Fiber optic (access) network

Stjepan Vodolšak

CROATIAN REGULATORY
AUTHORITY FOR NETWORK INDUSTRIES
(HAKOM)

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AGENDA

1 INTODUCTION

2 ORDINANCE ON FIBER OPTIC DISTRIBUTION NETWORKS

3 CONCLUSION

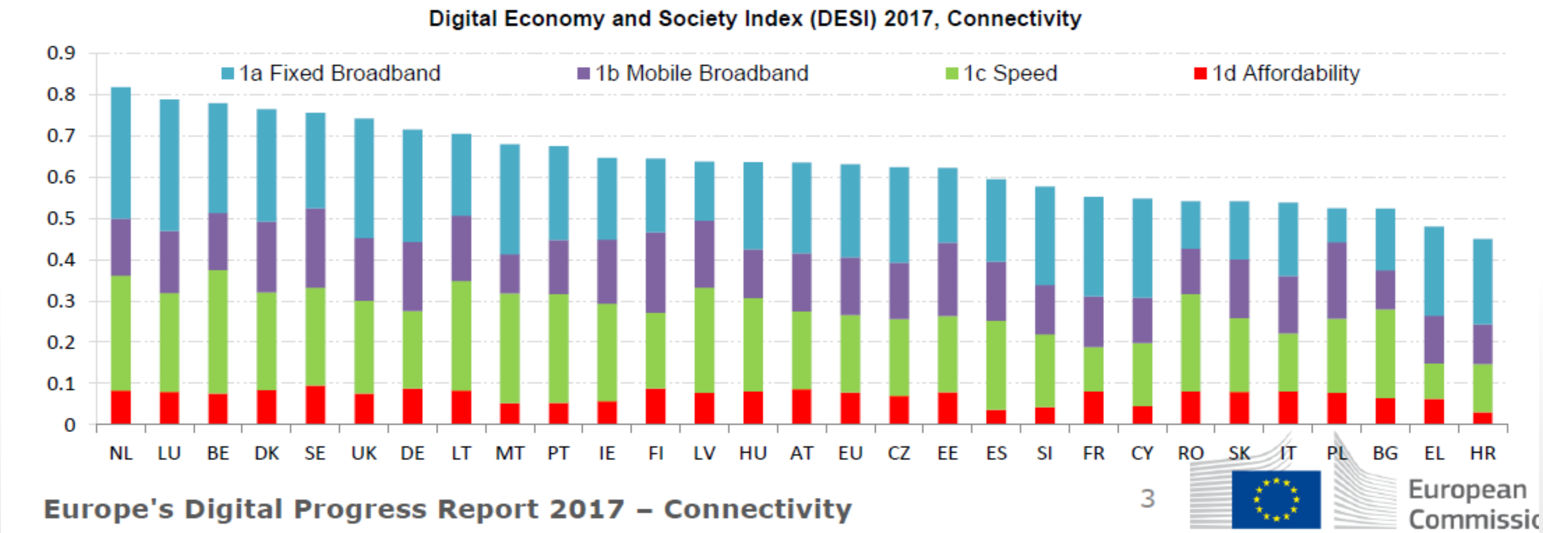
Deployment

Three main levers:

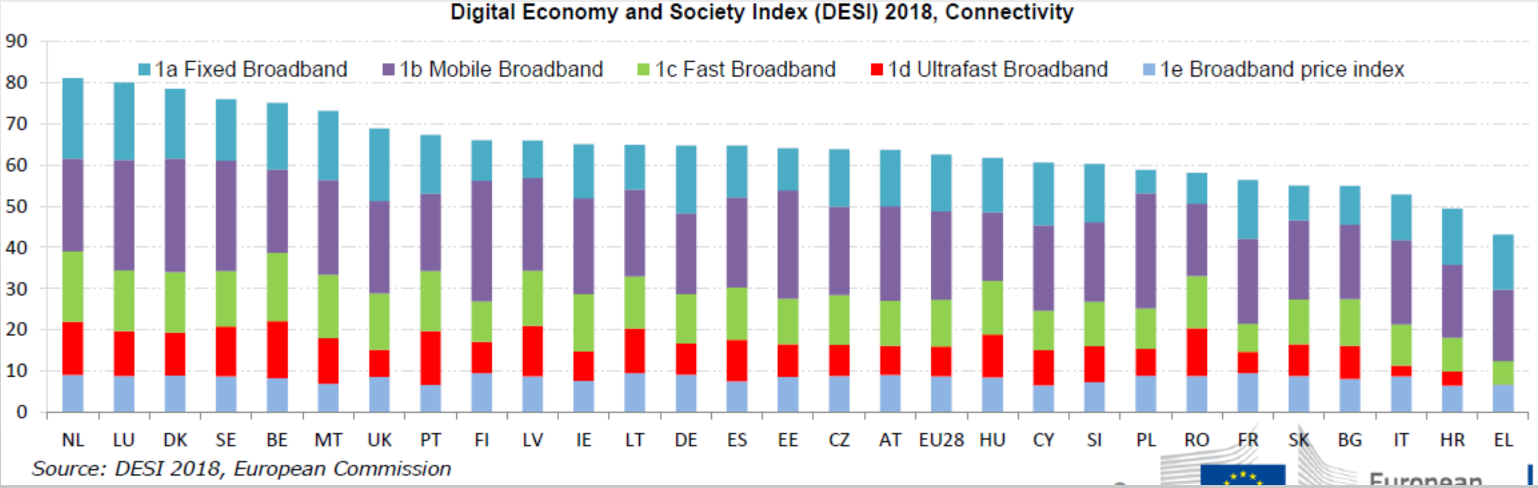
1. Incumbent – Croatia telecom (HT) -2008-2009 „Fiberland”
   - Around 200.000 HH covered with FTTH/B
   - GPON – two splitters level (second step is in the building)
   - Wholesale-physical access is not possible
2. EU fond(s) – Municipality & Operators
   - The national program envisages investments in two segments – agregation (backhaul) segment and access network
   - Aggregation part – 350 new node in white or brown field– total investment app. 100 mio Eur
   - Access network – covered 315.000 HH in white or brown field – total investment app. 124 mio Eur

   RESULT=0
3. Ordinance on fiber optic distribution networks 2009-

Review



Digital Economy and Society Index (DESI) 2017, Connectivity
1a Fixed Broadband
1b Mobile Broadband
1c Speed
1d Affordability
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
NL LU BE DK SE UK DE LT MT PT IE FI LV HU AT EU CZ EE ES SI FR CY RO SK IT PL BG EL HR
Europe's Digital Progress Report 2017 – Connectivity
3
European Commissio



Digital Economy and Society Index (DESI) 2018, Connectivity
1a Fixed Broadband
1b Mobile Broadband
1c Fast Broadband
1d Ultrafast Broadband
1e Broadband price index
90
80
70
60
50
40
30
20
10
0
NL LU DK SE BE MT UK PT FI LV IE LT DE ES EE CZ AT EU28 HU CY SI PL RO FR SK BG IT HR EL
Source: DESI 2018, European Commission

Figures

Number of houshold = 1,52 mio.

Coverage	HR-2016	HR-2017	EU-2017
Fixed broadband coverage (total)	97%	99%	97%
Fixed broadband coverage (rural)	89%	97%	92%
Fixed NGA coverage (total)	60%	67%	80%
Fixed NGA coverage (rural)	10%	16%	47%
Ultrafast coverage (total)	no data	34%	58%
4G coverage (average of operators)	67%	73%	91%

Source: Broadband Coverage Study (IHS and Point Topic). Data as of October 2016 and October 2017.

a. Fixed Markets

Fixed broadband market shares	HR-2016	HR-2017	EU-2017
Incumbent market share in fixed broadband	49.0%	47.6%	40.3%
Technology market shares			
DSL	80.3%	75.6%	64.2%
Cable	13.3%	13.9%	19.4%
FTTH/B	2.7%	4.1%	12.9%
Other	3.6%	6.3%	3.6%

Source: Communications Committee. Data as of July 2016 and July 2017.

Figures

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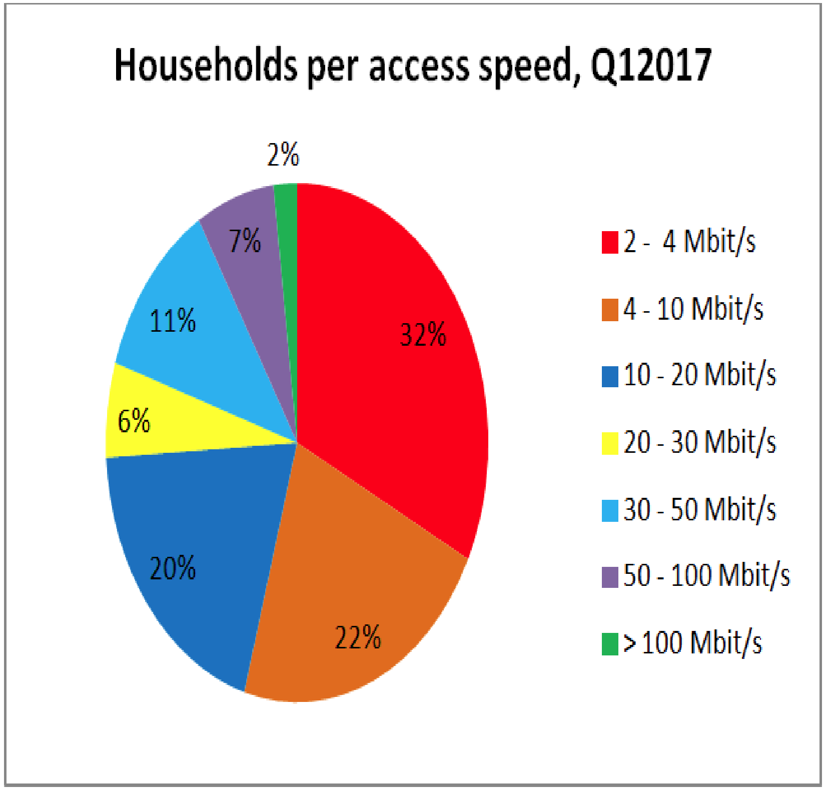
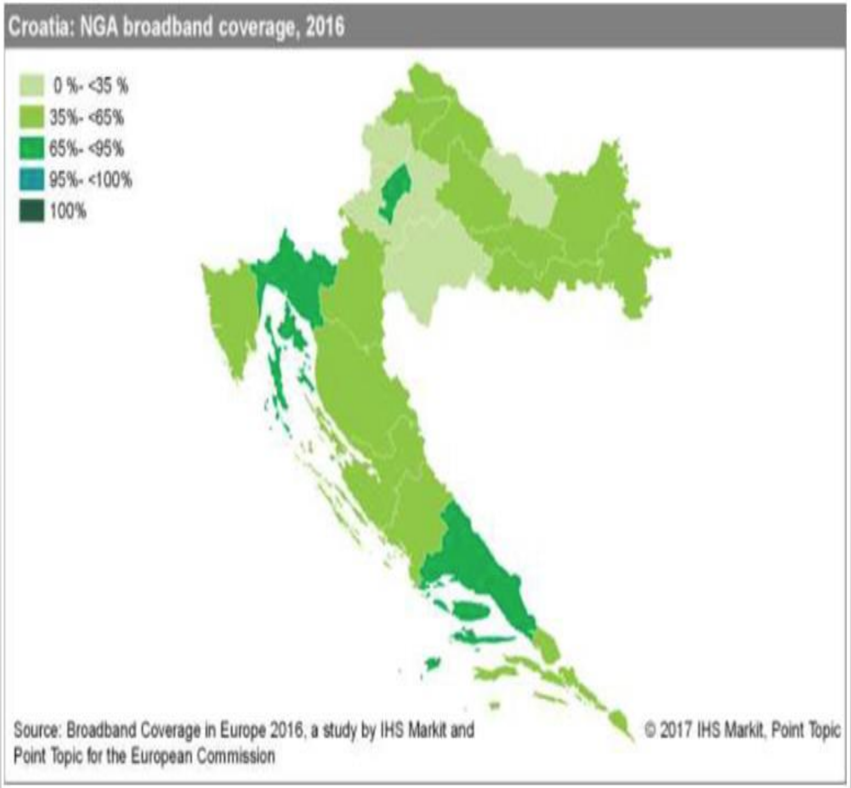




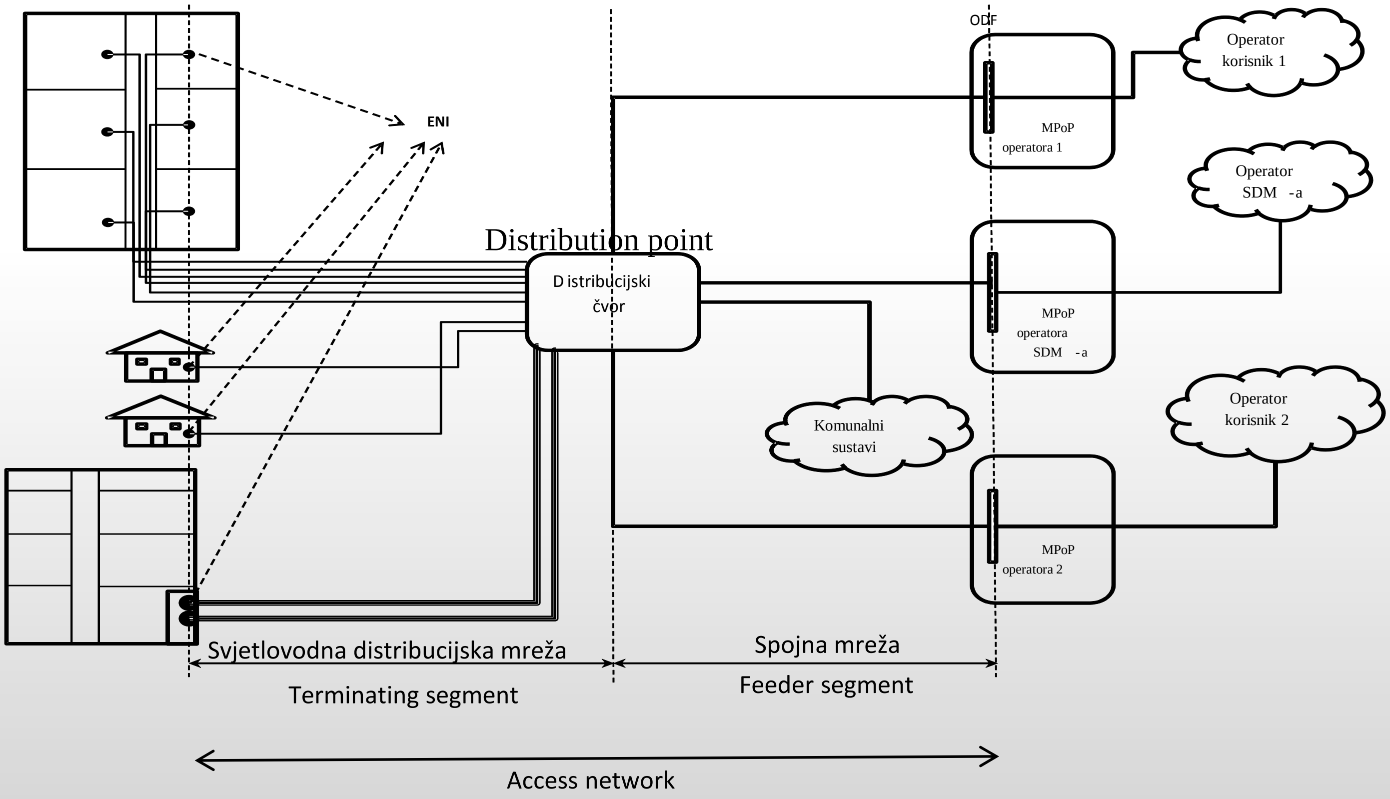
Households per access speed in Croatia (Source: HAKOM [7])

Overall NGA coverage in Croatia (as of end of June 2016) [8]

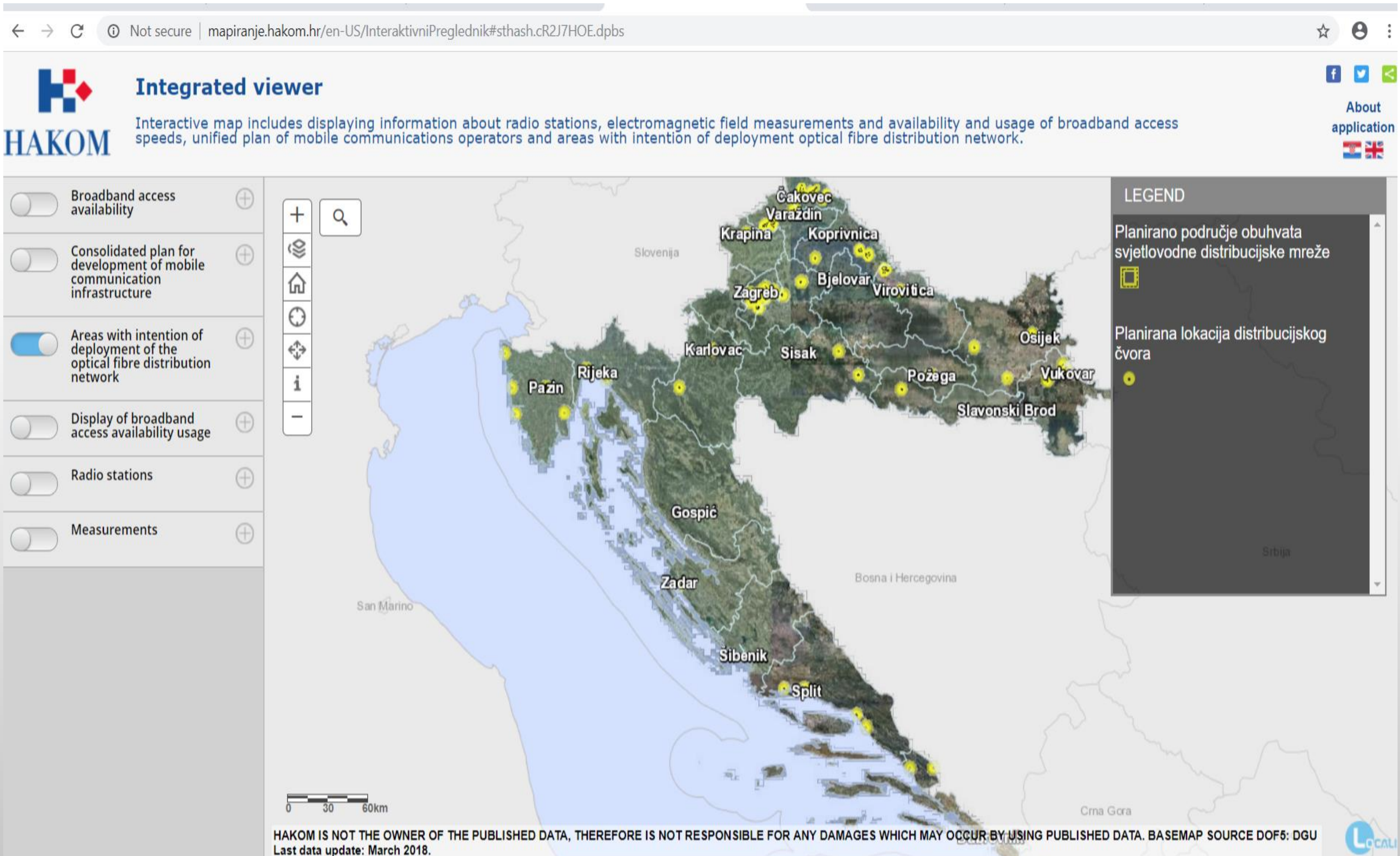
Ordinance on fiber optic distribution networks (2009, 2014)

1. Application:only in areas where household density is greater than 500 HH / km^2
2. The rules apply only to the terminating segment of the access network
3. Defines the minimum capacity of distribution node (300 FO)
4. Defines 1,2 FO per household
5. The obligation to announce the construction
    - statement of interest for rent or co-investment

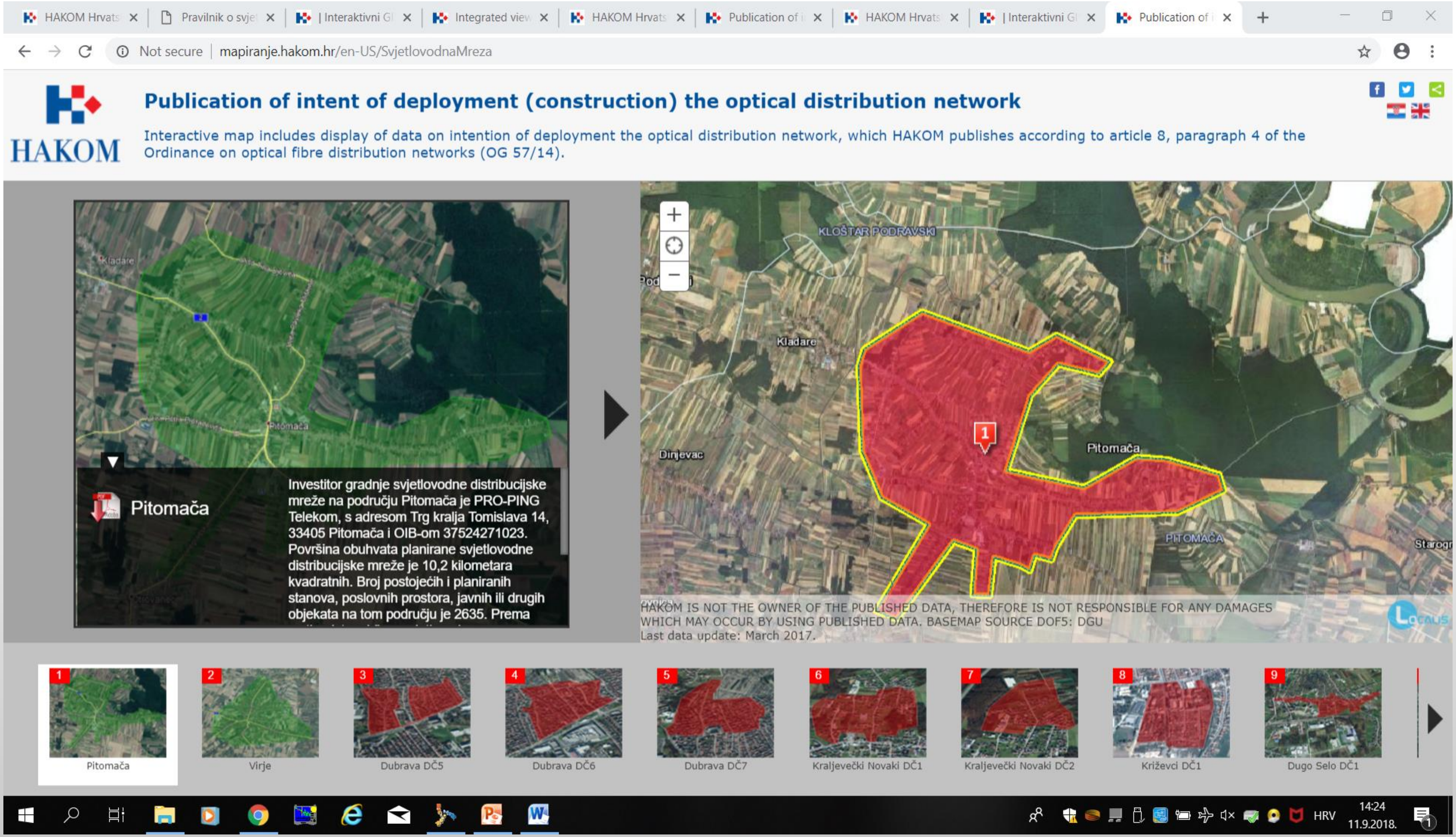
Ordinance on fiber optic distribution networks (2009, 2014)



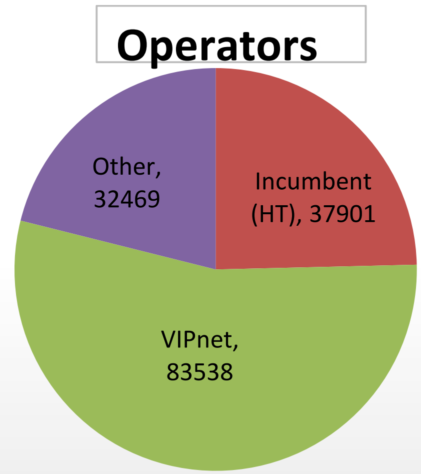
Integrated viewer



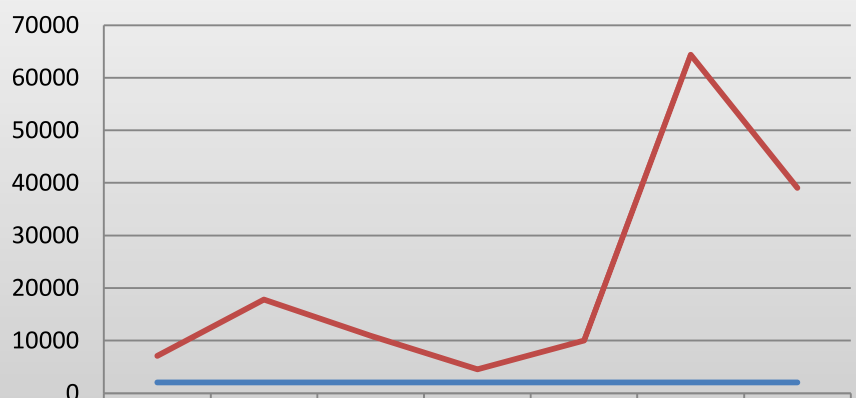
Integrated viewer



The results & realization



Announcement



	1	2	3	4	5	6	7
Series1	2012	2013	2014	2015	2016	2017	2018
Series2	7100	17833	10918	4550	10032	64407	39068

Conclusion

1. Competition leads to faster growth of FTTH
2. The introduction of technical rules makes sense
    1. Encouraged deployment one network per area
    2. Measures to encourage co-investment
3. „Lesson learn" – absorption of resources from EU founds

Stjepan Vodolšak

HAKOM
CROATIAN REGULATORY AUTHORITY
FOR NETWORK INDUSTRIES

ROBERTA FRANGEŠA MIHANOVIĆA 9
HR-10110 Zagreb, CROATIA
Tel: +385 (0)1/7007 007
Fax: +385 (0)1/7007 070
www.hakom.hr