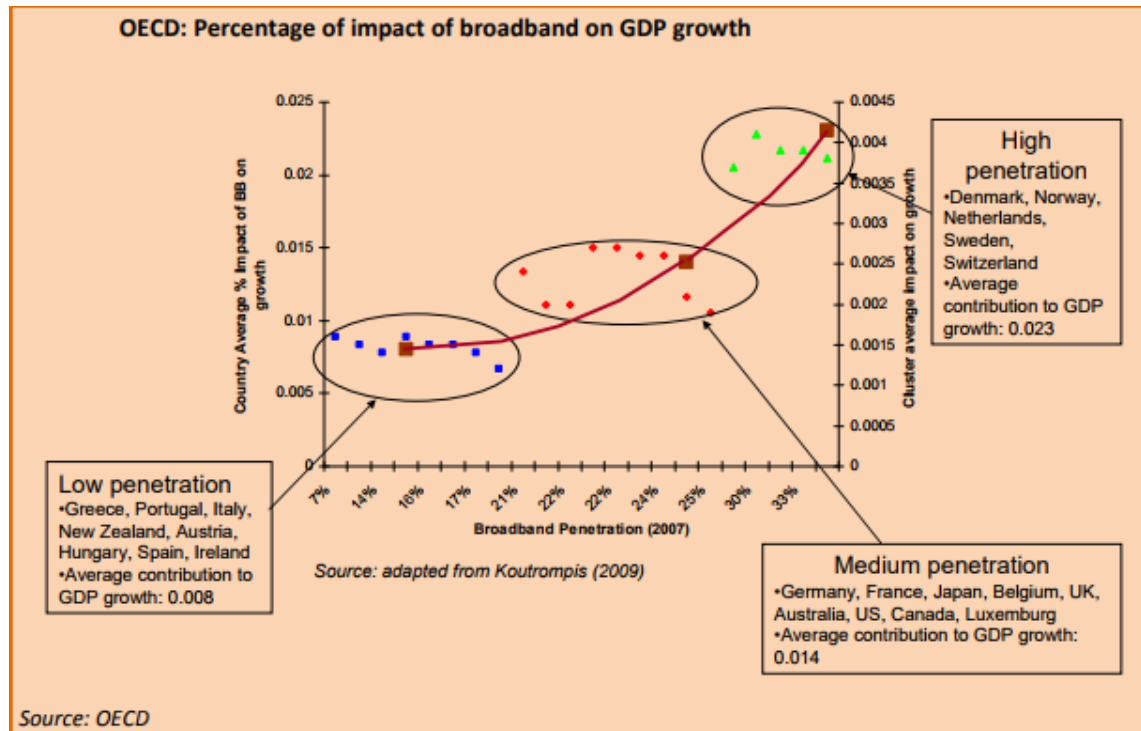


# LEVEL OF DEVELOPMENT OF NEXT GENERATION ACCESS NETWORKS AND REGULATORY MEASURES FOR PROVIDING EFFICIENT AND SUSTAINABLE COMPETITION

24-27 September 2017,  
Infofest, Budva

Sinisa Apostoloski,  
Agency for electronic communications,  
Macedonia

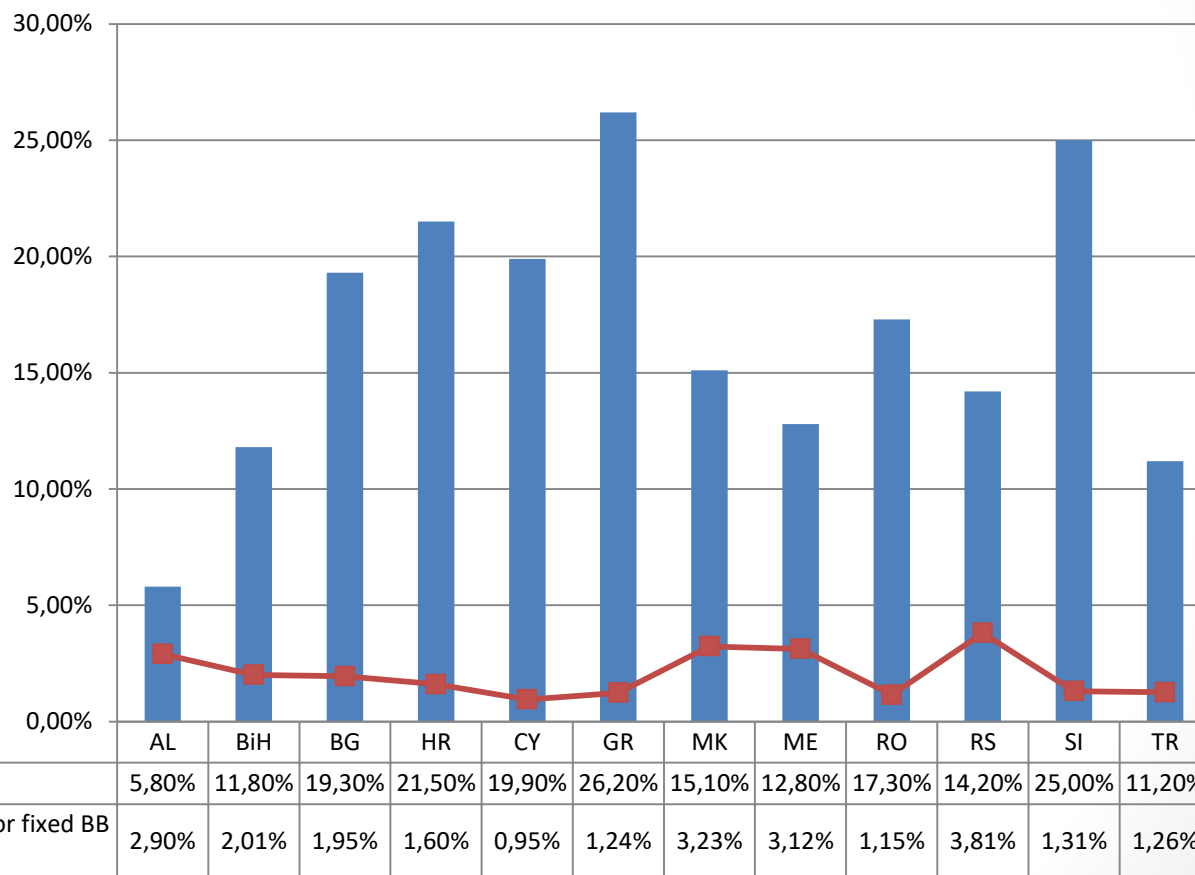
# ECONOMIC IMPACT OF BROADBAND



It has been shown that the increase in the penetration of broadband access to the Internet by 10% results in an increase of 1.21% of gross domestic product in the analysis of 66 high-income countries and an increase in gross domestic product by 1.38% when analyzing 120 countries with medium and low income of the population

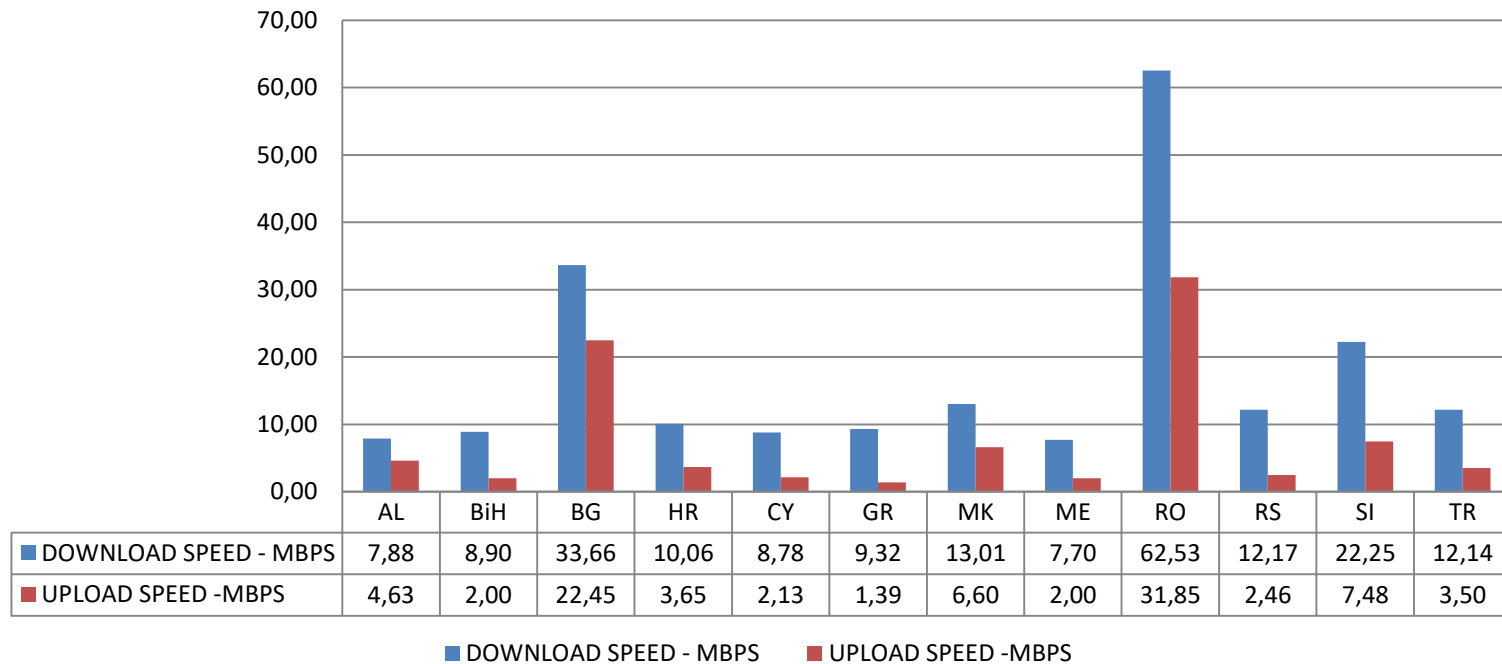
# BB PENETRATION vs AFFORDABILITY OF INTERNET ACCESS

## PENETRATION VS AFFORDABILITY

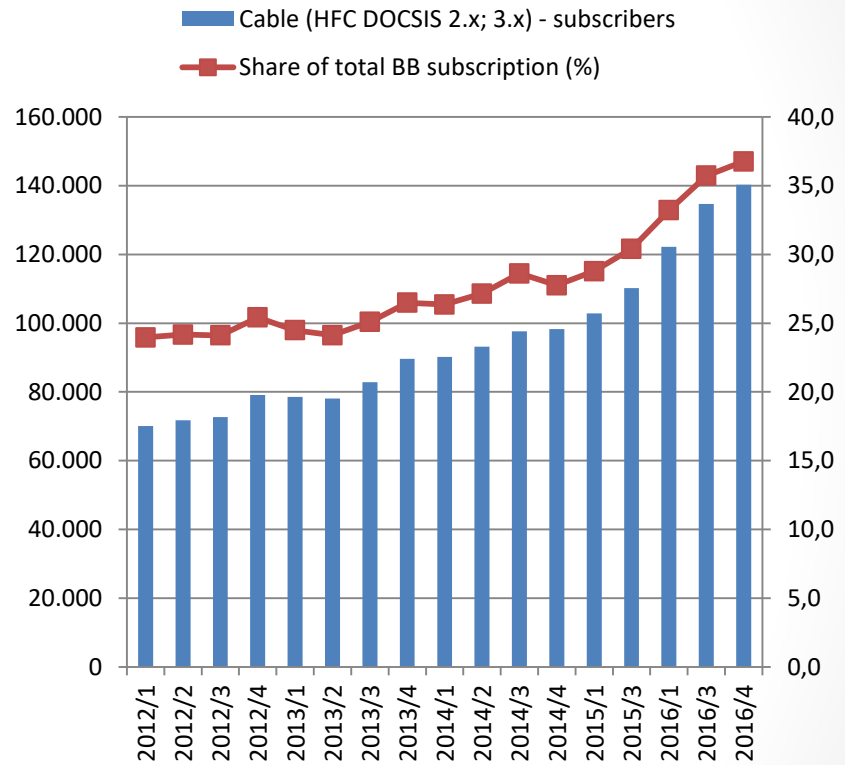
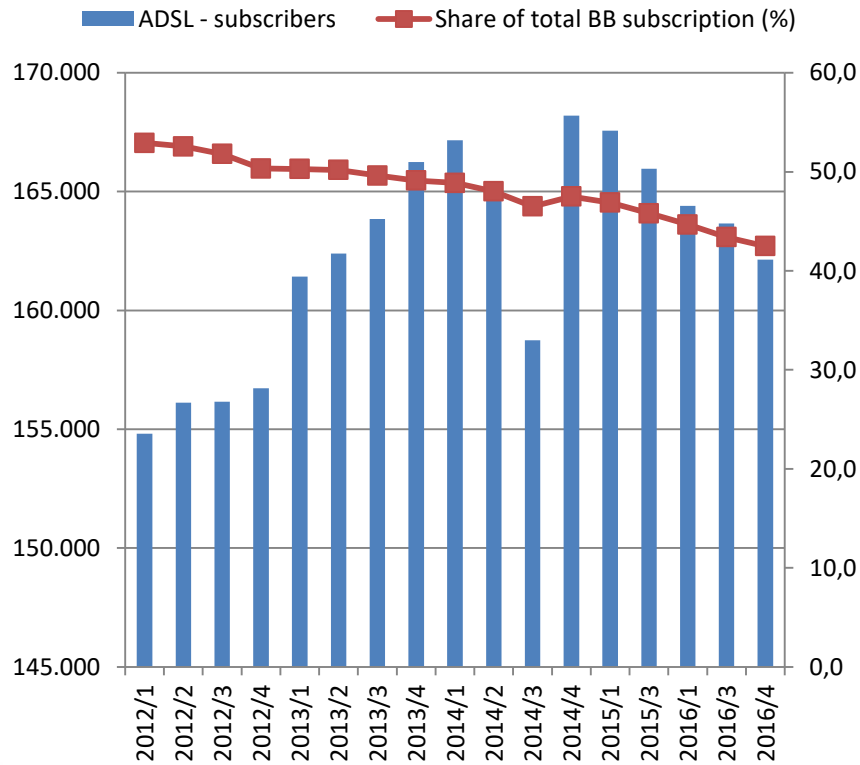


# AVERAGE DOWNLOAD/UPLOAD SPEED IN THE REGION

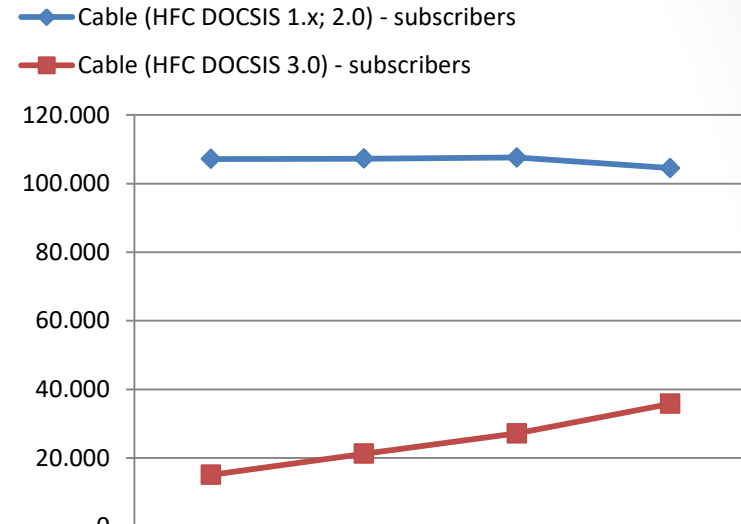
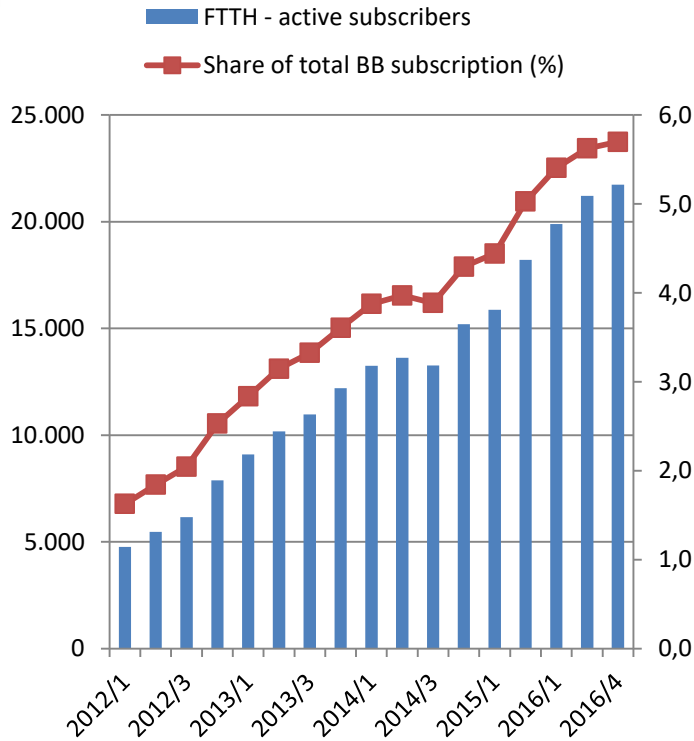
## AVERAGE DOWNLOAD/UPLOAD SPEED IN Mbps



# RETAIL INTERNET MARKET IN MK



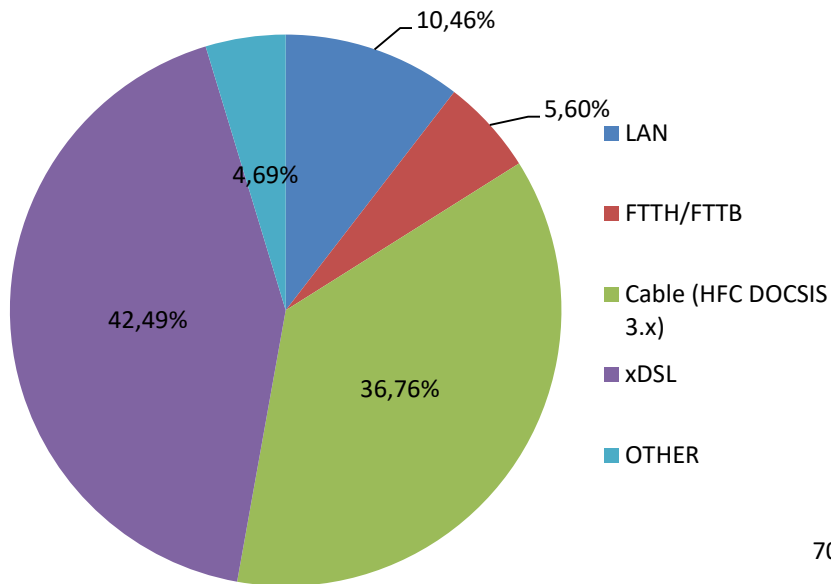
# RETAIL INTERNET MARKET IN MK



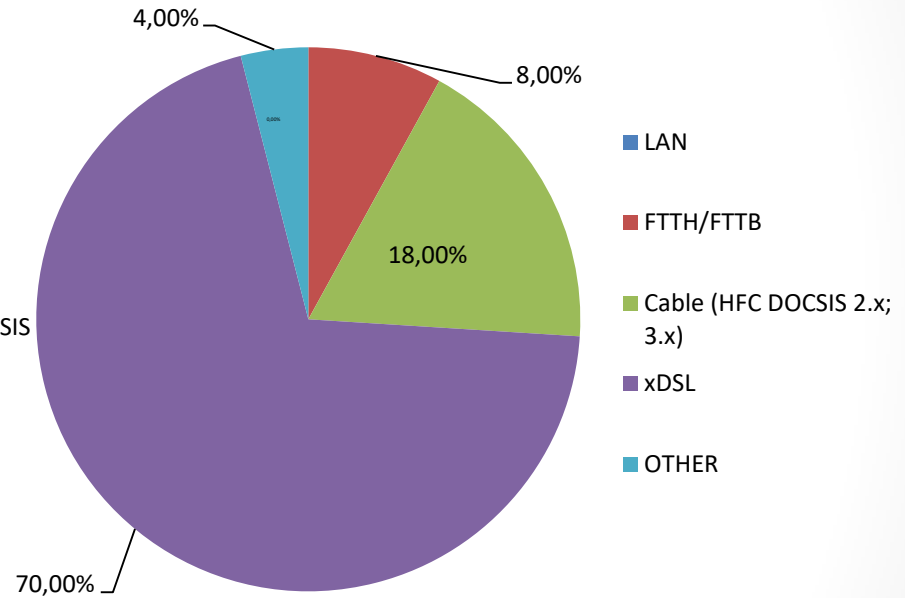
	2016/1	2016/2	2016/3	2016/4
Cable (HFC DOCSIS 1.x; 2.0) - subscribers	107.177	107.263	107.620	104.502
Cable (HFC DOCSIS 3.0) - subscribers	15.072	21.236	27.131	35.775

# RETAIL INTERNET MARKET BY TECHNOLOGY

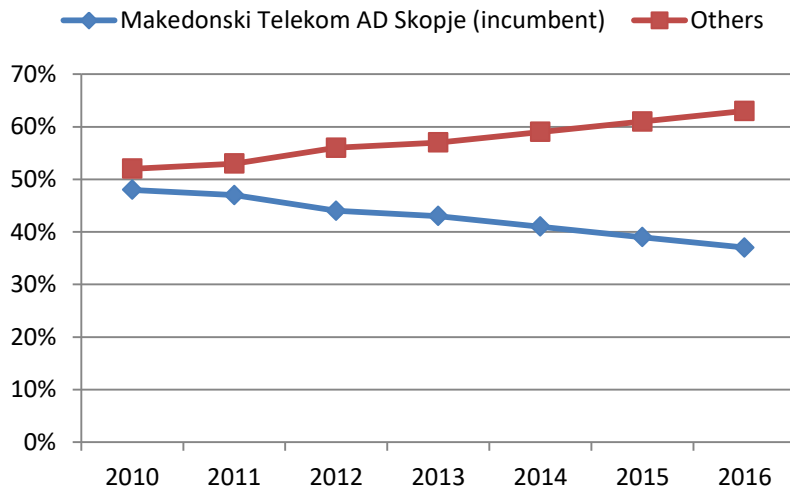
## BB access by technology - MK



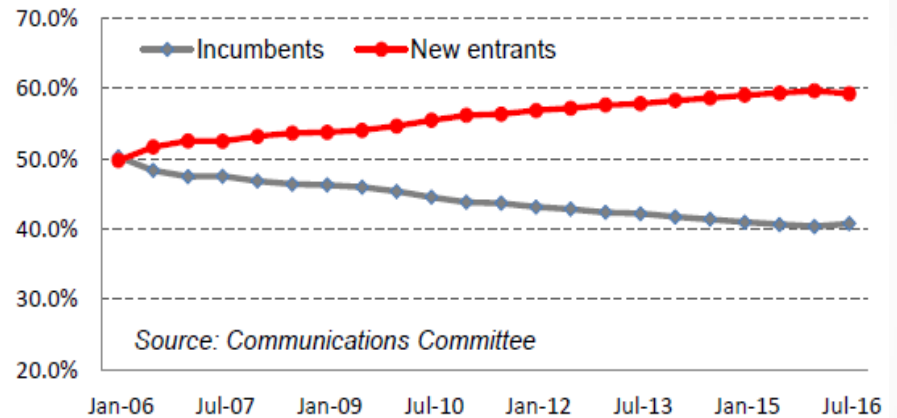
## BB access by technology - EU



# COMPETITION IN THE FIXED BROADBAND MARKET

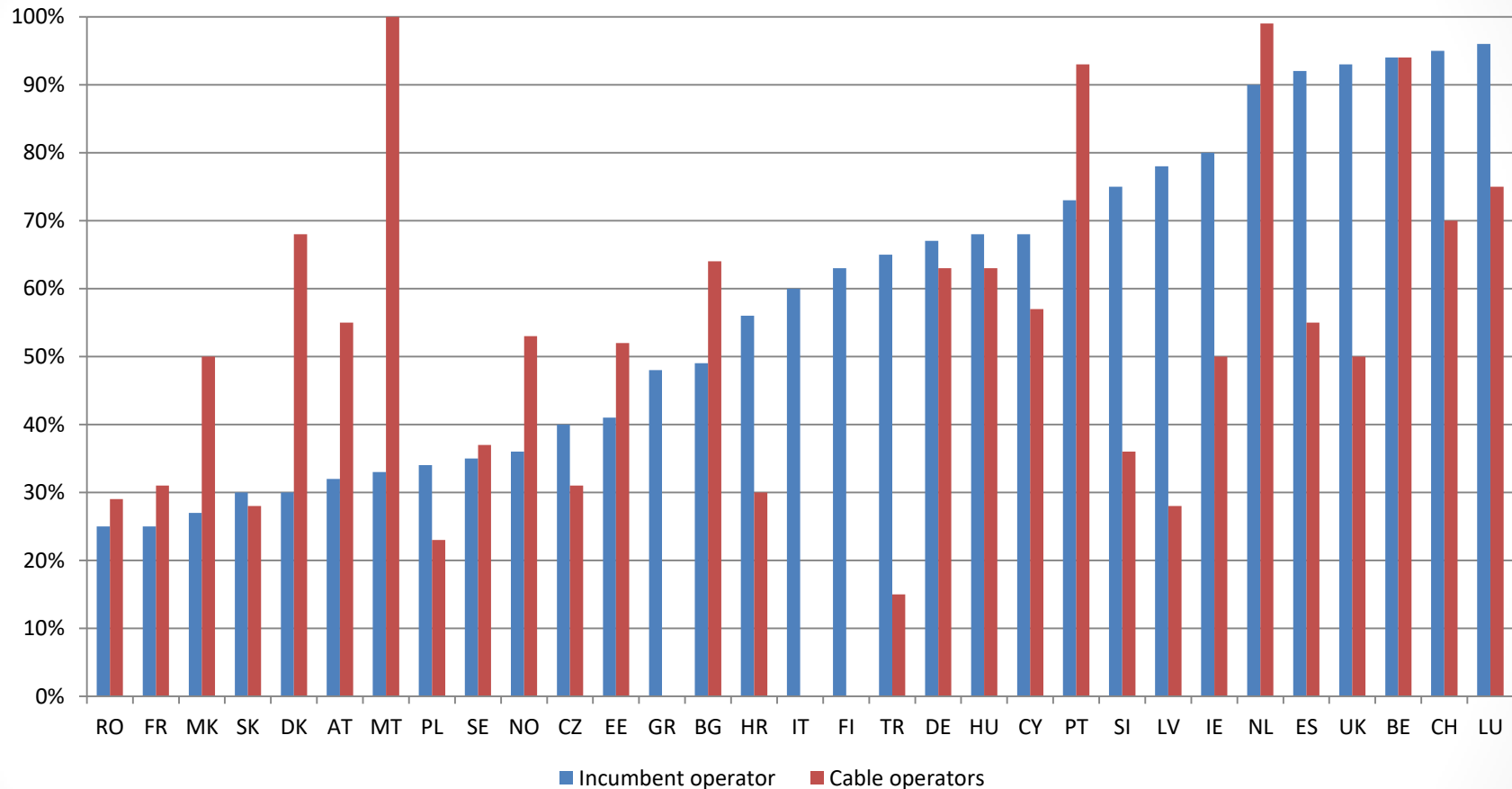


Fixed broadband subscriptions - operator market shares at EU level, January 2006 - July 2016





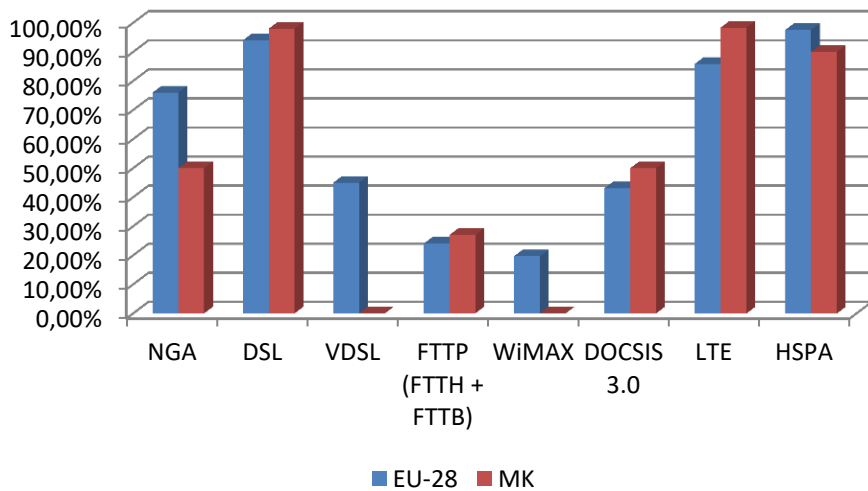
# LEVEL OF INVESTMENT IN NGA NETWORKS (INCUMBENT vs CABLE OPERATORS)



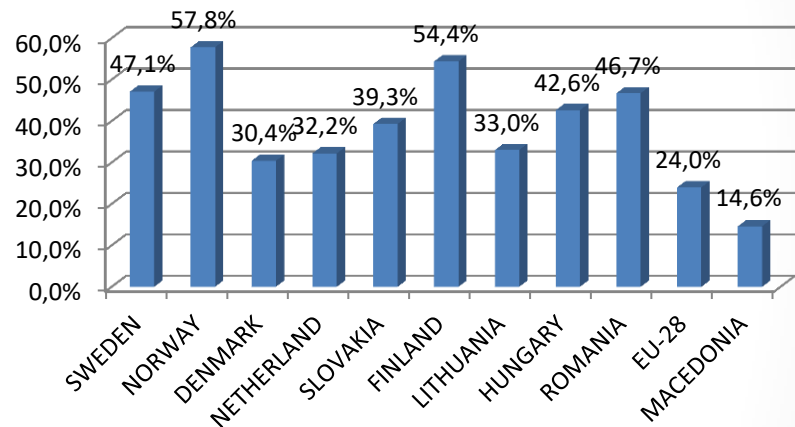
NGA coverage - % of households with the possibility to connect to NGA networks

# LEVEL OF INVESTMENT IN NGA NETWORKS

## Total coverage by technology



## % of take-up of FTTH/FTTB networks



## MARKETS 3A AND 3B (WHOLESALE BROADBAND ACCESS IN CASE OF FTTH and HFC NETWORKS)

In 2014 AEC did the third analyses on the WBA market (M5/2007).

AEC found that MKT has SMP power on this market in case FTTH is deployed in access network.

9<sup>th</sup> of march 2015 – Makedonski Telekom on it's web site published amendments of Reference Offer for WBA – wholesale broadband access in case FTTH in access network.

In 2016 AEC started with the fourth analyses on the WBA market (M5/2007).

AEC found that VIP has SMP power on this market in case HFC (DOCSIS 3.0) is deployed in access network.

By Decision of the Agency for Electronic Communications No. 1303-706 from 02.05.2017, ONE.VIP DOO Skopje was designated as a Operator with significant market power on the relevant Wholesale central access for mass-market products – WCA.

After the approval of the Agency for Electronic Communications from August 14, 2017, ONE.VIP DOO Skopje published the Reference Offer for wholesale central access for mass-market products .

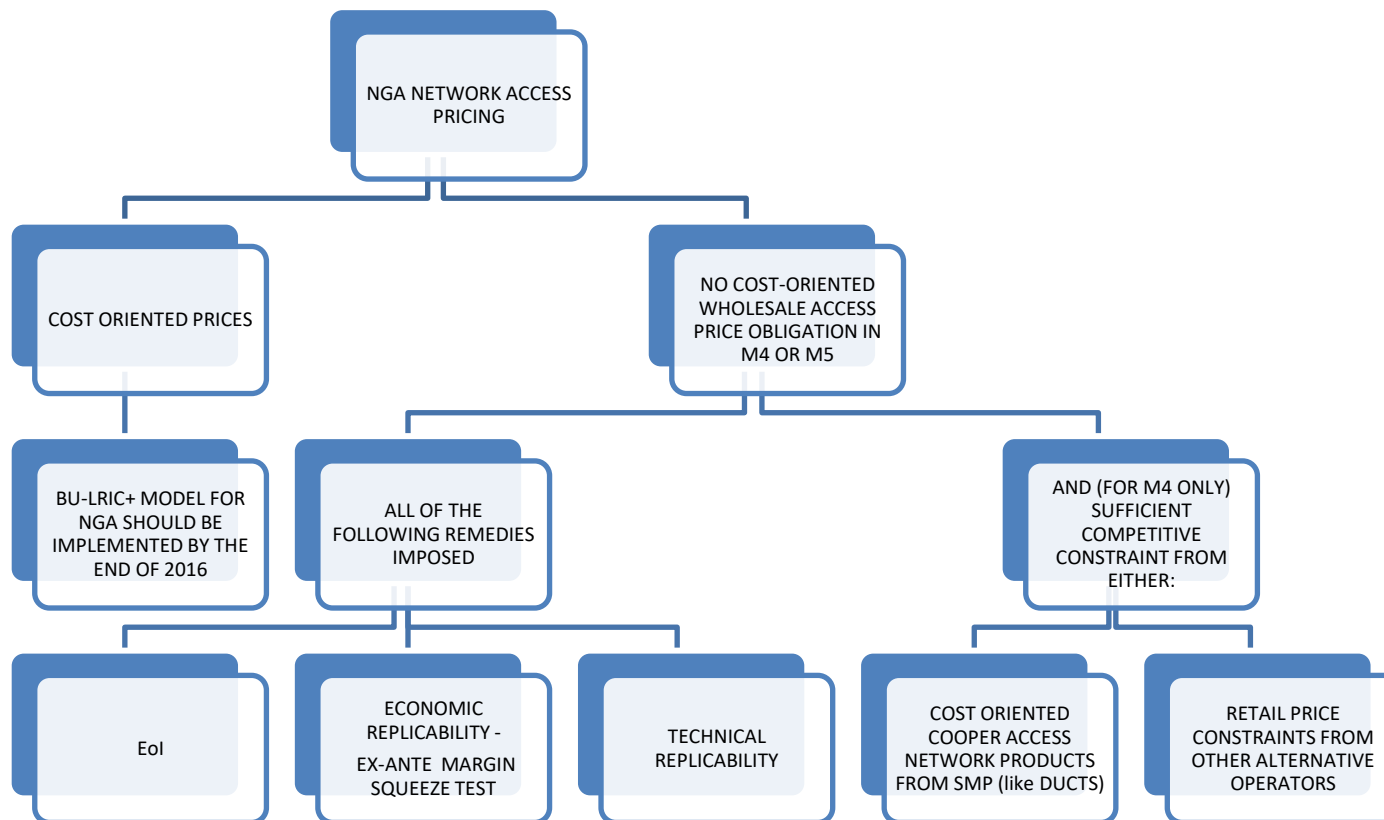
# RECOMMENDATION ON NEXT GENERATION ACCESS (NGA) FROM 20<sup>TH</sup> OF SEPTEMBER 2010 AND IT'S TRANSPOSITION IN MK REGULATION ( Market 4/2007 (market 3a/2014) remedies )

Access obligation	Precondition	Cost Oriented Prices	Reference Offer	Risk Premium
Civil engineering infrastructure	Where duct capacity is available	Yes	Yes	Usually NO
Terminating segments of SMP operator's access network	Where FTTH is deployed Includes in-building wiring	Yes	Yes	Yes
Unbundled fibre loop	Where FTTH is deployed At the most appropriate point in the network (normally, MpoP) Accompanied by measures including collocation and backhaul	Yes	Yes	Yes
Sub-loop unbundling	Where FTTN is deployed Accompanied by appropriate backhaul measures and ancillary remedies to ensure the viability and effectiveness of sub-loop unbundling.	Yes	Yes	No

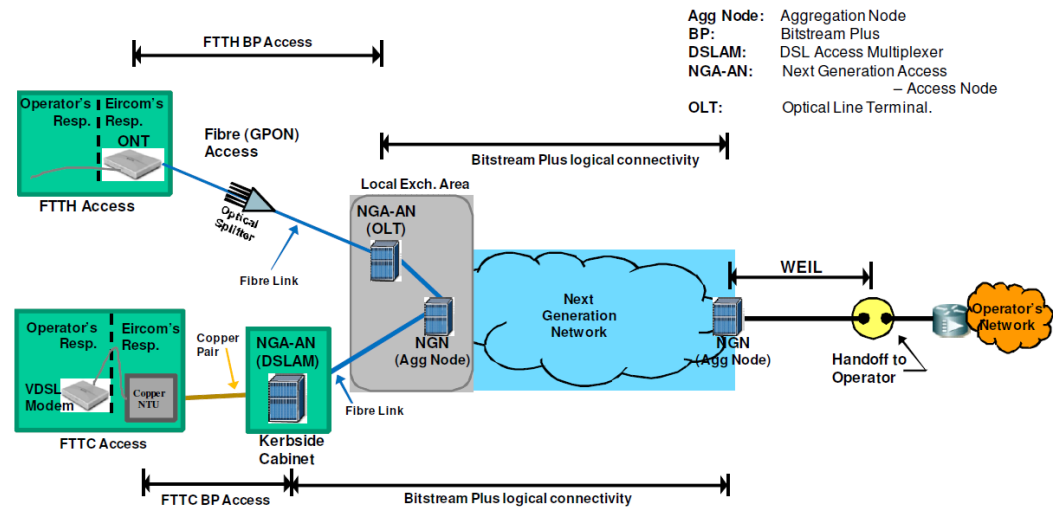
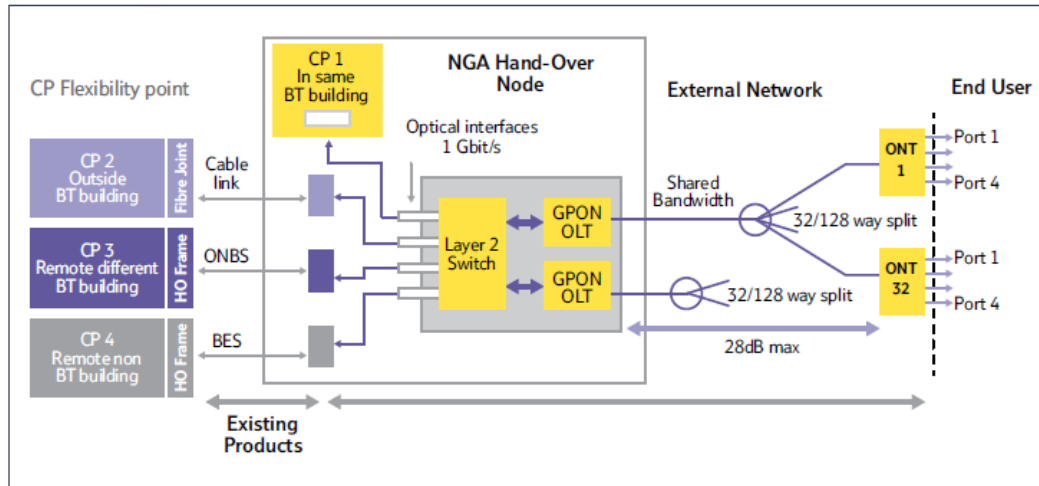
# NGA RECOMMENDATION FROM 20<sup>TH</sup> OF SEPTEMBER 2010 AND IT'S TRANSPOSITION IN MK REGULATION Market 5/2007 (market 3b/2014) remedies

Access obligation	Precondition	Cost Oriented Prices	Reference Offer	Risk Premium
<b>Wholesale broadband access (WBA)</b>	Reflecting the technological qualities of NGA so as to enable alternative operators to compete effectively, on the basis of differentiated service characteristics	YES	Yes, in principle (retail minus could be applied in appropriate circumstances)	Yes – in case of FTTH networks.

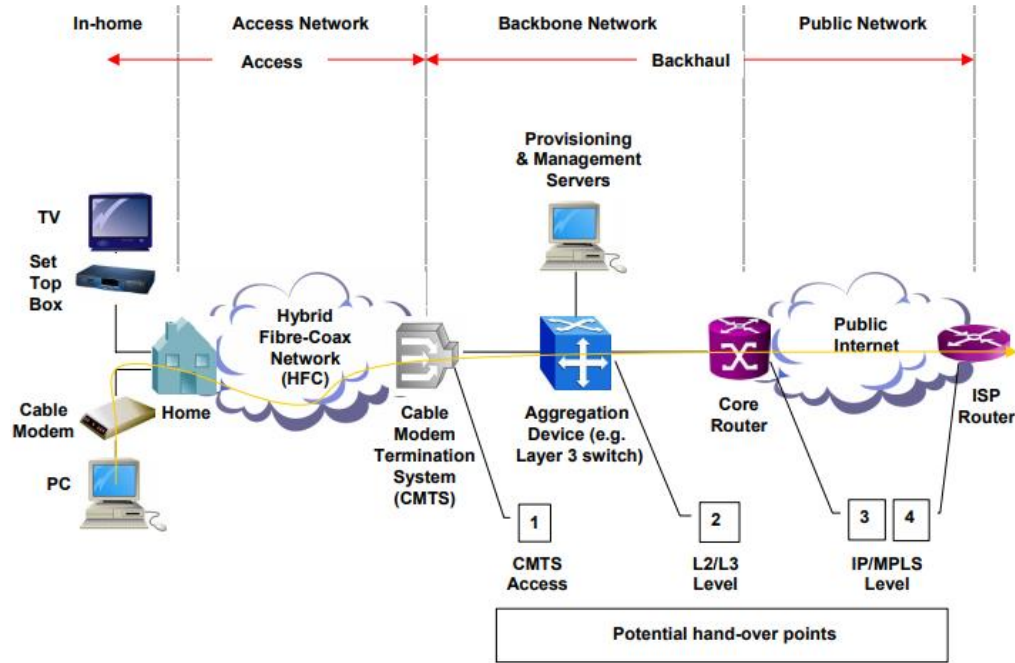
# RECOMMENDATION FOR NON-DISCRIMINATION AND COSTING METHODOLOGIES FROM 11<sup>TH</sup> OF SEPTEMBER 2013 AND IT'S TRANSPOSITION IN MK REGULATION



# MARKETS 3A AND 3B (WHOLESALE BROADBAND ACCESS IN CASE OF FTTH NETWORKS)

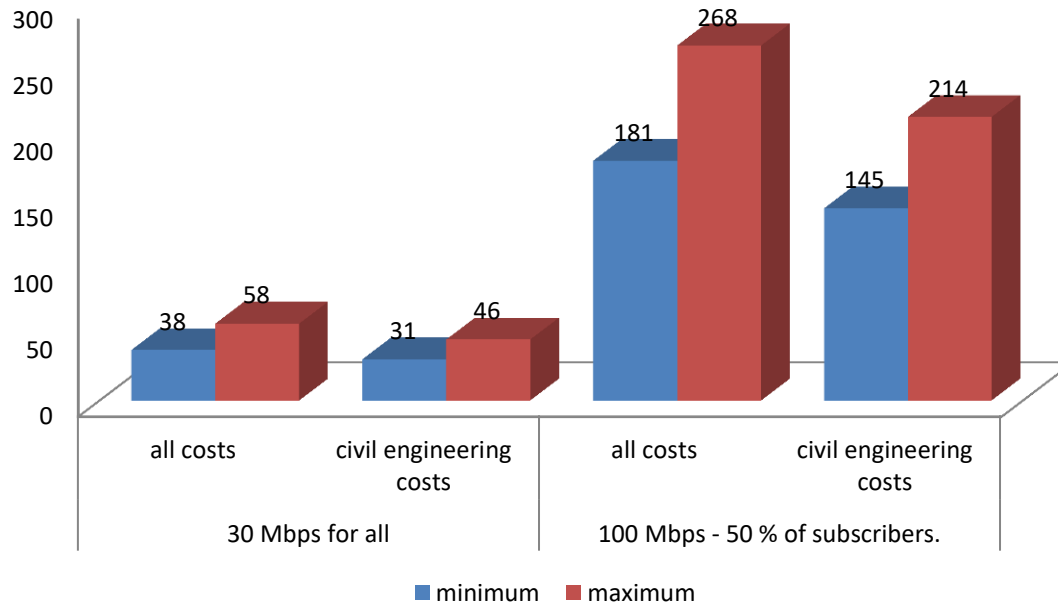


# MARKETS 3A AND 3B - WHOLESALE BROADBAND ACCESS IN CASE OF HFC NETWORKS





# DIRECTIVE ON REDUCING THE COSTS TO DEPLOY NGA NETWORKS



Cost estimation in order to reach Digital Agenda 2020 targets (in billion of Euros)

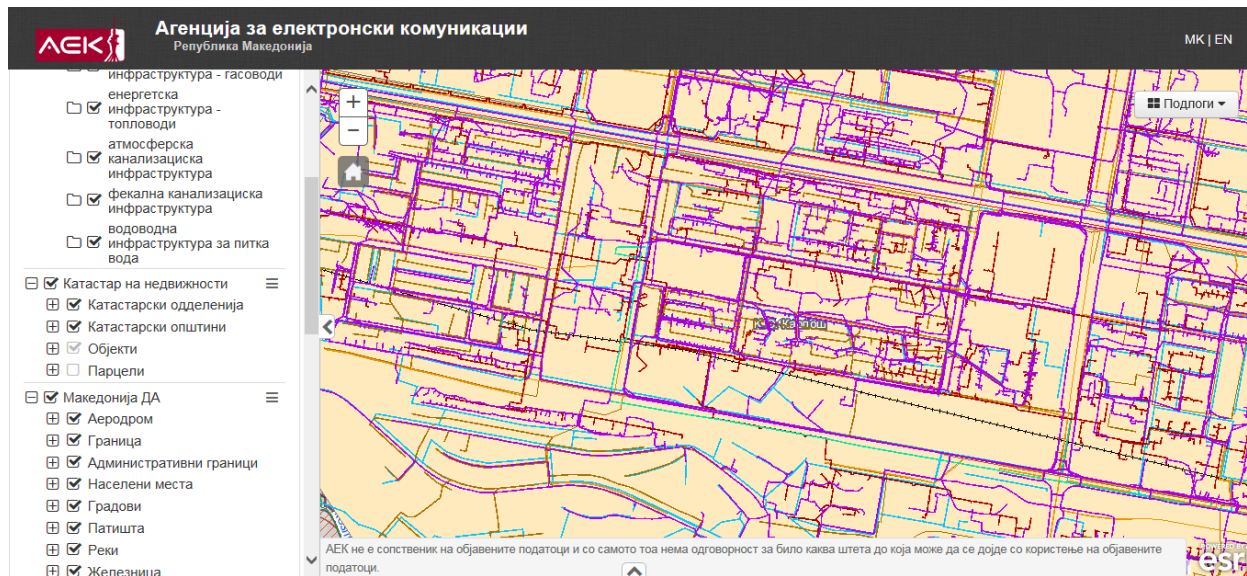
According to the Commission, the costs of broadband deployment associated with civil engineering, such as digging up roads to lay fibre and administrative burdens, can account for as much as 80% of the total costs

# DIRECTIVE FOR COST REDUCTION FOR DEPLOYMENT OF NGA NETWORKS AND IT'S TRANSPOSITION IN MK REGULATION

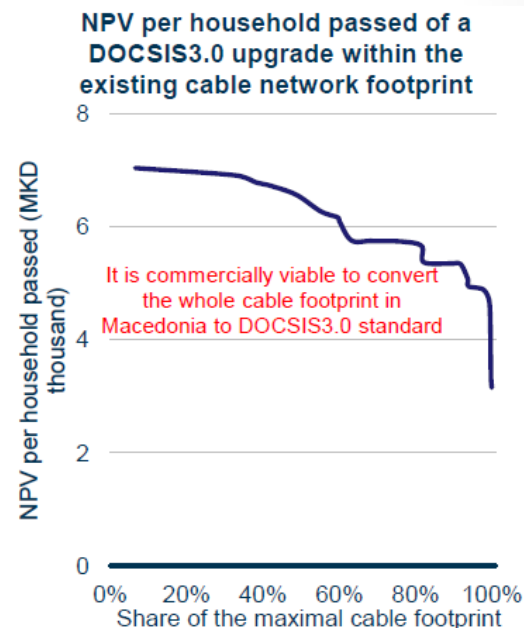
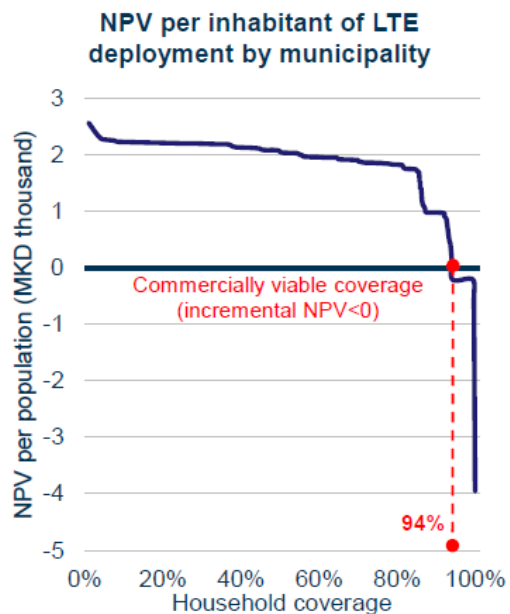
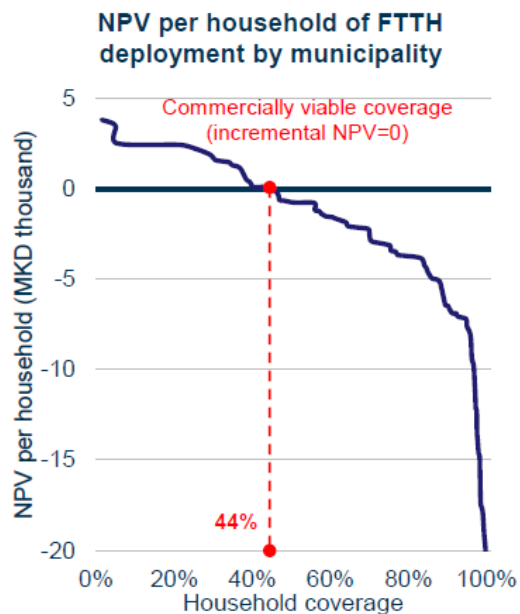
Directive for cost reduction – adapted in 15<sup>th</sup> of may 2014

Since 2015 Single Information Point is accessible for end users on the following web portal [www.e-agencija.aec.mk](http://www.e-agencija.aec.mk). Following minimum information are accessible on this portal:

- Planned construction for electronic communication networks from all operators (location and estimated date for starting the works).
- Access to existing physical infrastructures of utilities network operators ( network operators, electricity, water supply etc. and the legal entity who operates with it),
- Technical data of the horizontal and vertical underground and above ground networks.



# RETURN OF INVESTMENT OF NGA NETWORKS



Technology	2014 population / household coverage	Commercially viable coverage	Comment
FTTH	15%-20%	44%	Mostly in urban / suburban areas
DOCSIS3.0	<5%	51%	Only assessed on household currently covered by a cable network (51% of households)
LTE	>40%	94%	Justified by the limited cost of a deployment based on existing physical sites

## NEXT STEPS

In 2015 MISA adopted National Short Term ICT Strategy (2016-2017)

- Measures for development of fast and ultra-fast broadband access part of this Strategy.

Ongoing public discussion on the preparation of a National Operational Plan for the development of fast and super fast electronic communications networks in the Republic of Macedonia.



QUESTIONS ?