

# **Community owned fibre optic networks – a sustainable broadband future for rural areas in Croatia?**

**2010 European Regional ITS Conference in Copenhagen**

**Igor Brusić, Martin Lundborg, Wolfgang Reichl**

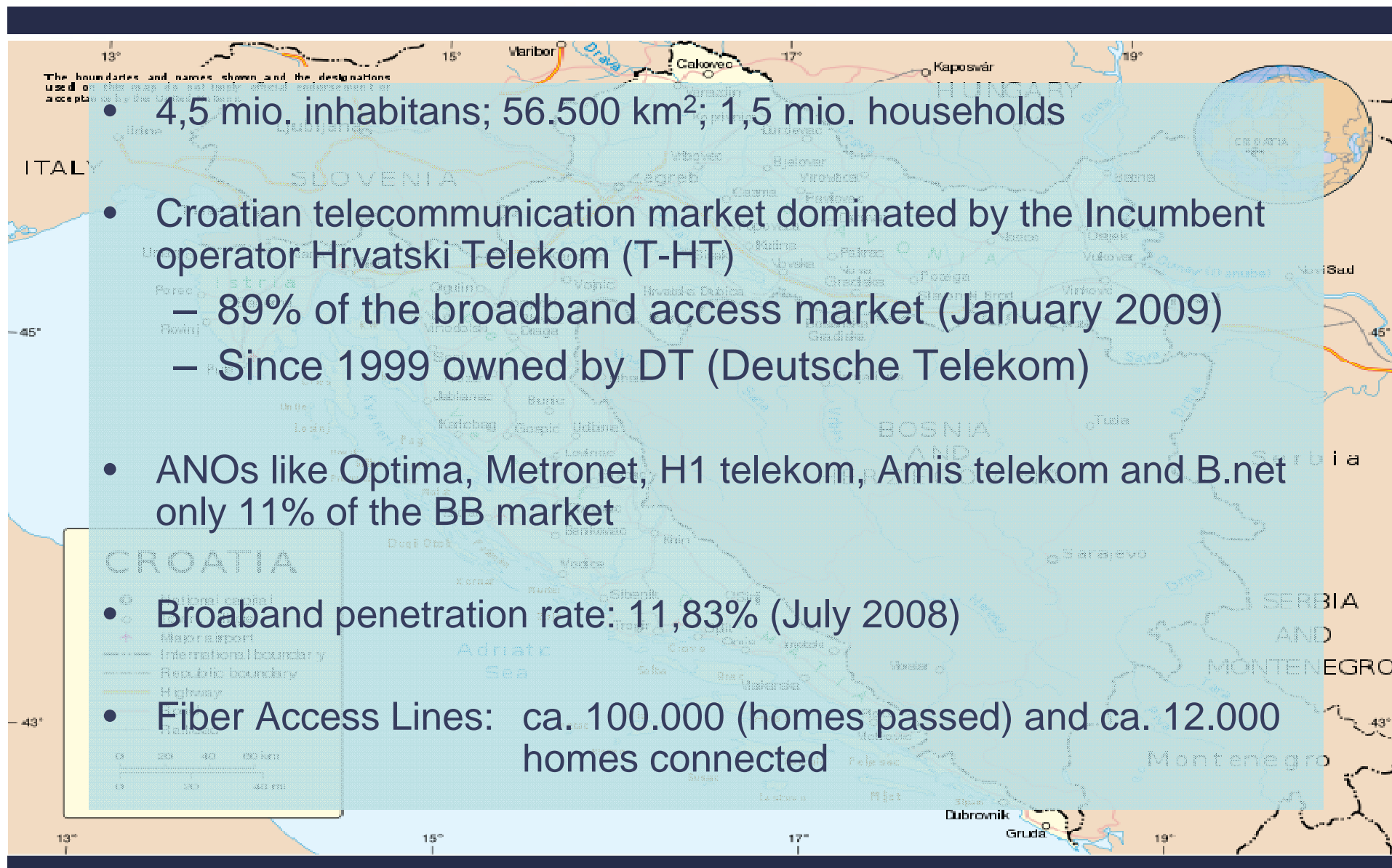
**SBR Juconomy Consulting AG**

**14.09.2010**

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# Croatia / General

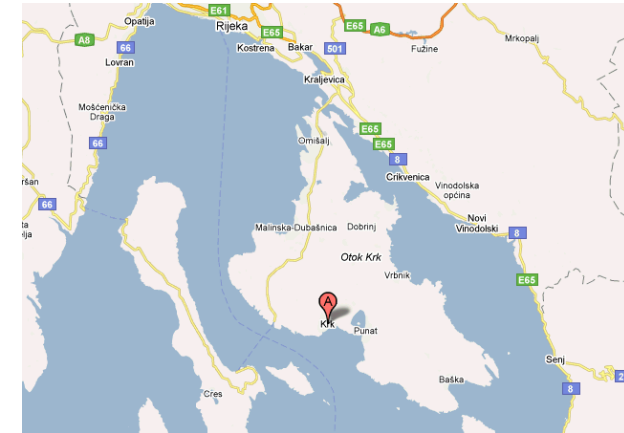


# Municipality optical network

1. Why municipality?	2. Why optical?	3. Why network?
<ul style="list-style-type: none"><li>▪ No operators will do it</li><li>▪ The municipality can build it together with other infrastructure (streets, canal, etc.)</li><li>▪ Independent of network operators</li></ul>	<ul style="list-style-type: none"><li>▪ It has the best characteristics concerning:<ul style="list-style-type: none"><li>▪ capacity</li><li>▪ electricity consumption</li><li>▪ insensibility</li><li>▪ durability</li><li>▪ environmental impact</li></ul></li><li>▪ The last decades most operators are using fibre optics in fixed networks</li></ul>	<ul style="list-style-type: none"><li>▪ It is one of the very few investments in infrastructure which is financially attractive</li><li>▪ It will be the basic infrastructure for future development of the town and the island</li><li>▪ Because the windows of opportunity is open</li></ul>

# Croatia / Island Krk / Town of Krk

- Town of Krk with 6.000 inhabitants and 2.200 houses (5.000 households)
- Tourism as main source of revenues
- At the town council decision in September 2009:
  - Collecting information about existing infrastructure (database)
  - Future civil work, obligation to collocate empty duct
  - Elaboration of a cost/benefit analysis
- The study can be downloaded at <http://www.sbr-net.de/fileadmin/sbr-group/pdf/juconomy/veroeffentlichungen/Cost-Benefit Analysis Town of Krk Draft10 Final Version.pdf>



**GRAD KRK**  
presjajni grad krčana

MAPA WEBA

TRAŽI

**Dobrodošli na službene stranice Grada Krka**

Ukoliko imate kakvih upita ili želite kontaktirati gradsku upravu, nazovite nas ili pošaljite e-mail. Materijale u pisanom obliku možete ostaviti u prijemnom uredu (soba 27), svakim danom od 08.00 do 11.30 te od 13.00 do 15.00 sati.

**Gradska uprava:**  
Trg bana Josipa Jelačića 2, 51500 Krk

**Radno vrijeme:** svakim danom od 08.00 do 11.30, te od 13.00 do 15.00 sati, osim četvrtkom kada se stranke ne primaju!

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**OIB Grada Krka:** 12405095116

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**Prijemni ured**  
Aleksandra Jurić, referentica općih poslova i arhivar  
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**NOVOSTI**

**25. 4. 2010.** - U Hotelu Koralj održan koncert Vokalne akademije Ljubljana; članice Karate kluba Krk uspješno nastupile na 11. Udine karate trophy

**26. 4. 2010.** - Održan 33. sastanak Kolegija gradonačelnika Grada Krka

**27. 4. 2010.** - Turistička agencija Aurea proslavila dvadesetu godišnjicu uspješnog poslovanja; objavljeni rezultati izbora za članove vijeća Mjesnih odbora: Korničić, Vrh, Skrpčić-Pinezić, Milohnić i Poljica

**KORISNI SADRŽAJI**

Prometna povezanost >

Prostorni planovi >

Plan grada >

ANKETA

Smatrate li grad svojim posjetiteljima nudi dovoljno atraktivnik sadržaja (poput sajmova, festivala, izložbi, radionica itd.)?

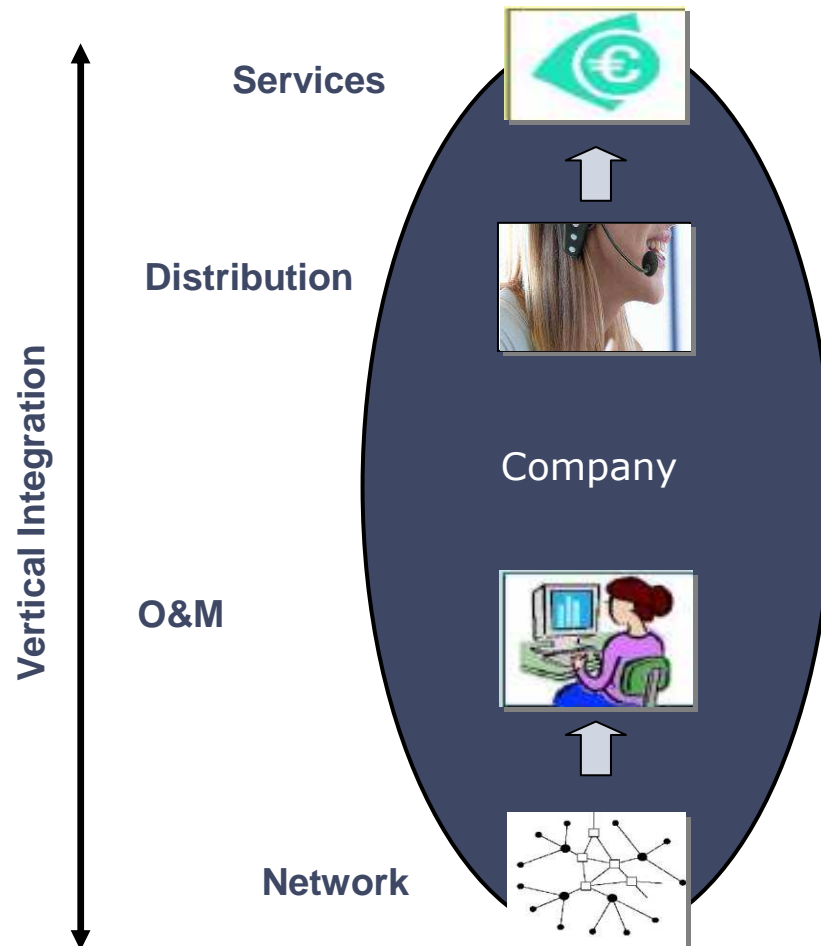
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GLASUJ REZULTAT

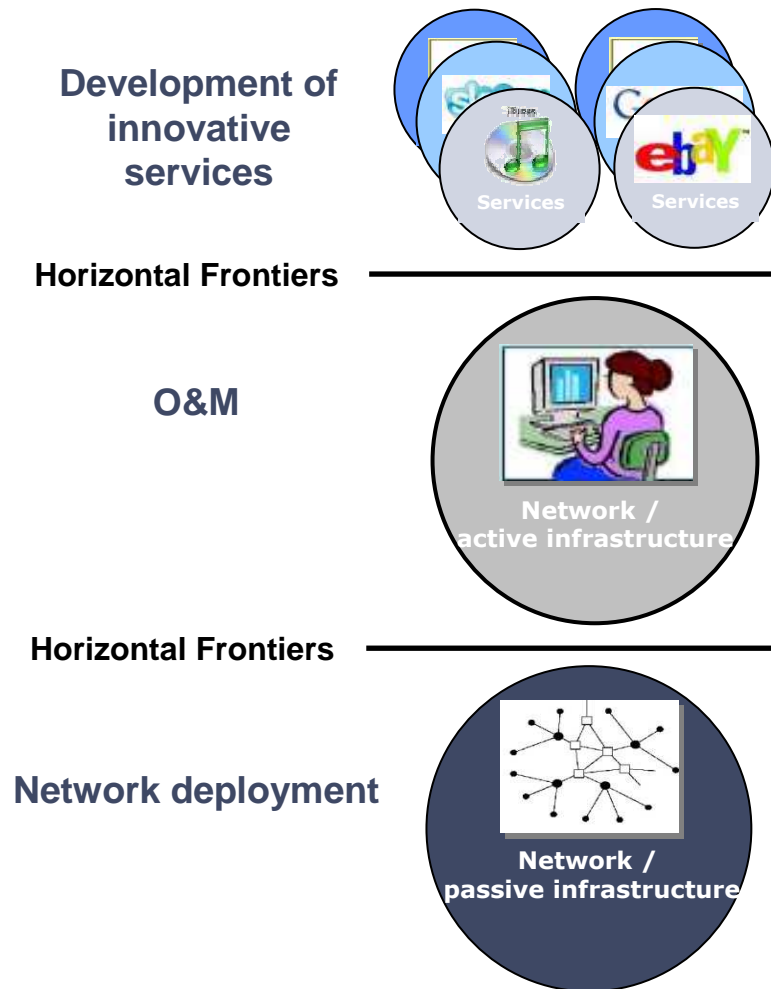
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# Vertically Integrated



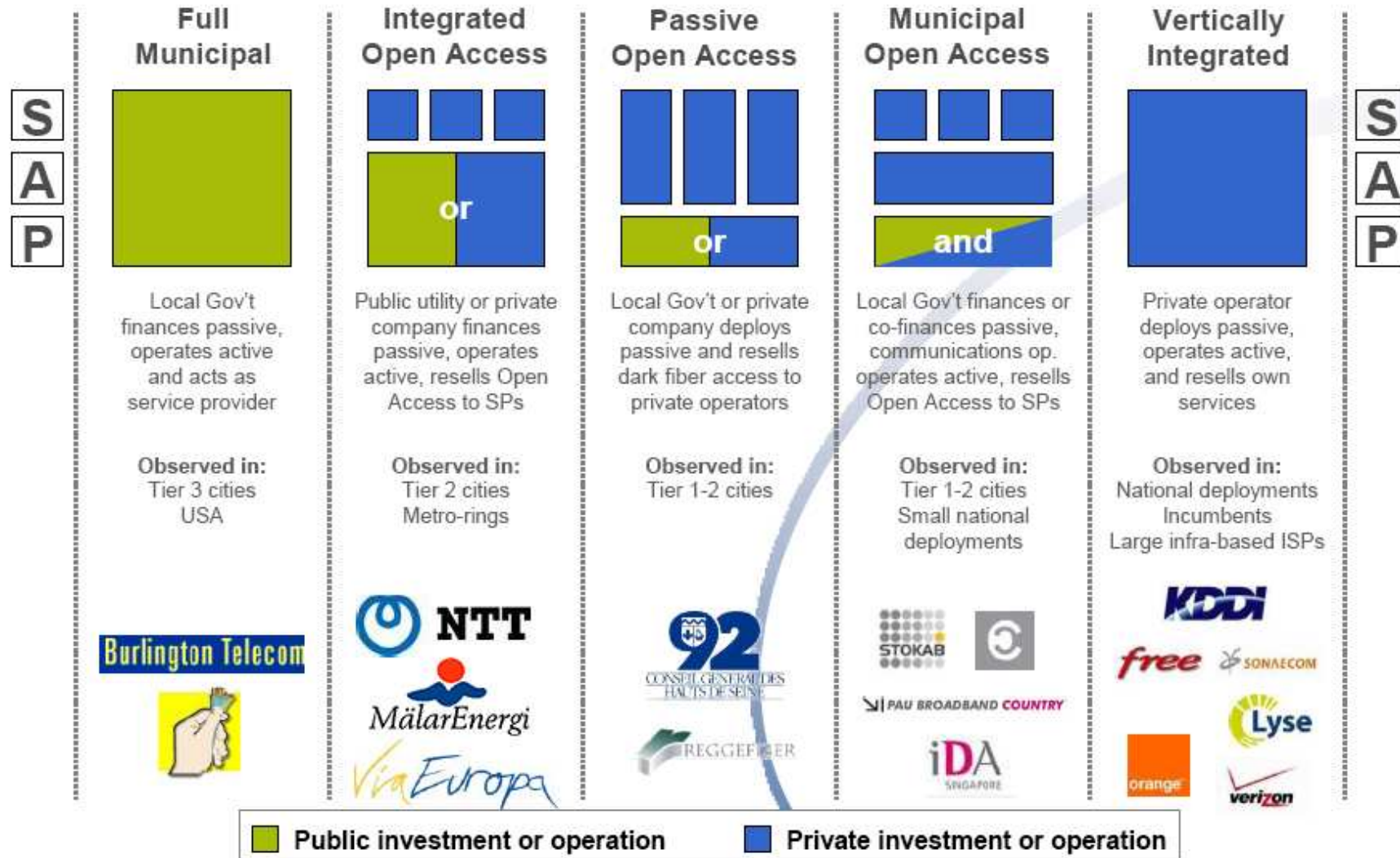
- Classical Network Operator
  - owns the infrastructure
  - administers / operates the network
  - provides services to end users
- Revenue from products / services contribute to financing the infrastructure and the operation
- Wholesale offers possible on different levels
- Investors require short term ROI
- Different regulatory remedies

# Horizontal Separated



- **Level 3: Retail Services**
  - Each provider has (open) access at non-discriminatory conditions
  - Digital market place
- **Level 2: Network operation**
  - Lightening of the fibre and operation of active equipment
  - Wholesale products for service providers
  - Open Access = no retail services
  - Local utilities, telecom operators
- **Level 1: Infrastructure**
  - Use of existing infrastructures (dark fiber, ducts, sewerage)
  - Optical fibre as natural monopoly?
  - Municipalities, cities, utilities as new players

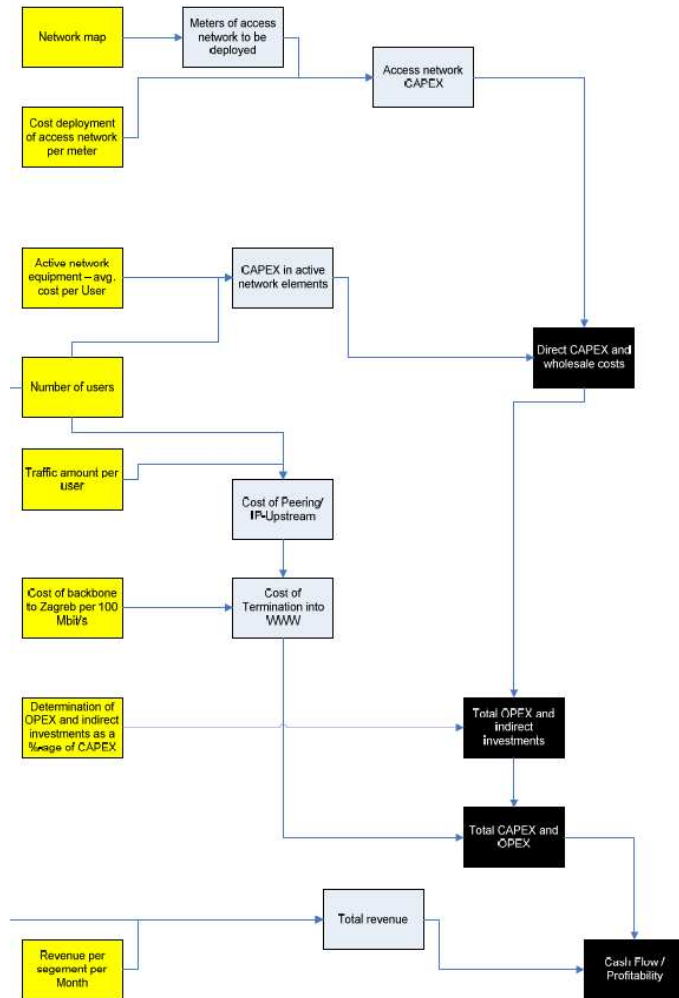
# Possible Business Models for Municipalities



Source: Benoit Felten, Exploring Open Access Models, 2008

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# Calculation



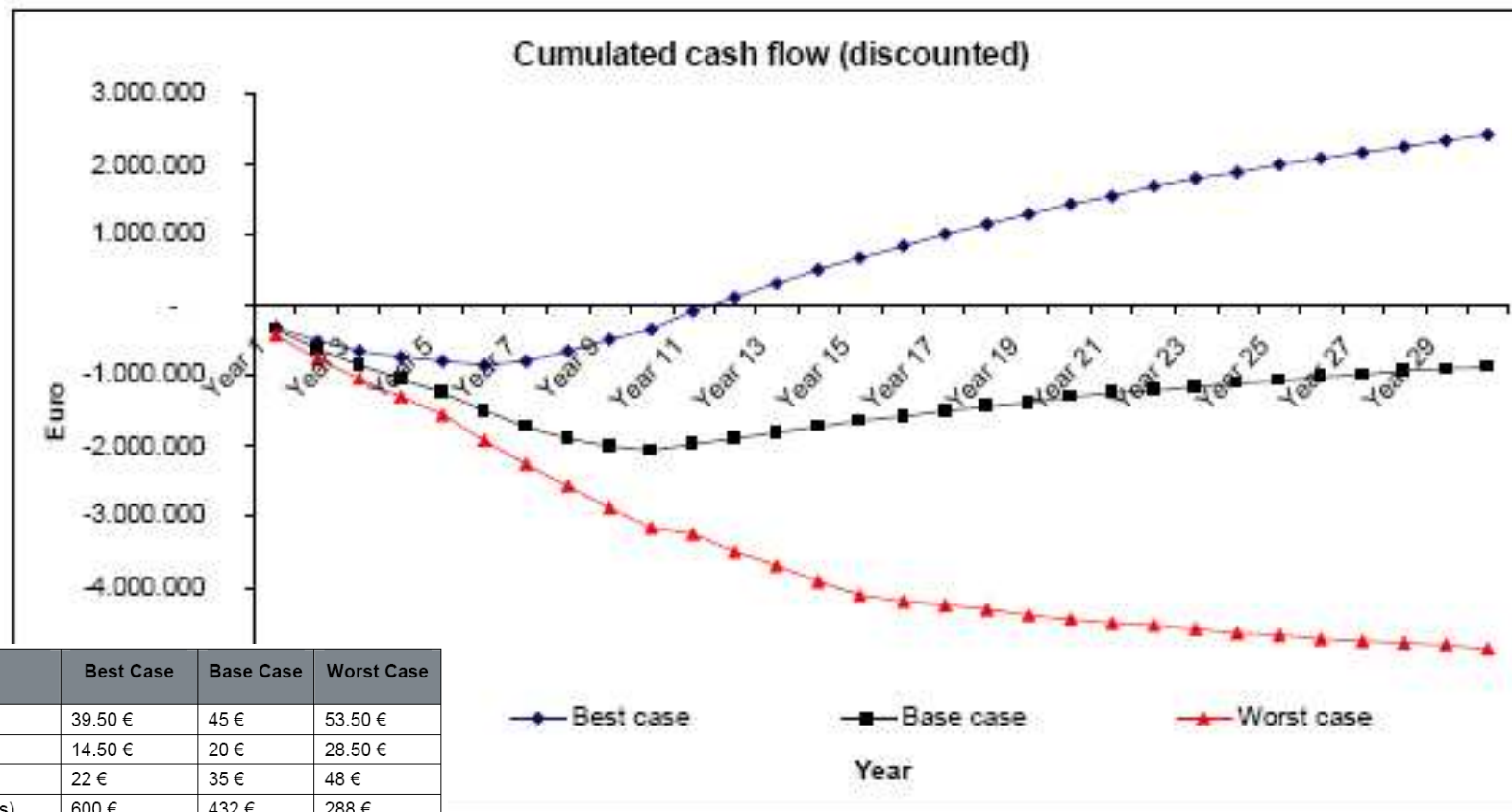
Cost and revenue estimation path

## Input parameters

Input parameter	Value	Source
CAPEX per meter in the access network	See below	Various benchmarks and cost studies, see below
Number of meters of ducts	See below	Market projection by SBR, see below
Number of homes connected	See below	Market projection by SBR, see below
Market share	Starting by 100% in year one, then falling by 2% for each year	Market projection by SBR

Input parameter	Value	Source	
Cost of Peering/IP-Upstream	Minimum EPMU	75,000 €	Based on the mark-ups for OPEX and Indirect operations costs, the absolute costs for OPEX are underestimated in case of a small size of the operations. Therefore, a minimum for indirect operations costs of 75.000 € per year equal to one full-time-employee has been budgeted.
Cost of leased line in Zagreb	WACC (cost of capital)	15%	
Investments in active elements per user	ARPU, Class 1 (Partner customers)	Base case: 36 € per Month for the bitpipe service Best case: starting at 50 € per month Worst case: starting at 24 € per month	
Direct equipment OPEX	ARPU, Class 2 (other customers)	Base case: 18 € per Month for the Bitpipe service Best case: 25 € per month Worst case: 12 € per month	SBR assumption
Indirect equipment OPEX			
Indirect OPEX			
Indirect operations cost (per MU)			

# Cumulated Cash Flow with WACC of 6%



Input parameter	Best Case	Base Case	Worst Case
CAPEX per Meter, type 1	39.50 €	45 €	53.50 €
CAPEX per Meter, type 2	14.50 €	20 €	28.50 €
CAPEX per Meter, type 3	22 €	35 €	48 €
Revenue (partner customers), p.A.	600 €	432 €	288 €
Revenue (other customers), p.A.	300 €	216 €	144 €
Number of homes connected	Starting with 65 in year one increasing to 2,700 in year 8	Starting with 65 in year one increasing to 2,570 in year 10	Starting with 10 in year one, increasing to 1,300 in year 15

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# Main Results of the Analysis

- Calculation confirmed that Krk is not attractive for classical network operators
- For the realisation of 2.000 connections investments of 1,99 mio. Euro
  - 968 Euro per household
- 9 km of empty ducts are installed in the city and the town is owning a cable TV network with 1.000 homes connected (70% of the cables are in ducts)
- Parameters positively influencing the project
  - Higher income per subscriber
  - Lower cost of Backhaul (Krk-Zagreb)
  - Lower cost of capital (WACC)
  - Lower OPEX
- Necessary to optimize the input parameters or changing the business model

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# Next Steps

- Elaboration of an master plan
- Marketing/educating/convince local companies and inhabitants
- Checking possibilities of financing
- Checking possibilities of cooperation with (local) private partners

# Conclusions

- Business case for municipalities is different than for classical network operators
  - Externalities can/have to be added
  - Each municipality has to be analyzed separately
- City owned ducts and cable TV network - better starting position than other comparable cities in Croatia
- On site support as a key factor!
- Public private partnership and open access are highly relevant in future elaborations

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