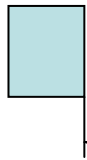


„The Problem – Telecommunication Internet Broadband Local Loop“

Problem : very high investment costs

40-50 billion GBP estimated for UK
50 – 100 billion Euro est. Germany
etc.

House
End Customer



still Monopoly, sometimes with
prices made by the regulator

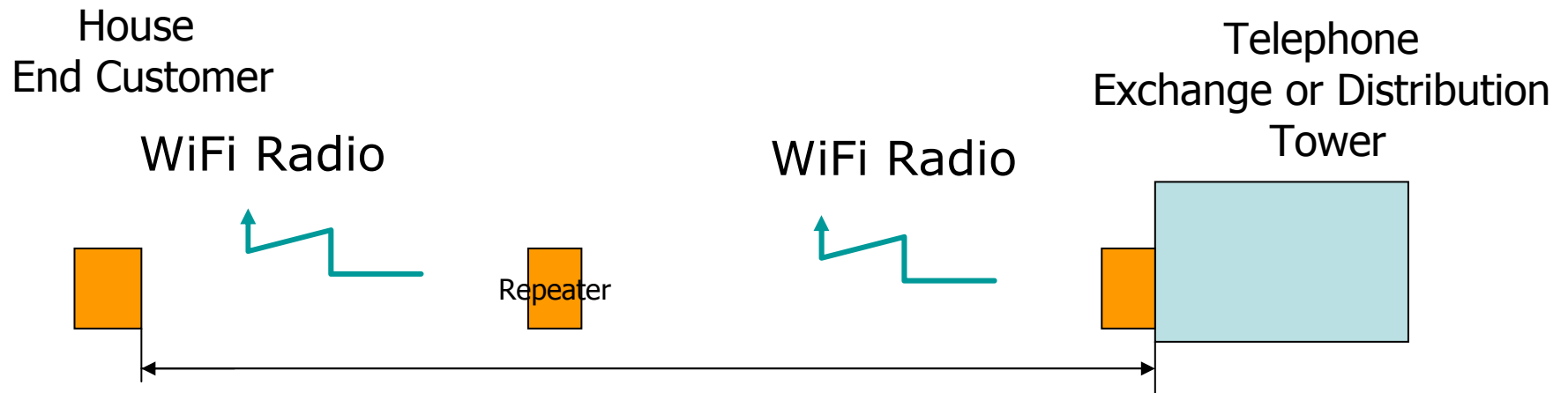
Telephone exchange
with DSLAM
and main distribution
frame



max. 3 km for two wire telephone cable and DSL connection

Alternatives like Coaxial- TV cables and fiber cables are very expensive;
4G has only limited bandwidth and is also very expensive

„The KI-EC Ltd. Solution – Local Loop“



Advantage :

- low investment costs (only 1/5 to 1/10)
- free radio licenses
- future proof bandwidth
- competitive with fiber
- price guaranteed
- Wifi- end customer devices available

Economical feasible Broadband Internet Local Loop Solution



KI-EC Ltd. offers an



Quick Break Even and Feasible

Economical feasible Broadband Local Loop Internet Solution e.g. as Turn Key Project or Whole- Sale Partner

- Only 1/5 to 1/10 of costs compared to a Fiber Roll-Out
- The Solution can be operated as Standalone Telecoms Service, which is economical feasible and has a quick break even for private and business demand
- Carrier Grade Classes of Services for the IP based Radio, Access and Core network are standard
- Full Coverage with WiFi with very small cells and statistical one user per radio system
- Easy, clever and inexpensive Very High Capacity Backhaul Solution
- Easy Migration to Fiber when bandwidth demand growth
- All Smart Phones and Laptops can immediately switch online with a Roaming Solution

Economical feasible Broadband Internet Local Loop Solution

Special Offer for Mobile Network Operators (MNO) :

Forget your Bandwidth Problems !

- Tell us your 20 areas with bandwidth bottlenecks**
- Agree to a forced handover into our network, whenever your customers discover our network - for at least 90 % of traffic**
- Agree to a monthly flat- rate per user based on speed 10 Mbit/s, 20 Mbit/s etc.**
- Video, Voice and Data**

WE DO THE REST

Economical feasible Broadband Internet Local Loop Solution

•More Solution Features :

7,- GBP per line & month

- British BDUK requirements are fulfilled, 7,- GBP per line and month are possible with reasonable break even.
- The EAP-SIM/802.1x (WPA2) based Roaming Solution provides immediate access to the network. There are currently 240 GSM operators connected to the roaming platform, an outbound roaming potential of billions of subscribers.
- 3G & 4G Offload services for smart phones with a slow mobility rate of 30 miles/h can be offered.
- Very densely populated areas, but also rural areas can be served with the solution.
- The solution helps Service Providers to provide Broadband Internet Access for the „Wired Local loop“ for private and commercial users.



Status on the Market



Growth Market

- In Europe Incumbents still have an ownership monopoly on the Local Loop network. New Local Loop networks emerge very slowly.
- The Local Loop Broadband and DSL market is still shaped by strong growth, e.g. 37 % in the UK.
- The Local Loop is still the cash cow of the former Incumbents.
- In many regions Broadband Internet can not be provided sufficiently or very high prices have to be paid for limited services.
- 75 % of the costs of a Telephony and Broadband Reseller are based on the expenses for the Local Loop.
- 25 % of the costs are related to Interconnection- Charges.

Unique Selling Position (USP) for Local Loop Solution

Highly Competitive Solution



- **Voice, Data and Video streams will be provided with one Multimedia Ready Network**
- **The new Radio Field Design can provide Mass Broadband Access for Internet Users in rural but also densely populated areas.**
- **Frequencies used for the solution are free, reserved, approved and free of charge**
- **The solution does not need any long term gap financing to keep the network running**
- **Depending on the targeted customer base, areas with 2500 up to 5000 citizens per sqkm are the aim of the technology with a fiber like bandwidth provision but much lower costs.**

Market Size

UK Solution Market Size 4-8 billion GBP



As example, only 71 % of people in the UK have Broadband Internet Access. In rural areas about 2 million people have at the moment no chance to get a Broadband Internet connection. The average speed amounts to 4 – 5 Mbit/s, but can be much lower in certain areas, due to a few very high speed connections, which have a strong influence on the statistics.

The investment demand for Broadband Internet in the UK based on Fiber technology is estimated to amount to 40 to 70 billion GBP. The investment demand in Germany is estimated to be 50 to 100 billion Euro. The demand for Broadband Internet in East European countries is even higher. The offered network solution cuts the necessary investments at least by the factor 5 to 10.

Business Plan Calculation

40 MBit/s - 5000 citizens/sqkm



The Local Loop is still a monopoly of Incumbents due to the fact that the necessary investments for the Local Loop are still very expensive. The offered Broadband –Internet solution makes it possible to offer Local Loop services with an extreme competitive price on a very high technical level with a very quick break even for the investment.

The offered solution intends to provide based on the business plan a maximum of 40 Mbit/s per user based on a contention ratio of 1/20. The radio network can be used in densely populated areas with an average of 5000 citizens per sqkm. Therefore the bandwidth which can be offered is even future proof in comparison with Vectoring or Fiber based FTTC, FTTH solutions.

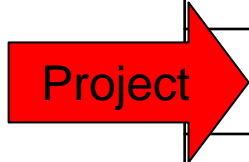
FTTC – Fiber to the Curb , FTTH Fiber to the Home

Sample Calculation Hampton Vale, Peterborough

Example Bandwidth Calculation

Citizens	Households Hampton	Users	Usage Ratio	Active Users	2 Links / 3,2 GBit/s per 90 deg. sector, Bandwidth	4 Links / 6,4 GBit/s per 90 deg. sector, Bandwidth	6 Links / 9,6 GBit/s per 90 deg. sector, Bandwidth
21840	5460	1200 are 22 % of households	1/20	60	3,3	6,7	10
			1/10	120	6,7	13,3	20
			1/5	240	13,3	26,7	40
		1500 are 27 % of households	1/20	75	40	85,3	128 *)
			1/10	150	20	42,7	64
			1/5	300	10	21,3	32
		16380 are 74 % of citizens	1/20	819	3,9	7,8	11,7
			1/10	1638	2	4	5,8
			1/5	3276	1	2	3
16800	4200	1200 are 29 %	1/20	60	53,3		160 *)
			1/10	120	26,6		80
			1/5	240	13,3		40

40 MBit/s per user



The available bandwidth depends on the usage ratio. The usage ratio will shift to higher values due to changing customer behavior.

*) Limits of technical radio interface reached

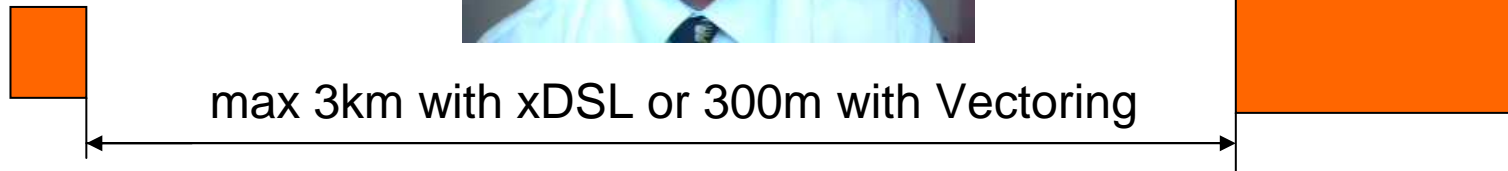


The economical Challenge

House
End Customer



Telephone exchange
with DSLAM
and main distribution
frame

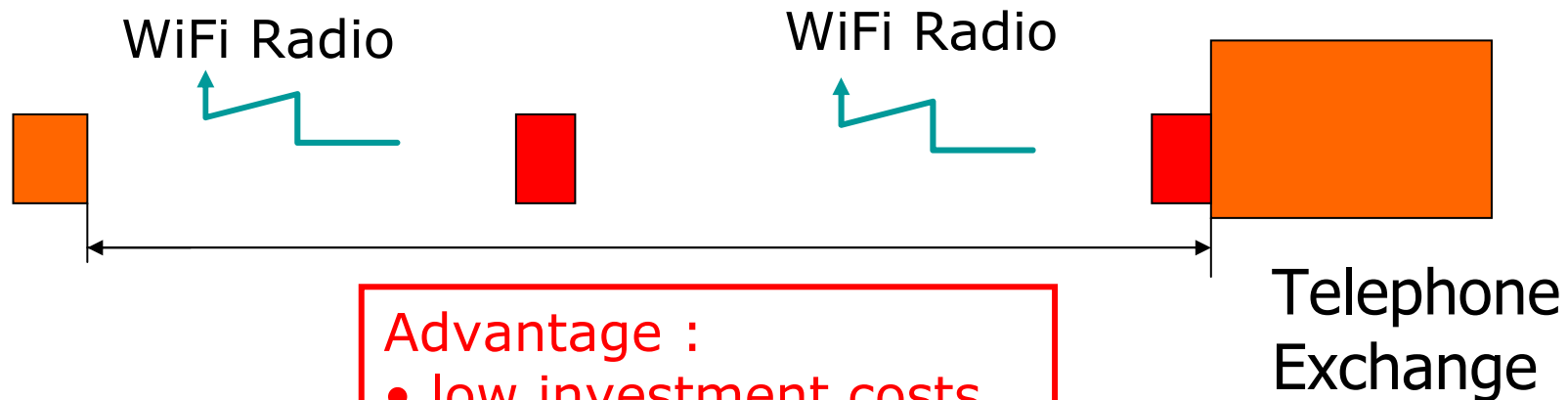


The Economical Challenges are :

- Monopoly with regulator influenced prices
- Maximal 3km range with existing 2-wire cable or 300m with Vectoring
- Limited range and bandwidth with xDSL and Vectoring
- Very expensive alternatives like coaxial or fiber cable

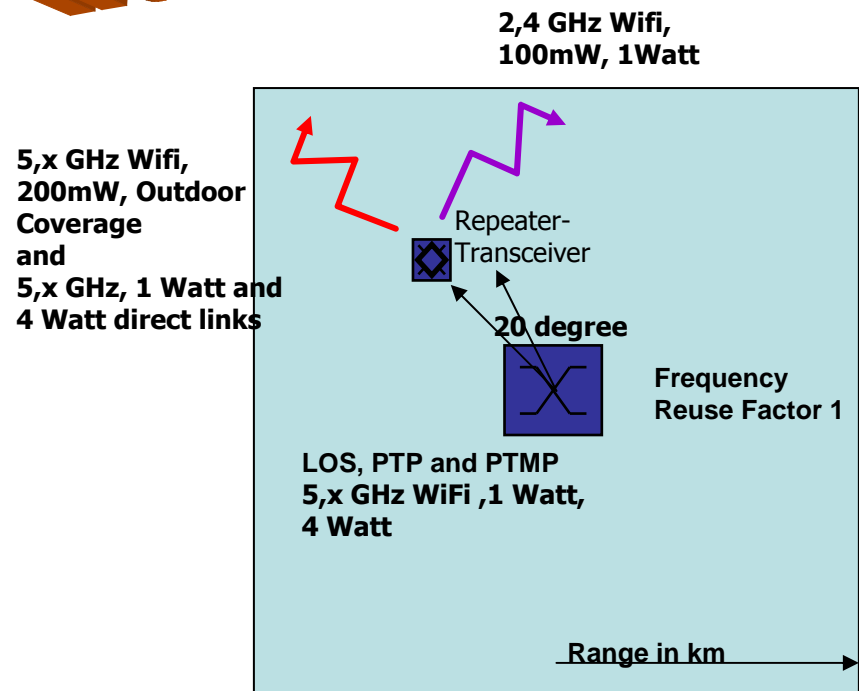
The Solution

House
End Customer



- Advantage :**
- low investment costs
 - free radio license
 - future proof bandwidth
 - no competition
 - price guaranteed

How does it work ?



The WiFi Multi Carrier approach and the CSMA/CA based sharing of bandwidth limits the frequency interference in the licence free band.

Parallel access attempts result only in the loss of bandwidth but not quality. There will be statistical one user per radio system based on 5000 citizens per sqkm.

Business Plan Broadband Internet Access for the Local Loop

5 sqkm - 820,000 GBP



It is economical possible to set up a complete Whole Sale Local Loop Provider for Broadband Internet Access. The solution will be delivered “Turn Key”, A business plan for the solution can be provided. The solution is as standalone business profitable and it is not necessary to provide continued subsidies, or so called gap funding to keep the Local Loop Provider alive.

As sample the suburb Hampton in Peterborough comprises 4270 houses and estimated 5460 households. An estimated total of 21900 citizens live in this suburb. The suburb has an expanse of estimated 5 sqkm, which has to be fully covered. This will cost as “Turn Key” 820.000 GBP without economies of scale considerations for large roll-outs.

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