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AUTORITETI RREGULLATIV I KOMUNIKIVE ELEKTRONIKE DHE POSTARE
REGULATORNI AUTORITET ZA ELEKTRONSKE I POŠTANSKE KOMUNIKACIJE
REGULATORY AUTHORITY OF ELECTRONIC AND POSTAL COMMUNICATIONS

Broadband Mapping and QoS Aspects Kosovo Experience

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Regulatory Authority of Electronic and Postal Communications

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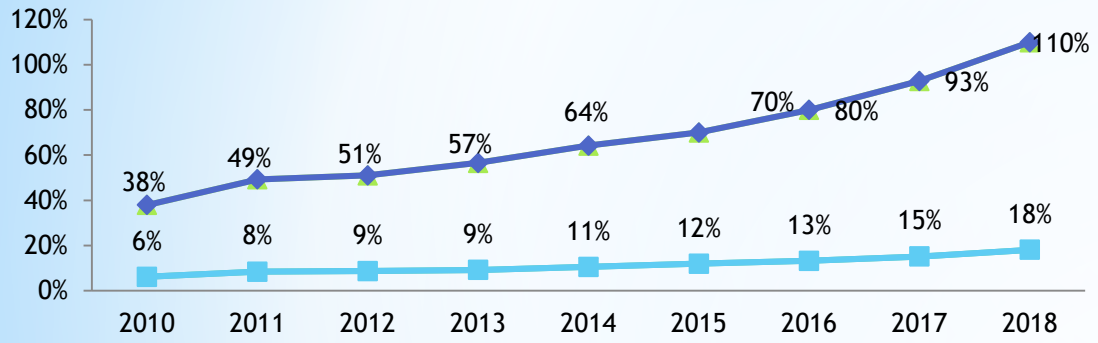
Presentation Outline

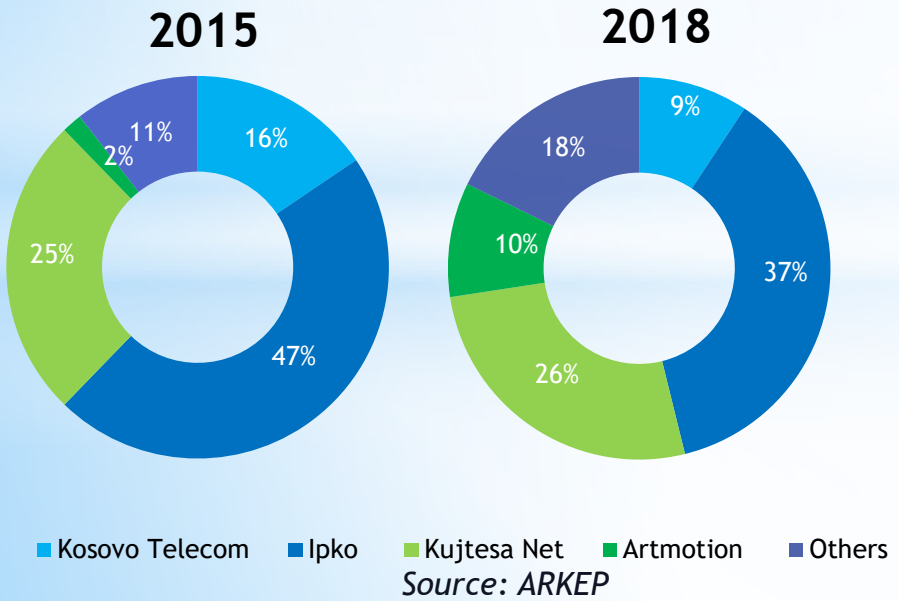
- Broadband market insights
- Key Strategic Documents related to development of broadband
- Infrastructure and Service mapping
- Mobile broadband service mapping and QoS

Broadband insights - Fixed Market

Fixed Internet Penetration rates [%]



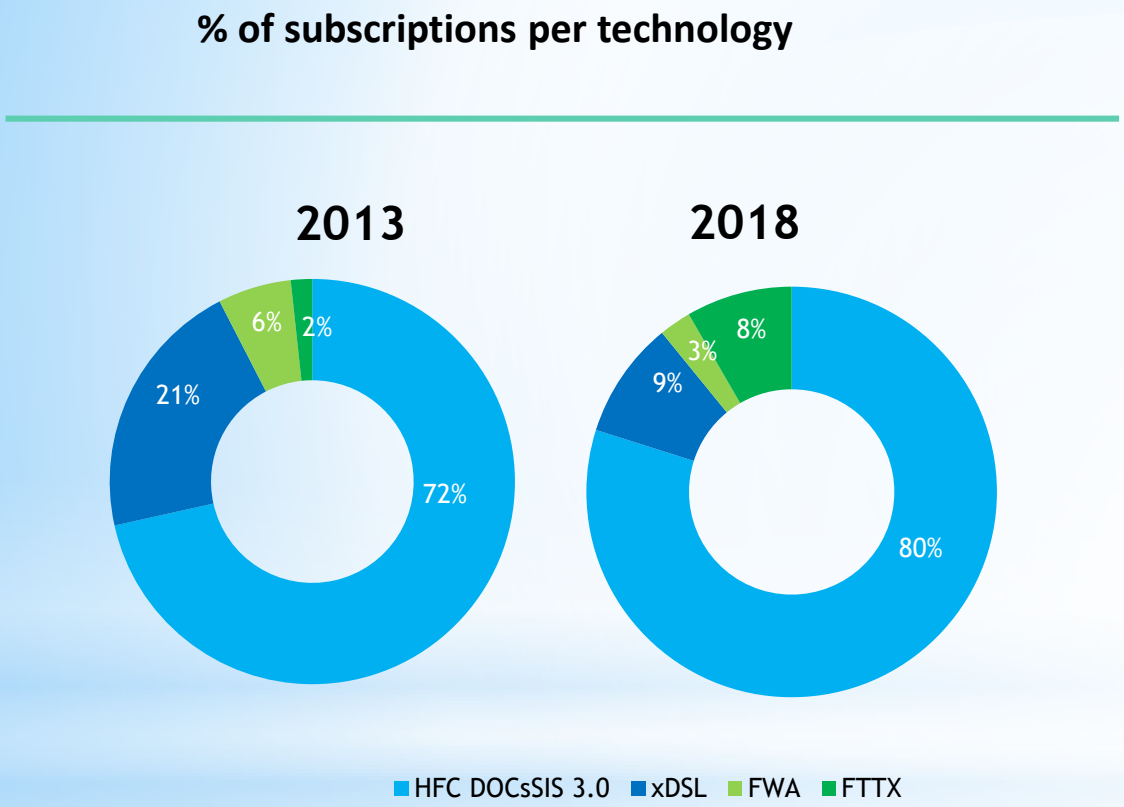
Market shares (% subscriptions)



Source: ARKEP

- Broadband penetration has reached 18.8% per population and above 110% per household;
- The number of ISPs active in the market may appear impressive in Kosovo is 53;
- Higher number of players in the market and specially the growth of local ISPs are factors contributing to lower the HHI over the last years;

Broadband insights - Fixed Market



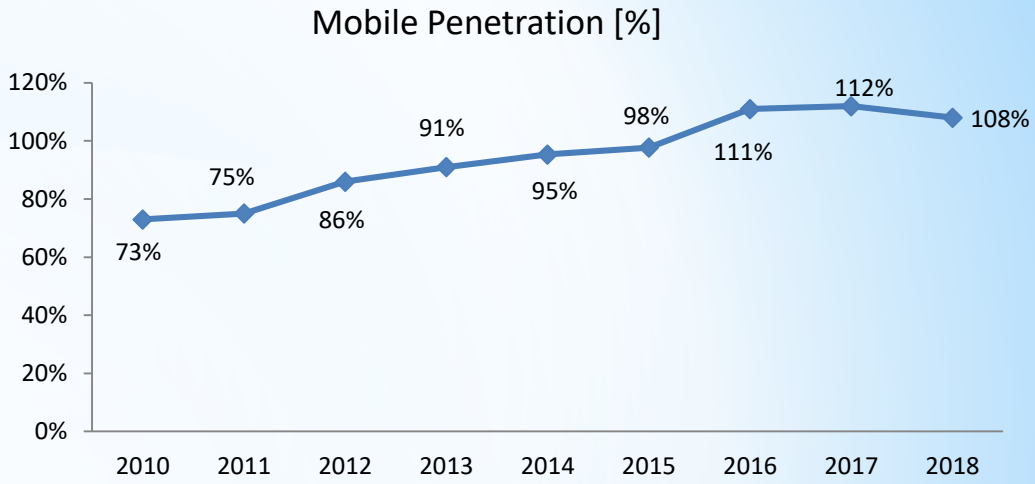
Source: ARKEP

- In terms of technology used, HFC DOCSIS 3.0 is the major technology which connects 80% of households, xDSL 9% , FTTX 8% and 3 % of households are connected through FWA over unlicensed band 2.4 and 5.0 GHz;
- As you see, Kosovo presents a unique situation where Cable operators have traditionally been the preferred mean of connection;
- All operators provide services based on their own infrastructure;
- Main ISPs are interconnected through fiber in KOS-IX and with all neighboring countries;
- Main ISPs also provide international connectivity for local ISPs;

Broadband insights – Mobile Market

- Four mobile operators (2 MNO & 2 MVNO) are active in the market;
- Currently all MNOs offer mobile broadband services 3G(UMTS /HSPA), and 4G (LTE);
- Active mobile phone users (use in the last 3 months of the year) in 2018 was around 1.97 million;
- Mobile broadband users who have used at least once during the last 3 months of 2018 was 1.8 mil while the active broadband users number are 1.2 mil;
- Penetration mobile broadband of the population for users (3G/4G networks) at the end of 2018 has reached 65% of the population.

Source: ARKEP



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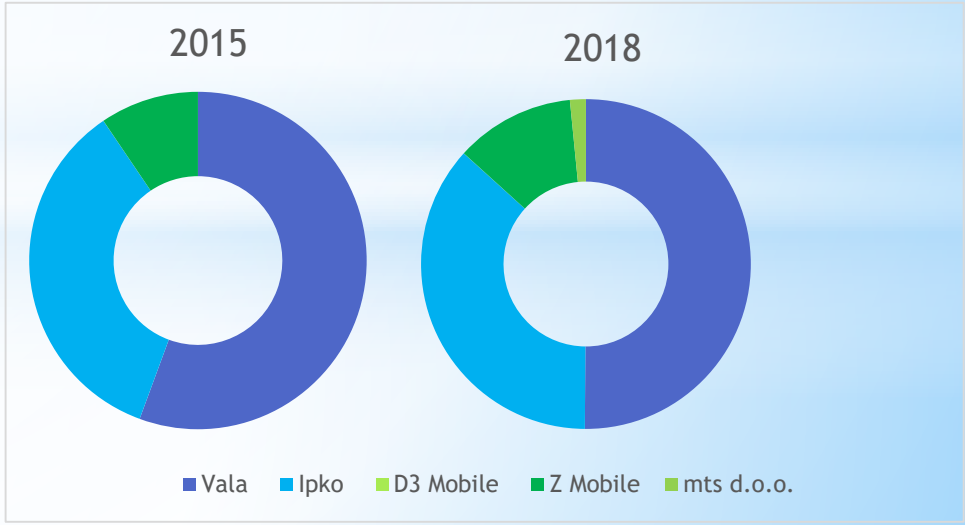
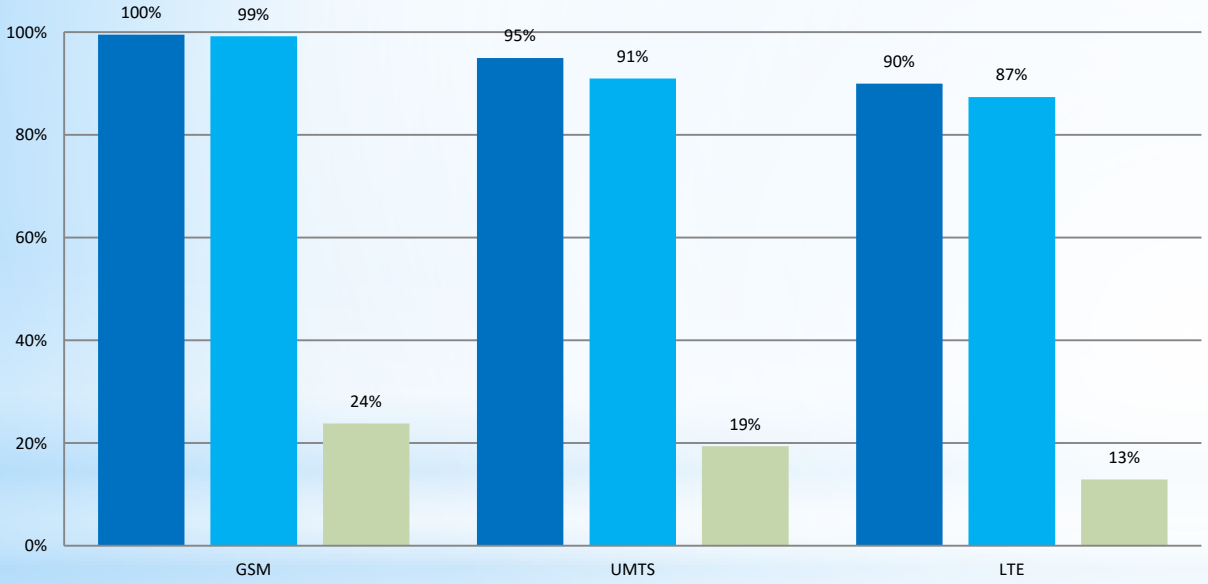
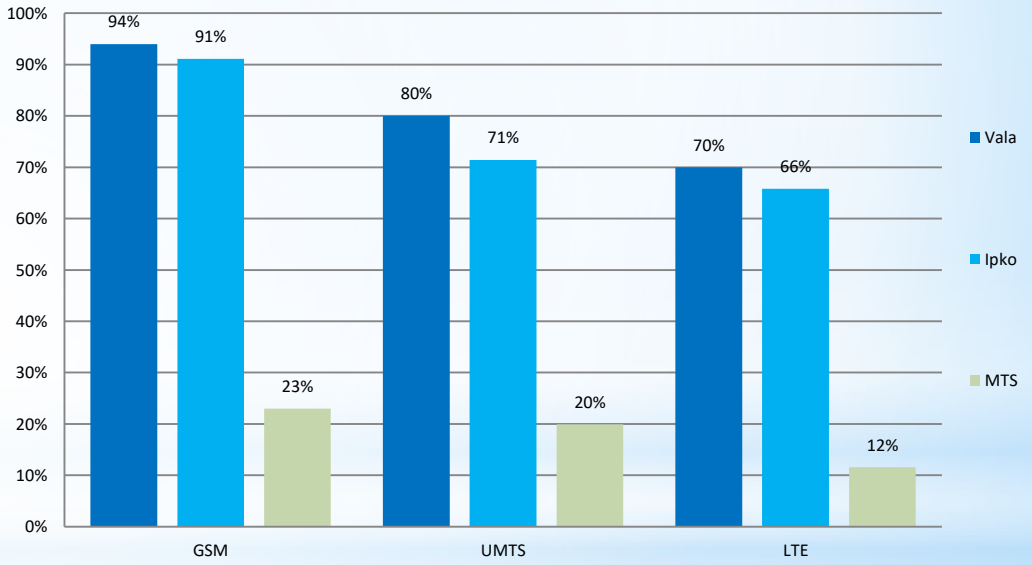


Broadband insights – Mobile Market

The coverage of Mobile Technologies based on Population Covered (%)



The coverage of Mobile Technologies based on Territory Covered (%)



Source: ARKEP

Key Strategic Documents

- Law on Electronic Communications No 04/L-109
- Electronic Communications Sectorial Policy- Digital Agenda for Kosovo 2013-2020

Main blocks of the Policy - Digital Agenda for Kosovo 2013-2020

Development of ICT infrastructure

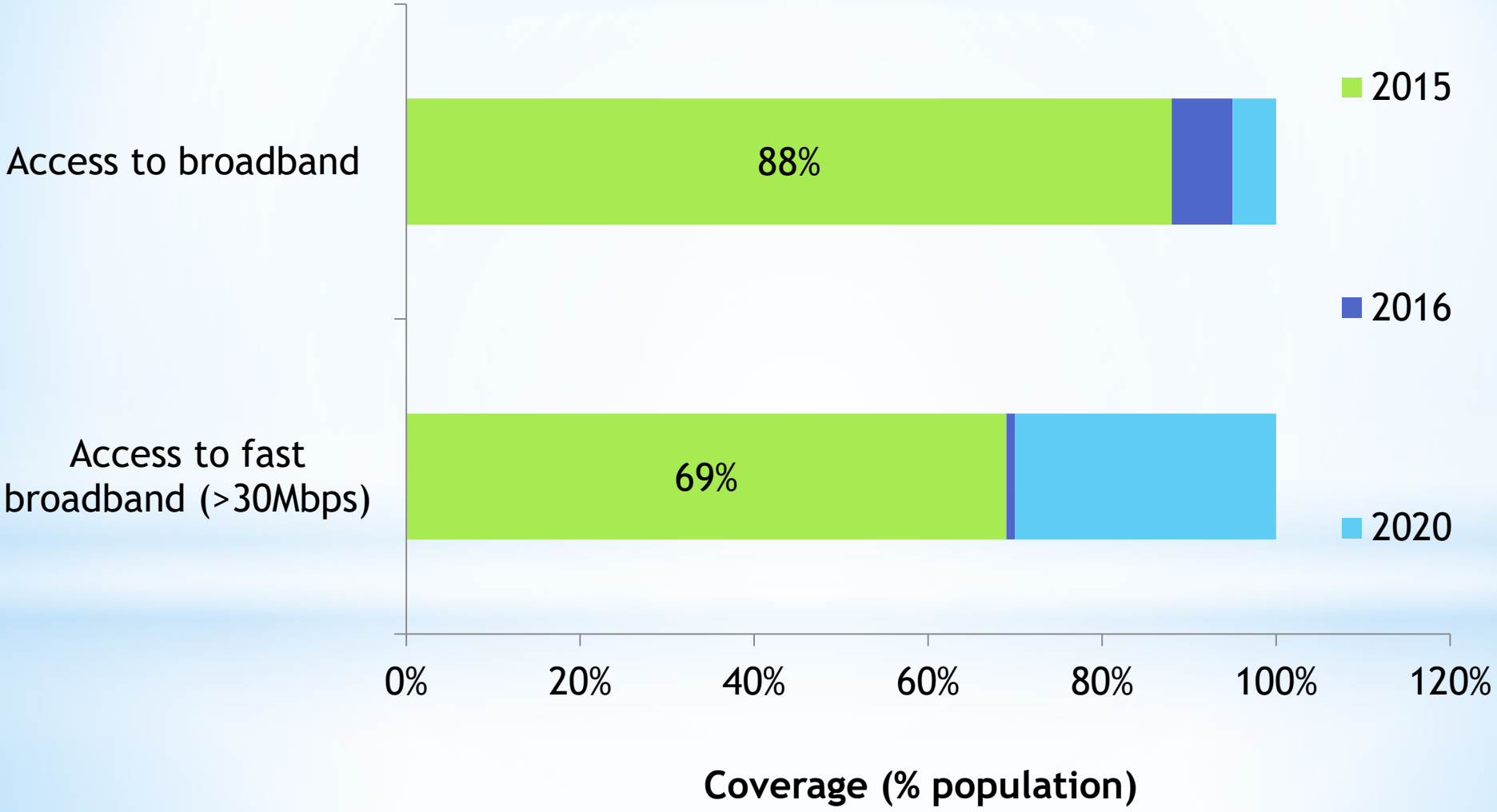
Development of the electronic content and services and promotion of use thereof

Development of ICT knowledge and skills

The Digital Agenda puts effort in targeting the issues:

- identified from the demand and supply point of view
- creating incentives for the deployment of NGA networks and
- developing telecom initiatives to improve broadband adoption by Kosovar citizen

Digital Agenda for Kosovo objectives in terms of broadband infrastructure



Reaching Digital Agenda objectives

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2013

- Decision on refarming GSM frequency band 900 and 1800 MHz for provision of 3G and 4G services in existing band;

2015

- Additional capacity where granted to the MNO in 1800MHz Frequency band

2019

- Adaption of Mid Term Frequency Bands Awarding Plan

Ministry of Economic Development

- Kosovo Digital Economy Project for Kosovo-KODE

The main objective of the project is to improve access to high-speed broadband services in rural/underserved areas, online knowledge sources, services and labor markets among citizens, and public and academic institutions

- Broadband Atlas

KODE project implementation

KODE is supported from the World Bank and direct financing from budget

Main objective to facilitate deployment of high-speed broadband connectivity in areas that have been identified as not connected or ISPs should roll-out optical fiber from the access point till subscribers premises.

Cost-oriented, non-discriminatory and open access to enable competition

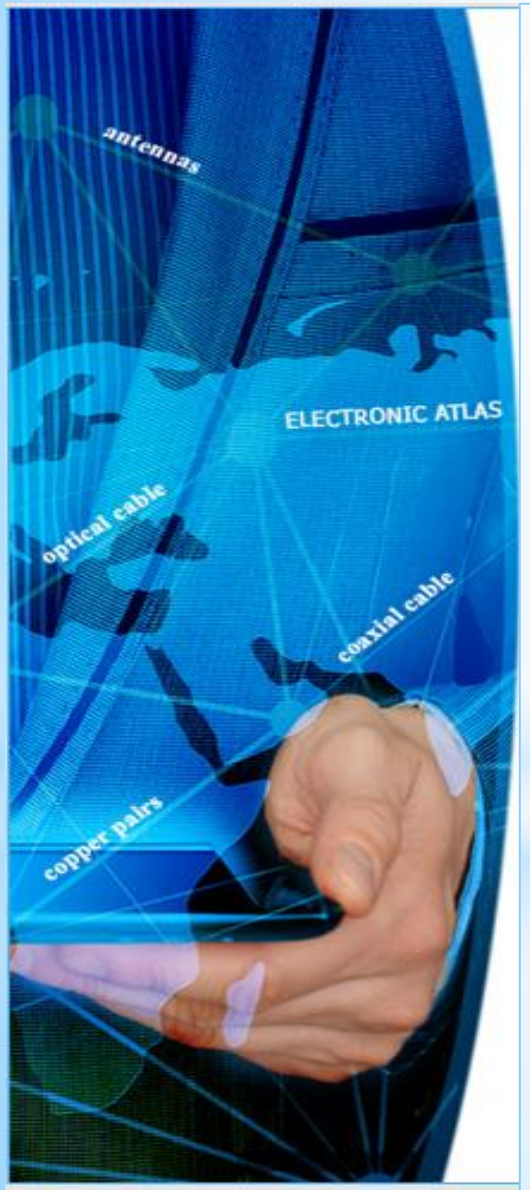
2018

- 1.8 mil € where granted
- 40 Cadastral zones in 12 Municipalities
- 19,405 Population covered
- 54 Public institutions

2019 – 2023

- Financing from grants
- 10 mil € Project budget
- 40 Cadastral zones in 12 Municipalities
- 19,405 Population covered
- 54 Public institutions

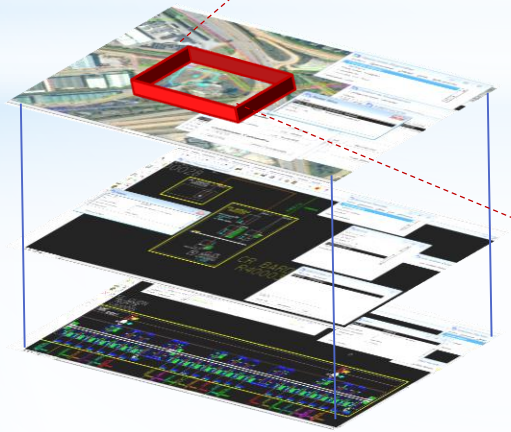
Infrastructure and service mapping Broadband Atlas

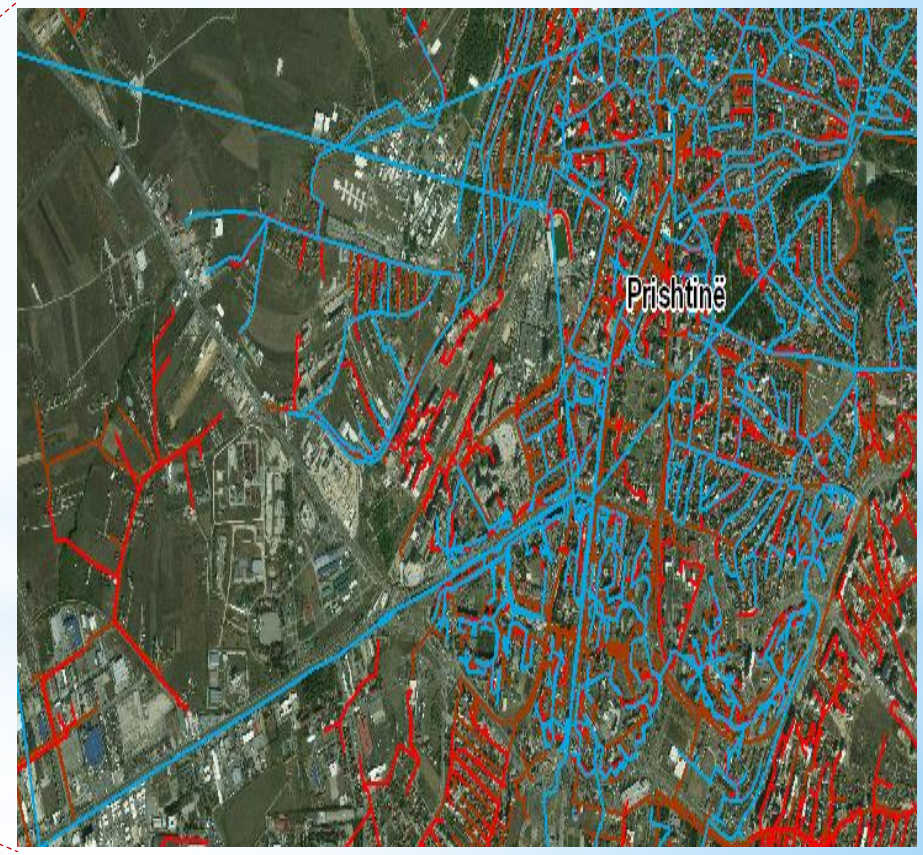


Electronic Atlas is an interactive multi-layer interactive map which contains data on the geographic location, form and attributes of elements of the public infrastructure of electronic communications and other infrastructures in the Republic of Kosovo.

Broadband Atlas contains:

- Telecom infrastructure
- Service map
- Investments Map
- Other alternative infrastructure





Platform for measuring quality of internet access service

Legal base:

Regulation no. 36 for Quality of Electronic Communications Services;

- Establishing the quality indicators for the provision of the Internet access service and the publication of the due parameters;
- A relevant set of quality indicators related to the provision of the Internet access service are based on BEREC Guideline;
- the conditions and means of publication of the parameters of these indicators.
- ARKEP shall create, manage and make available to the public an interactive application on its website to measure the technical quality indicators;
- The values of the measured quality parameters shall be calculated upon using a test server placed in an Kosovo Internet Exchange Point-KOSIX;

The aim - to enable the end-users to benefit from relevant, comprehensive, comparable and user-friendly platform.

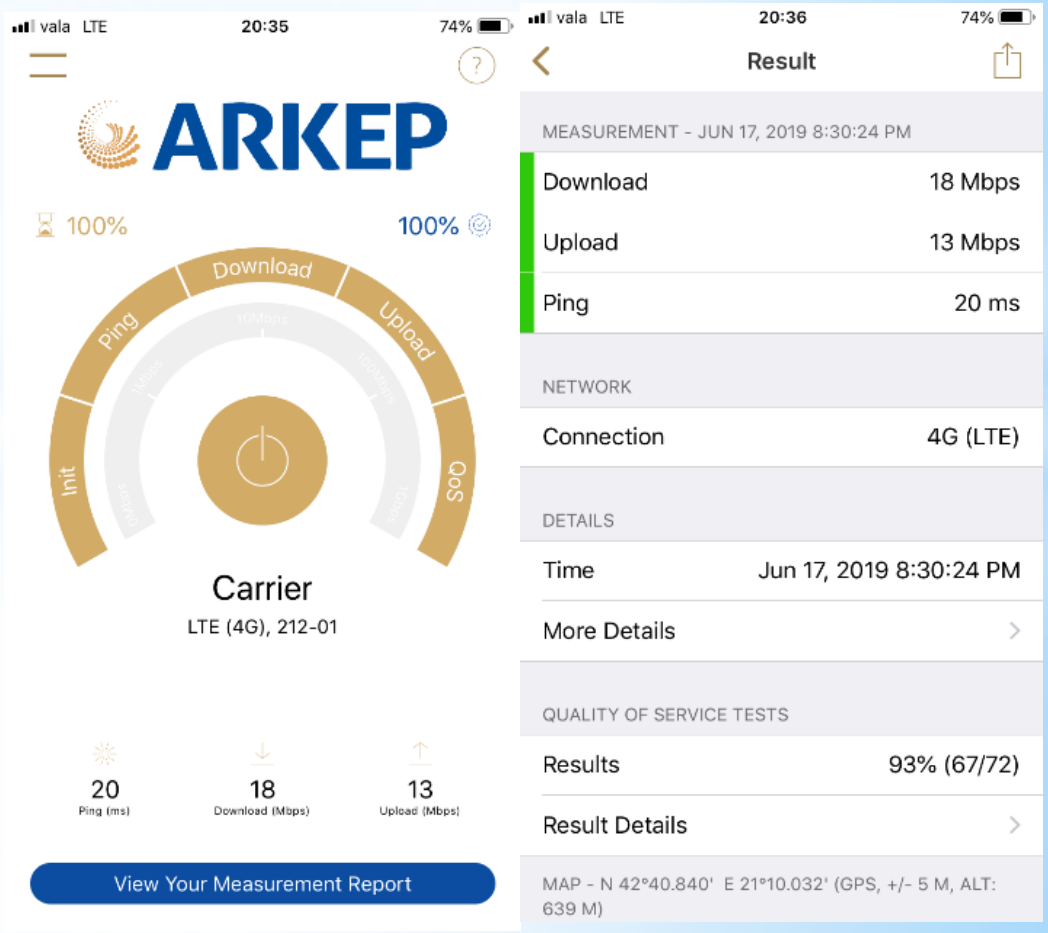
Developing and launching arkepnettest

By the end of 2018, ARKEP has implemented the platform for provisioning and measuring the quality of internet access services;

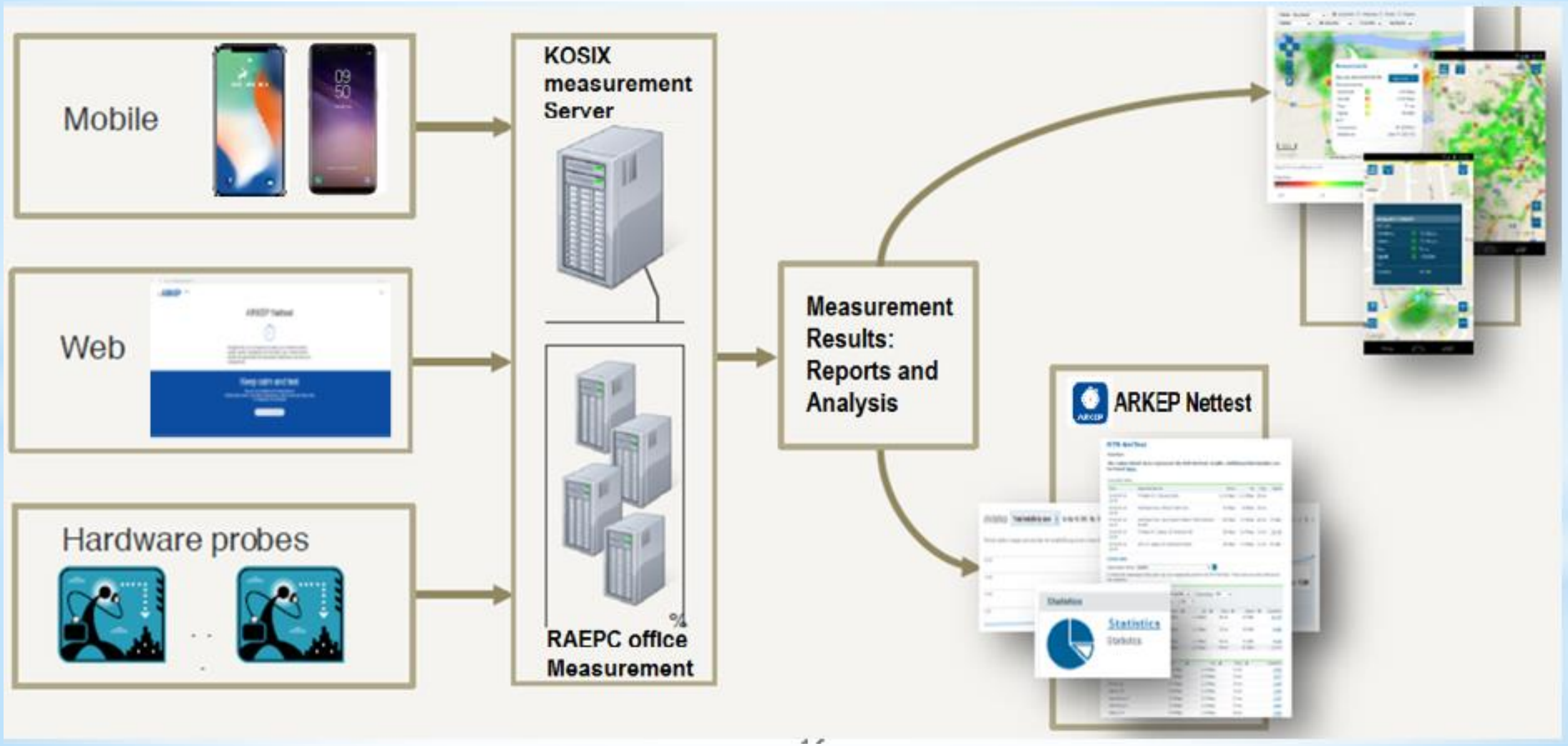
ARKEP Nettest measures:

- Quality;
- Speed;
- Availability;
- Neutrality parameters;

ARKEP Nettest is in full compliance with BEREC's recommendations.



ARKEP Nettest- platform

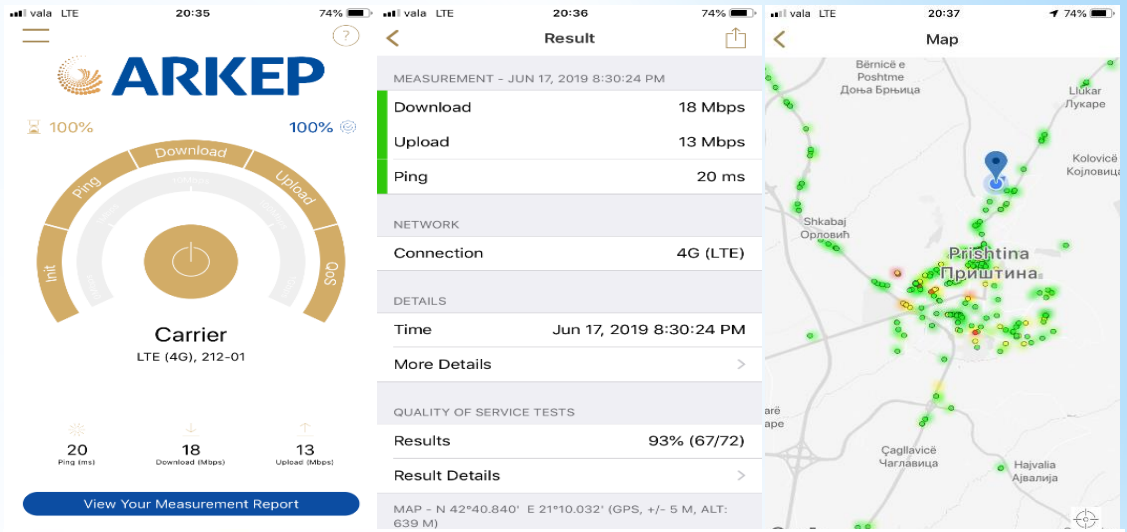


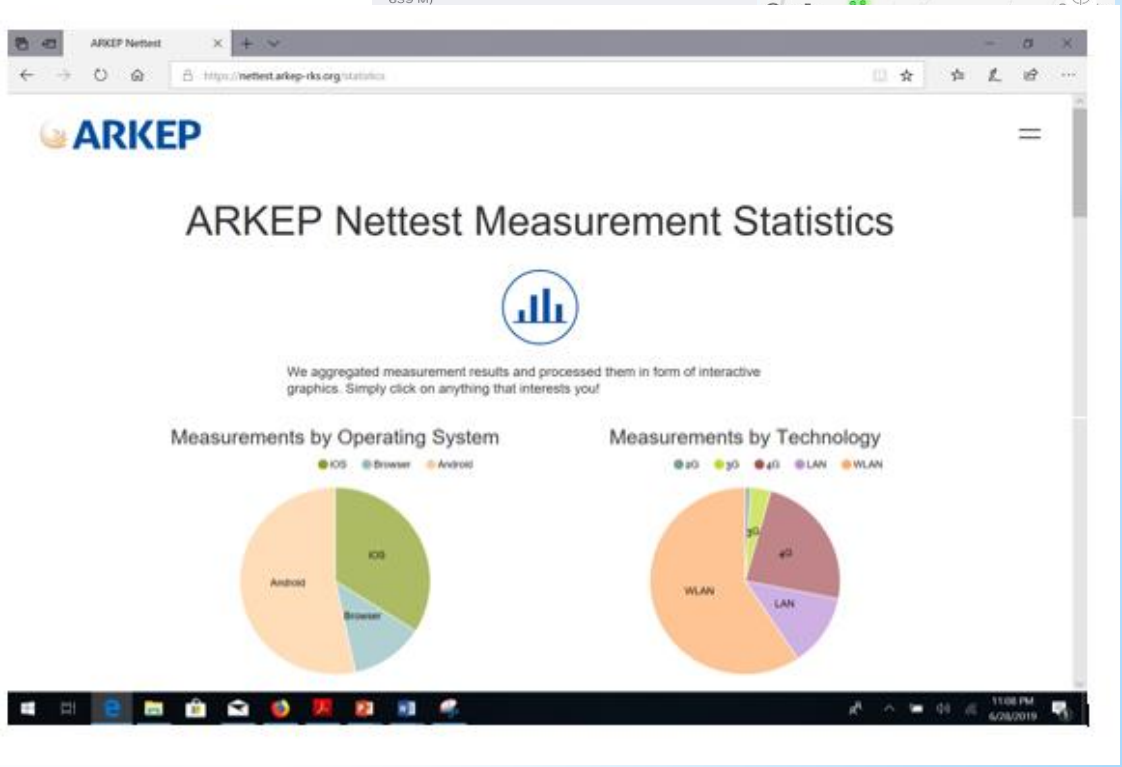
ARKEPNettest

Generate and processes results in: objective, secure and transparently manner

ARKEP Nettest platform is

Reliable, Comprehensive, Multiple Map Views, Open Source and Open Data platform





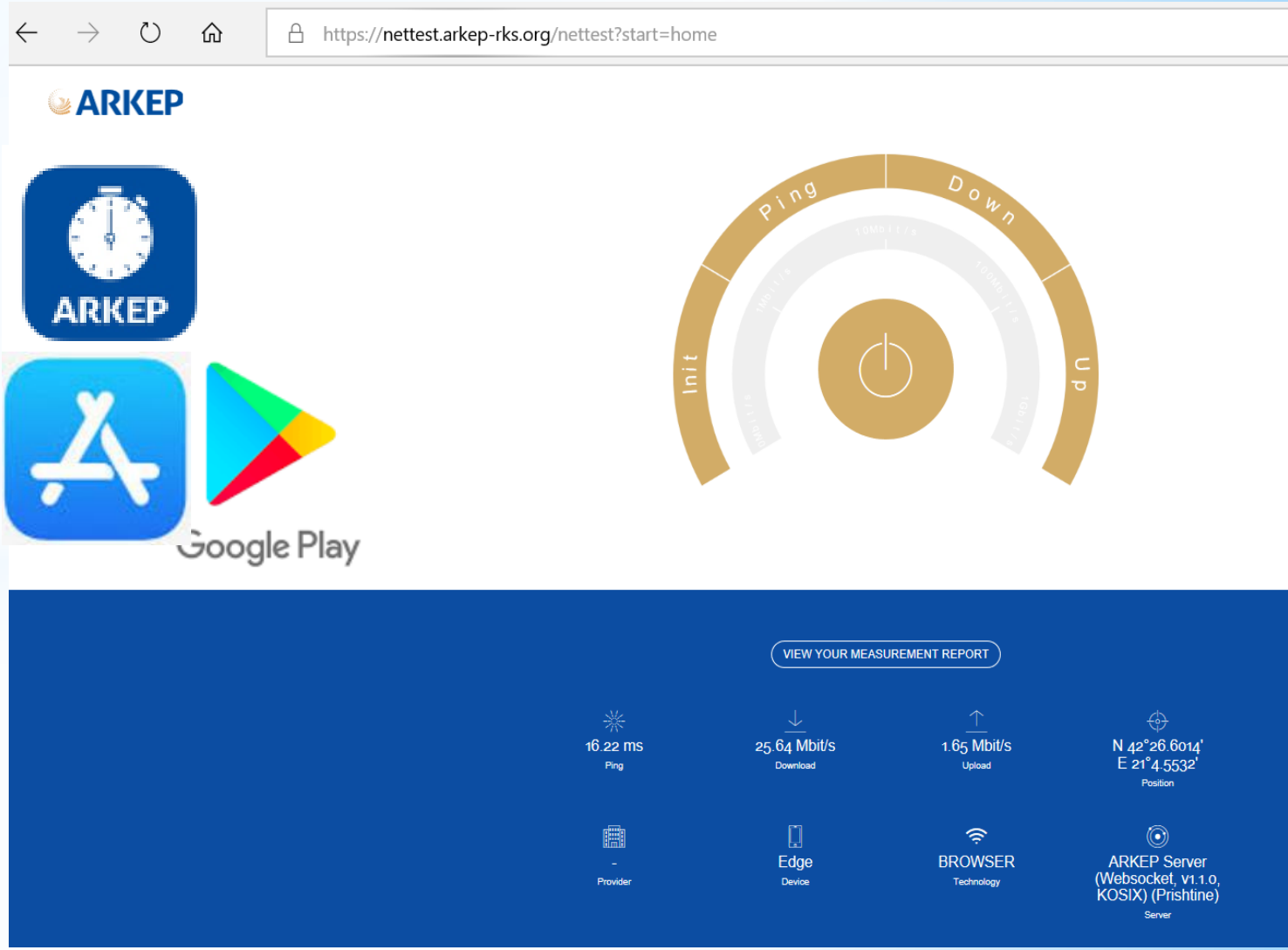
ARKEP Nettest- continue

ARKEP Nettest is Easy to USE

App can be downloaded in

IOS app store and Google plays store

Suitable For Desktop users at www.nettest.arkep-rks.org



Main Constraints for Broadband Development

Lack of financing

If state do not invest, no business case for telecs to invest in underserved areas

Cooperation with municipalities

Municipalities and telecom providers – Electronic Communication Infrastructure

Low Economic Development

Economic Indicators

Best practices - Kosovo case

➢ ICT Infrastructure Development

- The recent built highways have already integrated the infrastructure needed (ducts and poles) for the deployment of OF
- New roads with built in pipelines
- 1000km overhad fiber optic of KOSTT in place for sharing!

➢ Law on Electronic Communications No. 04/L-109

- Has shown as very effective on regulating with legal provision of not applying immovable property tax for public communication networks (Article 22 Paragraph 6)
- based on ARKEPs interpretation of the law regarding municipal tax regarding new deployment of electronic communication infrastructure the municipalities reduced/removed municipal tax

Challenges and future steps

➢ Challenges and Opportunities

- Adaption the Law on Measures for Reduction of Costs for deploying of High Speed Electronic Communications Network transposing 2014/61/EU Directive;
- Digital Dividend (790-862 MHz) and spectrum awards in other frequency bands
- Membership into relevant international bodies and mechanisms

➢ Overall sector trends and indicators

- Overall stable and good growth patterns and growth indicators in broadband market;
- Vitality of the sector and the strong potential for further growth ,
- Growing demands for new and better services with the dynamic trend and increasing rate of adoption of smart phones, etc.

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Thank You!

Kreshnik GASHI
Chairman of ARKEP Board
Regulatory Authority for Electronic and Postal Communications
Republic of Kosovo