULA service based on a benchmark derived from publicly available offers⁵⁰ in the Czech Republic.

c) Wholesale prices for bitstream services

A subsidy beneficiary sets wholesale prices for bitstream services by increasing the price for the VULA service by costs, including reasonable profit, connected with the provision of the transmission capacity to the mandatory transfer point.

d) Wholesale prices for collocation services

Wholesale prices for collocation services provided within the framework of the mandatory wholesale offer will be cost oriented.

The calculation of cost-oriented prices will be performed by the aid beneficiary and published in its reference offer. Prices may include only effectively and efficiently incurred costs related to the acquisition and operation of elements of electronic communications networks, including technology areas, and a reasonable profit, which is derived from the currently valid CTO-specified WACC value. The calculation may not include cost items which are not objectively necessary for the provision of the services presented above.

⁴⁸ The cheapest offer may be a standalone Internet access product or a package that includes Internet access.

⁴⁹ Applies for the VULA service.

⁵⁰ Publicly available offers mean offers from aid beneficiaries and potentially other available offers. The benchmark is carried out annually as the arithmetic mean of the prices from publicly available offers.

Consideration of received subsidy

Wholesale prices for the service of access to passive infrastructure and for the collocation service will not include received subsidy, but only the actual costs incurred by the subsidy beneficiary.

The specific conditions for setting the prices of the wholesale offer, based on the principles above, will be set by the subsidy programme administrator for the individual calls within the framework of the “manual” for the creation of the mandatory wholesale offer.

Annex No 4 Assessment grid for ex ante conditionality 2.2

The wording of ex ante conditionality 2.2 is presented in Regulation (EU) No 1303/2013 of the European Parliament and of the Council, Annex XI, point 2.2:

Next Generation Network (NGN) Infrastructure: The existence of national or regional NGN Plans which take account of regional actions in order to reach the Union high-speed Internet access targets, focusing on areas where the market fails to provide an open infrastructure at an affordable cost and of a quality in line with the Union competition and State aid rules, and to provide accessible services to vulnerable groups.

Criteria for meeting the ex ante conditionality 2.2	Are the criteria met?	
	YES/NO	Elements of non-fulfilment
<p><i>A national or regional NGN Plan is in place...</i></p> <ul style="list-style-type: none"> • The relevant operational programme and Partnership Agreement, where appropriate, contains a reference to the name of the plan (independently or as part of the intelligent growth strategic document) and determines the location where it is published (in the form of a link). 	YES	
<p><i>... that contains:</i></p> <ul style="list-style-type: none"> – <i>A plan of investments into infrastructure based on an economic analysis and taking into account the existing private and public infrastructure and the planned investments:</i> <ul style="list-style-type: none"> ▪ It is clear that an economic analysis has been performed, including: <ul style="list-style-type: none"> ○ The involvement of the participants; ○ A map of existing private and public infrastructure and planned investments, as well as data on coverage and introduction. ▪ A description is available of the priorities of the investments in areas affected by market failure and taking into account the relevant aspects (e.g. with regard to the geographic character of the territory, the population density, elements influencing demand, such as income level, education, training in ICT, employment status, age structure, etc.) and the development objectives in the given country/area. ▪ The plan outlines available budgetary resources for high-speed intervention (EU, national, regional and other sources according to need). 	<p>YES</p> <p>chap. 6.5 6.5.2. Chap. 4.1.1.</p> <p>chap. 6.4</p> <p>chap. 6.4</p>	

<ul style="list-style-type: none"> ▪ The plan is operational: <ul style="list-style-type: none"> ○ It includes coverage and implementation objectives and indicators that enable comparison with relevant indicators of the Digital Agenda for Europe; ○ It contains a list of planned investments during the programming period (including estimated costs), the objective of which is the achievement of rapid implementation of tasks planned for 2020 within the framework of the Digital Agenda for Europe, and a description of the method for the regular updating of this list. 	<p>and 6.5</p> <p>chap. 5 chap. 10</p> <p>chap. 4.1.1 chap. 6.5.1 chap. 6.5.2 chap. 6.5.3</p>	
<p>– <i>Sustainable investment models that enhance competition and provide access to open, affordable, quality and future-proof infrastructure and services:</i></p> <ul style="list-style-type: none"> ▪ The plan includes a presentation of planned investment models at national or other level: <ul style="list-style-type: none"> ○ The anticipated “investment models” are presented in the Guide for Investment in accordance with the categories; ○ There is a description of how the planned models optimise the use of public funds (e.g. the use of financial instruments and/or grants - subsidies). 	<p>YES</p> <p>chap. 4.4 chap. 6.3</p> <p>chap. 6.5.2 chap. 6.5.3</p>	
<p>– <i>Measures to stimulate private investment:</i></p> <ul style="list-style-type: none"> ▪ The plan describes all the relevant measures (already adopted or planned) to stimulate private investments (e.g. planning coordination, rules for sharing “physical” infrastructure and the internal equipment of buildings, cost-reducing measures). ▪ The plan includes a proposed timetable for the implementation of these measures. ▪ In the case of need, the plan contains a timetable for the authorisation of EU harmonised bands for wireless high-speed connectivity in accordance with the Radio Spectrum Policy Programme. 	<p>YES</p> <p>chap. 6.3, 6.5.2 chap. 4.3 chap. 6.1 chap. 6.2 chap. 10</p>	

Annex No 5 Economic analysis - model of investments in access networks

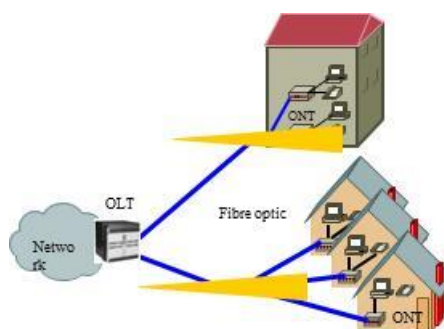
Task

1. Estimate the investment demands for the construction of FTTH/FTTN for BSUs, respectively larger areas, with NGA parameters.
2. Estimate the necessary amount of subsidy with regard to the considered ROI parameters in combination with the investment and operating costs for FTTH/FTTN NGAs.
3. Verify the long-term sustainability parameters of the investments (in particular in relation to ROI, operating cost levels, and the projected lead-in to use the installed capacities).
4. Estimate the total investment demands for the construction of backhaul networks for FTTH/FTTN solutions.
5. Estimate the total investment demands for coverage of all address points for individual “colour” categories (black, grey, white) of BSUs with NGA infrastructure – including a quantification of the anticipated price per FTTH/FTTN connection and the structuring of output for white areas according to region.
6. Estimate the share of costs for the establishment of backhaul networks, distribution networks and user networks, including active network elements.
7. Estimate operating costs for network operation and service and the related operating costs.

Network topology

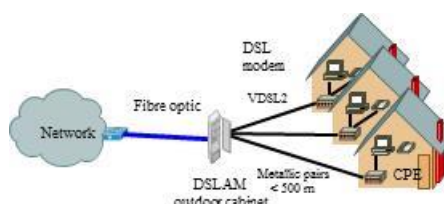
1) GPON FTTH (Fibre to the Home)

- Optical fibre into the home



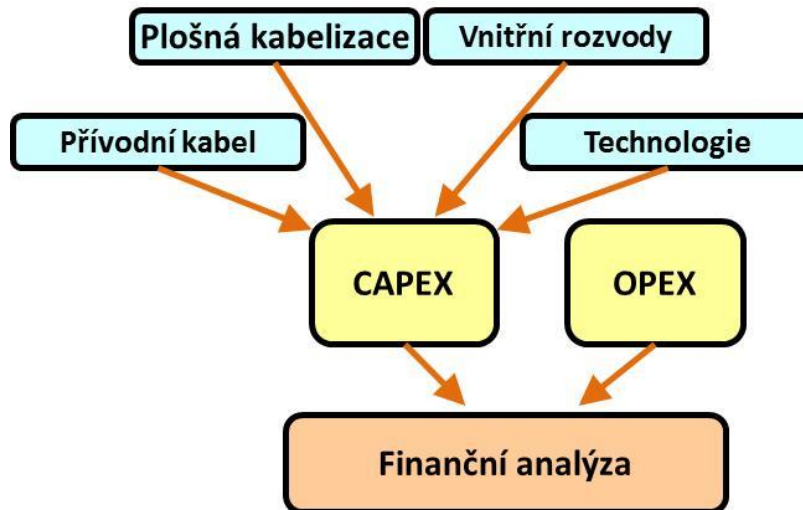
2) FTTN (Fibre to the Node)

- DSLAM cabinets
- VDSL2 / vectoring
- Cu pair length up to around 500 m



Model diagram

Database of BSUs, around 21,000 records used, BSUs without permanently occupied dwellings filtered out.



Estimate of costs for the construction of blanket optical cabling

Based on a comparison of a series of projects addressing the laying of the optical part of electronic communications networks in various areas, leading indicators were prepared for the financial demands of the building of blanket optical cabling according to the character of the individual BSUs. These indicators were then used to determine the cost demands of coverage of BSUs with FTTH-type electronic communications networks.

Estimate of the costs of internal wiring

From the group of analysed projects, unit costs were estimated for the implementation of internal wiring by type of development split into large multi-dwelling buildings (over 15 dwellings per building), medium multi-dwelling buildings (3 to 15 dwellings per building) and family houses. These indicators were then applied to the database of BSUs.

Estimate of the costs for connecting BSUs to the backbone optical network

Based on an analysis of the group of projects, the unit costs were estimated for supply optical cables according to their length and profile. The profile of a supply optical cable is designed in accordance with the FTTH or FTTN solution used depending on the number of connectable participants with the usually considered reserve. The length of the supply optical cables was then set based on an analysis of the existing networks and access points.

Estimate of the costs for technology

Within the framework of the solutions used, the costs for a GPON network with FTTH and FTTN topology were analysed. For FTTH the costs were calculated for an operator's network access point to which participants are connected through a Passive Optical Network (PON) and Optical Network Termination (ONT), meaning a subscriber modem. For FTTN, in addition to OLT the analysis included an Optical Network Unit (ONU), which may be a DSL multiplexer located in an outdoor cabinet or inside a block of flats, or an Ethernet switch located in a block of flats. In the first case we are talking about ONU-C, in the second ONU-B. ONU-C uses xDSL technology to connect end participants, meaning an existing

connection part of an electronic communications network. The installation of ONU-B requires the building of new internal wiring suitable for Ethernet transmission – structured cabling.

Estimate of the costs for network operation

A calculation of the costs for network operation was performed for both network topology variants, meaning both FTTH and FTTN. The calculation included costs for electricity, service and maintenance, fault resolution, repairs to damaged equipment and operator overhead. The operating costs of FTTH networks are significantly lower than those of FTTN networks. The calculation did not include the cost of LLU – the lease of part of electronic communications networks comprised of symmetric metallic cable.

Return on investment –wholesale prices model

The total investment into NGAs is split into active elements and passive infrastructure. For active network elements the usually considered return on investment of three years was used. For passive network elements the usually considered return on investment of ten years was used.

Cost structure

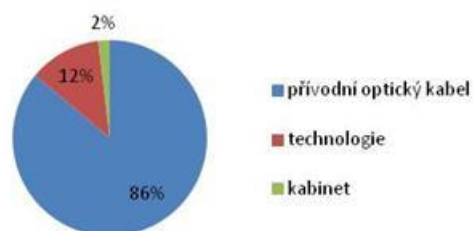
FTTH - Structure of calculated costs:

- Supply optical cable
- Blanket cabling
- Internal wiring
- Active technology



FTTN - Structure of calculated costs:

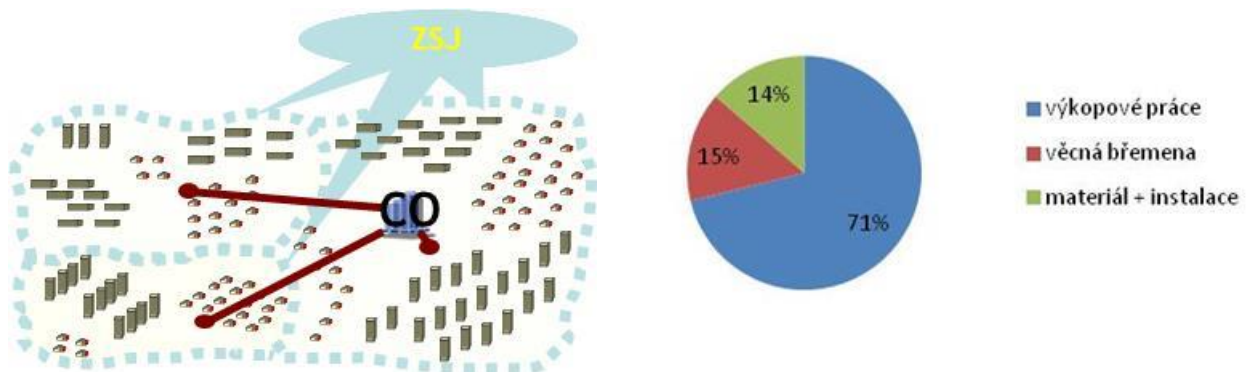
- Supply optical cable
- Active technology
- Cabinet



Supply cable

- 1) Based on an analysis of the data on the price level of the implementation of optical cable networks in the Czech Republic. Data from an analysis of the costliness of supply cables – strip cables with 48, 96, 288 and 720 fibres used in the calculation.
- 2) Database of access points supplied by the operators used.

The calculations in the analysis showed that the average price for construction/excavation work including projecting is CZK 1 380/m, for an easement CZK 293/m and for material including installation CZK 240/m (prices from CZK 92/m to CZK 305/m depending on the required quality and according to cable type). The weighted average of the presented values means we arrive at the presented shares of the individual cost categories.

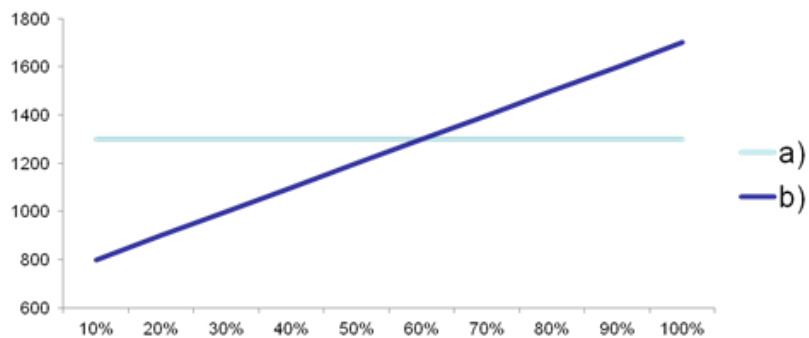


Definition of the area splitting

1. Area with a high number of blocks of flats = 27% of the territory
 - blocks of flats (> 15 dwellings per building)
2. Area with a low number of blocks of flats = 46% of the territory
 - blocks of flats (>5 and <15 dwellings per building)
3. Provincial development = 18% of the territory
 - small blocks of flats with max. 5 flats per building and family houses, population density >50 inhabitants per km²
4. Rural areas = 8% of the territory
 - family houses, <1.1 flat per building, population density <50 inhabitants per km²

Internal wiring

1. Group of internal wiring projects analysed.
2. Result calculated separately for each type of area.
3. Analysis performed both for FTTH, meaning optical internal wiring, and also for FTTB, meaning UTP cabling.
4. 2 scenarios defined:
 - a) Complete cabling through to the plug – used in the analysis for FTTH
 - b) Only the vertical part of the wiring and sequential connection of end customers
5. Relationship with OPEX

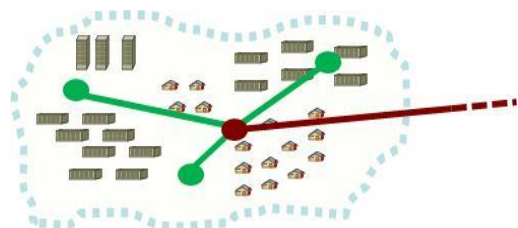


Active technology

1. Only GPON OLT technology calculated for FTTH. Optical modems, or ONT, are not included in the calculation
2. Costs for four types of DSLAM (or ONU-C) according to location and size calculated for FTTN:

Type of DSLAM	Type 1	Type 2	Type 3	Type 4
Capacity for the connection of terminals	768	384	192	48

3. DSLAM capacity adapted to the number of permanently occupied dwellings in the serviced territory.
4. Number of DSLAMs in BSUs calculated with a max. length of connection wiring of 0.5 km using data about population density.
5. Length of the supply cable adjusted according to the number of DSLAMs in the BSUs.



Operating costs

1. Operating costs was calculated for each network structure. It is clear that the costs for operating passive optical infrastructure are significantly lower than the costs for operating a dense network of DSLAM cabinets and metallic networks.
2. The costs for different solution variants for internal cabling were calculated, with FTTH variant a) being used for the purposes of the model. A variant with UTP internal cabling was not calculated.
3. The OPEX cost model included costs for:
 - a) Setting up/cancelling/changing a service
 - b) Network operation
 - Faults
 - Preventive maintenance
 - Electricity
 - Service contracts
 - Overheads

Financial analysis

1. The costs for subscriber terminal equipment (ONT, DSL modems) were not calculated in the operating costs, as it is anticipated that the service provider has these costs included in its calculations.
2. Discount rate set at 15%.
3. Return on investment into active technology set at three years.
4. Return on investment into passive infrastructure set at ten years.
5. BSUs with positive BC were then filtered out based on the setting of these unit revenue parameters and the level of subsidy.

Dependence of total investments in white BSUs on the maximum subsidy amount for individual BSUs:

FTTH	Average revenue per participant = CZK 350/month		
	Total investment [billion CZK]	Subsidy [billion CZK]	Number of dwellings
Prague Capital City	0.147	0.079	4 014
Central Bohemia Region	3.604	2.559	51 278
South Bohemia Region	0.366	0.303	3 049
Plzeň Region	0.486	0.339	7 236
Karlovy Vary Region	0.045	0.030	713
Ústí Region	1.600	0.966	40 385
Liberec Region	1.226	0.882	17 430
Hradec Králové Region	1.669	1.219	22 427
Pardubice Region	0.605	0.459	7 165

Vysočina	1.156	0.931	11 185
South Moravia Region	2.255	1.294	66 391
Zlín Region	0.835	0.574	12 925
Olomouc Region	2.046	1.369	33 547
Moravian-Silesian Region	1.788	1.085	36 249
Total	17.828	12.089	313 994

Table No 4 Economic analysis of the feasibility of construction of NGAs in white BSUs (FTTH technology), MIT

FTTN	Average revenue per participant = CZK 350/month		
	Total investment [billion CZK]	Subsidy [billion CZK]	Number of dwellings
Prague Capital City	0.081	0.055	3 903
Central Bohemia Region	1.743	1.387	49 393
South Bohemia Region	0.159	0.139	2 614
Plzeň Region	0.245	0.198	6 999
Karlovy Vary Region	0.024	0.019	675
Ústí Region	0.789	0.565	39 732
Liberec Region	0.610	0.490	16 781
Hradec Králové Region	0.888	0.740	21 509
Pardubice Region	0.334	0.284	6 900
Vysočina	0.573	0.497	10 747
South Moravia Region	1.079	0.729	66 043
Zlín Region	0.372	0.281	12 611
Olomouc Region	1.008	0.788	32 437
Moravian-Silesian Region	0.787	0.556	35 618
Total	8.692	6.728	305 962

Table No 5 Economic analysis of the feasibility of construction of NGAs in white BSUs (FTTN technology), MIT

Sensitivity analysis of the dependence of total investments in white BSUs (with parameters for return on investment as presented in chapter 6.5.2.)

FTTH Coverage of permanently occupied dwellings	Average revenue per participant = CZK 350/month		
	Total investment [billion CZK]	Subsidy [billion CZK]	Number of dwellings
96%	27.016	20.634	345 277
87%	17.828	12.089	313 994
78%	12.325	7.245	281 853
72%	9.497	4.897	258 431
68%	8.168	3.862	244 065
64%	7.074	3.063	229 667
60%	6.118	2.413	214 761

55%	5.201	1.836	198 207
51%	4.448	1.398	182 868
47%	3.891	1.106	169 994

Table No 6 Sensitivity analysis of total investment in white BSUs (FTTH technology), MIT

FTTN	Average revenue per participant = CZK 350/month		
Coverage of permanently occupied dwellings	Total investment [billion CZK]	Subsidy [billion CZK]	Number of dwellings
85%	8.692	6.728	305 962
70%	4.226	2.656	253 175
62%	2.755	1.406	223 564
56%	1.999	0.811	202 043
52%	1.574	0.504	186 396
47%	1.212	0.264	169 956
45%	1.065	0.176	161 998

Table No 7 Sensitivity analysis of total investment in white BSUs (FTTN technology), MIT

Annex No 6 Publicly available maps of backbone networks in the Czech Republic

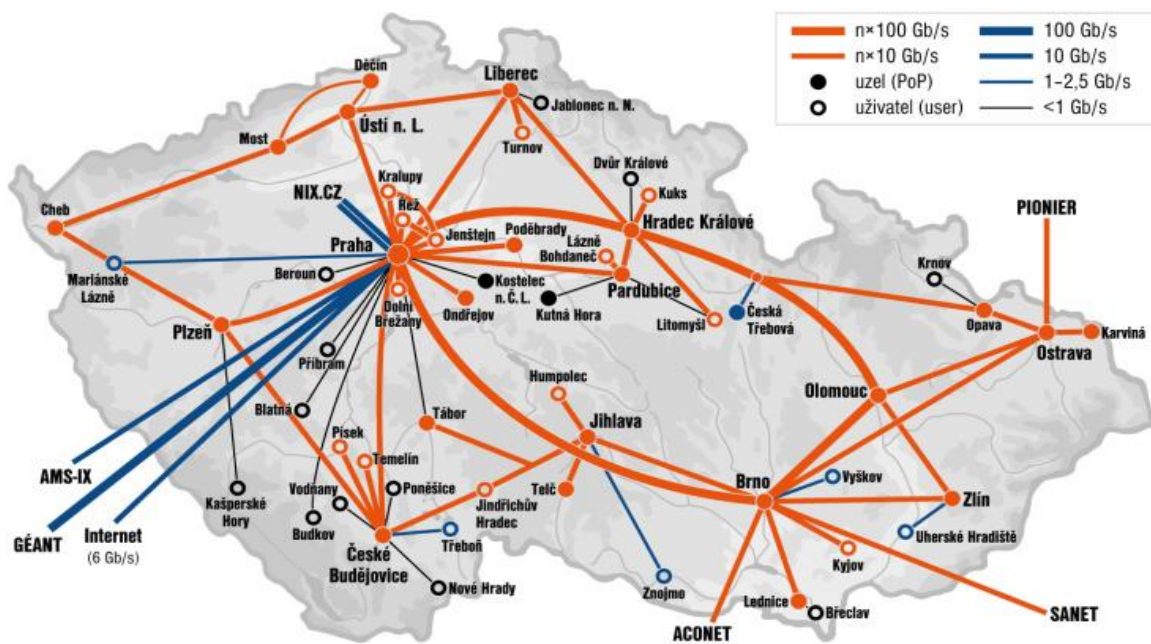
T-Mobile



ITSelf

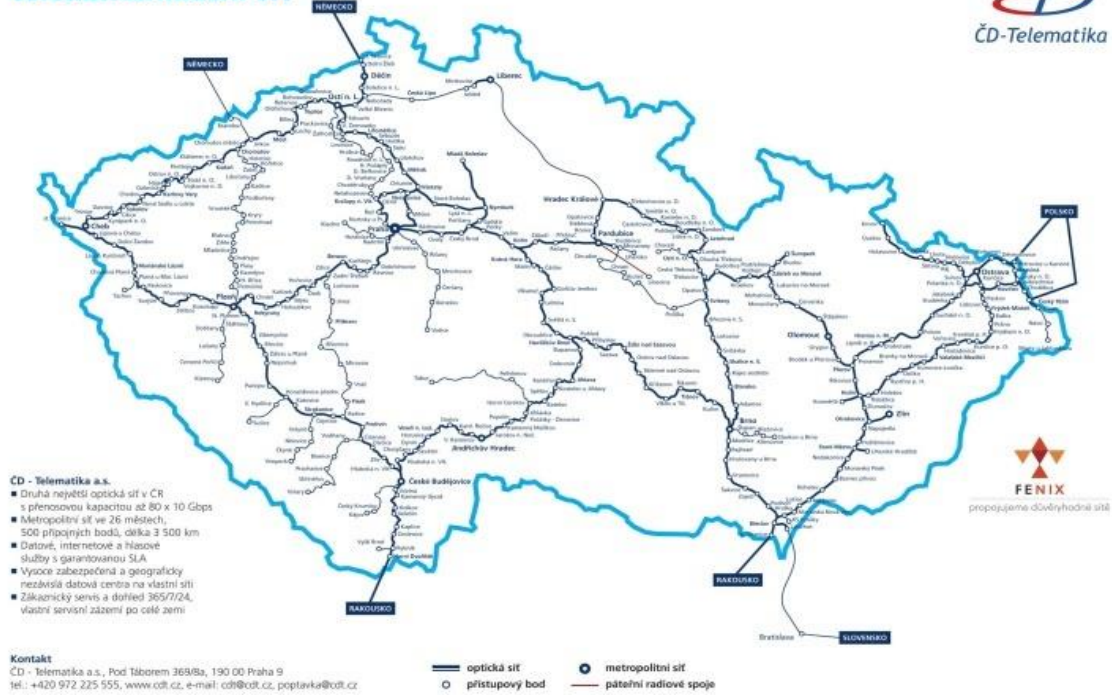


CESNET



ČD Telematika

Telekomunikační síť

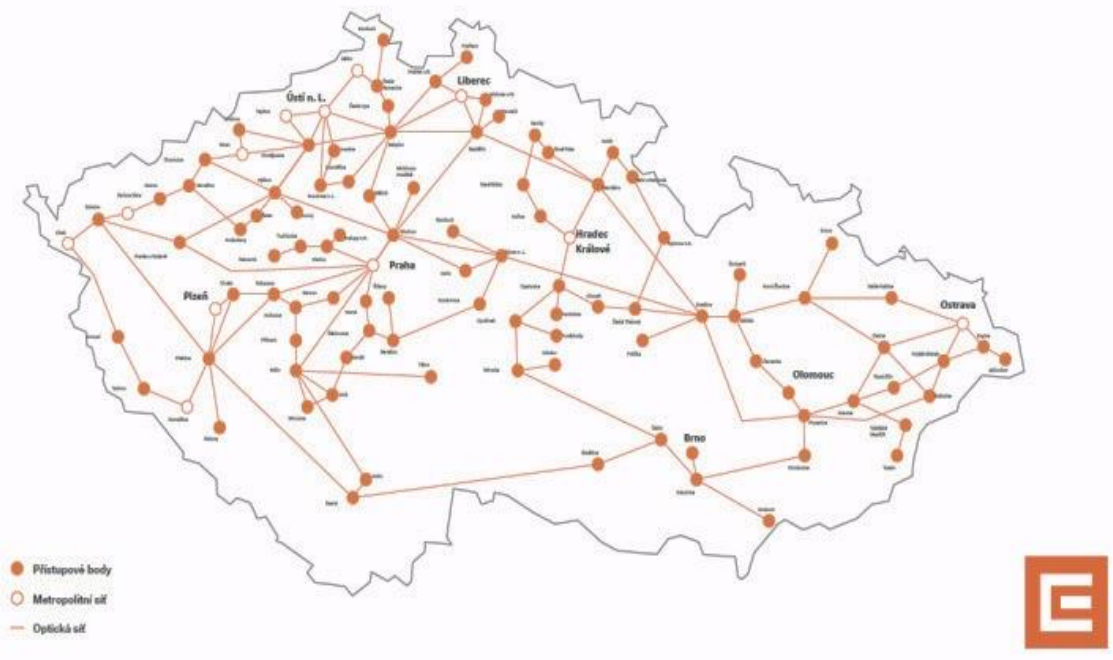


Dial Telecom

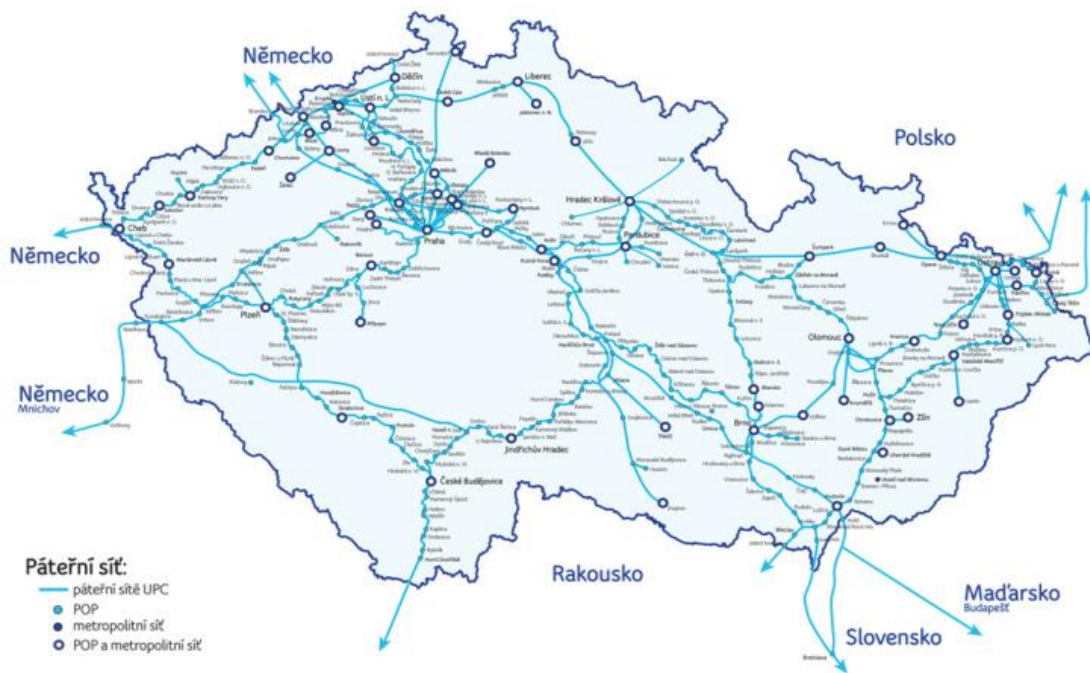


ČEZ

OPTICKÁ SÍŤ
Telco Pro Services, a. s.



UPC Česká republika

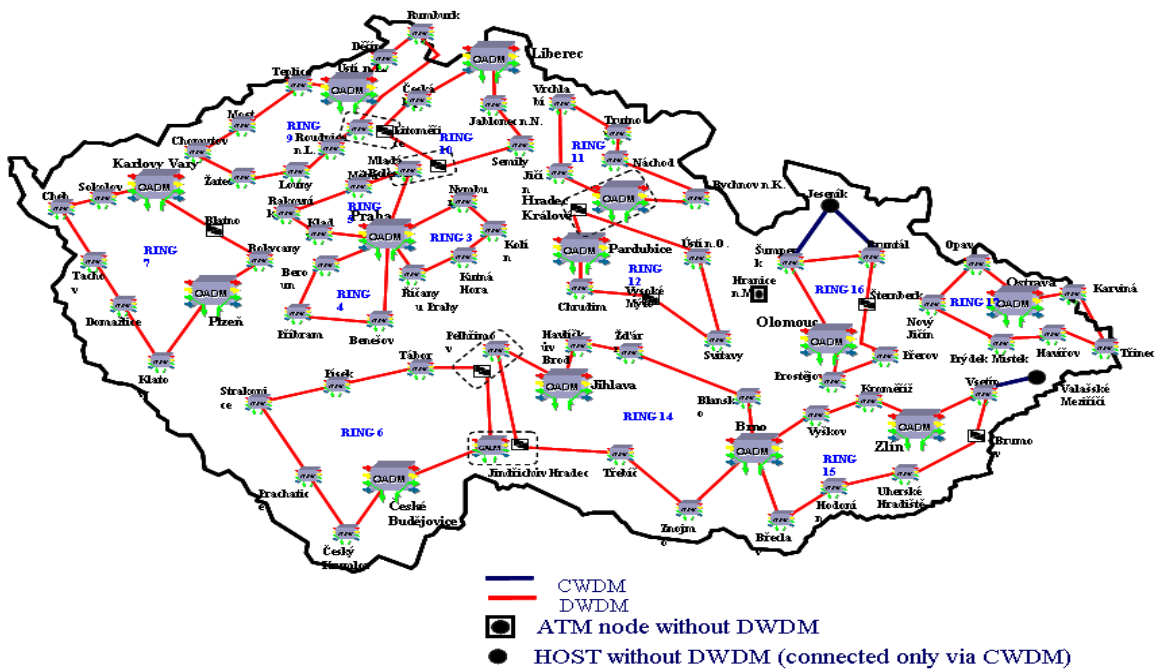


České Radiokomunikace

MAPA INFRASTRUKTURY ČESKÝCH RADIOKOMUNIKACÍ



Česká telekomunikační infrastruktura



Ha-Vel



Annex No 7 Abbreviations and terms

Abbreviation	Meaning in Czech / translation	Meaning in English	Note
ADSL	Asymetrická digitální účastnická přípojka	Asymmetric Digital Subscriber Line	Metallic connection where transfer speed for data towards the user is higher than from the user
AP	Přístupový bod	Access Point	A point inside an access network in which the subscriber line, the subscriber segment of the network, connects to the distribution network.
API	Agentura pro podnikání a inovace		
Backhaul	Přípojná síť	Backhaul	Part of an NGA providing the connection of the distribution part of the NGA to the backbone network
BCO	Informační kanceláře pro vysokorychlostní připojení	Broadband Competence Offices	
CATV	Kabelová televize	Community Antenna Television	A cable network consisting of optical and coaxial cables, transmitting multimedia services and providing Internet access based on Frequency-Division Multiplexing
CEF	Nástroj pro propojení Evropy	Connecting Europe Facility	EU program to support the construction of access networks
CO	Ústřední bod přístupové sítě	Central Office	The central office of the NGA access network where an active technology is located, connecting all subscribers within a perimeter of a given NGA network
CSO	Český statistický úřad		
DBO	Návrh, výstavba a provoz	Design, Build and Operate	
DOCSIS		Data Over Cable Service Interface Specification	An international standard for data transmission over coaxial cables
DP	Distribuční bod	Distribution point	The point at which the distribution part of an NGA branches from the primary distribution network to the secondary distribution network.
DSL	Skupina digitálních účastnických přípojek	Digital Subscriber Line	Technology that allows the use of existing metallic cable used for telephone connections for high-speed data transfer.
DSLAM	Digitální časový multiplexer	Digital Subscriber Line Access Multiplexer	Equipment that enables a fast Internet connection on a subscriber line via xDSL technology. DSLAM combines several tens to hundreds of data streams, which are diverted from subscriber connections (i.e.

Abbreviation	Meaning in Czech / translation	Meaning in English	Note
			from the last mile) using a splitter, so do not use a telephone exchange
EFRR	Evropský fond pro regionální rozvoj	European Regional Development Fund	
EC	Evropská komise		
EP	Evropský parlament	European Parliament	
ESIF	Evropské strukturální a investiční fondy	European Structural and Investment Funds	
ESD	Elektronický sběr dat		Data collection concerning the Internet networks access provided by CTO
EU	Evropská unie	European Union	
FTTB	Vlákno do budovy	Fiber to the Building	A type of optical connection for electronic communications networks with a terminal in a building (e.g. in the basement of a block of flats).
FTTCab	Vlákno do kabinetu (kontejneru)	Fiber to the Cabinet	A type of optical connection for electronic communications networks with a terminal near the subscriber's premises.
FTTH	Vlákno do domu	Fibre to the Home	A type of optical connection for networks with a terminal in the household of the subscriber.
FTTN	Vlákno do uzlu	Fibre to the Node	A type of optical connection for electronic communications networks with a terminal in a further distance from the subscriber's premises than that of FTTCab.
FOTP		Fiber to the Premises	A broader term including both FTTH and FTTB
GPON	Gigabitová pasivní optická přístupová síť	Gigabit Passive Optical Network	Gigabit network according to ITU-T G.984
GDP	Hrubý domácí produkt		
ICT	Informační a komunikační technologie	Information and Communication Technologies	
IoT	Internet věcí	Internet of Things	
IP	Internetový protokol	Internet Protocol	A basic protocol used in data networks and distinguishing various network interfaces by means of an IP address
IT	Informační technologie	Information Technologies	
ITU	Mezinárodní telekomunikační unie	International Telecommunication Union	
LAN	Lokální datová síť	Local Area Network	A data network connecting small areas (e.g. a household, an enterprise)
LLU	Zpřístupnění místní	Local-loop unbundling	A form of access , the aim of which is to allow alternative operators to

Abbreviation	Meaning in Czech / translation	Meaning in English	Note
	smyčky		lease an existing connection of a particular user (i.e. local loop or a subscriber line) from dominant electronic communications operators
M2M –	(Komunikace) mezi stroji	Machine to Machine	
MIT	Ministerstvo průmyslu a obchodu		
NGA	Přístupové sítě nové generace	Next Generation Access Networks	
NGN	Sítě nové generace	Next Generation Networks	
NNI	Rozhraní- předávací bod mezi dvěma sítěmi	Network to Network Interface	
OLT	Optické linkové zakončení	Optical Line Termination	
ONU	Optická síťová jednotka	Optical Network Unit	
OPEX	Provozní náklady	Operating Expense	
P-P, or. P-MP	Bod – bod Bod - multibod	Point to Point, Multipoint	A direct connection between two network nodes within an electronic communications network, or a point – multiple points
PLC	Přenos dat po silové elektrické síti	Powerline Communication	
PO	Prioritní osa		
PON	Pasivní optická přístupová síť	Passive Optical Network	
POP	Fyzický síťový uzel	Point of Presence	NGN point or node, a technology room that houses the active technology
OP PIK	Operační program Podnikání a inovace pro konkurenceschopnost 2014-2020		
PSP	Poslanecká sněmovna Parlamentu ČR		
RFI	Registr fyzické infrastruktury		
ROI	Návratnost investic	Return On Investment	
SLA	Dohoda o úrovni poskytovaných služeb	Service Level Agreement	An agreement between a service provider and user where the parameters of provided services are specified
SWOT analysis	Silné stránky, slabé stránky, příležitosti, hrozby	Strengths, Weakness, Opportunities, Threats	A method by which it is possible to identify strengths, weaknesses, opportunities and threats associated with a particular project, type of business, business plan, policy, etc.
UMTS		Universal Mobile Telecommunication	Another step (3G) in the development of GSM networks

Abbreviation	Meaning in Czech / translation	Meaning in English	Note
		System	
UTP	Kroucená dvojlinka	Unshielded Twisted Pair	A type of cabling used in electronic communications and computer networks
VDSL	Vysokorychlostní digitální účastnická přípojka	Very High Speed DSL	DSL technology that enables faster data transmission compared to ADSL
VULA	Virtuální zpřístupnění komunikačního vedení	Virtual Unbundled Line Access	
WACC	Vážený průměr nákladů kapitálu	Weighted Average Cost of Capital	
WDM	Vlnově dělený multiplex	Wavelength-Division Multiplexing	
Wi-Fi	Bezdrátová věrnost	Wireless Fidelity	Label for several standards designed for wireless communication in computer networks.
xDSL	Viz DSL	See DSL	See DSL
BSU	Základní sídelní jednotka		According to the definition provided in Act No 89/1995 Coll., a BSU is a part of a municipal territory with unambiguous territorial technical and urbanistic conditions or a catchment territorial grouping of a residential or recreational nature.