The Economics of Next Generation Access

Results of a study for ECTA

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1. Scope of the Study
2. Some recent global developments
3. Modelling approach
4. Some major model results
    - Germany
    - France
    - Sweden
4. Regulatory policy conclusions and recommendations

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1. Scope of the study

(1) Review of recent studies on NGA done for regulators, Governments and the OECD

(2) Review of global experience on NGA roll-out, replicability and regulatory approaches (USA, Japan, Singapore, Australia)

(3) Modelling approach for VDSL and FTTH NGA roll-out

- 6 countries (D, F, I, ES, P, SE)
- Area of profitable roll-out
- FTTC, FTTH-PON, FTTH-P2P architectures considered
- Degree of replicability of first mover (incumbent) NGA roll-out
- Impact of potential regulatory measures on replicability

(4) Regulatory policy conclusions and recommendations

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2. Some recent global developments

Australia (1)

- Envisaged nationwide Fibre to the Node (FTTN) network (1)
  - In April 2008 the Australian Federal Government released a Request for Proposals for the roll out of a nationwide FTTN network, which will:
    - Deliver minimum downlink speeds of 12 Mbps to 98% of Australian homes
    - Using Fibre to the Node (FTTN) or Fibre to Premises (FTTP) technology
    - Support high quality voice, data and video services including symmetric applications such as high definition video conferencing
    - Facilitate competition in the telecomunications sector through open access arangements that allow all service providers access to the network on equal terms
    - Enable uniform and affordable retail prices to customers, no matter where they live.

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2. Some recent global developments
Australia (2)

- Envisaged nationwide Fibre to the Node (FTTN) network (2)
  - The Australian Government has committed to spend up to 4.7 billion AUD to enable the roll-out
  - The party to build the nationwide Fibre to the Node network will be selected through a „competitive assessment process“
  - Only bidding parties so far:
    - Telstra
    - Terria Consortium (formerly G9)
    - Macquarie
  - The Government aims to announce the successful bidder in late 2008.

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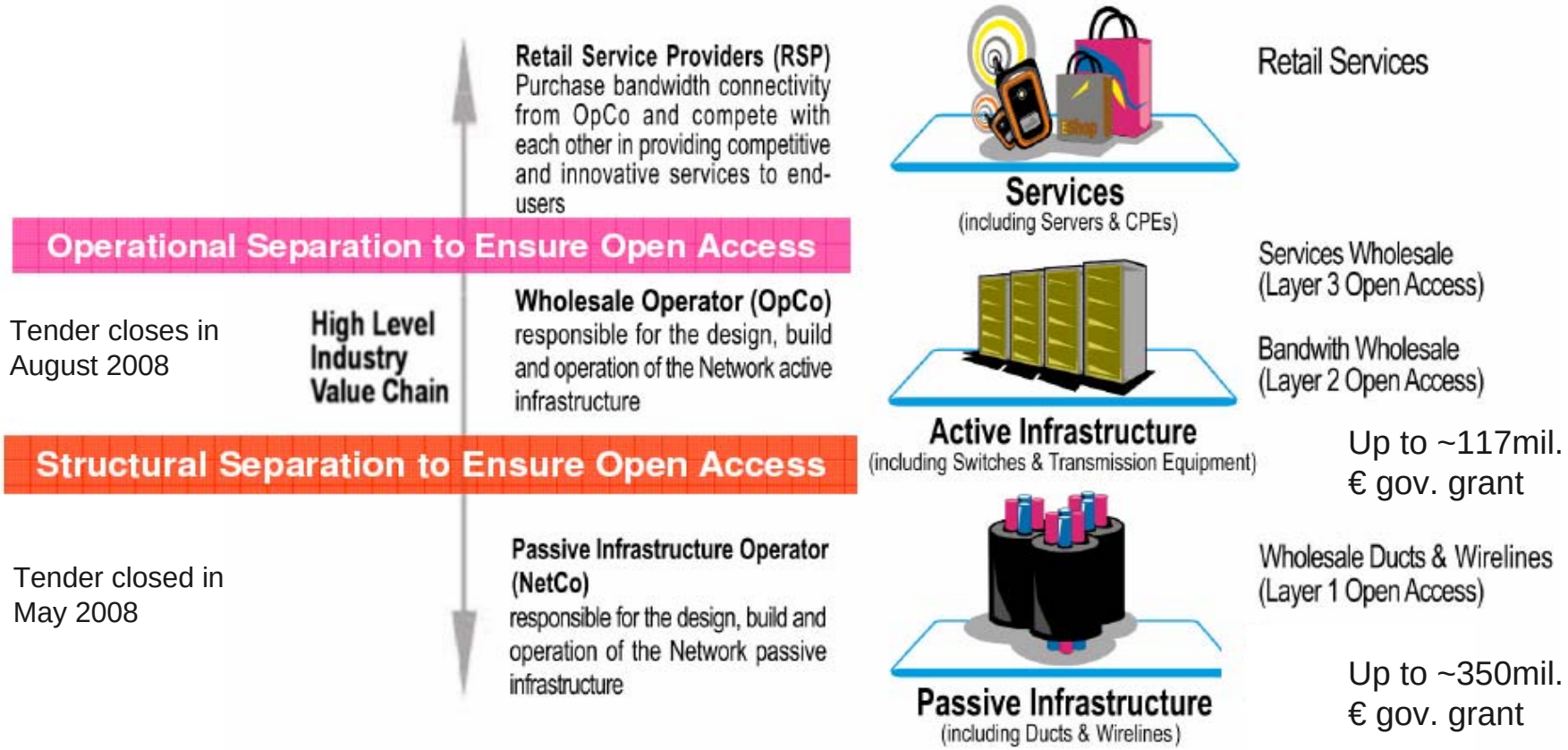
2. Some recent global developments
Singapore

Singapore NGN plan includes 2 RFPs for double separation

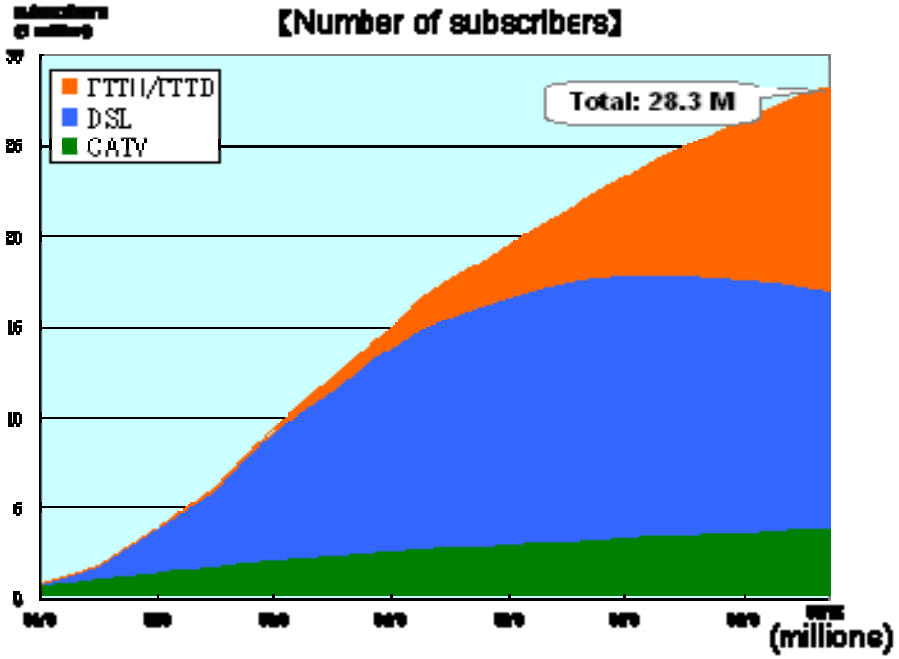


Source: IDA

2. Some recent global developments

Japan (1)

Broadband penetration in Japan according to different technologies



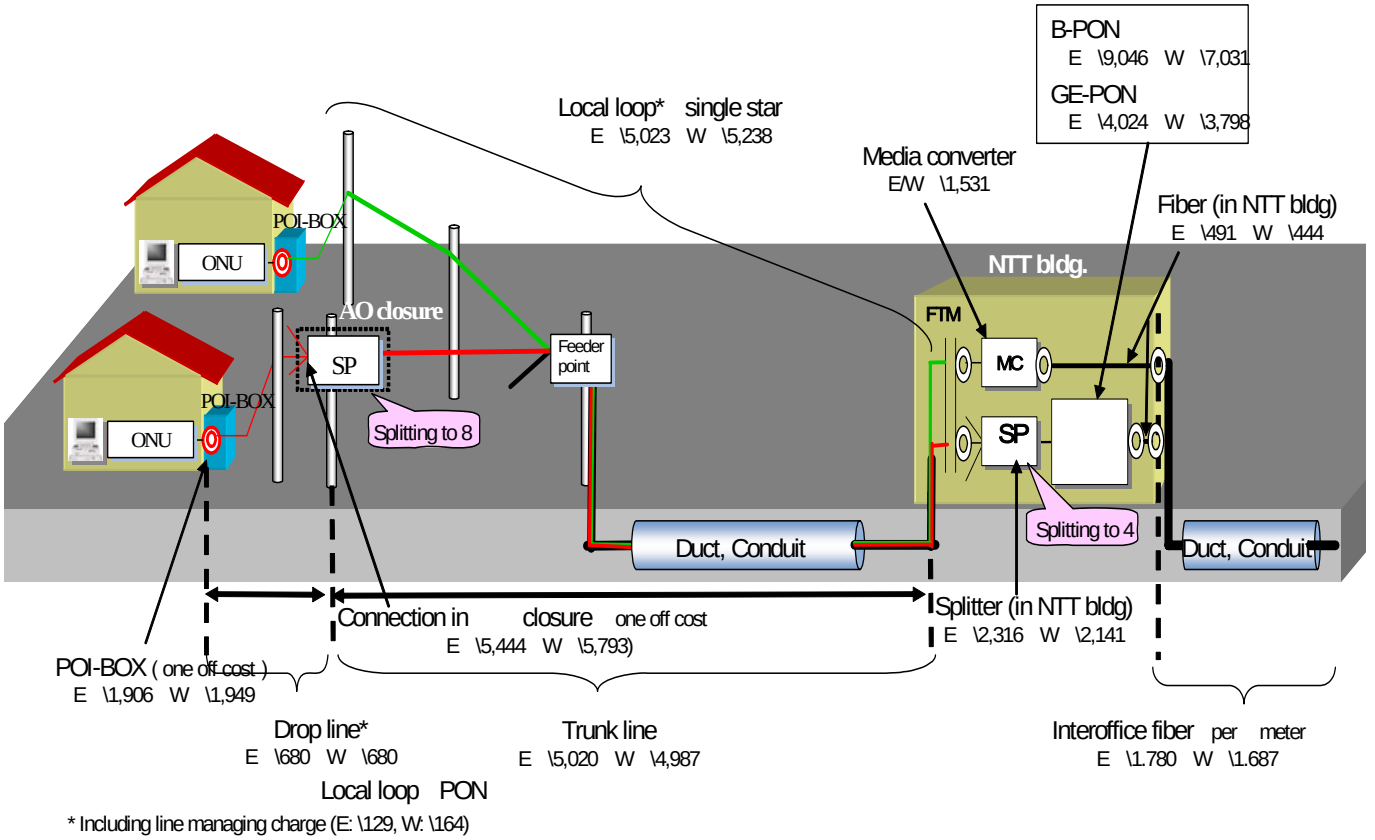
	02/09	03/09	04/09	05/09	06/09	07/09	07/12
FTTH/ FTTB	0.003	0.3	1.1	2.9	5.5	8.8	11.3
DSL	2.4	7.0	11.2	13.7	14.5	14.0	13.1
CATV	1.5	2.1	2.6	3.0	3.3	3.6	3.8

Source: Katagiri (2008)

2. Some recent global developments

Japan (2)

Access Charges for FTTH Devices in Japan (E = NTT East; W = NTT West; figures in Yen)



Source: Glocom (2006)

3. Modelling Approach (1)

- Generic bottom-up cost modelling approach
- Long-term consideration, but no time dimension
- Advanced broadband market assumption
- FTTC (VDSL), and FTTH (PON and P2P) NGA-technology considered
- Modelling of access, reasonable assumptions for concentration and backbone network
- Consideration of business and residential users
- Calculation of critical market share for profitability (< 100 %) and replicability (< 50%)

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3. Modelling Approach (2)

- Services modelled:
  - Telephony
  - Telephony and Broadband Internet Access
  - Telephony + Internet Access + TV
- Modelling and results for 8 clusters or geotypes

3. Modelling Approach
Geotypes of the model

Geotype		Cluster	Subscriber density per km²
Urban	(1)	Dense Urban	> 10.000
	(2)	Urban	> 6.000
	(3)	Less Urban	> 2.000
Suburban	(4)	Dense Urban	> 1.500
	(5)	Suburban	> 1.000
	(6)	Less Suburban	> 500
Rural	(7)	Dense Rural	> 100
	(8)	Rural	≤ 100

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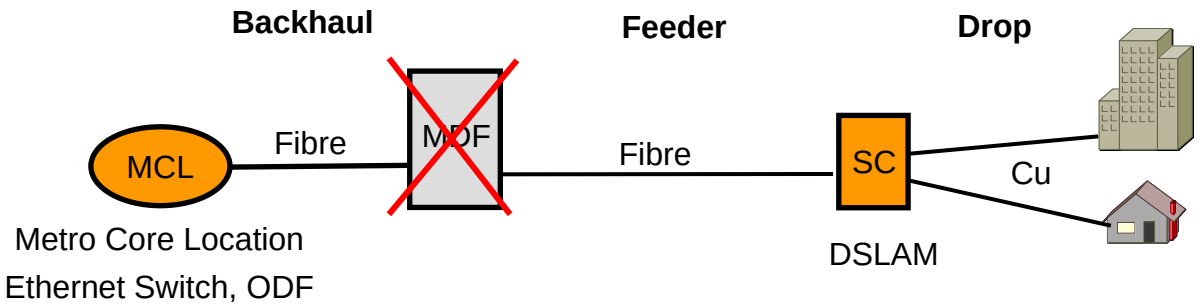
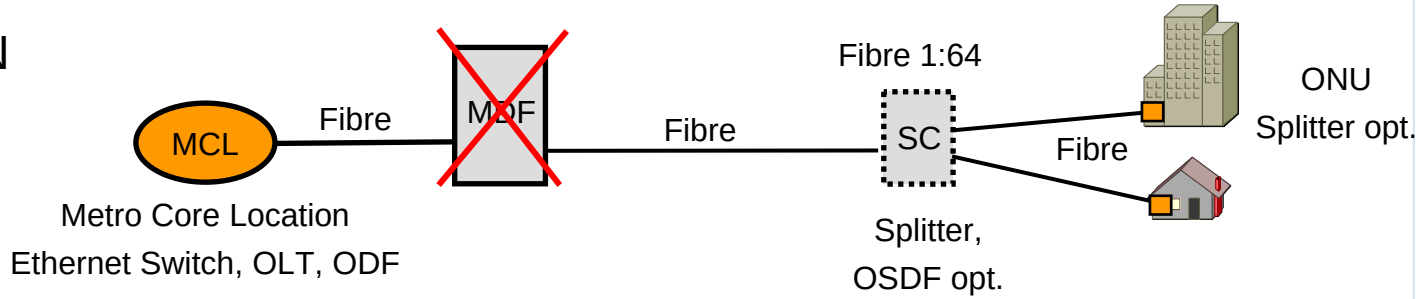
3. Modelling Approach

We consider three access network technologies

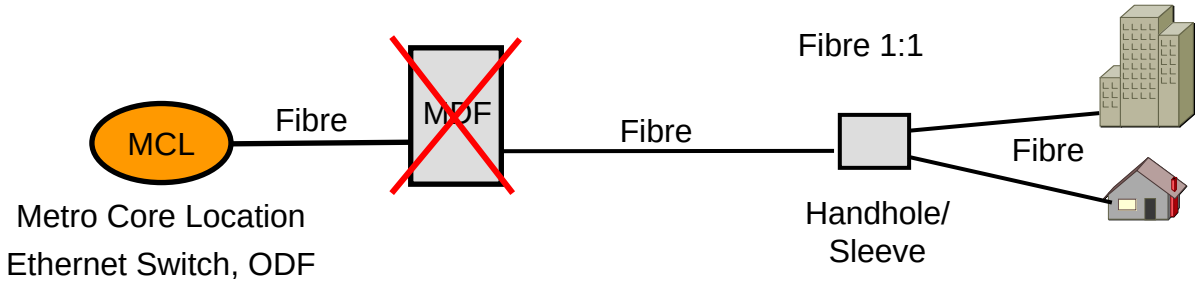
- VDSL



- FTTH PON



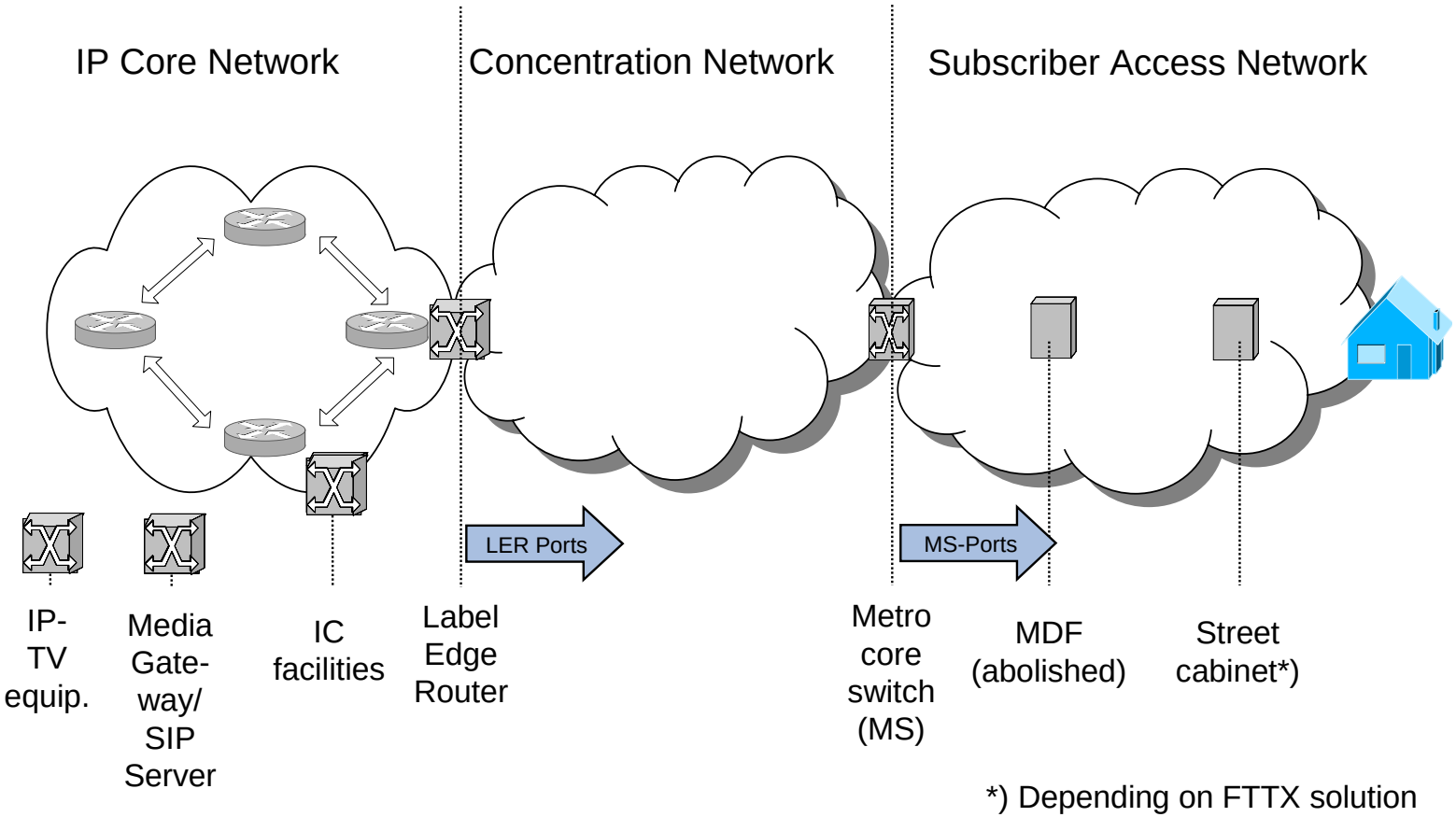
- FTTH P2P



Traffic concentration now on a higher level than MDF

Active Electronic Equipment

3. Modelling Approach
Network elements modelled



*) Depending on FTTX solution

3. Modelling Approach
Access opportunities

- Regulatory means which can be modelled
- **FTTC/vDSL scenario**
  - Sharing of street cabinets
  - Use of existing empty ducts or dark fibre for backhaul
- **FTTH PON scenario**
  - Fibre SLU (sub loop unbundling)
  - Sharing of OSDF (concentration point equivalent to street cabinet)
  - Duct access or dark fibre for backhaul or full loop
- **FTTH P2P scenario**
  - Fibre LLU at the Metro core location
  - Duct access or dark fibre
- **Means of construction**
  - Use and sharing of aerial cable
  - Common construction of trenches/ ducts

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3. Modelling Approach
NGA market and regulatory scenarios

			Remarks
(1)	Stand Alone operator as first mover	VDSL	
		PON	
		P2P	
(2)	Incumbent as first mover	VDSL	Investment savings due to dismantling of MDFs, better use of infrastructure
		PON	
		P2P	
(3)	2nd mover VDSL	80% duct access	10% less revenues than in (1) and (2) In 20% cases no co-location at SC
		20% duct access	
		80% dark fibre access	
		20% dark fibre access	
		80% dark fibre/duct access	
		20% dark fibre/duct access	
(4)	2nd mover PON	80% duct access no SLU	10% less revenues than in (1) and (2)
		20% duct access no SLU	
		80% dark fibre access SLU	
		20% dark fibre access SLU	
		80% dark fibre/duct access SLU	
		20% dark fibre/duct access SLU	
(5)	2nd mover P2P	80% duct access no SLU	10% less revenues than in (1) and (2)
		20% duct access no SLU	
		LLU	

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4. Some major model results

Broadband technologies market share (Jan. 2008)

	DSL	Cable	Other	Retail market share incumbent	Broadband penetration per HH[1)]	Mobile only users[2)]
Germany	94%	5%	1%	46%	52%	7%
France	95%	5%	-	47%	62%	17%
Italy	97%	0%	3%	64%	46%	17%
Portugal	64%	35%	1%	67%	47%	33%
Spain	79%	20%	1%	56%	58%	16%
Sweden	62%	19%	18%	38%	64%	5%
EU27	79,9%	15,3%	4,8%			

[1)] January 2008

[2)] Related to 2004

Source: EU 13th Implementation Report, WIK, Ipsos

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4. Some major model results

Subscriber distribution of potential customer base

	Cluster type	Germany			France			Sweden		
		in Mio.	in %	Cumulative	in Mio.	in %	Cumulative	in Mio.	in %	Cumulative
(1)	Dense Urban	0,12	0,2	0,2	0,89	2,6	2,6			
(2)	Urban	0,9	2,1	2,4	1,4	4,2	6,8			
(3)	Less Urban	4,9	11,3	13,7	4,0	11,8	18,6	0,43	8	8
(4)	Dense Suburban	2,0	4,8	18,4	2,2	6,6	25,2	0,55	10,3	18,4
(5)	Suburban	2,85	6,6	25,1	3,2	9,5	34,7	0,73	13,7	32,1
(6)	Less Suburban	5,25	12,3	37,4	3,3	9,6	44,3	1,35	25,5	57,5
(7)	Dense Rural	14,6	34,1	71,5	6,2	18,2	62,6	0,46	8,7	66,3
(8)	Rural	12,2	28,5	100	12,7	37,4	100	1,8	33,7	100
		42,83	100		33,9	100		5,3	100	

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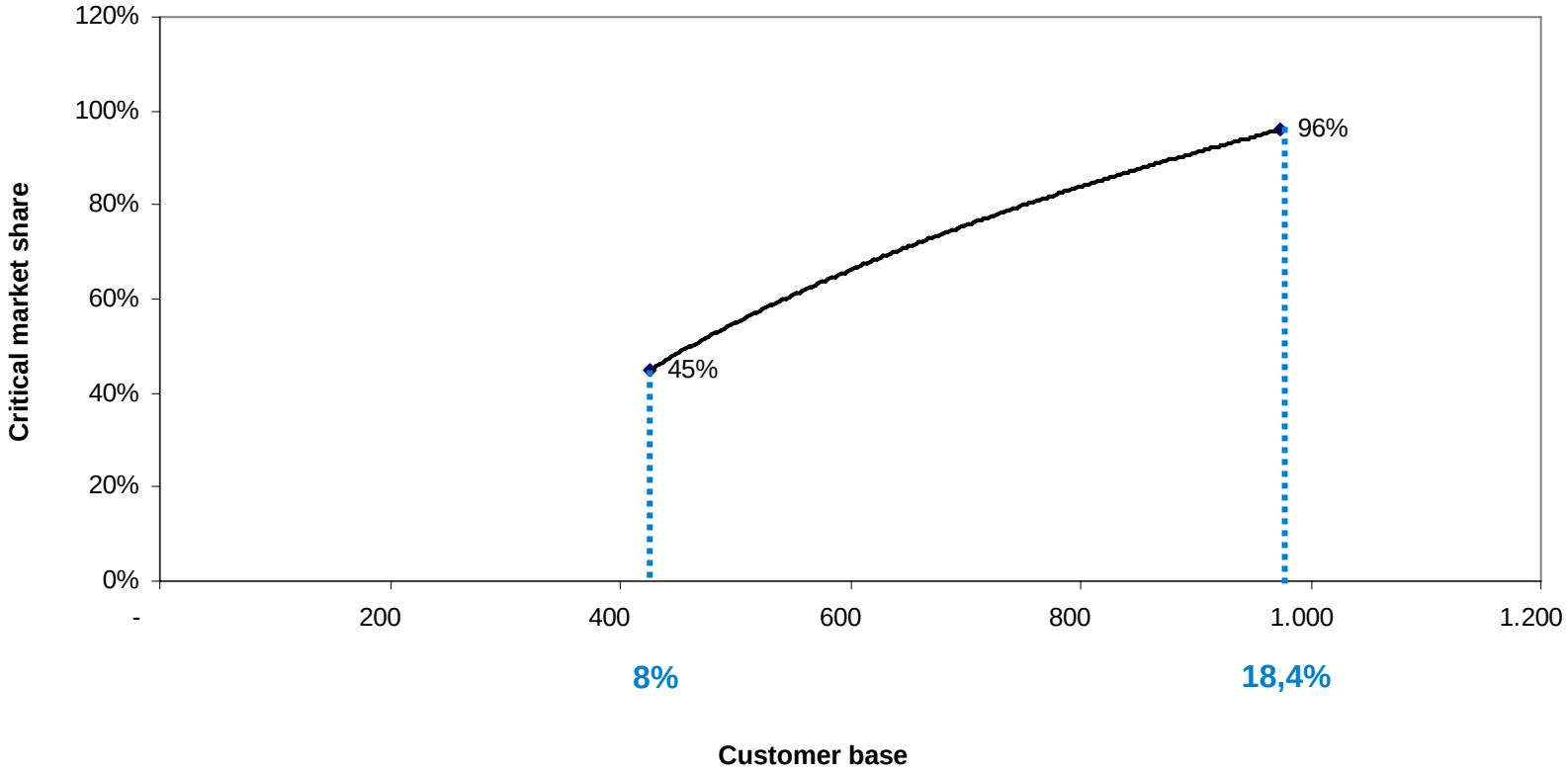
4. Some major model results

Main results: Sweden

- NGA (VDSL and FTTH) is only profitable in urban areas which account for 8% of potential customers
- Replicability is only possible for VDSL but not for FTTH
- Results seem to be in line with actual market developments

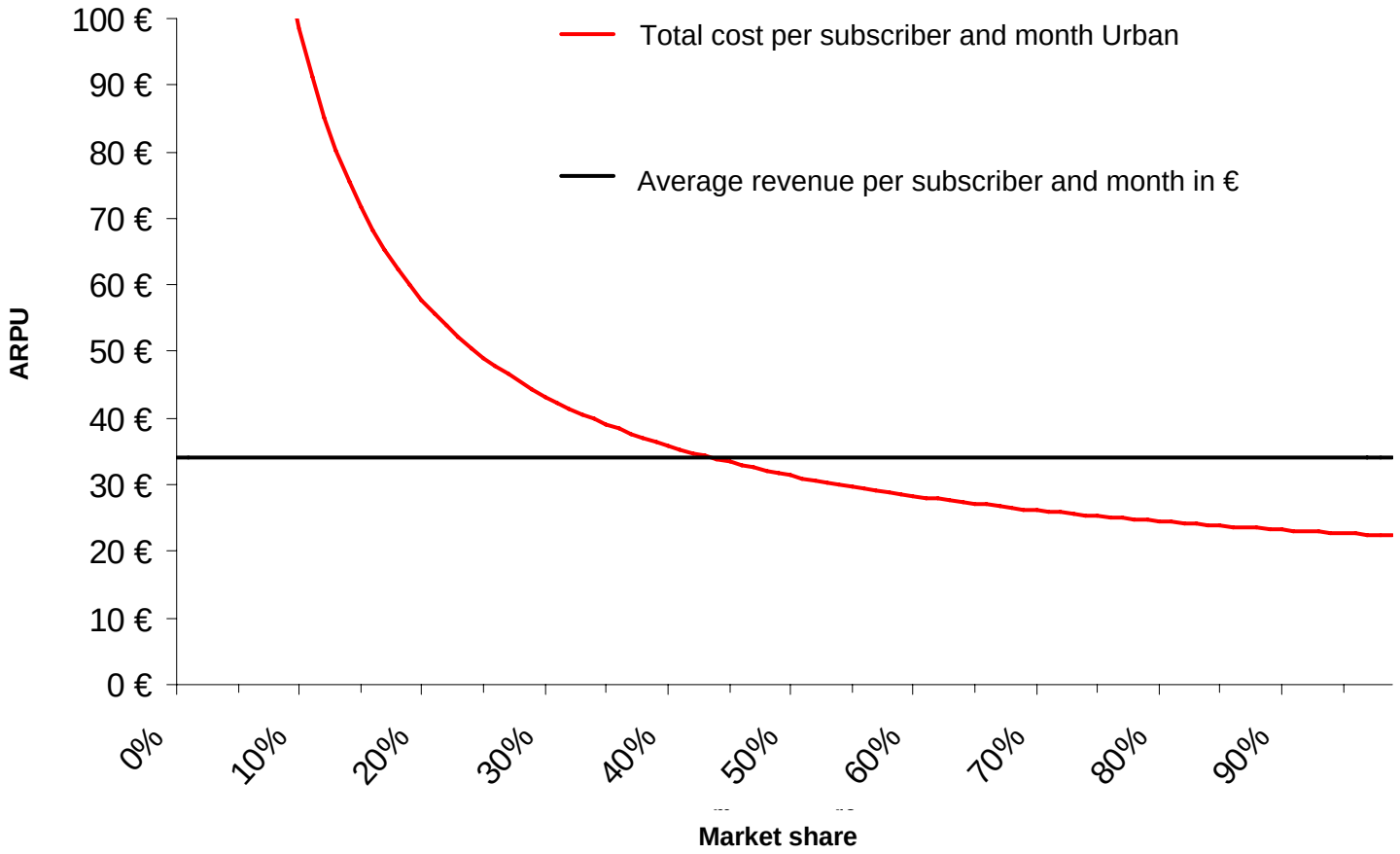
4. Some major model results

Main results: Sweden FTTH/PON



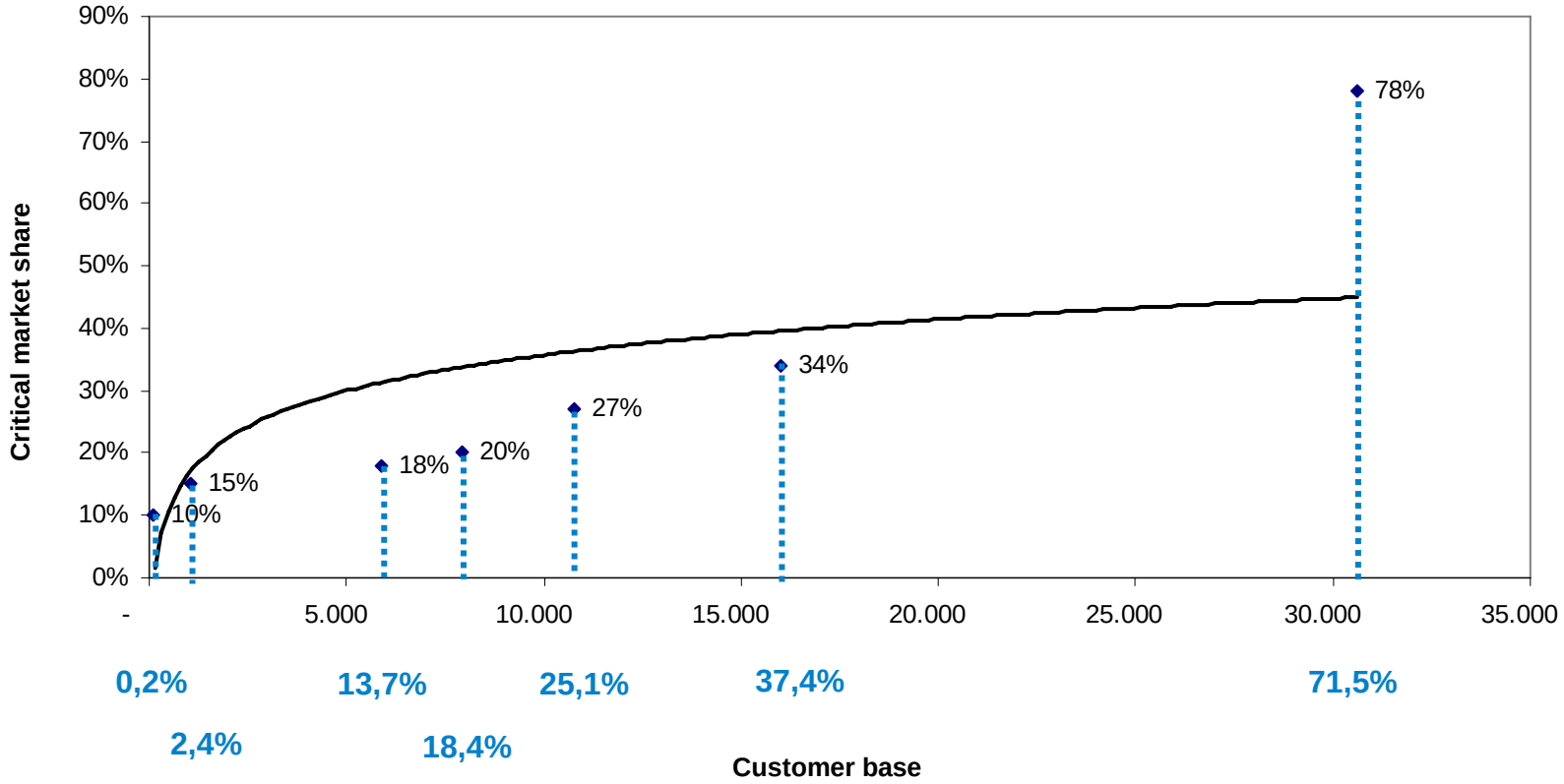
4. Some major model results

Main results: Sweden FTTH/PON Urban



4. Some major model results

Results for Germany: Incumbent: VDSL



- Profitability up to (theoretically) 71,5% and realistically 37,4% of population
- Profitability requires 78% of market share, or 34% in the realistic case

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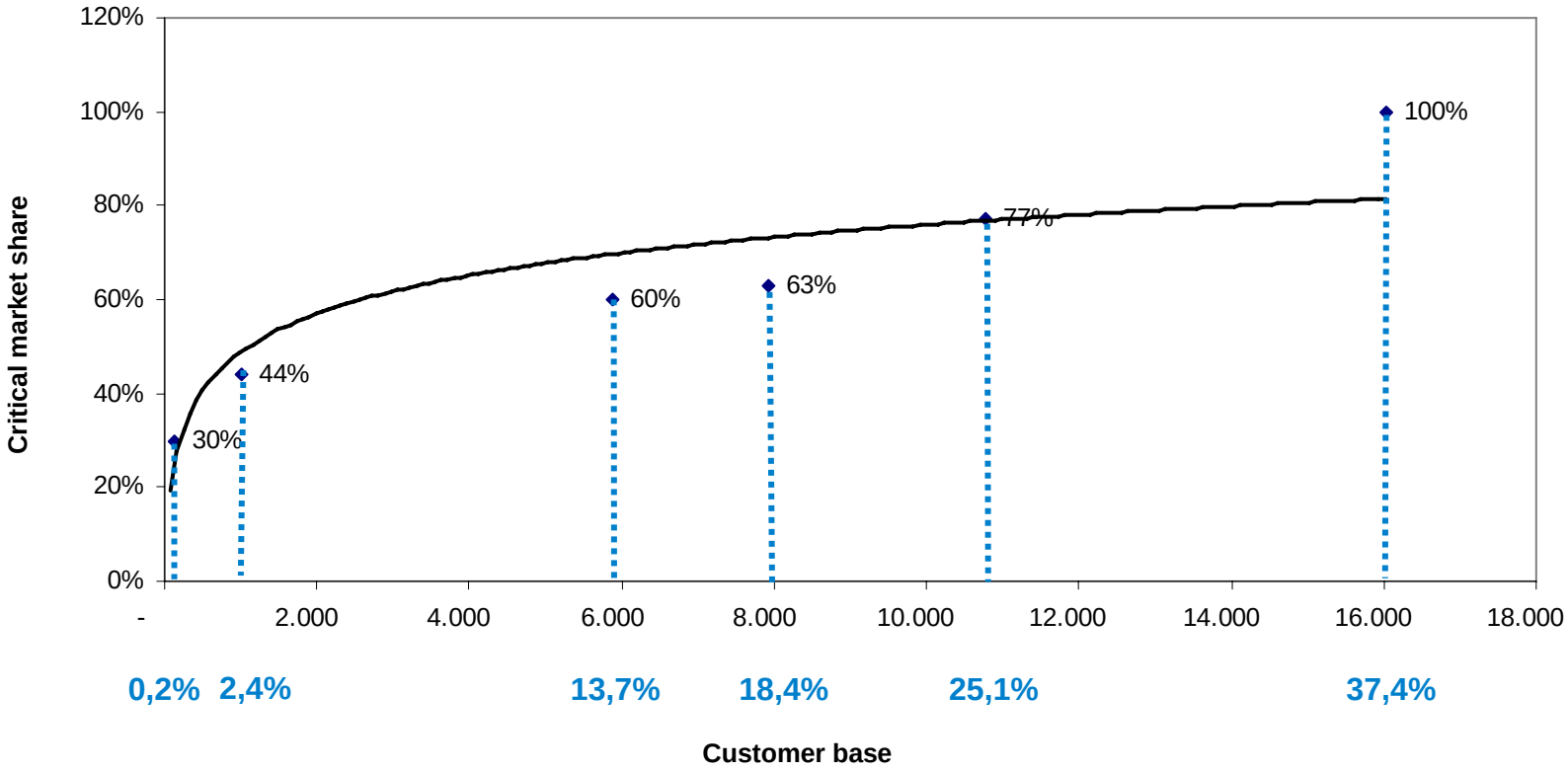
4. Some major model results

Results for Germany: Incumbent: PON



- Profitability: 25,1% of population (theoretically) and 18,4% realistically (up to dense suburban)
- High market shares needed: 77%, 63% respectively

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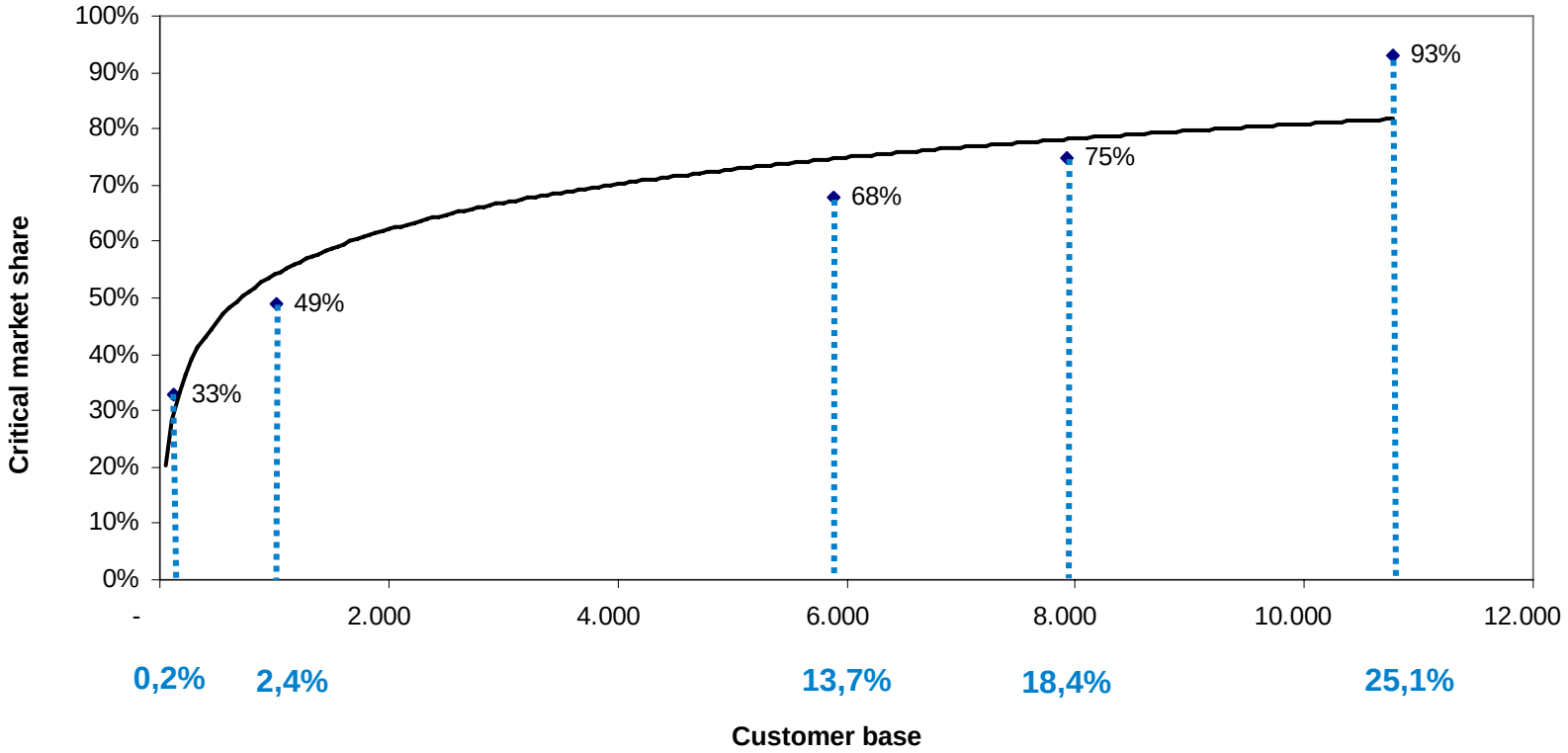
4. Some major model results

Results for Germany: Incumbent: P2P



- Profitability: 25,1% of population (theoretically) and 13,7% realistically
- High market shares needed: 93%, 68% respectively

4. Some major model results

Results for Germany: 2nd mover: VDSL

- Without regulated access: replicability only for 13,7% of population (at the best)
- Even in the regulatory best case (80% duct access possible) replicability up to 18,4% of population
- Critical market share for profitability: 37% compared to 20% of incumbent
- Under less favourable regulatory conditions (20% duct access) replicability goes down to 13,7% of population

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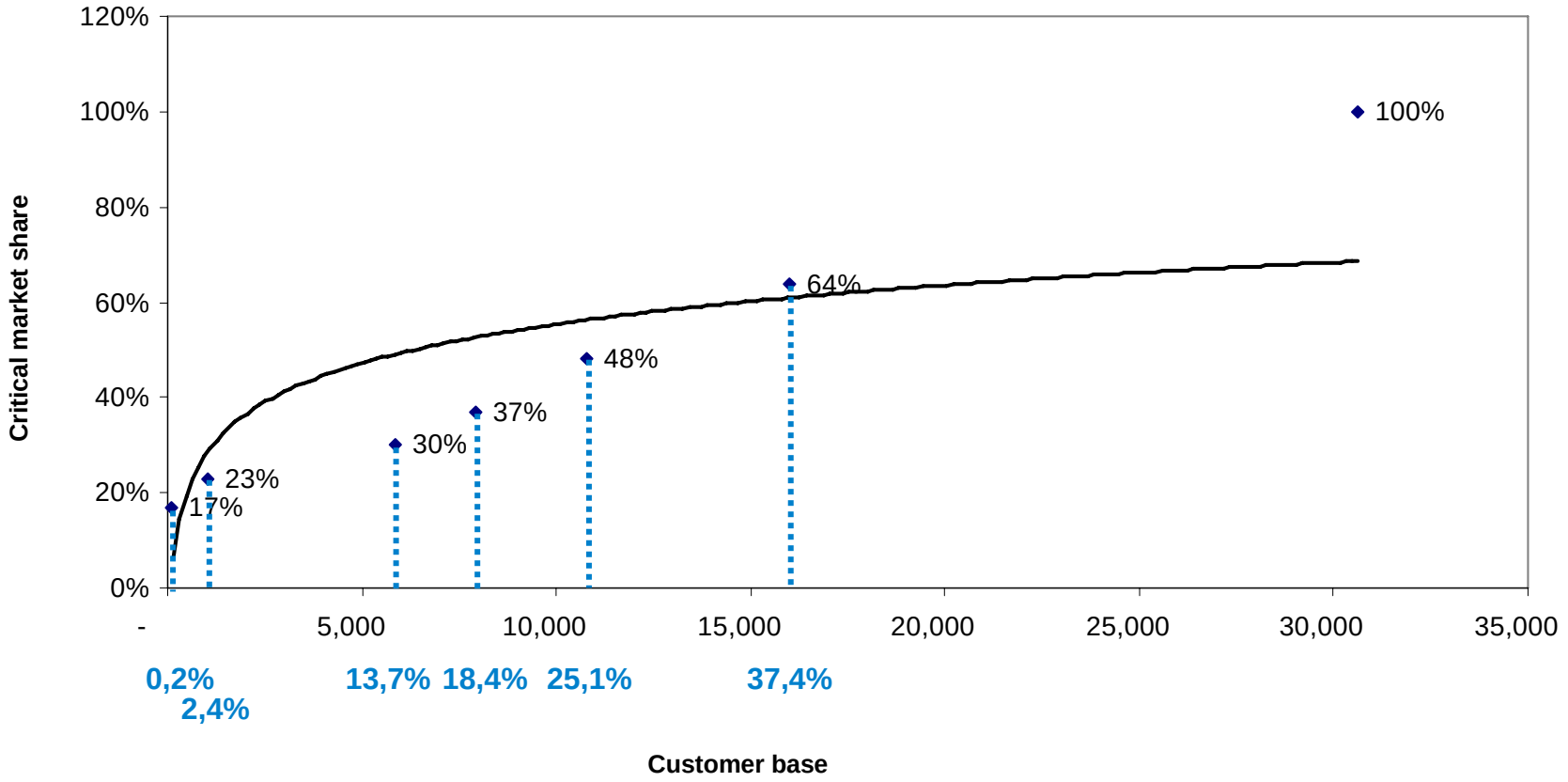
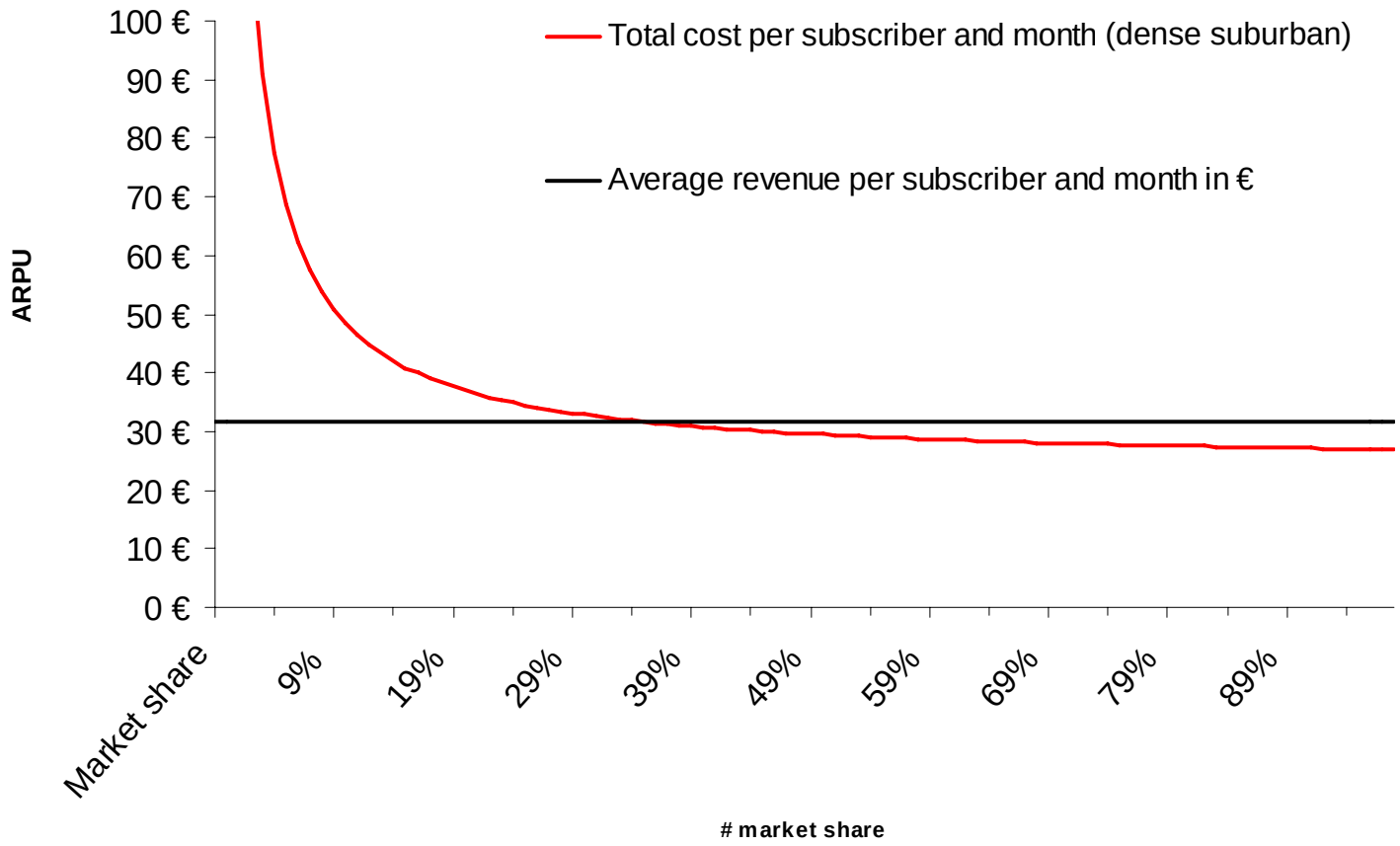
4. Some major model results

Results for Germany: 2nd mover: VDSL 80% duct access



4. Some major model results

Results for Germany: 2nd mover: VDSL 80% duct access



4. Some major model results

Results for Germany: 2nd mover: PON

- Nearly no replicability at all under stand-alone conditions (only for 0,2% of population)
- Even under 80% duct access replicability increases only slightly to 2,1% of population
- Under SLU fibre access, replicability wherever the first mover (e.g. incumbent) rolls out PON

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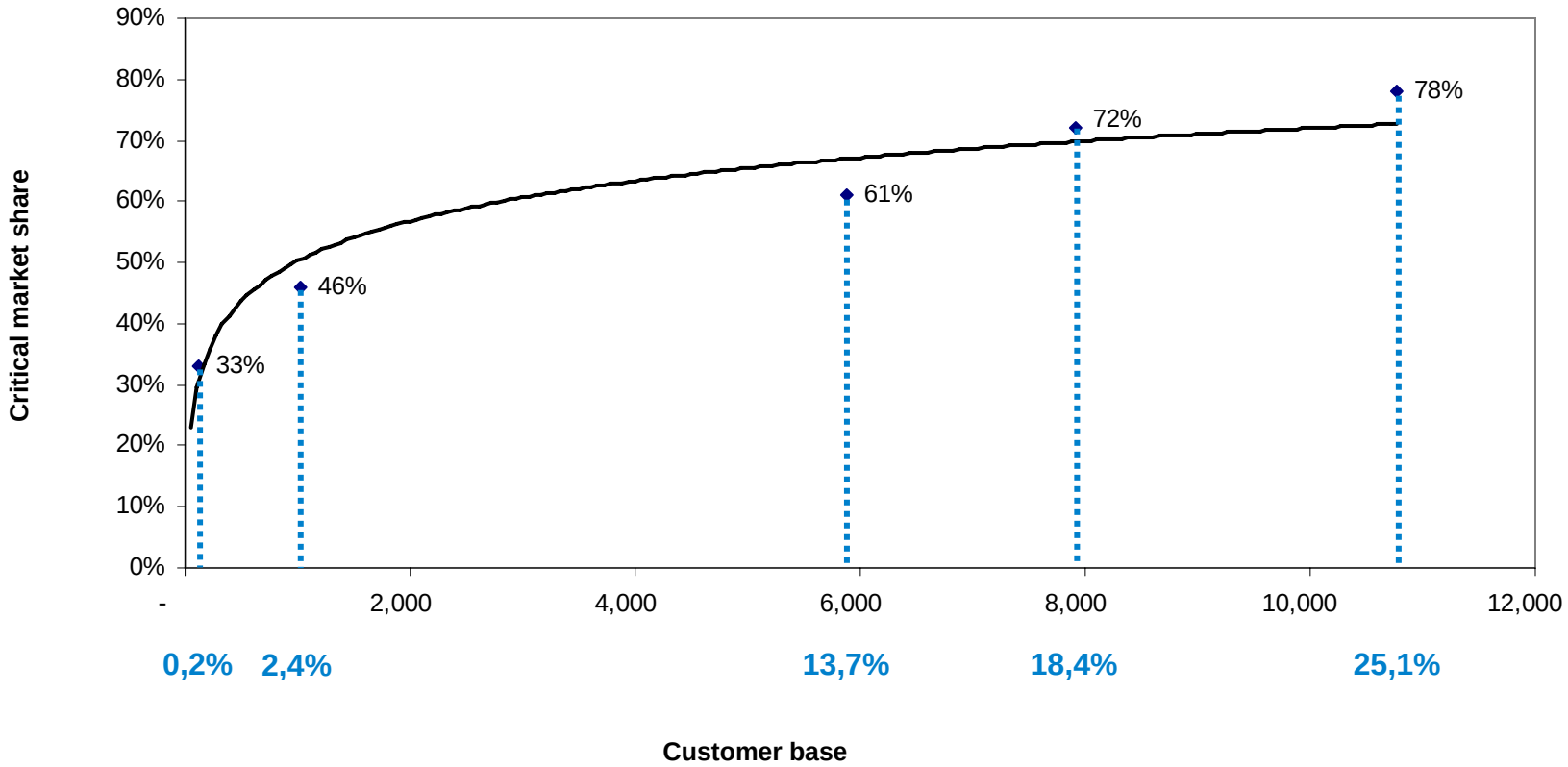
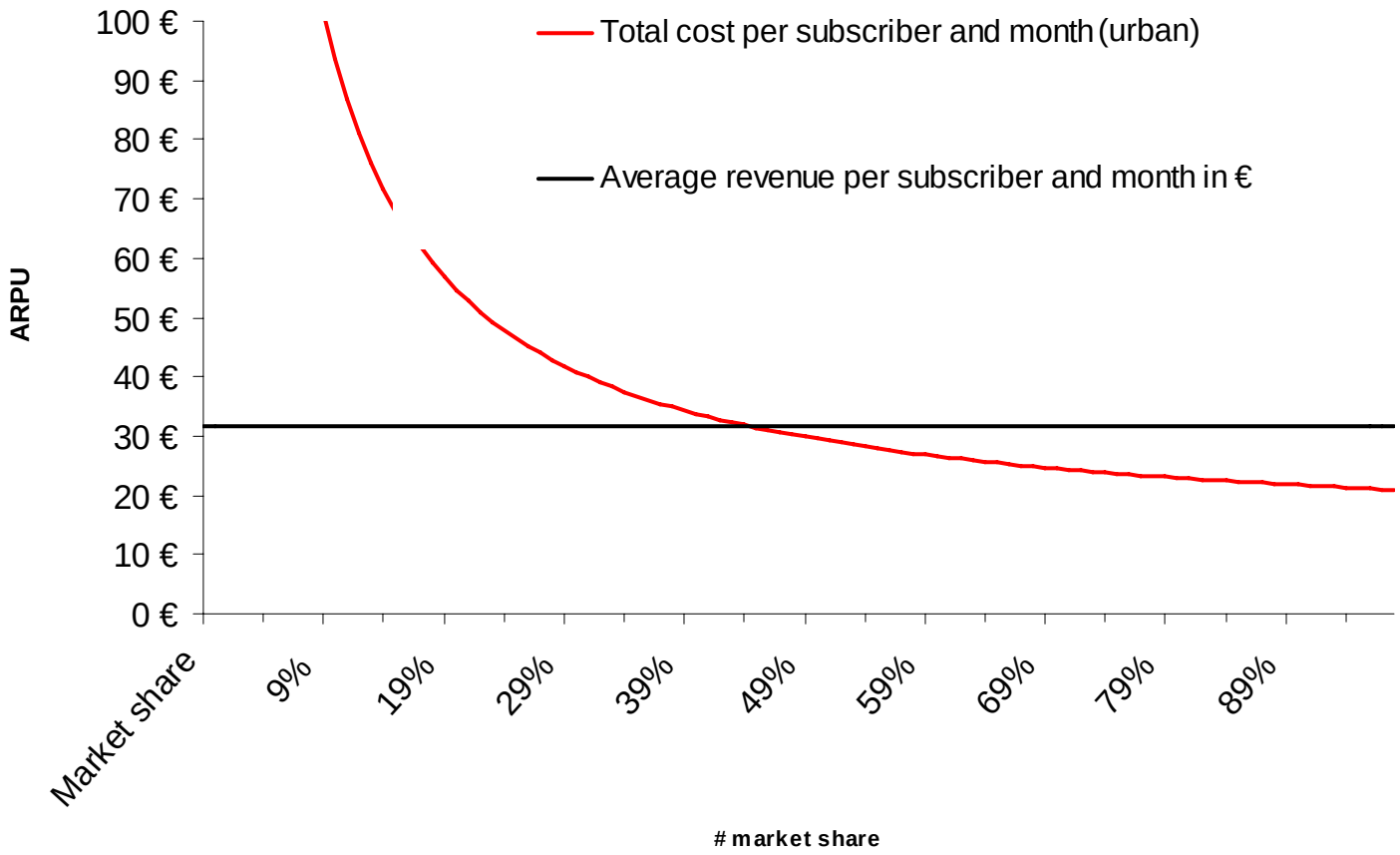
4. Some major model results

Results for Germany: 2nd mover: PON 80% duct access



4. Some major model results

Results for Germany: 2nd mover: PON 80% duct access



4. Some major model results

Results for Germany: 2nd mover: P2P

- Nearly no replicability at all under stand-alone conditions (only for 0,2% of population)
- At 80% duct access replicability only for 0,2% of population
- Under fibre LLU access, replicability wherever the first mover (e.g. incumbent) rolls out P2P for at least as many operators as under copper LLU

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4. Some major model results

Results for France: FTTH

- PON and P2P FTTH roll-out are only profitable for the densest urban regions
- Only a significant increase in retail revenues and/or reduction of infrastructure costs can expand the scope of profitable roll-out
- Without regulatory measures replicability in the areas profitable for a first mover (e.g. the incumbent) is extremely limited
- Duct and dark fibre access are not sufficient to generate replicability results which are viable for competition
- Only fibre SLU (in the case of PON) and fibre LLU (in the case of P2P) generate replicability
- In case of fibre SLU and LLU two or more alternative operators can roll-out their network wherever the first mover (likely the incumbent) rolls out fibre

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