



NATIONAL PLAN FOR SUSTAINABLE DEVELOPMENT OF DIGITAL INFRASTRUCTURE, BROADBAND 2020-2025

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LIST OF ACRONYMS

AI	Artificial intelligence
AKCESK	National Electronic Certification and Cybersecurity Agency
AKEP(EPCA)	Electronic and Postal Communication Authority
NAIS	National Agency for Information Society
AMA	Audiovisual Media Authority
ATLAS	Electronic ATLAS of AKEP
AZHT	Territorial Development Agency
B2B	Business to Business
BBCom	Broadband Commission for Sustainable Development
BPL	Broadband in Electricity Lines
BTS	Base Transceiver Station
CIRT	Cyber Incident Response Team
DCM	Decision of Council of Ministers
DD2	Digital Dividend 2
DSL	Digital Subscriber Line
EGDI	E-Government Development Index
ESIF	European Structural and Investment Funds
EU	European Union
FTTB	Fiber to the Building
FTTC	Fiber to the Cabinet
FTTH	Fiber-to-the-Home
FTTN	Fiber to the Node
FTTx	Fiber to the x
GDP	Gross Domestic Product
GMIP	Integrated Program Management Groups
GNI	Gross National Income
GSR	Global Symposium for Regulators
HFC	Hybrid Fiber Coaxial
HHI	Herfindahl Hirschman Index
HPC	High Performance Computing
HSPA/+	High Speed Packet Access/+
ICT	Information Communication Technology
IDI	ICT Development Index
INSTAT	Institute of Statistics
IoT	Internet of Things
ISP	Internet Service Provider
ITU	International Telecommunication Union
KDS	Sectoral Steering Committees
LLU	Local Loop Unbundling
LSGU	Local self-government units
LTE	Long Term Evolution
MFE	Ministry of Finance and Economy
MIE	Ministry of Infrastructure and Energy
MNO	Mobile Network Operator
MPLS	Multiprotocol Label Switching

MT	Mobile Termination
NGA	Next Generation Access
NGN	Next Generation Networks
OECD	Organization for Economic Co-operation and Development
OSHEE	Electric Power Distribution Operator
OST	Transmission System Operator
RoW	Right of Way
SME	Small Medium Enterprises
SMP	Significant Market Power
TSO	Transit System Operator
UNDP	United Nation Development Program
US(SHU)	Universal Services
USF	Universal Service Fund
VoIP	Voice over IP
WBIF	Western Balkans Investment Framework
WEF	World Economic Forum
WiFi	Wireless Network
WiFi4EU	WiFi for European Union
WSIS	World Summit on Information Society
3G	3rd Generation of mobile technology
4G	4th Generation of mobile technology
4IR	4th Industrial Revolution Industrial
5G	5th Generation of mobile technology

Introduction and aim of the Document

The development of ICT infrastructure is one of the priorities of the Government of Albania and part of the national strategic objectives, for development and integration.

Recognizing the role that ICTs and digital transformation can play in furthering economic and social development, the Government of Albania, identified affordable and reliable connectivity and the availability of a wide range of communications services as a key priority, in the strategic documents of ICT development, the Digital Agenda, Economic Reform Programme.

The Albanian Government also recognized that to harness the transformative powers of ICTs, it is essential to have high-speed broadband throughout the country. Broadband infrastructure development is part of the national projects with strategic importance. In 2013, with the support of the UN Broadband Commission for Sustainable Development ("BBCom"), the first National Broadband Plan for Development ("NBPD") was adopted, which provided a vision and corresponding general objectives and specific goals to be achieved for the period 2013-2020. The plan was reflective of the 2020 targets of the BBCom and modeled on the EU 2020 broadband targets, including, but not limited to, a focus on infrastructure expansion also in rural and remote areas, as well as the doubling of connectivity to households and businesses by the end of 2017, 100% school-, university-, post offices, health centers- and hospitals connectivity, and the expansion of the number of electronic services to Albanian citizens and digitalization of all public services.

Since the adoption of these strategies, Albania has come a long way in preparing and fostering digital transformation of its economy and institutional and administrative organization, setting out its ongoing ambitions in its "Digital Albania Strategy 2015-2020", in line with Resolution 71 adopted at the ITU's Plenipotentiary Conference in Dubai 2018. Albania's medium-term aspiration is to achieve integration into the EU single market, which requires the adoption and implementation of the *acquis communautaire* pertaining to all areas of the economy and society, enabled through convergence of the economic, institutional and administrative levels of Albania with the average of the EU. In the area of information society and audio-visual media, the latest 2019 EU Report for Albania finds that Albania is moderately prepared. Progress was made regarding the implementation of Albania's Digital Agenda, the NBPD, and e-government services. Key ICT statistics support the reports' findings, showing that Albania is on a good trajectory of development, with more than 75% of its population using the internet and more than 95% of enterprises having access to the internet, which is above the EU average. Furthermore, in the area of eGovernment services, which is one of the most important Action Lines of the World Summit on Information Society (WSIS) Tunis Agenda, Albania has made great strides. The establishment of the e-albania.al governmental portal has brought more than 600 e-services available to citizens, businesses and government institutions and more than 1,300,000 registered users.

In the United Nation's 2018 "E-Government Development Index" ("EGDI") Albania scores highest among its regional peers with regards to online services and scores well on Human Capital. Moreover, the WBIF19 Digital Diagnostics Report finds that eGovernment services are available in almost all municipalities. This is underpinned by a good level of ICT skills and

ICT use. ITU's ICT Development Index 2017 ("IDI") shows that Albania scores above world average in the sub-indices of IDI skills and IDI use.

Yet, Albania's weakest link to-date is ICT infrastructure, specifically (high-speed) broadband infrastructure, relating to both availability and quality (speed). In ITU's IDI sub-index of IDI access, Albania scores below the world average. The relatively weak position in relation to infrastructure is mirrored in the UN's EGDI 2018, where Albania scores poorly on the telecom infrastructure component. While some progress was made with regards to infrastructure targets included in the 2013 NBPDP, the goals set therein were not fully achieved. A significant rural-urban digital gap persists, mainly due to the lack of adequate infrastructure to provide meaningful connectivity.

It is the objective of this document to update the Broadband Policy Document. In the most recent 2019 EU Report for Albania it is recommended "to revise the 2013 Broadband Plan with clear objective and targets" in the context of market-, legal-, regulatory-, and institutional developments since 2013.

For these purposes, a stakeholder consultation, including a Stakeholder Roundtable and a Stakeholder Questionnaire, was held on 5 July 2019 at the MIE. The purpose was to discuss the views and perspectives of all relevant market participants regarding the current and future NBPDP vision, general objectives and specific goals. Moreover, it asked stakeholders to share their perceived key challenges and priorities regarding broadband infrastructure development going forward for the period 2020-2025.

While the vision and most of the general objectives and current goals of the 2013 NBPDP were found to be still relevant, the view crystallized that given the persistent digital divide, a focus shift of the NBPDP was required towards the cost-effective expansion of high-speed broadband infrastructure to cover the whole country, and in particular to shift more attention to covering rural and remote areas, without neglecting the development of broadband infrastructure in urban areas.

Such a focus was found to necessitate the identification and introduction of new financing and funding mechanisms that encompass a broader stakeholder basis, including increased financial engagement by the public sector. This focus shift is strongly supported by the WBIF19 Digital Diagnostics Report, which provides key insights on the situation in rural and remote areas and stresses the absence of incentives to invest by network operators in these localities. It is also in line with the European Commission's strategy on Connectivity for a European Gigabit Society and its complementary initiatives, in particular as regards the new state aid rules. Therefore, the current general objectives and specific goals are reviewed towards formulating new objectives and targets that are more reflective of local market needs going forward, with a strong focus on developing infrastructure, including the identification of more effective financing and funding measures and activities for implementation.

It should be noted that the current document will be completed with the outputs expected from the WBIF Feasibility Study, which will be finalized during the first part of 2020. The WBIF Feasibility Study will give detailing in-depth proposals on local infrastructure roll-out

requirements, technology proposed, and associated investment, costing and funding needs and appropriate models for different localities across the country.

This document was prepared with the support of ITU experts and took into account the findings of the Feasibility Study for Broadband Development (WBIF2019). The document is structured as follows:

- **Section 1**, outlines the rationale for broadband infrastructure as a precondition and driver of digital transformation and economic and socio-economic development;
- **Section 2**, provides an analysis of the current situation, including a summary of the progress made with the current goals of the NBPd;
- **Section 3**, details the main findings and key issues to be addressed as essential results of consultation with stakeholders;
- **Section 4**, presents the strategic vision, objectives and goals proposed and revised of the Plan, targeted for the period 2020-2025;
- **Section 5**, presents the policies and measures to be undertaken to achieve the objectives and addressing key priorities for the period 2020-2025, as well as the definition of the activities to be undertaken, in order to further the identified priorities;
- **Section 6**, presents possible financing and funding models for implementation (reflecting a more generic approach);
- **Section 7**, that describes the mechanisms of implementation and monitoring;
- **Section 8**, sets out the possible costing of implementation of the NBPd (reference to outputs of the WBIF Feasibility Study).

THE IMPORTANCE OF BROADBAND INFRASTRUCTURE

As highlighted in the most recent UN Broadband Commission's "State of Broadband Report 2019"¹, in today's digital era, the role of broadband – and the benefits of broadband connectivity – in driving and underpinning a country's progress have never been greater and have never been more clearly measurable. As numerous studies have examined, including Broadband Commission documents, and ITU's recent study "Broadband and Digital Transformation", fixed and mobile broadband contribute to economic growth,, digital transformation and the interplay of ICT regulation with national economies. The study shows that an increase of 1 per cent in fixed broadband penetration yields an increase of 0.08 per cent in GDP, and an increase of 1 per cent in mobile broadband penetration yields an increase of 0.15 per cent in GDP.

What is Broadband?

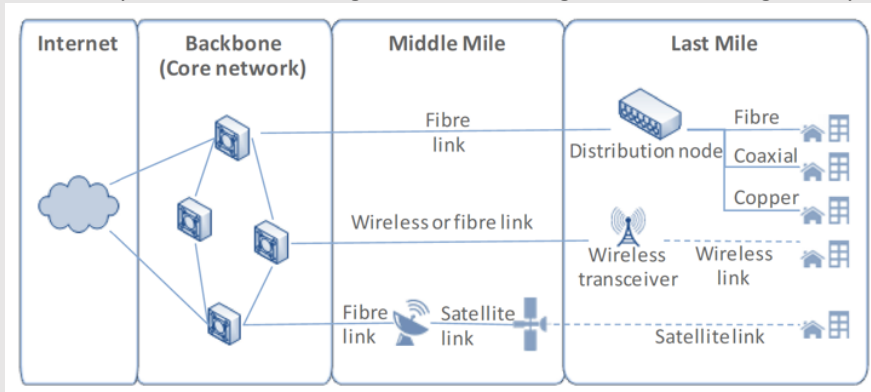
The definition of broadband across countries continues to evolve as technologies improve, new generations emerge of wireline and wireless broadband and baseline expectations continue to be raised of what constitutes minimum download speeds for the optimal end-user experience. Broadband networks are telecommunication networks, or electronic communications networks, that enable high-speed and very high-speed data communication. Therefore, as defined by the European Commission, the term "Broadband" does not refer to a

¹ https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROADBAND.20-2019-PDF-E.pdf

particular technology used for Internet access but represents a term for a digital infrastructure that allows for high-speed internet access that is always on and that is faster than traditional dial-up access. The Commission defines three categories of download speeds as follows:

- ✓ 'Basic broadband' for speeds between 144 Kbps and 30 Mbps;
- ✓ 'Fast broadband' for speeds between 30 and 100 Mbps; and
- ✓ 'Ultra-fast broadband' for speeds higher than 100 Mbps.
- ✓ The European Commission's strategy on Connectivity for a European Gigabit Society set the target speed to 1 Gigabit.

A broadband network generally comprises three main elements, including the backbone or core network, the middle mile and the last mile. The World Bank also identifies an "invisible mile"², which includes the network components that are not visible, including the radio spectrum, network databases (for example, for numbering), cybersecurity, and so on, but can also include potential bottlenecks such as market concentration, multilayered taxation of activities, lack of access to rights-of-way, and inefficient regulations including trans border regulatory issues.



Source: Special Report No 12: Broadband in the EU Member States: despite progress, not all the Europe 2020 targets will be met, European Court of Auditors³

Broadband networks are an increasingly integral part of the economy. The OECD in its Final Report 2015 "Addressing the Tax Challenges of the Digital Economy", termed that the digitalized economy can no longer be ring-fenced. Broadband networks are the fundament that can facilitate the development of new challenges, new and improved goods and services, new processes, new business models, and it increases competitiveness and flexibility in the economy. More generally, broadband networks and broadband connectivity can enable the scaling and improved performance of ICTs (and 4IR technologies), which are considered to be general-purpose technologies ("GPT") that fundamentally change how and where economic activity is organized.

Broadband facilitates the development of new inventions, new and improved goods and services, new processes, new business models, and it increases competitiveness and flexibility in the economy. More generally, Broadband offers an improved performance of ICTs, which are considered to be general-purpose technologies that fundamentally change how and where economic activity is organized.

² See: UN Broadband Commission Working Group Report 2019 "Connecting Africa Through Broadband: A strategy for doubling connectivity by 2021 and reaching universal access by 2030"

³ See: <https://www.eurosai.org/en/databases/audits/Broadband-in-the-EU-Member-States-despite-progress-not-all-the-Europe-2020-targets-will-be-met/>

As the technologies evolve and bandwidth increases, the scope for broadband to act as an enabler of structural change in the economy expands as it affects an increasing number of sectors and activities. Broadband can therefore also be recognized as a cross-sectoral enabler, underpinning national efforts to develop knowledge economies, fostering digital transformation in government services and digital transition across all sectors, expanding opportunities for enterprises and providing greater value for citizens and consumers. This is evident in the number of national digital economy efforts linking broadband connectivity to sectoral initiatives, including the delivery of quality education, the promotion of social inclusion and the benefits that accrue specifically in rural and remote regions. Direct effects result from investments in the technology and from rolling out the infrastructure. Indirect effects come from broadband impact on factors driving growth, such as innovation, competition and globalization.

As such, significant impacts on the economy can be expected from enhanced broadband development, by enabling organizational change and enhancing coordination to reap productivity gains from overall investments in ICTs. Furthermore, compared to other historical GPTs, such as railways and electricity, the impacts of Broadband and ICT may be larger and materialize more rapidly due to scale and network effects.

High speed, ubiquitous broadband internet connectivity therefore is the critical enabler for digital ecosystems that are necessary components of programs aimed at development, economic transformation and income growth. It is the foundation and pre-condition for digital transformation of the Albanian economy and society and therefore may be considered as an essential utility, alongside other utilities such as road, water, electricity and gas.

Analysis of the current situation

Albania has undertaken a number of structural reform efforts across different economic sectors and activities, including (among others) the information and communication technology sector. The Albanian government for more than ten years from the first strategy for ICT's development has continued to promote ICT in various sectors, presenting and implementing various strategies and policies that have ICT in their focus, the development of information society, digital agenda and Broadband development. Moreover, in recent years the Albanian government has invested on digitizing public infrastructure and setting up government electronic systems and services.

ICTs and electronic communications play a central role in Albania. Total 2017 ICT sector contribution to GDP amounted to 3%⁴, while in the EU, the value added of the ICT sector in 2016 was 3.75% of GDP, which is behind Japan (5.4 %), the US (5.3 %) and China (4.7 %) in 2014. The electronic communications market contributed 2.45% of the GDP, respectively.

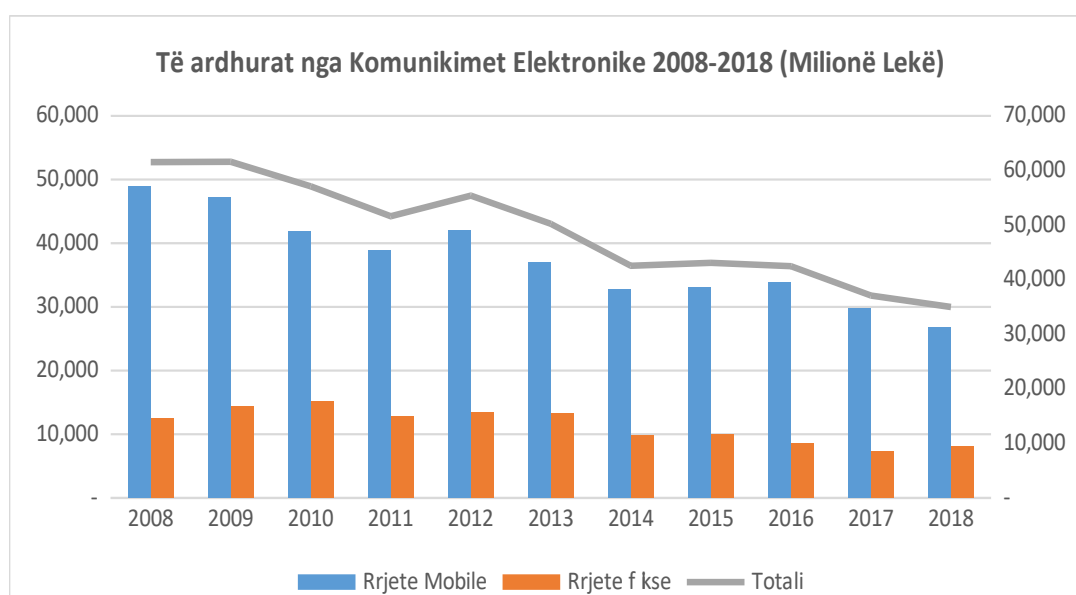
⁴ Shiko: https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_sector_-_value_added,_employment_and_R%26D

State of play in the telecommunication market

General Overview

The Albanian telecommunications market has undergone significant development in recent years and has been fully open for competition since 2008 with the adoption of the Law No 9918, “On electronic communications in the Republic of Albania”. The main players are Vodafone Albania, Telekom Albania and Albtelecom. Total market turnover in 2018 was US\$320.6 million. Revenues were stable between 2014-2016 and declined by 13% in 2017 to US\$326.6 million. Over time, revenues declined by more than 40% between 2008-2018. The mobile-fixed revenue split in 2018 was 80%:20%. Tariffs for telephone services and broadband access to the Internet from fixed and mobile networks are at affordable levels for households with an average level of income, and the market provides very low tariffs that are also reasonable for low income families.

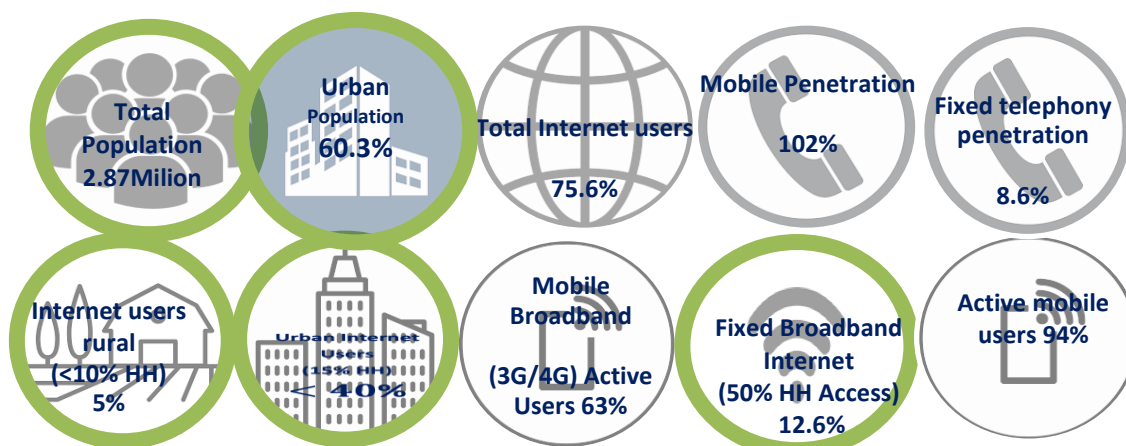
Figure 1: Mobile and fixed revenues over time 2008-2018



Source: AKEP

Albania's telecommunication market is consistent with developments elsewhere in the region, with fixed-line telephony penetration declining as subscribers migrate to mobile solutions and with ongoing efforts to improve broadband availability and access conditions. In terms of ICT use, 75.6% of Albanians use the Internet, there are 102% of active users of phone services and 50% of households have fixed Internet access. Yet, broadband speeds, according to AKEP's reports and Feasibility Study's results, are low: the existing bandwidth in fixed and mobile networks is less than 30 Mbps.

Figure 2: Key ICT Statistics



Source: Imme Philbek, based on statistics from ITU, AKEP, UN Population Division, WBIF

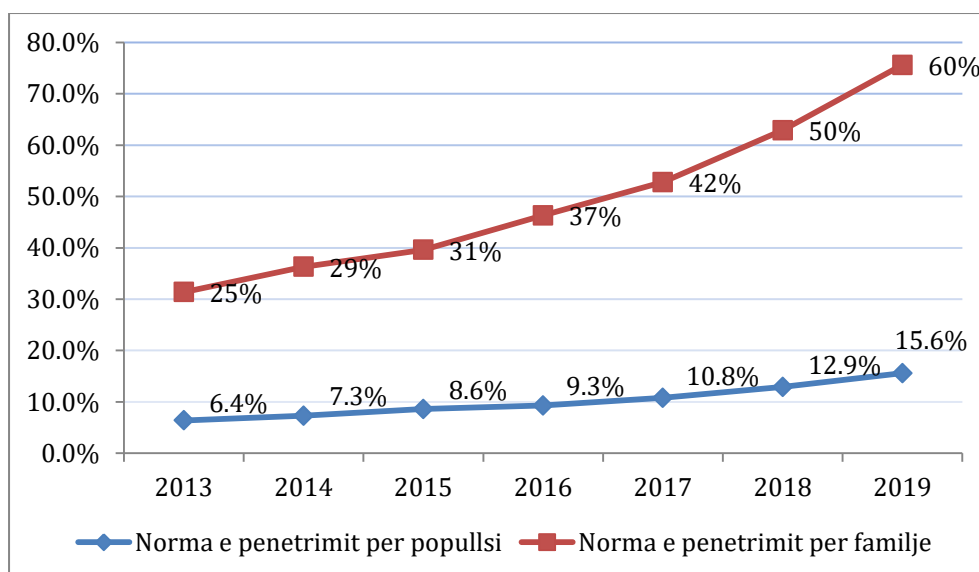
Broadband market

The broadband market is one of the most vibrant markets in the telecommunications sector in Albania, with 240 ISPs authorized by AKEP and three mobile network operators that offer mobile broadband services. Broadband is currently supplied through myriad fixed and mobile technologies including DSL, FTTH/FTTB, FTTx in combination with NGA. Most DSL lines are combined with fiber optic and copper networks (FTTN /FTTB). It is worth noting that fixed network operators, during the years 2018-2020, are investing mostly in fiber optic networks (FTTH and FTTB). Networks consisting only of optical fibers are being expanded by small operators in rural areas, which is another novelty for Albania. Broadband is also supplied via coax cable (HFC) and electricity lines (BPL). In terms of mobile technologies, broadband is supplied via 3G/HSPA/HSPA+ and 4G/LTE networks, as well as satellite technologies.

Main fixed broadband operators include ALBtelecom with a share of 36% and Abcom with a share of 18%, ASC/Tring with 14%, as well as Abissnet with 10%⁵. The rest of the market is divided into alternative operators that offer Internet Broadband, based on fixed networks. In terms of fiber optic backbone infrastructure, there are two main operating companies, ALBTELECOM and ATU. Fixed broadband penetration for both population and family, as given in the figure below, in the 2013-2020 periods has increased more than twofold. Fixed broadband penetration remains well below the EU average and other penetration levels of neighboring countries, albeit growing by 10%-15% annually.

Figure 3: Fixed broadband access by subscriber and HH 2013-2019

⁵ The remaining 22% of the market is shared between other operators, including Bleta shpk, Digicom and Nisatel. The four main operators ALBtelecom, Abcom, Abissnet and ASC / Tring have a total market share of 78%.



Source: AKEP

As regards mobile broadband, there are three MNOs, namely Vodafone, Telekom Albania and Albtelecom who provide 3G and 4G services. 4G services were launched in July-September 2015 using the 18MHz frequency band, and cover between 65% and 85% of the population. Territorial coverage is significantly lower for 4G at between 21% and 55.6% by operator. Most of the 4G coverage is concentrated in urban areas, which is supported by the most recent findings of the WBIF19 Digital Diagnostics Report. In total there are 63% of Albanians that use mobile broadband.

Figure 4: 2G, 3G, and 4G Territorial and Population Coverage 2018

	Telekom Albania	Vodafone Albania	Albtelecom		Telekom Albania	Vodafone Albania	Albtelecom
Territorial Coverage (%)				Population Coverage (%)			
GSM	92.50	96.40	93.80	GSM	99.80	99.86	99.40
3G	88.00	89.00	86.80	3G	96.50	99.20	90.40
4G	55.60	35.00	21.20	4G	85.30	70.70	65.00

Source: AKEP

According to quality of services QoS monitoring reports, conducted by AKEP during 2019, mobile operators are taking measures to extend 4G coverage in rural areas, focusing mainly on those areas where 3G coverage has not been very good. The investment period, according to the statement of mobile operators, will extend during the 2020-2023.

There is room for improvement as regards access speeds / quality of service. The main technology that is used to deliver fixed broadband connections is still via DSL (55%, comprising 46% of DSL-FTTN/FTTC connections and 9% of DSL 100% copper lines). Only 23% of broadband connections are delivered via FTTH/B, 18% over cable (of which 14% are Cable DOC SOS 3.0) and 4% using other technologies. In total there are 66% of NGA subscribers,

that are mostly FTTN/C.⁶ In relation to fixed broadband by download speed, in 2018 a majority of 62% of subscribers was on 4-10Mbps, 24% on 10-30 Mbps (54,000 in 2017 and 89,000 in 2018), and 12% of subscribers were still below 4Mbps. As regards fast and ultra-fast BB above 30 Mbps, while subscriptions delivered more than doubled in 2017, the total proportion is still low at 2%.

From the analysis made, it is estimated that access to Mobile Broadband is economically affordable. Based on the data from the ITU report, "Measuring the Information Society Report" (November 2018), in the data in the following table, Albania in terms of economic affordability ranks well.

Tabel 1. Albania's ranking for the ICT price index in ITU 2015-2017 reports:

	2015 ranking		2016 ranking		2017 ranking	
	% GNI	ITU's ranking	% GNI	ITU's ranking	% GNI	ITU's ranking
Fixed broadband	2.57	83	2.71	86	1.63	58
Mobile	1.71	84	1.8	94	1.87	89
Mobile Broadband Data (Prepaid Handset)	1.18	58	1.24	85	1.28	84
Mobile Broadband Data (Postpaid USB)	1.18	58	1.24	72	1.29	69

Source: AKEP Annual Report 2018⁷

According to the data in the table above, the expenditures for ITU baskets for Broadband (fixed and mobile) in Albania are 1.28-1.87% of GNI, which are considered affordable.

These levels of spending on Basic Broadband, relative to GNI, are also below the target level of 2% for the affordability of Broadband tariffs in 2025, of the United Nations Broadband Commission. Overall, between 2008-2015, average monthly spending on broadband had fallen by 80% from US\$32 in 2008 to US\$ 6.3 in 2015.⁸

In relation to willingness to pay, the WBIF 2019 Digital Diagnostics Report finds that the average price paid for mobile telephony's services is 10 Euros or LEK 1200 and the average price paid for fixed telephony's services is LEK 2000. Tariffs between LEK 2000-2500 for 30 Mbps is considered an affordable price. Services for 50 Mbps or higher are not yet considered as required for the daily life of the citizens. However it should be noted, that the level of affordability is not the same for different areas, specifically as regards rural areas.

⁶ The technology mix compares fairly well with figures from the EU (2015), where broadband was delivered through 69% of DSL/VDSL connections, and 19% Cable (of which 80% were delivered over Cable DOC SIS 3.0). As regards EU NGA access, 35% of broadband subscriptions were delivered using VDSL, FTTH/B and Cable DOC SIS 3.0.

⁷ Based on the data of ITU's reports "Measuring the Information Society Report 2016-2018"

⁸ Shiko: Raportin e Sofrecom 2016, fq.19

Broadband demand

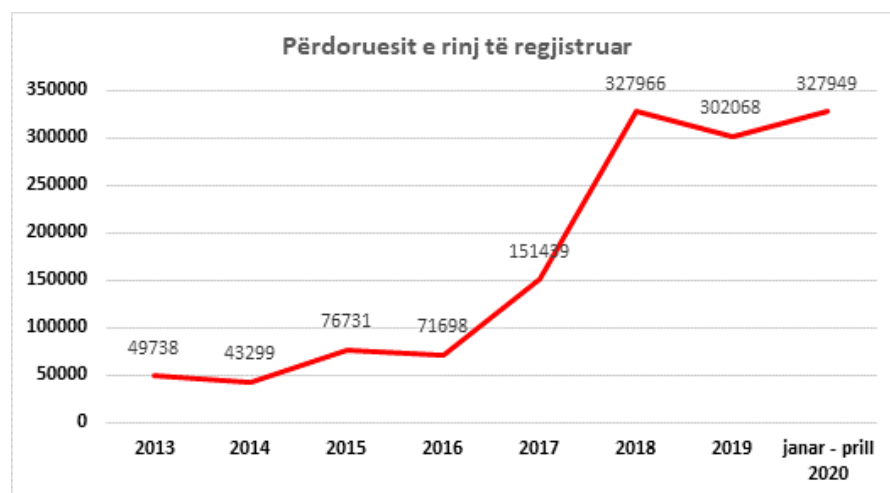
Development of electronic services

As regards demand and demand stimulation for broadband, there has been significant progress since the approval of the first document of NBPD in 2013. As a key broadband stakeholder, the Albanian Government has made concerted efforts to stimulate demand for ICT services through (1) acting as a key consumer of digital services itself by purchasing a range of services for its e-Government Network infrastructure through NAIS, (2) creating centralized ICT services for Government institutions (such as internet broadband connectivity, email services, web- and hosting services, MIS, databases and e-services); and (3) providing myriad e-services to citizens, businesses and the administration itself.

In 2015, the **e-Albania** portal⁹ was created, serving as an aggregation one-stop-shop platform for e-services of all government institutions, agencies and authorities. Almost 600 e-services are available on the e-Albania portal today, and 53 electronic systems are connected to the Governmental Interoperability Platform ("GIP"), through which more than 70 million transactions were performed by the end of 2019. The e-Albania portal counts more than 1,300,000 registered users in 2019.

eGovernment services are available across almost all of Albania's 61 municipalities and, increasingly, citizens and businesses are adopting the use of e-services offered through the e-Albania portal, accessing also from the mobile.¹⁰ There are in excess of 1 million uses of electronic services each month on the e-Albania portal, with 17 million uses during the 2019 and January – April of 2020. Services include family or personal certificates, health cards, and application of construction permits, application for a passport and identity card, and many more.

Figure 5: e-Albania Portal new users 2013-2020 and new interface



Source: NAIS, <https://e-albania.al/>

⁹ The government portal e-albania.al is developed and administered by the National Agency for Information Society (NAIS) as a multifunctional portal, and it is considered as one stop shop. It provides services 24 hours, 7 days a week. The portal started as a European Union investment in 2009. At the early stage, it was very simple including 6 electronic services and 4 systems linked to the government interoperability platform. The portal is linked to the Governmental Interoperability Platform, which is the basic architecture that combines hardware, software, and services enabling the interaction between all the connected systems of the government institutions.

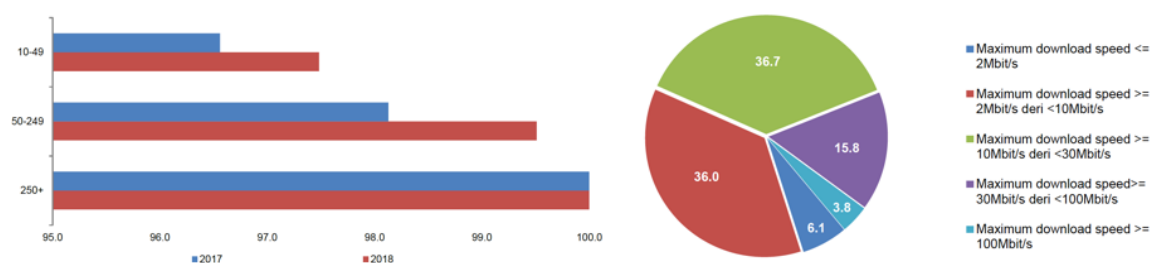
¹⁰ It should be noted, however, that across a number of municipalities there is not sufficient bandwidth for the eServices offered, and the one-stop-shops are not functional in many LGUs. One reason is the lack of digital identity. Moreover, many LGUs lack more developed ICT equipment and expertise.

Use of ICTs by businesses

In terms of private sector enterprise ICT use, survey data from Albania's Institute of Statistics ("INSTAT") shows that in 2018 across 11 economic activities, more than 95% of surveyed enterprises across all three size classes analyzed had internet access (including six economic activities with 100% Internet access).

The proportion of enterprises with an Internet connection increased from 88.4% in 2017 to more than 95% in 2018. Internet connections available are delivered mainly through DSL with the majority (72.7%) of connections having a maximum download speed of between 2Mbits/s - <30 Mbits/s. The number of enterprises with a download speed higher than 10 Mbit/s was 56.3 % in 2018, up from 45.8 % in 2017.

Figure 6: Enterprises by class size with Internet access (left) and the maximum download speed available (right)



Source: Institute of Statistics, 2018

As regards citizen broadband use, Albania has made great strides in Internet use and penetration. According to the 2019 INSTAT survey, for the use of ICT by individuals and families, it turns out that nationwide 82.2% of Albanian households have access to the Internet. More than 56.6% of them have a fixed broadband connection, and 88.9% of families have mobile internet access. 87.1% of Albanians use the Internet for various purposes, including social media, online purchases and digital financial services, but also increasingly engage with the public sector through e-services. Based on the statistics, there are a total of 1.5 million active social media users (or 51% of the population). The number of social media users accessing via their mobile is 1.3 million or 44% of population. The total number of monthly active Facebook users is 1.3 million of which 87% access Facebook via their mobiles.

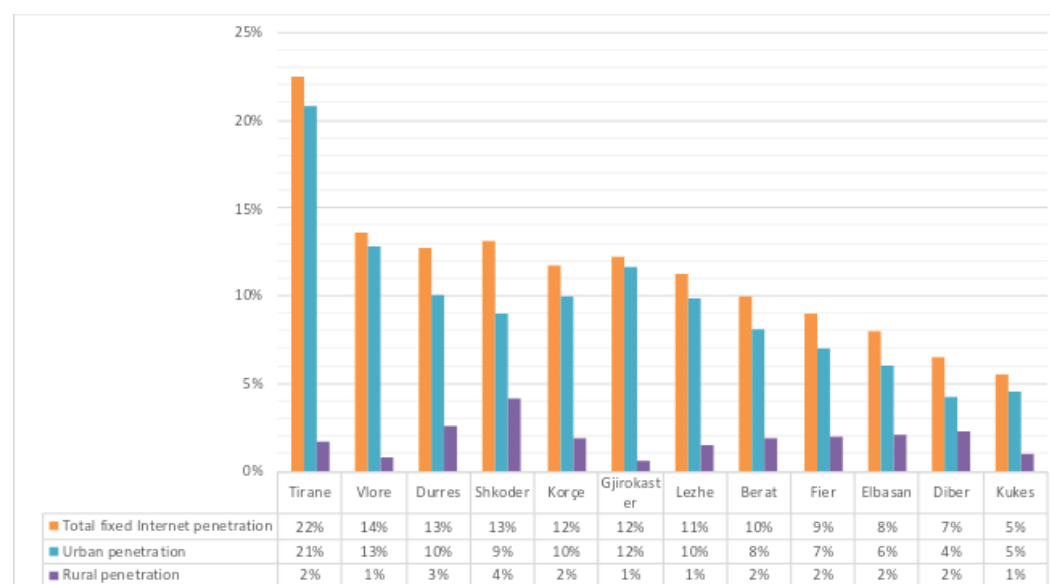
Moreover, the total Internet traffic on fixed and mobile networks has increased several times in recent years. Internet traffic in 2019, in fixed networks has doubled, compared to 2018; also the traffic of data communication in mobile networks continues to increase. With digital transformation of all economic sectors, development of vertical industry, innovative solutions of Smart Cities, digitalization of SMEs, demand for broadband, in particular fixed broadband, will likely come from different economic sectors, and B2B will be one of the key drivers.

Digital Divide

ICT infrastructure is relatively well developed in urban centers. However, there remains a significant gap between urban and rural areas: while rural areas represent 39.7% of the

population, only 3.4% of the population that lives in rural areas is connected to the Internet¹¹, although in some areas, this figure is higher. For fixed internet penetration, the urban-rural divide is particularly pronounced. While 12% of the urban population has fixed internet access, only 2% of the rural population has fixed Internet access. At the regional level this differs significantly.

Figure 7: Fixed total, urban and rural internet penetration by region 2019



Source: Based on AKEP data for 2019, and INSTAT for regional population figures January 2019

ITU identified the lack of rural connectivity as “one of the major gaps” that hampers growth in the country.¹² Rural and urban fixed line subscriber figures from AKEP from 2019 show that 50% of all fixed lines are in the region of Tirana, the average urban penetration is 25%, while the average rural penetration is about 5%.

Based on the results of the feasibility study, regarding the distribution of fixed broadband connections in 2019, almost 90% of the total fixed connections are in urban areas and 10% in rural areas. The Digital Divide in urban and rural areas remains high.

Key reasons for the persistent Digital Divide are lack of infrastructure and lack of institutional capacities, but also affordability, for both fixed and mobile broadband access, especially in rural and low-income areas. While there is a wide range of broadband speeds on offer in urban areas at a wide range of prices with an affordability of between 2-4% of GDP per capita, in rural areas the percentage spent of GDP per capita for speeds above 16 Mbps can be as high as 27%.¹³

¹¹ See: <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20180417-albania-report.pdf>. It should be noted that the lack of rural connectivity has spurred the government to focus on the development of rural broadband in particular, with for example the 2015 AKEP decision Nr.2648, which approves zones with low population density to expand and improve broadband services.

¹² See: ITU (2016), *ICT Centric Innovation Ecosystem Country Review Albania*. <https://www.itu.int/en/ITU-D/Innovation/Documents/Albania%20Country%20Review%20Innovation%20June%202016.pdf>.

¹³ See Sofrecom Study p. 56

The WBIF19 Digital Diagnostics Report 2019 provides detailed insights into the Digital Divide for the regions, identifying also that in most rural areas there are no or only one operator, whereas in urban or suburban areas, there is competition between local operators and at least one national operator.

In terms of network investment, most local operators invest in fiber networks in cities and tourist areas, whereas national operators invest mainly in city centers. There is an absence of investment in rural areas due to low or no profitability.

In small cities, copper technology is still the main solution for internet services, however further investments into copper are not foreseen in the future. In contrast, many rural areas are mainly served via wireless technologies (WiFi), if at all. Aerial cables are found in most cities and most of the villages. As regards mobile 4G infrastructure, it is present in the cities but not in all rural areas.

During the 2018-2020 period, it is observed that in many of these cities, small entrepreneurs have started developing fiber optic networks, while audiovisual operators, which previously offered only coaxial networks and TV services, have begun to change the main network (and in some cases the entire coaxial network), turning it into a fiber optic network, through which they are also offering internet service.

This is also observed in many rural areas, where new fiber optic networks have been invested and audiovisual coaxial networks with fiber optic have been improved, where wireless (WiFi) technology continues to be used in the 2.4 and 5.5 GHz bandwidth.

In recent years, AKEP has played an important role in reducing air networks, requiring fixed network operators to follow the technical rules set by AKEP, in terms of methods of their construction and security. In terms of 4G mobile infrastructure, it is present in cities and national roads, but not in all rural areas.

However, competition is more pronounced in the mobile sector, with all three operators being present in most areas. In relation to quality of service, it is relatively good in cities, however in rural and suburban areas, the quality of service is substantially worse, and needs improvement to enable e.g. municipalities to provide digital services to their citizens. The One-Stop-Shops are not functional in many LGUs, schools and hospitals are generally connected to the Internet however the speeds need improvement. In rural and remote areas, a significant proportion remains without connectivity.

Progress as regards NBP 2013 current objectives and targets

In a general look at the progress, regarding the overall objectives and goals of the National Broadband Plan 2013-2020, there is an achievement of objectives in relation to:

- ✓ Improvement and further development of broadband
- ✓ Increasing broadband penetration by more than double
- ✓ Increased competition and lower prices of broadband access

- ✓ Increased number of e-services available to Albanian citizens and digitalization of all services
- ✓ Increased awareness of the society regarding the benefits arising from the use of broadband
- ✓ A doubling of the number of families and companies that have access to broadband

Meanwhile, the realization of other objectives such as high-speed broadband internet connectivity for schools, broadband Internet in each classroom, the provision of internet services by post offices for a period of time, the facilitation of access with 100Mbit/s for 50% of families or 30 Mbit/s for everyone etc., remain partially realized or in process. To achieve these objectives, the Regional Broadband Development Project has been initiated and started with the support of WBIF.

Regarding technical and regulatory issues, regarding the implementation of the Plan 2013-2020, there have been a significant number of regulatory and legal developments that have stimulated the development of Broadband infrastructure. The main legal development is the adoption of law no. 120/2016 “On the development of high-speed electronic communications networks and the provision of the right of way”, which marks the beginning of a reform in the development of broadband infrastructure, creating spaces for the shared use of the existing utility infrastructure (transport, energy, gas, water supply) for Broadband Networks, encouraging the coordination of civil works in order to reduce costs, etc. However, the implementation of this law is still in its infancy and the package of bylaws for its implementation is expected to be completed. AKEP has undertaken several activities that include allocating spectrum frequencies for mobile broadband, removing technological restrictions on the use of the spectrum, creating an atlas for telecommunications infrastructure, and some decisions and regulatory measures have been taken which are directly or indirectly related with broadband development such as measures for shared infrastructure use, market regulation analysis, review of MTRs, removal of restrictions on spectrum use, measures to advance broadband security in rural and remote areas, and measures taken in the field of international roaming.

For a short period 2015-2017, the digital Albania fund was established to support rural and regional infrastructure development projects, ICT, e-government, e-learning, etc. However, the focus of ICT-related developments has been the digitalization of public administration infrastructure and electronic services.

On the basis of the Order of the Prime Minister No. 157, dated 22.10.2018 “On taking measures for the implementation of the broad sectoral / cross-sectoral approach, as well as the establishment and functioning of the integrated sectoral / cross-sectoral mechanism” which created Integrated Program Management Groups (“GMIP”) and Strategic Steering Committees to promote cooperation between institutions, various government agencies as well as corresponding policies and activities have been established thematic group for telecommunications and broadband, as part of the Strategic Steering Committee "Connectivity", headed by the Ministry of Infrastructure and Energy.

Since 2016, broadband development has been part of the National Single Pipeline.

In July 2017, in the framework of regional cooperation and European integration processes, the Economic Development Plan of the Western Balkan Countries, MAP-REA, was approved. The digital integration, and in particular the development of Broadband Infrastructure, are part of the important commitments of this plan.

During 2017, with the support of UNDP, a pre-feasibility study for broadband development focused on four regions and 13 municipalities was conducted.

Albania has applied to projects in the field of digital infrastructure, in all open calls under the WBIF for this sector and has benefited from several projects such as: Project for the Feasibility Study for the Development of Broadband Infrastructure. The grant amount for this project is 520,000 Euros. This project is currently being implemented and will be completed in May 2020. Also within the WBIF, the pilot project for the development of Broadband in rural areas (Shkodra, Kukës, Tropojë, and Dibër) has been approved for detailed design, environmental impact study and social and tender documentation, as part of the “100 villages” program. The grant required for this project is 700,000 Euros.

The regional project for the "Balkan Digital Highway" was also approved, with the participation of Albania, Montenegro, Kosovo and Northern Macedonia. The grant required for this project is 1,400,000 Euros (for the region). This project aims to increase the capacity of the digital connection in the region, through the joint use of fiber optic of transmission system operators for broadband.

In focus of the development of Digital Infrastructure and Broadband, is also the development of support infrastructure for research and innovation networks such as High Performance Computer (HPC).

A list of the main legal and regulatory developments as well as the Table with a summary of the general objectives and goals as provided in the National Broadband Plan 2013 and their implementation is given in the attached appendix.

The overall situation of broadband development in particular fixed networks and the pronounced digital divide between urban and rural areas shows the high need for significant investment in the development of broadband digital infrastructure and that investment only by the private sector in network development in particular in rural and remote areas is insufficient.

Sector Issues and Broadband Development Challenges

This section summarizes the main issues and challenges perceived by stakeholders regarding the development of Broadband infrastructure.

In the context of drafting this document, telecommunications operators say that for the further expanding and upgrading of broadband networks in Albania, they face complexities in obtaining construction permits, unclear enforcement of existing laws and regulations regarding rights of way/passage, lag in implementation of existing activities and measures

as included in decisions and laws passed, unfair competition from unlicensed ISPs, significant costs of network roll-out set against low or no return on investment in rural and remote areas, sole reliance on the private sector to invest into infrastructure due to the absence of public funding mechanisms such as State Aid provisions or a Universal Service Fund, limited availability of spectrum due to delays in freeing the digital dividend, and high spectrum fees for some bands.

The main issues raised by stakeholders are grouped into the following topics:

- ☐ Digital Divide and broadband infrastructure development financing and funding;
- ☐ The right of access and co-use of existing infrastructure;
- ☐ Spectrum management and,
- ☐ Fair competition.

Digital Divide and infrastructure financing and funding

ITU identified the lack of rural connectivity as “one of the major gaps” that hampers growth in the country. Albania has made progress in expanding broadband penetration and broadband infrastructure. Yet, the rural-urban divide persists. While there are a number of activities¹⁴ that seek to address expansion and build-out of infrastructure in rural and remote areas, little progress has been achieved to-date.

One key issue identified during the stakeholder consultation and stakeholder roundtable that slows or hinders broadband infrastructure development, in particular in rural and remote areas, is the absence of public funding mechanisms for broadband infrastructure, as well as the absence of the right incentives to invest. At the moment there is no Universal Service Fund and a mechanism for public contribution, no state aid, and no separate public budget at national or municipality level earmarked for the build-out of broadband infrastructure. Instead, the provision and build-out of infrastructure almost solely relies on commercial provision by network operators. The roll-out of infrastructure is very costly, in particular where there are little or no previous infrastructure, where population density is low and where accessibility due to challenging geography is difficult.

In these areas there is little or no incentive for operators to invest into infrastructure, given low average tariffs (see WEF Global Information Technology Report 2016 and Sofrecom Study 2017) and a low expected return on investment due to key population demographics such as low income, and relatively low willingness to pay. In this regard, a second issue raised by industry stakeholders as a key obstacle to achieving a digital society and the persistence of a digital divide concerns the finding that available NGAs are underused. In the major cities, where there are practically high-speed networks, the average speed of fixed broadband connections remains low, below 30 Mbit / s.

¹⁴ To address this divide, AKEP, with cooperation from MNOs, passed Decision Nr.2648, dated 03. 12. 2015, which approves zones with low population density requiring improvement of mobile broadband coverage and QoS for Telekom Albania, Vodafone Albania and Albtelcom. AKEP has cooperated with the local government authorities to provide the construction permissions for MNOs, and one MNO has already made the relevant investment in one of the designated areas. Decisions to offer broadband services in such areas have been taken in pursuance to decision No. 300 of the Council of Ministers (removing restrictions on technology and services) and in the framework of actions under the “Plan for Universal Service in the field of electronic communications 2013-2016”.

This is mainly due to the unwillingness or inability of subscribers to upgrade to and pay for the higher quality service, leading to ineffective use of available new generation access infrastructure (NGA). Moreover, quality of service is not just poor in rural and remote areas, but also an issue in the bigger cities. The cause of this has been highlighted as the prevalence of aerial cables that are susceptible to faults.

The roll-out and improvement of broadband access and connectivity can contribute to an improvement in the prevalent demographic variables by providing opportunities and access to e.g. education, public and commercial services and employment. Moreover, and as shown in the Sofrecom Study 2017, there is pent-up demand in rural and remote areas, with people in the four regions examined (Shkodër, Kukës, Dibër and Korçë) waiting for improved connectivity and preparedness to spend an extra (albeit low) fee per month to get access to the applications and services they need in the areas including personal applications, VoIP, business applications, e-health, e-government, education, public safety, e-Commerce and tourism.¹⁵

In order to ensure that the pent-up demand in rural and remote areas is met by an increased and improved supply, the right legal and regulatory framework for investment needs to be established, cooperation at all levels that promotes investment in digital infrastructure needs to be strengthened, and, most importantly and as put forward by the EU with its new State Aid Guidelines, a framework and mechanism for public funding needs to be created.

Access Regulation and shared infrastructure use

The second key issue identified that impedes the progress in infrastructure build-out and improvement is the current process of obtaining permits for construction and obtaining access to and sharing existing and alternative infrastructure. Almost all stakeholders stressed the difficulty and complexity in the process of obtaining construction permits, of getting access to and sharing existing infrastructure and resolving ownership disputes.

Stakeholders highlighted that the implementation and, particularly, the consistent enforcement of already existing measures, laws and decisions and associated activities is not properly undertaken. For example, an inventory of existing passive infrastructure of municipalities for reuse for broadband is still outstanding. In this regard, it is unclear whether the decision of the Council of Ministers no. 851 of 7.12.2016 “On the Transfer of Data on the Expansion of the Engineering Infrastructure Network of Municipalities” has been properly implemented. The decision mandates the institutions responsible for road infrastructure, water supply and sewerage companies, OSHEE sh.a., TSO sh.a, as well as other companies operating in the field of water supply and sewerage and electric networks, to submit to the responsible municipalities all updated cartographic data and material on the extent and capacity of networks and infrastructure lines and subsequently notify the municipalities of any changes to these networks. In addition, the implementing package of new law 120/2016 needs to be completed across and by all relevant actors, in particular by

¹⁵ See: Sofrecom Study 2016, p.22

local authorities who either own the passive infrastructure/ducts or have the authority to issue permission to build the network (municipalities, Road / Transport Authority).

As regards the process of obtaining construction permits, issues have been raised both for fixed and mobile network infrastructure roll-out. This is supported by the findings of the WBIF2019 Digital Diagnostics Report, which highlights that on average it takes 15 to 40 working days (municipalities' view) to provide permissions to the operators regarding civil works. Industry stakeholders highlighted that this can easily take much longer – up to 60 days. The WBIF Digital Diagnostics Report further finds that while ducts exist in several cities and in some cases in rural areas, access to them needs to be regulated. Moreover, in 50% of the Local Government Units (“LGUs”) there have been no requests for granting permissions for civil works constructions and a lack of organization from the LGUs among the several road construction projects regarding the ‘dig once initiative’ was found.

From the perspective of industry, on the mobile side BTS site acquisition and permission processes are too long and often delayed with many restrictions, which limit roll-out of new sites in time, thereby driving down yearly allocated MNO budgets for network roll-out.

On the fixed side, it is necessary to harmonize the rules for infrastructure permits applied by the Municipalities, the absence of dedicated personnel and expertise in municipalities, as well as the lack of assignment of clear responsibilities at the different regulatory bodies is also a difficulty.

The main issue remains the harmonization of the territorial planning legislation and the extension of the telecommunication network at the municipal level. It is necessary to regulate the procedures for prompt issuance of permits for infrastructure works, both at the national and local level, in order to speed up the process and encourage investments by operators.

In relation to sharing of existing infrastructure, cooperation with and between telecom operators, other utilities and municipalities is not working, but is urgently required to bring down cost of network roll-out using alternative existing infrastructure.

As regards regulation of access in backbone networks, currently there are two national backbone network operators, but only one is designated as having SMP and access tariffs for the other one's network are not regulated. This poses difficulties to obtain access to backbone infrastructure. To facilitate access it is necessary to take measures that include:

- Facilitate the co-use of passive infrastructure on non-discriminatory principles
- Speed up commercialization of OST fiber infrastructure as a possibility for more cost effective access on fiber for MNOs
- Symmetric regulation for Albtelecom and ATU for transparency of tariffs and services, access on passive infrastructure and optic fiber in inter-urban connection levels
- Price control of duct / optic fiber access
- Improving ATLAS information for electronic communication networks

A key finding of the WBIF19 Digital Diagnostics Report is the lack of a methodology at the level of LGUs when they are launching road constructions projects to develop the necessary

passive infrastructure for utilities and telecom networks. Infrastructure sharing could be enhanced by enforcing a model based on the principles of the regulated cost-based “dig once initiative”.

To this end, industry stakeholders emphasized that a number of activities are required, including the construction of the presently missing cable networks and purchase of equipment in the nodes on the level of (1) backbone networks to enable a seamless piece of infrastructure for TSOs to commercialize nationally - these networks can then connect cities with cities within national borders (within participating countries) and, (2) international networks to cross-border TSO OPGW sharing - these networks can then connect cities with networks in other countries, situated across the border (connecting neighborly countries). Moreover, energy-telecommunications infrastructure sharing will be one of the key vehicles to boost regional cooperation.

While a number of decisions and activities have been identified to address these issues, progress is slow. AKEP is cooperating with the local government authorities to provide the construction permissions for MNOs, as set out in the AKEP 2019 Annual Report. MIE is drafting general rules for procedures to grant rights of the way/passage for construction.

OST, the electricity provider, has recently been provided with Authorization by AKEP, for the provision of telecommunication services, the provision of access to OST fiber optics for Broadband.

Other recent activities by AKEP include a series of SMP remedy documents on LLU market analysis, broadband access (bitstream) and leased lines to address access, the Regulation No.35 dated 10.07.2015 "On joint use of passive infrastructure of public electronic communications network" to address infrastructure sharing, coordination with the electricity sector to provide information on power infrastructure to be used for broadband; cooperation with the Ministry/Government to prepare secondary legislation for the Law on the promotion of fast and ultra-fast broadband to facilitate the granting process of permits for civil work, cooperation with local authorities to grant permits for operators to deploy broadband infrastructure, especially in underserved areas with mobile services. Also, according to the Decision of the Council of Ministers no. 851, dated 7.12.2016, “On transfer of data on the extension of the engineering infrastructure network to the municipalities”, AKEP is cooperating with the municipalities to facilitate the process to collect data on telecom networks and identify gaps. The question remains whether this process is working effectively and whether the information is readily available.

Spectrum management

A third issue that impedes progress with regards to broadband infrastructure development regards the release of the Digital Dividend 2, i.e. making available the 700 MHz frequency band. Progress is slow mainly due to the fact that this band is currently used for television services and is administered by the Audiovisual Media Authority. Moreover, high frequency fees for microwave links in the V- and E-bands were raised as an issue by industry stakeholders serving as a disincentive to invest, particularly so in the context of 5G.

Regarding 5G, stakeholders also stressed that the auction of the 3.5 MHz band needs to be accelerated and undertaken in 2020 as a key objective of the National Broadband Plan.

As regards the release of the Digital Dividend 2 (frequency band 694-790 MHz),¹⁶ being a complex process, MIE, AKEP and AMA have organized several meetings to discuss important issues related to this process and the steps necessary for its implementation. Considering the time needed to carry out these processes AMA believes that the key challenge is to meet the deadlines set by EU Decision 2017/899¹⁷.

The second issue that was brought up by industry stakeholders pertains to relatively high spectrum fees for microwave links in the V-band (60 GHz) and the E-band (70/80 GHz). The microwave links using the V-band, or the E-band are a good alternative to optical fibers and well suited to supporting 5G (and broadband in general) due to their 10 Gbps to 25 Gbps data throughput capabilities¹⁸. Due to flexibility and low installation cost, these microwave links can be used for rapid deployment of mobile backhaul networks in any area (urban, suburban or rural).

As regards 5G, stakeholders stressed that 5G should be regarded as a key component of the Albanian Digital Society in particular in the context of mobile networks being more advanced in Albania than fixed networks as regards penetration. Hence, to achieve the goals of 5G service provision in 2021 as set out in the 5G Strategy, the 3.5 GHz band should be auctioned as soon as possible during 2020 and be a key part of the National Broadband Plan.

Fair competition

A fourth issue raised by industry stakeholders that was regarded as undermining sustainable broadband infrastructure development was unfair competition. Stakeholders highlighted that while the broadband market is characterized by significant competition, price competition is at times erosive and not sustainable in the longer term, as some offers are below the cost of provision, often provided by unlicensed ISPs.

Albania has one of the lowest fixed broadband tariffs not just in the EU and vis-à-vis regional neighbors, but also world-wide, scoring 7th in the Sub-Index on Affordability for fixed broadband tariffs in the World Economic Forum's Networked Readiness Index 2016.¹⁹ The issue of uncompetitive practices in broadband services is a deterrent to investment and

¹⁶ According to AMA, the development of mobile broadband infrastructure in Albania is related to the process for the release of Digital Dividend 2 (694-790 MHz). Based on the Decision (EU) 2017/899 of the European Parliament and of the Council of 17 May 2017 "On the use of the 470-790 MHz frequency band in the Union", by 30 June 2020, Member States shall allow the use of the 694-790 MHz ('700 MHz') frequency band for terrestrial systems capable of providing wireless broadband electronic communications services. Member States may, however, delay allowing the use of the 700 MHz frequency band for up to two years on the basis of one or more of the duly justified reasons. In Albania the 700 MHz band is currently in use by analog and digital operators for audiovisual transmission.

¹⁷ Decision (EU) 2017/899 of the European Parliament and of the Council of 17 May 2017 "On the use of the 470-790 MHz frequency band in the Union", by 30 June 2020, Member States shall allow the use of the 694-790 MHz ('700 MHz') frequency band for terrestrial systems capable of providing wireless broadband electronic communications services. Member States may, however, delay allowing the use of the 700 MHz frequency band for up to two years on the basis of one or more of the duly justified reasons.

¹⁸ See: <https://www.gsma.com/futurenetworks/wiki/mobile-backhaul-an-overview/>

¹⁹ See: http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf

Broadband development. Attention is required to address the issue of unfair competition practices or informal activity²⁰.

A second issue in relation to competition pertains to access to buildings for purposes of services provision. Private sector stakeholders have highlighted that while based on the law, owners of buildings should grant access to any service provider who wants to compete for end-customers, building owners do not grant access, often citing “exclusivity” to one provider as the reason. This practice is unlawful and should be stopped by the relevant authority. In this context, MIE is drafting rules on internal infrastructure for high-speed electronic communications networks and administration of access points in buildings.

In summary, the requirements for addressing the issues are given as in the table below:

Figure 8: Key Priorities for Broadband Development

<p>1. Broadband Infrastructure Build-Out</p> <ul style="list-style-type: none"> ✓ Infrastructure Mapping – improvement of Atlas ✓ Addressing of permits for construction by municipalities and ministries ✓ Improving infrastructure sharing by addressing the enforcement of regulations of rights of way / passage ✓ Promotion of NGN network build-out, including 5G ✓ Developing BB in public spaces/WiFi networks ✓ Addressing Security of Networks ✓ Finalization and implementation of 5G Strategy ✓ Strengthening Institutional Framework for BB Development 	<p>2. Strengthening of Financial and Broadening of Funding</p> <ul style="list-style-type: none"> ✓ Improvement of framework and incentives for private sector investment ✓ Review of Universal Service and Universal Service Fund ✓ Public Funding/Use of State Aid ✓ Use of International Assistance
<p>3. Spectrum Management</p> <ul style="list-style-type: none"> ✓ Complete the process and release of the Digital Dividend 2 (700 MHz frequency band) Public Stakeholder Consultation ✓ Consider Spectrum Fees 	<p>4. Sustainable Competition</p> <ul style="list-style-type: none"> ✓ Examine unlicensed practices and taking action ✓ Ensure diligent enforcement of existing laws and regulations

Source: Based on outcome of stakeholder consultation

²⁰ See: Sofrecom p.13

Strategic Vision and Objectives 2020-2025

This document defines as a vision:

Albania with Digital Infrastructure Broadband of high speed and very high speed across the country to build the fundament for a gigabit society

For the realization of this vision, the following strategic objectives of broadband development are defined:

- ✓ **Strategic Objective 1:** Sustainable development of broadband infrastructure
- ✓ **Strategic Objective 2:** Reducing the digital divide and providing broadband services comprehensive
- ✓ **Strategic Objective 3:** Increasing Demand for Digital Economy Development and a Gigabit Society

Based on the analysis and information presented in this document and the challenges and issues identified, and considering the aspirations to move in line with the European Union's strategies for creating a gigabit society, which are listed in summary in the appendix of this document, the general objectives of the first national plan for broadband development are still valid and are aligned with the defined vision and strategic objectives above.

The specific national objectives for broadband for the period 2020-2025 are as follows:

- ✓ **By the end of 2025**, to have Broadband penetration of 100% of households, businesses and public institutions, of which
 - ✓ 50% to have possibility of high-speed access with at least 1 Gbps (urban areas – Tirana)
 - ✓ 50% to have possibility of access with speed at least 100 Mbps
- ✓ **By the end of 2025**, 100% of households in rural and remote areas to have possibility of broadband access connection with at least 100 Mbps
- ✓ **By the end of 2025**, 100% of schools to be connected with high-speed broadband connection with 1 Gbps **By the end of 2025**, 100% of universities, to be connected with high-speed broadband connection with 1 Gbps Albanian Academic Network, to be part of European network of High Performance Computer (HPC)
- ✓ **By the end of 2025**, 100% of health centers and hospitals, to be connected with broadband high-speed of 1 Gbps
- ✓ **By the end of 2025**, to have a major city, the major transport corridors and strategic locations to be covered with 5G connectivity
- ✓ **By the end of 2023**, 50% of public spaces like parks, libraries and squares in all cities and villages to have free access to WiFi connection

Developing broadband digital infrastructure and achieving the strategic objectives requires large investments. The main challenges of broadband development are therefore related to:

- ☐ Promoting and supporting investments in broadband digital infrastructure
- ☐ Providing universal broadband service and creating support schemes to reduce the digital divide
- ☐ Improving the legal and regulatory framework for supporting investments in broadband infrastructure to ensure the rights of way and joint use of existing NGA infrastructure
- ☐ Developing sustainable and fair competition
- ☐ Increasing / strengthening institutional capacities responsible for the development of broadband, both at the central level (line ministry, regulatory body) and the local level in the municipalities.
- ☐ Coordinated and harmonized development of policies for the development of utility infrastructure to reduce the development costs of digital broadband infrastructure.
- ☐ Increasing demand through the development of digital services and increasing demand from the vertical industry through the development of applications and innovative solutions for smart cities, ICT applications in the field of transport, energy, other sectors of the economy, digitalization of SMEs;
- ☐ Development of high-performance computer networks (HPC) in the service of academic network and scientific research;
- ☐ Development of digital skills to increase the demand and benefits of using broadband infrastructure and all services and application developments, including IoT and the use of AI.

Supportive measures to achieve the objectives are as follows:

- ✓ **By the end of 2020**, to have established a clear process with clear responsibilities regarding the application and issuing of construction permits
- ✓ **By the end of 30.06.2022**, to have freed up the 700 MHz band from media broadcast operators and have reissued the 700 MHz band to MNOs
- ✓ **By the end of 2020-2021**, to have established Competent Broadband Offices (CBOs) and assigned responsibilities at municipality level
- ✓ **By the end of 2021**, to have established a US Fund, including a public funding mechanism and clear rules for disbursement
- ✓ **By the end of 2020**, to have adopted regulations for State Aid
- ✓ **By the end of 2022**, to have updated Atlas to include all active infrastructure operators and alternative infrastructure providers (utilities), both by entrepreneurs registered in AKEP for electronic communications networks, and by municipalities also, in accordance with the provisions of DCM no. 851 dated 07.12.2016 "On the Transfer of Data on the Extension of the Engineering Infrastructure Network to the Municipalities".
- ✓ **By the end of 2022**, to have created an inventory of alternative infrastructure that can be used for broadband, including utilities and passive infrastructure owned by municipalities
- ✓ **By the end of 2022**, to have established financing, funding and provision mechanisms for public WiFi networks
- ✓ **By end of 2022**, to have addressed any given anticompetitive practices that undermine the development of broadband infrastructure

Measures to meet objectives and priorities

To achieve the strategic objectives of sustainable development of broadband infrastructure, reducing the digital divide and providing broadband services, and increasing demand for the development of the digital economy and a Gigabit society, sector priorities for the period 2020-2025, include high level sector priorities such as: the promotion of construction of future generation networks NGN, development of infrastructure and fiber optic extension, including the development of Broadband Mobile Networks NGN, (release of the 700 MHz band and other spectrum for 5G,); advancing infrastructure mapping and infrastructure sharing at local and national levels.

Improving the atlas for the electronic communication infrastructure, including information about the network endpoint, information on existing passive networks that can be used for Broadband, completing an inventory of exiting passive infrastructure of municipalities for reuse for broadband; provide public funding of broadband infrastructure in rural and remote areas by improving the legal and regulatory framework to include public funding through USO and State Aid based on EU best practice. These measures need to be taken in this regard...

Private sector priorities pertain to the expansion of mobile broadband coverage country-wide and deep indoor coverage via the deployment of LTE in 800MHz. Moreover, there are plans to enhance capacities to meet increased demand for data, to expand fiber backbone and backhauling footprints, construct new sites to densify networks in urban and tourist areas and cover remote rural areas or isolated villages, increase the use of small cells to cover hotspots, and prepare network infrastructure for 5G introduction. To ensure that these priorities can be met, the focus will be on the correct and timely enforcement and implementation of existing laws and regulations for infrastructure access and sharing in relation to the rights of way / passage. Moreover, simplification of procedures and timely issuance by municipalities and ministries of construction permits and permits for site acquisition will be part of the measures to achieve key priorities, as well as ensuring that a regulatory framework is built on the principles of competitive sustainability and sustainable investments.

Improving the Broadband Atlas

Proposed activity:

- ✓ Improve Atlas and include infrastructure of all local operators that are currently not included and alternative infrastructure of utilities and municipalities that can be used for broadband development
- ✓ Improve data collection process through intensifying collaboration with local authorities, municipalities and institutions
- ✓ Update Atlas regulation and hold public consultation

Responsibility:

- AKEP, MIE
- Local authorities, municipalities
- Network Operators

Timing: 2020-2022

Improving the investment climate

Addressing the issuing of permissions for construction and site acquisition by municipalities and ministries are key priorities and a key pre-condition for private sector stakeholders to commit investments. In order to encourage operators to invest, significant improvements must be made in the application process, strict deadlines, and capacity building at the municipal level.

Proposed Activities:

- ✓ Improve procedures for construction permits for broadband network development, including a shorter and streamlined approval procedure
- ✓ Simplify current processes (list of documents required) – create exemption for different types of infrastructure projects, also in the context of small-cell deployment
- ✓ Improve coordination and collaboration between relevant local municipalities, ministries and regulatory bodies on broadband network issues
- ✓ Capacity and expertise building by assigning and appointing responsible in each municipality
- ✓ Organizing and annual national conference on broadband infrastructure

Responsibility:

- MIE for coordination purposes
- AZHT
- AKEP, other related institutions
- local municipalities and regulatory bodies for local coordination and to establish simplified procedures / one-stop-shop (e-Albania portal)

Timing: 2020-2022

Co-use of existing Infrastructure

A second priority identified by both, public and industry stakeholders to further infrastructure development in a cost-efficient manner is improving infrastructure sharing... This includes infrastructure sharing at the municipality level, in particular as regards port sharing, but also as regards the launching of road construction projects and the parallel development of necessary passive infrastructure for utilities and telecom networks. Regulating access to the existing backbone infrastructures (Albtelecom, ATU), as well as enabling the use of the OST fiber optic network, will increase competition in this segment of the market.

Proposed Activity:

- ✓ Address any regulatory barriers to infrastructure sharing
- ✓ Implement and enforce existing laws, regulations and recommendations on infrastructure sharing
- ✓ Address access to backbone infrastructure
- ✓ Address access to buildings
- ✓ Inventory of alternative infrastructure owned by utility companies and public buildings (Atlas inclusion)
- ✓ Inventory of passive infrastructure owned by municipalities

- ✓ Advance the licensing process for alternative infrastructure providers

Responsibility:

- MIE to address the finalization and implementation of existing laws and by-laws / secondary legislation by the end of 2020.
- AKEP – to address any regulatory barrier to infrastructure sharing
- Local municipalities – to ensure that laws are correctly enforced and to provide inventory of alternative infrastructure available for reuse
- Energy, transport, gas, water Regulators

Timing: 2020-2025

As part of the regulation of access to existing infrastructure there are also the measures for:

- Accelerating the commercialization of OST fiber optic infrastructure as an opportunity for more cost-effective fiber access for MNOs.
- Implementation of symmetrical regulations for Albtelecom and ATU, for tariffs and services transparency, access to passive infrastructure and fiber optics, at interurban level connections.
- Promoting cooperation between OSHEE and fixed network operators on the regulation and use of passive infrastructure, based on agreements between parties.
- Control over the price of pipeline / fiber optic access.
- Improving the information contained in ATLAS for electronic communications networks.

Quality of service and consumer protection

The National Integration Plan, for the 2020-2022 period, envisages the transposition of the new EU directive 2018/1972 / EU, Code of Electronic Communications (EECC), during 2021. With the amendment of the law on electronic communications, the consumer protection requirements will be improved.

In this context, AKEP will develop an online platform (a Measuring tool), which will provide citizens with the opportunity to make complaints in real time, related with the Internet service, for example with its quality. Any end user can use the platform to measure current internet speed, comparing it to the speed agreed in the contract. The same tool can also be used to verify the availability of universal service.

Through this platform AKEP will be able to analyze and publish data on the quality of service provided by Internet operators, displaying data on service quality (QoS), ranking of operators and handling user complaints by encouraging operators to provide high quality service according to the best regulatory practices developed in European countries.

5G Roadmap and implementation

In September 2016, the European Commission published its 5G for Europe Action Plan²¹, to boost the rollout of 5th generation telecommunications networks (5G) across the EU. The

²¹ 5G for Europe: An Action Plan

Commission stressed the need for a coordinated approach to ensure prompt deployment of the 5G technology throughout the Union. European telecom ministers responded in December 2017 by endorsing an ambitious roadmap for making Europe the world leader in 5G technology. The roadmap sets out the need to make the spectrum available more swiftly and in a more predictable manner so that 5G networks can be rapidly deployed, with the aim of:

- making 5G available in at least one city per Member State by 2020;
- promoting the rollout of 5G between 2018 and 2025;
- creating a “gigabit society” by 2025 by introducing 5G in major towns and cities, and along key transport routes.

Albania, being a candidate country for EU membership, is obliged to harmonize its national policies on electronic communications development with EU policies, which will be harmonized with the strategic objectives of the EU 2010 initiative on Digital Agenda for Europe²², as an umbrella strategy for information society development, and the EU 2016 strategy Towards a European Gigabit Society for 2025²³. The use of the Internet via mobile phones and Mobile Broadband networks is predominant in Albania. Mobile Broadband and 5G will be a key component of Albania's national infrastructure. Regarding the development of 5G networks, the aim will be:

1. Facilitate the timely availability of spectrum
2. Simplification of processes to reduce the administrative complexity of build permits
3. Address any environmental consideration and social development with minimal effect in the environment
4. Promoting awareness on opportunities and benefits for 5G
5. Guarantee of the network security and consumer protection

Proposed Activity:

- ✓ Finalize 5G roadmap, drafting an action plan
- ✓ Implement the key recommendations as contained in the 5G Strategy and Roadmap
- ✓ Implementing security/trust measures for networks according to best international practices

Responsibility:

- MIE – legal framework
- AKEP – allocation of available spectrum
- AMA – ensure that DD2 spectrum is available
- Municipalities – access to public infrastructure
- Network Operators – network build-out, access

<https://ec.europa.eu/digital-single-market/en/news/communication-5g-europe-action-plan-and-accompanying-staff-working-document>

²² Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2010) 245 final, *A Digital Agenda for Europe*

[https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC0245R\(01\)](https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC0245R(01))

²³ COM (2016) 587

- AZHT, Ministry of Health
- Other

Timing: 2020-2022

The low frequencies of the digital dividend band are ideal for covering large areas with a small number of stations. For MNOs the release and allocation of these bands is very important, in order to provide coverage in rural areas in an economically sustainable way. In some countries, including countries in the region such as Montenegro, the allocation of 800 MHz bands has been accompanied by specific coverage conditions for one or more usage rights to cover rural areas with low-density. The Ministry of Infrastructure and Energy will cooperate with AKEP to establish specific conditions for providing the rural areas with coverage, within the framework of the use of digital dividend band, being committed in taking the necessary regulatory measures for the development of networks, such as the right of way, harmonization of procedures and fees applied by municipalities (especially in rural areas), promotion of joint use of passive and active infrastructure of mobile networks in rural areas. According to the international practices, the use of these instruments is considered to be the most effective method for promoting the coverage of rural areas with mobile networks, enabling that BB access and reducing the digital gap with the urban areas.

WiFi networks for the public

Based on EU best practice of its WiFi4EU, an initiative that promotes free WiFi connections in and around public buildings, health centers, parks or squares, the build-out of public WiFi networks, will be an opportunity of making available WiFi for public centers in cooperation with municipalities, other authorities related to the development of ICT infrastructure, the Albanian Post etc.

Proposed Activity:

- ✓ Address questions of financing of new infrastructure, including provision of funding for public WiFi networks
- ✓ Create the possibility of public electronic services and internet connectivity provision in Albanian Post Offices locations

Responsibility:

- ✓ The key responsibility of coordination lies with MIE
- ✓ AKEP – to support on USO
- ✓ NAIS
- ✓ Ministry of Finance and Economy – State Aid
- ✓ Establishment of funds to support broadband infrastructure in rural areas / developments in agriculture - Ministry of Agriculture
- ✓ Regional Development Funds – construction of passive infrastructure
- ✓ Local governments – budget allocation for broadband networks / passive infrastructure
- ✓ Albanian Post
- ✓ Network Operators – private investment and build-out

Note: Some recommendations for an appropriate scheme for Albania are expected from WBIF/IPF8

Timing: 2022-2025

Addressing security of broadband networks

One key priority in broadband infrastructure development is the safe, secure and trusted use of broadband Internet access, which should be free of cyber threats.

Telecommunication networks are exposed to network damage, which can affect its integrity, resulting in unauthorized access to the network, loss of communication confidentiality, and the risk of availability of communication services, so necessary nowadays. Development trends in telecommunications, expected developments such as the transition to 5G generation networks, are expected to bring significant changes in communication with the introduction of new applications / communication models related to industry (transport, energy, health, etc.), with public institutions, communications between devices (Internet of Things (IoT), massive machine communications (mMMC), etc.) On a global level, these developments are associated with an increased attention to communication security issues on 5G networks.

Cyber-attacks have the potential to severely damage the exchange of information in critical information infrastructures. Law no. 9918 dated 19.5.2008 "On Electronic Communications in the Republic of Albania", as amended, foresees important measures to strengthen the security situation in the field of electronic communications and eliminate the effects of risks to National Security, which may arise from the commitment of private and foreign companies in of electronic and postal communications sector.

The legal obligations stipulated in Chapter XV of the law are applicable to all private companies, whether they are domestic or foreign. These obligations are accompanied by measures and sanctions that escalate, from fines to removal and revocation of the authorization on the basis of which they exercise their activity.

Pursuant to Article 122 of Law no. 9918 dated 19.5.2008, AKEP has approved Regulation no. 37, dated 29.10.2015 "On Technical and Organizational Measures to Guarantee the Security and Integrity of Electronic Networks and / or Services".

Regarding the implementation of technical and organizational measures, to ensure the security and integrity of electronic communications networks and / or services, AKEP has conducted inspections and measures have been taken in cases of violations found.

In terms of cyber security - during the past year, an assessment has been made by ITU (International Telecommunication Union) experts and the World Bank. Both reports provide some recommendations for Albania regarding the need to increase capacity for cyber security / CIRT creation. By order of the Prime Minister, AKCESK is working on the drafting of The National Strategy for Cyber Security.

Proposed Activity:

- ✓ Updating legal and regulatory requirements for broadband network security in line

with international standards

- ✓ MIE will collaborate with AKEP, AKCESK and private sector for increasing security in telecommunication/communication networks

The risk from the expected developments in the 5G networks will be analyzed and the appropriate legal / regulatory measures will be drafted / proposed according to the EU practice.

Responsibility:

- MIE – changes in the law on electronic communications according to the EU Electronic Communications Code, international best practice
- AKEP
- AKCESK

Timing: 2020/2021

Strengthening the Institutional Framework for Broadband Development

To ensure that the national broadband plan and its supporting activities can be implemented, the institutional framework needs to be strengthened. Institutional capacities across different ministries and municipalities need to be increased and in line with the EU's complementary initiatives to help reach the EU's Gigabit Society Objectives, Broadband Competent Offices need to be established, that serve as a single contact point in Albania at the national and local level.

Proposed Activity:

- ✓ Increase institutional capacities to ensure that the NBPD can be effectively implemented
- ✓ Establish Broadband Competent Offices at the national and/or local levels to serve as single contact points according to EU best practice

Responsibility:

- ✓ MIE
- ✓ AKEP
- ✓ Local Government, Municipalities

Timing: 2020-2021

Increased Demand - NGA Infrastructure Use

To achieve a digital society and reduce the digital divide, the use of existing NGA infrastructure and services need to be encouraged and increased. In the major cities including Tirana, where significant deployments of NGAs provide for the availability of very high-speed connections, the actual average connection speed adopted and used is very low 4 – 12 Mbit/s. This is mainly due the unwillingness or inability of subscribers to upgrade to and pay for the higher quality service, leading to ineffective use of available new generation access infrastructure.

Priority should be given to exploring ways to incentivize citizens living in NGA coverage areas to make use of or upgrade to higher speeds through e.g. demand stimulation. Moreover, quality of service is not just poor in rural and remote areas, but also an issue in the bigger cities. The cause of this has been highlighted as the prevalence of aerial cables that are susceptible to faults. Here, priority should be given to ensuring that infrastructure is moved underground.

Proposed Activity:

- ✓ Explore ways to incentivize citizens living in NGA coverage areas to upgrade to and use higher speeds through increased demand stimulation for Broadband services
- ✓ Promoting the use of electronic services and increasing digital skills to enable use
- ✓ Improve service quality by moving aerial infrastructure underground

Responsibility:

- ✓ MIE
- ✓ NAIS
- ✓ AKEP
- ✓ Local Governments, Municipalities
- ✓ MNOs
- ✓ Other

Timing: 2020 and following years

Sustainable development of broadband networks and green economy

Within the National Broadband Plan implementation, the development of broadband networks will include measures to promote environmentally friendly developments, such as the use of alternative technologies for communication systems (e.g. solar heating systems deployed at remote sites and stations), as well as measures to reduce environmental pollution from the use of electronic equipment.

Given the high sensitivity of the public, which constantly raised concerns about the possible damage caused by the emission of electromagnetic waves, AKEP during 2018 and 2019, conducted a monitoring campaign of electromagnetic field levels in public institutions such as schools, kindergarten, and hospitals. Measurements were also carried out near the transmitting antennas in cases when it was requested by the Office for Radiation Protection, which administered concerns about the presence of mobile antennas near the dwellings. In order to inform the public for the results, AKEP published them on the website www.akep.al; also the measurements were forwarded to the Office for Radiation Protection for further administration and evaluation.

In the Republic of Albania, the competent bodies which cover the main issues of non-ionizing radiation are the Commission for Radiation Protection (CRP) and the Office for Radiation Protection (ORP), in accordance of Law no. 10469, dated 13.10.2011 “On Protection from Non-ionizing Radiation”. These bodies are responsible for the drafting of regulations which determine the radiation limits, as well as the conduction of studies to prevent and maintain public health in our country.

AKEP conducts measurements of field transmission points, which are a concern, ensuring compliance with the guidelines published by the ORP and the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

The results of the measurements recorded so far indicate that the levels of radiation emitted by mobile antennas do not exceed the safety threshold, set by ORP and ICNIRP. ORP has assessed that no tested installation has exceeded the specified radiation safety limit.

However, it seems that there is still room for clarification when it comes to implementing the 5G technology. Concerns are increasingly being raised about the level of radiation added to the environment where we live and the consequences for human health. For this reason, AKEP, supporting the mission of the competent bodies CRP and ORP, will continue to perform measurements, in order to ascertain the field values and will monitor changes in electromagnetic field values, derived from the implementation of 5G technology.

In particular, developments related to 5G networks, in addition to the advantages of providing new services, with extremely high speed and quality in health care, energy, transport or education, have raised concerns about potential radiation hazards and safety.

5G networks (and 6G in the future) will use much smaller antennas compared to actual implemented systems. At the same time, the new antennas will achieve much better coverage and higher connection speed. They will also be less visible and produce less electromagnetic emissions. In fact, they can be compared to WiFi installations. To protect against radiation and increase safety, consumer protection, protection of public health against electromagnetic fields, the EU has adopted some clear rules and high levels of public health protection against electromagnetic fields (in accordance with Council Recommendation 1999 / 519 / EC).

Council Recommendation 1999/519/EC sets strict limits on public exposure to electromagnetic fields, in accordance with the 1998 guidelines of the International Commission for the Protection of Non-Ionizing Radiation (ICNIRP). This means that: EU limits for exposure to EMF of the general public, are always at least 50 times lower than international scientific evidence suggests they may have an effect on health. These limits are not binding on EU Member States. However, the European Code of Electronic Communications refers to them and calls on Member States to implement them rigorously.

[NGN network developments in Albania will be carried out in accordance with international practice and standards, ICNIRP guidelines and EU decisions .Broadening of financing and funding sources for broadband infrastructure development](#)

In Albania, a Digital Divide persists because the market fails to commercially provide broadband infrastructure and services in areas that are uneconomical. This is due to both, an absence of a framework for private investment that sets the right incentives and an absence of public funding mechanisms. Currently, broadband infrastructure is almost solely financed by the private sector. In uneconomical areas, there may be a role for the public sector to step in with a combination of investment incentives and public funding. MIE's

priorities therefore include the elimination of obstacles for investments in broadband specifically in rural areas. Moreover, MIE has put forward to bring on its way the improvement of the legal framework in relation to the USO provision to include broadband development...

While Albania has a general framework for state aid, which was approved by law in 2005, there is no state aid for broadband infrastructure development in practice yet. In November 2019, the Ministry of Finance and Economy approved Directive No. 92 on the rules for state aid in broadband development based on EU practice. In the EU, one of the guiding principles is that any state intervention should limit as much as possible the risk of replacing or excluding private investment, changing incentives for trade investments and distorting competition. When this principle is applied in the case of the development of broadband infrastructure, it must be ensured that public funds are used properly, and that state aid is complementary and does not replace or distort the investments of market actors.²⁴ In terms of investment priorities, MIE is working on a broadband development project where an investment estimate of € 48 million has been made at the application stage.

Proposed Activity:

- ✓ Adoption and implementation of regulation for state aid based on relevant EU regulations
- ✓ Raising awareness of state aid schemes for broadband in designated areas
- ✓ Application of state aid for broadband in designated areas and cases

Responsibility:

- MIE
- Ministry of Finance and Economy
- AKEP
- Other institutions related to broadband development in rural areas

Timing: 2020-2025

Universal Service Review and funding schemes

AKEP in 2017 with Decision No. 12 dated 19.04.2017 approved the document "Status of Electronic Communications Universal Service - 2017" with the conclusions that the inclusion of broadband access to the US scope in Albania would be premature in 2017 and the near future. At this point in time, Albania has not designated any US providers and there is no Universal Service Fund in place.²⁵ In light of the current state of broadband development and the persistent digital divide, it is necessary to review the definitions for the universal service as well as the financing and funding schemes.

The European Parliament and the Council of Europe, on 18 December 2018, adopted the Directive (EU) 2018/1972 on the European Electronic Communications Code (EECC). The

²⁴See: Decision <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:025:0001:0026:EN:PDF> dhe https://ec.europa.eu/regional_policy/sources/conferences/state-aid/broadband_rulesexplained.pdf

²⁵ See: ITU Questionnaire, Albania 2019

Code entered into force on 20 December 2018 and Member States must transpose it into national legislation, within a maximum of two years, by 21 December 2020.

The new EU regulatory framework (below the EECC) has brought, among other things, significant changes to the Universal Service. With regard to the universal service objective, the EECC establishes that:

- All consumers must have access at affordable prices, according to the specific conditions of the Member State, in Broadband access services at adequate speed and in voice communication services, according to the quality specified in the respective country, including network connection from fixed location
- Also, Member States may consider the affordability of the services cited above, which are not provided by fixed locations, in cases where they consider this necessary to ensure full social inclusion and economic participation of consumers in society.

Functional Internet access has been part of the US objective since 2009. The new regulatory framework includes Broadband Internet Access as an element of US. With regard to ensuring the availability of US, for areas where there is no service / coverage, the Code establishes that Member States have the right to designate one or more operators as US providers, when it cannot be provided through normal commercial practice or through other public policies instruments such as state aid funds or EU funds.

Based on the analysis of retail tariffs, Member States may decide that operators should offer tariff plans at the national level, different from those provided by normal commercial practices, in order to meet the needs of low-income consumers or users with specific needs (the elderly, users with disabilities, users living in remote areas). Member States may also decide to choose the option of direct customer support for communication services, which may be part of social assistance or the provision of coupons, in order to minimize market distortions.

Regarding the financing of US net costs, EECC determines that it can be realized through public funds and / or the contribution of industry / operators. This constitutes a change from the current regulatory framework in EU countries (and in Albania), which establishes that the net costs of US are borne by the US fund created with operators' contributions.

EECC determines that the adequate speed of Broadband Access on the Internet can be set by each Member State, according to national conditions and the minimum speed used by most consumers, taking into account BEREC reports on best practices related. Adequate Broadband speed should enable at least access to basic online services used by most individuals (e.g. e-mail, web page navigation, access to newspaper or news portals, online shopping services, access to e-Government services, social media, etc.). BEREC by June 21, 2020 will publish a report on best practices to help determine the adequate speed of Broadband Internet Access for US.

In accordance with the provisions of the Code, BEREC on December 6, 2019, published for public consultation the "BEREC - Report on Member States, best practices to support the defining of adequate internet access service" document. This document contains

information about the practices followed by EU countries, for the inclusion of the Broadband Access in US. Based on this document, it results that:

- Broadband access is part of US (under the current legal / regulatory framework), only in 9 EU Member States: Belgium, Finland, Latvia, Croatia, Malta, Spain, Slovenia, Sweden and the United Kingdom. The minimum download speed selected for US in these countries varies from 1 Mbps to 10 Mbps and only two countries have set the minimum upload speed.
- In the evaluation for the selection of the internet speed, most of these countries have used the 50/80 criterion, evaluating whether the speed set for US at the national level is used by:
 - o at least 50% of all households; and
 - o at least 80% of all households with Broadband connection.
- Other important criteria include the assessment of the expected availability of Broadband Access, the costs of US implementation, geographical surveys for Broadband Access coverage, the impact on market distortion, potential demands, etc.
- Currently, US costs for broadband are financed by industry in three countries (Slovenia, Spain and the United Kingdom) and in three other countries (Finland, Latvia and Sweden) a public financing mechanism has been established. The financial funds of US BB have been activated only in Spain (funded by industry) and in Latvia (public funds).

Albania has planned to review the law on electronic communications with the aim of transposing the new European Union Directive (EECC) during 2021. In this context, the legal provisions for the Universal Service for Broadband and funding mechanisms according to good European practices will be reviewed.

Proposed Activity:

- Review of the legal and regulatory framework for electronic communications in relation to universal service harmonized with European Electronic Communication Code
- Address question of whether to include Broadband in the USO based on new Electronic Communications Code (EECC)
- Address the questions of establishing a US Fund and using state aid for the development of broadband infrastructure
- Decide on US Funding contribution both from public and private funds, and the disbursement mechanism

Responsibility:

- MIE
- AKEP
- Ministry of Finance and Economy
- Network Operators

Timing: 2021-2022

After reviewing the status of US in 2017, AKEP estimated that one of the obstacles in using BB access is the high cost of end user devices (PC, laptop, tablets, smartphone) for the low-income population groups.

AKEP's statistical data collected by operators (offers) and INSTAT questionnaires on the use of ICT by households (demand), confirm the very high correlation between the number of families with BB access from fixed networks and the number of households with PCs. The government estimates that in addition to measures on the supply side to promote Broadband Access, it is necessary to take action on the demand side, such as supporting alternatives to provide end devices suitable for Internet access of the low income population groups. Providing these part of society with 1 PC / laptop or tablet would lead to an increase in demand for Broadband Access from fixed and mobile networks, and this accompanied with affordable offers for this service from fixed and mobile network operators, would lead to a greater increase in the use of Broadband Access and all the other already recognized economic and social benefits of using the Internet. In this context, measures taken by the Government, but also by the operators themselves, can have a positive impact in this regard, through the provision of smart mobile devices in tariff packages with reasonable monthly payments, as applied as in many European countries, including countries in the region.

Spectrum Management

In order to support the developments of Broadband Infrastructure, work is needed to be done in order to provide the necessary spectrum. The release of the digital dividend 2, will be done carefully in order to ensure the right spectrum available for the further development of broadband mobile networks and services, but also to ensure continuity in the provision of broadcasting services.

Spectrum must be affordable and should therefore be available at the right price to incentivize operators to supply services and build networks using different technologies.

Activities to address priorities in relation to spectrum will include the approval of the medium-to long-term spectral policy, and a review and update of the National Frequency Plan according to the International Radio Regulations and the European Allocation Plan.

Proposed Activity:

- ✓ Hold a Public Stakeholder Consultation
- ✓ Draft an action plan for the release of DD2 by 2020.
- ✓ Finalize the release of the Digital Dividend 2
- ✓ Analysis and Review of relevant spectrum fees
- ✓ Giving for use the free 800 MHz frequencies.
- ✓ Timely 3.5 GHz auction

Responsibility:

- MIE
- AMA, AKEP
- MFE

Timing: 2020-2022

Depending on technological developments and market demands, MIE and AKEP will collaborate in determining the technical criteria and conditions for coverage in rural areas,

for the unoccupied spectrum of the 800 MHz band (1x10 MHz paired). The tender of this spectrum, will be aimed before the one of the 3400-3800 MHz band, or it can be tendered in combination with the 3400-3800 MHz band.

Sustainable and fair Competition

To guarantee that market practices do not erode competition, private sector stakeholders highlight the need for a regulatory framework that is built on the principles of competitive sustainability and sustainable investments.

Proposed Activity:

- ✓ Investigate and address anticompetitive practices
- ✓ Analysis of relevant markets for broadband and regulatory measures
- ✓ Implementation and enforcement existing competition law
- ✓ Periodic regulatory activities by competition authority and stakeholders on competition issues in the broadband market

Responsibility:

- AKEP
- Competition Authority
- MIE

Timing: continuous

Innovative developments for the digital economy

Promoting the development of applications based on broadband networks such as smart city, Internet of Things (IoT), the use of artificial intelligence will be part of activities and measures within the implementation of the national broadband coordinated plan and activities of the Digital Agenda.

A summary of measures according to the objectives with the respective activities and measures, responsible institutions and deadlines will be presented in a concise manner in a separate annex at the end of the document.

Financing and Funding Models for Implementation

Albania, as many countries across the world, encounters some challenges as regards investment into high-speed internet infrastructure, especially in rural and remote, sparsely populated areas that are uneconomical to private investors. This is evidenced by the persisting digital divide. In densely populated areas, demand for broadband and willingness to pay is higher than in low-density areas, making a decent case for profitability in fully competitive, mainly urban areas, where operators invest, set against a medium-competitive area, where actors need to rely on sharing infrastructure and, lastly, areas where networks require state funding, as private investment would be loss-making.

It is the purpose of a broadband plan to develop the best financing and funding strategy that maximizes commercial coverage and provision to the largest proportion of Albanians.

This approach was also stressed in ITU's GSR 2019 Private Sector Chief Regulatory Officer Meeting's Outcome Statement, which stated that:²⁶

1. To connect those that are still not able to benefit from the digital revolution, new collaborative approaches are needed, including a broader involvement of the public sector;
2. Financing of infrastructure expansion for the remaining 49% cannot be solely done by mobile operators but requires concerted efforts from all stakeholders of the ecosystem;
3. The regulatory environment has to provide the right incentives to ensure that the largest possible coverage can be provided commercially; and
4. In areas that are uneconomical, the right balance has to be struck between regulation, public sector involvement and competitive market forces.

There are many different ways to finance broadband infrastructure development. In Albania to-date, the build-out of broadband infrastructure has been mainly financed by the private sector, namely network operators. No public funding has been provided and no public funding mechanisms exist in this area, except for funding through international technical assistance. The private sector has committed significant, albeit declining investments over the last 8 years, which totaled ALL4 billion in 2018.

The private sector continues to be committed to furthering broadband infrastructure development, with investment priorities for the period 2020-2025 focusing on upgrades and improvements across all parts of the network, including first mile, middle mile and last mile.

In the coming years, investment and contribution of the private sector will be significant, supported by international and European best practice measures.

To support the private sector and facilitate investment, AKEP in its Strategy and Action Plan for 2018 set forth favorable conditions for investors, including:

- Clear and sustainable rules for open development of broadband infrastructure and promotion of investment in fiber optic infrastructures;
- acceleration of procedures for allocation to operators of suitable spectrum for broadband services;
- acceleration of procedures to launch the Universal Service scheme; and
- support of broadband development initiatives in commercially unattractive areas.

On the public side, Albania has taken advantage of technical assistance from international and regional organizations, such as, for example, pre-accession assistance from the EU under the WBIF earmarked at €48 million for broadband development²⁷, a UNDP-financed Pre-Feasibility Study ("PFS") undertaken by Sofrecom in 2017, and the World Bank's 2017 study "Balkans Digital Highway".

²⁶ See: https://www.itu.int/en/ITU-D/Conferences/CRO/Documents/CRO10/CRO2019_chairman_report.pdf , GSR2019, 10th CRO Outcome Statement

²⁷ See: <https://www.wbif.eu/wbif-projects/details?code=PRJ-ALB-DII-001&ogtitle=Regional%20Broadband%20Infrastructure%20Development&ogdescription=PRJ-ALB-DII-001&ogimage=workspace://SpacesStore/bdace1e6-19dd-400a-b68a-2a5fa3e50358>

There was a fund for digital projects (“Digital Albania”) established/functioning during 2015-2017, which was used to fund eGovernment related activities. However, and as shown by the Sofrecom PFS 2017, without increased financial commitment and engagement by the public sector, the Digital Divide will persist.

For Albania, the three generic broadband financing alternatives include (1) investment by private companies, (2) Public-Private Partnerships, and (3) Public funding program / the use of state aid.

To achieve broadband targets stipulated in the Digital Agenda for Europe²⁸, the European Commission called upon member states to use “public funding in accordance with the EU rules for competition and state aid”.

To this effect, the purpose of using state aid in Albania would be to reach the national broadband targets and ultimately achieve the vision of universal high-speed connectivity towards an information society, supporting greater access to and use of services, higher quality of services and pro-competitive investments also in unprofitable areas.

The Sofrecom Study puts forward the use of Public Private Partnerships and Public Funding Programs / State Aid to represent likely suitable alternative funding mechanisms to extend infrastructure to areas with low profitability by region as follows:

- ✓ **Investment by private companies in Region 1**, namely Tirana, Durres, Fier
- ✓ **Public Private Partnerships in Region 2**, Elbasan, Lezhe, Berat, Vlore
- ✓ **Public Private Partnerships, and Public funding in Region 3**, namely Shkoder, Korce, Diber, Kukes, Gironkaster

Building on the results of the Sofrecom Study, an €0.5 million EIB grant was allocated by the WBIF in June 2018 for the next stage of the project – the undertaking of a feasibility study and creation of a development plan for efficient and smart investments in broadband infrastructure across the country. Total project costs were estimated at €48 million. Implementation of the study was meant to commence in July 2019 with an expected duration of 9 months. The ICT investments covered by the overall project will target better internet connection for schools, hospitals, public institutions, local administrations, and households as well.

According to European practice, there are a number of Broadband funding tools and resources, including Universal Financing, State Grants, and Foreign Funds. Particularly in the EU, the following funding tools are available for Broadband development projects:

- **Income-based financing:** the investor receives income from rent in the wholesale market of dark fiber, transmission services and infrastructure rental in the retail market or from connection fees.
- **Private capital and financial markets:** investment funds that provide financing for capital or debt, as well as hybrid solutions, e.g. intermediate financing.
- **Government-backed loans and bank bonds**, also recognized as collateral.

²⁸ See: <https://www.europarl.europa.eu/factsheets/en/sheet/64/digital-agenda-for-europe>, and Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, European broadband: investing in digitally driven growth, COM (2010) 472 final.

- **Public funds:** available at the local, regional and national government levels (in this context, state aid rules can be applied).
- **Public funding at EU level** through European Structural and Investment Funds (ESIF).
- **Bottom-up community funding:** shares are sold to a community company, which either implements and directs the network itself, or does so through suppliers.

There will be diverse funding sources to achieve the objectives for the development of Broadband Infrastructure, including investments from the private sector, which will continue to be the main contributor to the development of the telecommunication sector, grants or other forms of financing according to legal provisions.

WBIF: The EU Western Balkans Investment Framework supports investment in energy, environment, transport and social infrastructure, as well as private sector development projects. The digital sector is also likely to benefit from similar grants in the EU's expected programs for the period 2021-2027.

Public funding from local government units on the development of passive infrastructure in their possession, or for the development of certain projects to provide broadband coverage in the respective areas in line with European countries models, will be one of the forms of financing for implementation of objectives set.

Investments in the development of passive infrastructure on national roads, for the pipelines used for optical fiber extension, will be followed by ARRSH, according to the provisions of the legislation on the development of Broadband networks. Encouraging synergy in utility projects such as energy, water, gas, transportation, will also be an opportunity to reduce costs for developing Broadband infrastructure.

Coordinating activities for regional development, tourism, agriculture or rural development, with the development of Digital Broadband Infrastructure, will also be a way to address funding needs in white or gray area coverage. The line ministry and other institutions involved will be committed to find ways to support the development of digital infrastructure. The final results of the Feasibility Study will provide recommendations regarding appropriate funding mechanisms for Albania to achieve its Broadband objectives. A summary of the various financing mechanisms implemented in different countries is given in the attached Annex.

Mechanisms of implementation and monitoring

As regards the mechanism of implementation of the NBPD, a mechanism was established with the 2013 NBPD, which is still largely in place. However, some changes have occurred at the institutional and governmental level, which have impacted responsibilities and competencies of different institutions and agencies.

At the decision-making level, the key institution that is now responsible for broadband infrastructure development and implementation of the NBPD is the Ministry of Infrastructure and Energy ("MIE").

Based on the Prime Minister Order No. 157 of 22.10.2018 “On measures for the implementation of a broad sectorial / cross-sectorial approach, as well as the establishment and functioning of the sectorial / cross-sectorial integrated mechanism” Integrated Programme Management Groups (“IPMGs”) and Sectorial Lead Committees are created to promote cooperation between different government institutions, agencies and corresponding policies and activities. A specific “Thematic Group on Telecommunications and Broadband” (the former “Technical Secretariat”) was created in October 2018, which is part of the “Connectivity” Sectorial Lead Committee lead by the MIE with the participation of representatives of AKEP, and other related institutions.

A second change concerns the reorganization of the National Agency for Information Society (“NAIS”). NAIS is responsible for information society and eGov and coordination of all of the Government’s activities in the field of Information and Communication.²⁹

From an operational point of view, the “Thematic Group on Telecommunications and Broadband” under the Connectivity Sectorial Lead Committee will pursue the ongoing process of implementing and achieving the objectives for the development of broadband as contained in the NBP, and it will serve as the coordinating unit of the implementation for all relevant activities and stakeholders. As proposed as a key activity for the period 2020-2025, and in line with the EU recommendations, Broadband Competent Offices will be created to support the “Thematic Group on Telecommunications and Broadband” in serving as single points of contacts for the execution of concrete tasks and projects.

The development and in particular the promotion of broadband demand through increased use of public services will be coordinated through NAIS. Other relevant ministries, agencies, departments and local authorities will continue their roles, as far as they have not changed, in terms of implementation of the tasks and objectives assigned to them regarding broadband infrastructure development under the previous NBP.

Ministries and local public administrations will continue to cooperate with civil society and the private sector. Each of the relevant ministries, institutions and agencies will report periodically to the Thematic Group on Telecommunications and Broadband on the status of implementation of their activities.

The monitoring and evaluation of progress towards the achievement of the objectives will be based on periodic reports and key statistical indicators submitted by all relevant stakeholders.

Indicators for monitoring the development of broadband in Albania include:

- ✓ Access to networks / broadband services (number of subscribers and users, penetration rate of broadband and penetration growth rate)
- ✓ Broadband coverage area
- ✓ Competition (HHI in the retail and wholesale sectors)
- ✓ Price levels of broadband services (fixed and mobile broadband tariffs)

²⁹ NAIS’ main tasks and role are defined pursuant to DCM No. 673, dated 22.11.2017 on Re-organization of the National Agency on Information Society.

- ✓ Quality of broadband services (number of customer complaints and assessments, SLAs)
- ✓ Number of broadband services, applications and their use (indicators are growth of data downloaded from the Internet, number of available services and apps, types of downloads).
- ✓ Use of broadband in education and research (to be measured by the use of broadband in schools, universities and vocational training sectors).
- ✓ Use of broadband in health (broadband use by practitioners, specialists and hospitals, number of connected hospitals and health centers).
- ✓ Use of broadband to deliver government services (will be measured by the use of broadband by government and access is from the official websites of institutions users).
- ✓ Use of broadband by businesses (by number of employees who use broadband).
- ✓ Use of broadband by the community (population).

The DESI³⁰ index will be used to monitor the overall development of the economy and digital society, according to the model applied by the EU. The calculation of this index, will be done in cooperation with INSTAT, AKEP, AKSHI and other institutions related to the sub-indicators included in this indicator.

Costing of implementation

The WBIF's Feasibility Study, through the Broadband Development Cost Model Report, details the implementation costs of Broadband Infrastructure in order to achieve gigabit society. The report provides four development scenarios and a cost estimate for each of them over a 20-year period. For each of the scenarios, the values for investments in CAPEX and OPEX costs are calculated, ranging from 533 million Euros to 960 million Euros for CAPEX and from 253 million Euros to 323 million Euros for OPEX according to different scenarios as follows:

- Scenario 1: GPON technology, FTTH underground network for the entire territory of Albania
- Scenario 2: GPON technology, with combined underground and air network with FTTH for the entire territory of Albania (Percentage of air network with Fiber: 15% in urban area and 85% in rural area)
- Scenario 3: GPON mixed technology with underground and air network with FTTH and LTE Fixed Wireless Access Network for the entire territory of Albania (10% of the population covered with fixed wireless access (FWA) and 90% of the population with underground network / air with FTTH, GPON technology (using the percentages of the second scenario).
- Scenario 4: combined solution, mix GPON underground / air network FTTH for the whole territory excluding areas where there is no presence of schools, health centers, public buildings (main socio-economic drivers) using similar parameters for the combination as in the second scenario.

³⁰ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2019>

Annex 1: List of Regulatory Developments and Achievements since 2013

List of Legal and Regulatory Developments for Broadband since 2013

- “Plan for Universal Service in the field of electronic communications 2013-2016”³¹ and Decision No. 12, dated 19.04.2017 that approved the document "Status of Electronic Communications Universal Service - 2017"
- Decision No. 300 of Council of Ministers (dated 8 April 2015) “On removing restrictions on technology and services” was approved by AKEP’s council, amending Law No.9918 ‘On Electronic Communications in the Republic of Albania,’ paving the way for any of the nation’s cellular providers to launch 4G services.
- Spectrum allocation and award of the 790-862 MHz frequency bands for mobile communications and availability of the 694 - 790 MHz frequency bands for mobile communications until 2020
- Decision Nr.2648, dated 03. 12. 2015, which approves zones with low population density for covering them with broadband services and zones for services improvement
- A series of SMP remedy documents such as LLU market analysis, broadband access (bitstream) and leased lines
- Regulation No.35 dated 10.07.2015 on "On joint use of passive infrastructure of public electronic communications network"
- Regulation no. 37 "On technical and organizational measures to ensure security and integrity of electronic communications networks and /or services" passed in 2015
- Decision of the Council of Ministers no. 851, dated 7.12.2016, “on transfer of data on the extension of the engineering infrastructure network to the municipalities”
- Approval and adoption of the National Allocation Table by the DCM No 277 on 29 March 2017
- Regulation No.47 on the Implementation of the General Authorization Regime
- The DCM “On approval of the list of critical information infrastructures” was approved in 2018 together with the necessary secondary legislation.
- Order No. 157 (dated 22.10.2018) “On measures for the implementation of a broad sectorial / cross-sectorial approach, as well as the establishment and functioning of the sectorial / cross-sectorial integrated mechanism”
- AKEP has been coordinating with the electricity sector to provide information on power infrastructure to be used for broadband
- AKEP has been cooperating with the Ministry/Government to prepare the secondary legislation for Law on the promotion of fast and ultra-fast broadband to facilitate the granting process of permits for civil works
- AKEP has been cooperating with local authorities to grant permits for operators to deploy broadband infrastructure, especially in underserved areas with fixed and mobile services (AKEP Action Plan 2019)
- MIE together with external experts and market stakeholders has developed a 5G Roadmap and Strategy for Albania “Expert Report: 5G Strategy for Albania – Roadmap for the 5th generation of mobile communication in Albania”, July 2019

³¹ See: [AKEP Steering Board Decision No.2324, dated 28.06.2013](#)

Overview of Progress regarding general objectives and 2013-2020 goals

General Objectives	Attained	Not Attained	2013-2020 Goals	Attained	Not attained
Improvement and further development of broadband	✓		Doubling the number of households and companies that have access to broadband connections no later than the end of 2017	✓	
Increasing penetration of broadband	✓		100% of schools with at least a broadband internet connection in each class		X
Provide Internet with high speed and reliability at local, regional and national level, including remote and rural areas		X	100% of universities with broadband Internet connection with high speed		X
Increased competition and lower prices	✓		100% of post offices to offer at least a broadband Internet connection to citizens		X
Increase in the quality of service	partially		100% of health centers and hospitals with at least one broadband Internet connection		X
Expanding the number of e-services available to Albanian citizens and digitalization of all public services	✓		Facilitating access to high-speed transmission, at least 100 Mbps to 50% of households and at least 30 Mbps for all Albanians		X
Raising awareness of the society, including people with special needs, regarding the benefits arising from the use of broadband	✓				

Source: Author, Stakeholder Consultation

Annex 2: EU Broadband Targets and Gigabit Society Strategy for 2025

The Commission's strategy on Connectivity for a European Gigabit Society, adopted in September 2016, sets a vision of Europe where availability and take-up of very high capacity networks enables the widespread use of products, services and applications in the Digital Single Market.

This vision relies on three main strategic objectives for 2025:

- Gigabit connectivity for all of the main socio-economic drivers,
- uninterrupted 5G coverage for all urban areas and major terrestrial transport paths, and
- access to connectivity offering at least 100 Mbps for all European households.

The strategic objectives confirm and build upon the previous broadband objectives for 2020, which include targets for high-speed internet infrastructure and services as follows:

- 30 Mbit/s coverage or more for all in Member States of the European Union (EU);
- 50 per cent of households to have 100 Mbit/s subscriptions or higher.
- Furthermore, it calls for 5G connectivity to be available in at least one major city in each Member State by 2020 at the latest.

The Commission has also launched a series of complementary initiatives to help reach these objectives: The new **European Electronic Communications Code**, proposed by the Commission and agreed on by the European Parliament and the Council end of 2018, will boost investments in very high capacity networks across the EU, including in remote and rural areas. Further actions

include a 5G Action Plan, an initiative to bring free access to WiFi connectivity (WiFi4EU) in public spaces like parks, libraries and squares, the Connecting Europe Broadband Fund supporting the financing of broadband network infrastructure and the Connecting Europe Facility (CEF) stimulating the deployment and modernization of broadband networks. The CEF Digital strand as a part of the new EU 2021-2027 budget, should finance strategic digital connectivity infrastructure with EUR 3 billion and will be decided by the end of 2019. An initiative on mapping of broadband data will provide an interactive online application visualizing availability of broadband and quality of service on a European scale.

The Commission's state aid rules allow for the use of public funding for investments in broadband networks, when these investments bring substantial improvements to the existing networks (so-called "step change").

The Multiannual Financial Framework (MFF) reflects the Commission's strategic infrastructure investment priorities. The MFF has been adjusted for 2019 and a modern, long-term budget proposal for 2021-2027 period has been made.

Source: See <https://ec.europa.eu/digital-single-market/en/broadband-europe>

Annex 3: Overview of different Financing and Funding Models and sources across different countries

Financing models define how the deployment of broadband networks can be financed by public funds and private investments. Public intervention should focus on reducing the cost of investment and, where necessary, provide public funding within the policy framework of national strategies, while making sure that private investment is not displaced.

Investment models present involvement opportunities, especially interesting for a public authority that engages in regional broadband development. The choice of a model is based on the economic situation. Four investment models can be identified:

- **Publicly-run municipal network model / Public DBO model:** In this model, the public authority builds a broadband network in the municipality, county or region (DBO refers to as design, build and operate). The deployment is run and directly controlled by the public authority. This model has been successfully applied in Argentina Connected, Lithuania RAIN project and Qatar, QNBN.
- **Privately-run municipal network model:** In this model, the public authority procures the building and operation of a broadband network in the municipality, county or region from a private actor (also referred to as public outsourcing or concession model). The contracted private firm generally builds an open, operator-neutral network over which competing service providers can deliver their services to all end users. The public authority keeps ownership of the passive infrastructure but the operation contract with the external firm is typically in the form of indefeasible right of use (IRU) of e.g. twenty years.
- **Private Design Build and Operate model (DBO):** a private-sector organization receives public funding (often a grant) to assist it in deploying a network offering open wholesale access. The public sector has no role in the ownership or running of the network. This model has been successfully used in the Dominican Republic Rural Broadband Connectivity Project, in Malaysia (NBI), in Mongolia's ICT Infrastructure Development Project in conjunction with the government of Mongolia, the government of Japan and

the World Bank, in Pakistan's USF Broadband Programme, in Saudi Arabia's Universal Service Project and in relation to Singapore's NGN BN.

- **Bottom-up or local community broadband model:** In this model, the broadband investment is carried out as a private initiative by local residents (bottom-up approach). Such projects have generally been very successful in driving the take-up rate among the end users and in building financially sustainable cases. The degree of competition varies between projects using an open network business model with good levels of competition to others acting as vertically integrated operators or procuring services from one operator for a number of years. The public sector has no role in owning or running the infrastructure, but it can support co-financing and right-of-way (RoW) granting, regulate and coordinate with other infrastructure deployments and access to public infrastructure and points of presence to provide backhaul connections. Public authorities can also help establish fair conditions for all operators seeking access to the infrastructure. Successful examples include private initiatives in the UK, Finland (eRegio in North Karelia), Sweden (Rural Development Programme) and in the Netherlands (OnsNet project in Nuenen).
- **Operator subsidy model/ gap-funding:** In this model, the public authority is not directly involved in the broadband deployment projects of the region but subsidizes one market actor to upgrade its own infrastructure. Incumbent telecommunications operators and large alternative providers usually own the passive infrastructure, active equipment and offer services to end users in a vertically integrated model. The public authority funds the gap between what is commercially viable and the coverage that the public authority aims to achieve. Funding is offered as a grant to one or more private operators. This has been successfully implemented in Germany.

There are a number of financing tools and funding sources for broadband, that include Universal Services Funding, Government grants, and external funds. In the EU specifically, there are the following financing tools available for broadband development projects:

- **Revenue-based financing:** investor receives revenue from wholesale dark fiber lease, transmission services and retail infrastructure lease or connectivity fees.
- **Private capital and financial markets:** investment funds that provide equity or debt financing as well as hybrid solutions, i.e. mezzanine funding.
- **Government-backed bank loan and bonds,** also known as guarantees.
- **Public funds:** available at local, regional and national government levels (in this context state aid rules might apply).
- **Public financing at EU level** through the European Structural and Investment Funds (ESIF).
- **Bottom-up community financing:** shares are sold to a community company, which either implements and runs the network itself or commissions this through suppliers.

See: ITU "Developing Successful Public-Private Partnerships To Foster Investment In Universal Broadband Networks" at https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-THEM.17-2013-PDF-E.pdf , and EU <https://ec.europa.eu/digital-single-market/en/financing-broadband-project>, <https://ec.europa.eu/digital-single-market/en/investment-models>