

MEMO

TO: ACM
DATE: October 2014
FROM: NERA
SUBJECT: NERA Response to Questions from Dutch Telecom Operators

ACM has requested NERA to provide a response to questions from Dutch telecom operators on NERA's FttH research report. This memo provides NERA's response.

Section A: Costs

1. *Does NERA assume the ODF tariffs remain unchanged over time? Or do they assume the tariffs are indexed with the inflation rate?*

The model is based on real values. Inflationary effects on ARPU and costs will neutralise each other and are therefore not modelled.

2. *Does the model only consider the national ODF tariff and discount?*

Yes, the assumption is that entrants pay the national tariff for ODF-access (not the alternative tariff schedule based on the different geographical CAPEX areas).

3. *Did NERA use a post-tax or pre-tax WACC?*

NERA uses a pre-tax WACC, based on NERA's expert opinion as well as information from various stakeholders. All the cost parameters (including the WACC) and ARPU in the model are stated in real terms.

4. *NERA uses a 25 year cash-flow model. Is this the pay back period? How does this account for the higher risks of ODF entrants?*

The WACC includes a mark-up for the additional risk of ODF entrants compared to operators that only invest in passive infrastructure. Furthermore the 25 year cash-flow period reflects the time horizon over which the entrant may consider potential recovery of costs, but the payback period can be significantly shorter depending on the scenario and type of entrant. Under the base case modelling assumptions neither of the potential entrants recovers their costs within the forecast period up to 2017. NERA has estimated an approximate payback period in the range of 7-10 years for entrants under the base case assumptions.

5. *How did NERA model the different generations of equipment for the entire period of 25 years? NERA modelled 1 Gbps port cards, but these will have to be replaced in that time period. Furthermore what prices and product life did NERA use for equipment?*

NERA has modelled the equipment for the entire period of 25 years. A number of different types of equipment are replaced within this time period, and NERA has accounted for equipment replacement during

this time period. When a specific type of equipment reaches the end of its asset life, NERA assumes that the equipment is replaced with new equipment. NERA consulted extensively with stakeholders for its equipment price and product life inputs. These inputs are based on NERA's expert opinion as well as information from various stakeholders. The sources of these parameters are confidential.

6. *Did NERA model extra costs for business customers? Business customers ask extra service and therefore generate more costs per line.*

NERA assumes that the business customers which are served via the FttH networks are mostly small and medium businesses and are therefore addressable with consumer products. Large businesses are not served by Reggefiber's FttH network.

7. *What costs are included in the model? It for example seems that entrant 2 has lower costs than entrant 1. For entrant 2 connects to about half the PoP (in terms of homes passed) while having a substantially lower ARPU.*

The relevant cost parameters are summed up in appendix B of the report. Furthermore the most important assumptions on the costs (OPEX, WACC, etc.) are stated in the public version of the report. The sources of these parameters and the model are confidential.

Indeed lower costs are modelled for entrant 2. Table 4.1 and 4.2 show that the costs for content and VOIP are different for premium and budget operators. The 40% discount on ARPU has a significant impact on the business case. This is the main reason that entrant 2 connects to a significant lower number of PoP's than entrant 1 and it explains why entrant 2 has no positive business case based on WBA. The sensitivity analyses also point out that the business case of entrant 2 is vulnerable for downside risks.

8. *What does NERA assume for the core network? Do the entrants have a complete core network that leads to the CityPoP's? Does NERA model the extra investments in the core network which are needed to accommodate the steadily increasing traffic volumes from FttH services? Did NERA include the costs for WAP (wholesale access ports) in the WBA business case as well as the ODF-access business case?*

Yes, NERA assumes that entrants have their own core network. However, they still have to invest in backhaul to connect each CityPoP with their core network (see Table 3.1 in the report). Yes, extra investments in the capacity of the core network are incorporated in the model. See paragraph 5.1 of the report: "The dimensioning model also computes the provision of factors required in the Network Core, each year". NERA has also included the costs for WAP in the WBA business case.

9. *Did NERA model active equipment for the entrant on all existing 1.161 Area PoP's (see Table 3.1)?*

Yes, the model contains costs for active equipment on all PoP's that the entrants actually connect to (although in the base scenario entrants do not roll-out to 100% of the PoP's).

10. Are the patch and de-patch costs modelled for each new or churning customer?

Yes, see table B2.2 in the report.

11. How does the model cover the common and joint costs of entrants?

These costs are covered by the OPEX mark-up.

Section B: ARPU

12. NERA predicts that customers will gradually shift to more expensive bundles. Did NERA include any extra costs in the model for those more expensive bundles (for example costs for Spotify and PC security)?

NERA predicts a shift towards larger bundles (double-play and triple-play) and higher speeds. This increases ARPU. NERA includes media costs in the model, and differentiates between the media costs of a normal entrant (which incurs some premium media costs) and a budget entrant (which incurs lower media costs). NERA does not explicitly differentiate between the costs for premium services such as Spotify and PC security.

13. How did NERA model the business ARPU and wholesale ARPU? How did NERA determine these values? Is a wholesale customer an operator that buys WBA from an entrant? It is stated in the report that 2% of all homes passed are business customers and 10% are wholesale customers. Did NERA also use these percentages for the customer base of the entrants?

The business and wholesale ARPU are NERA's estimates. All assumptions in the model and report are based on NERA's expert opinion as well as information from various stakeholders. Yes, wholesale customers buy WBA from the entrants. Yes, NERA assumes that the customer base of entrants is also made up of 2% business customers and 10% wholesale customers.

14. It is stated in the report that the wholesale ARPU is 50% lower than the retail ARPU. What is the basis for this assumption? There should be some correlation with the retail costs that entrants make on top of the WBA costs. There should also be some relation with KPN's WBA tariffs.

The 50% wholesale ARPU is an estimate of NERA. All assumptions in the model and report are based on NERA's expert opinion as well as information from various stakeholders.

15. Figure 4.4 doesn't show the 50% discount on Wholesale ARPU.

Figure 4.4 is for illustrative purposes only and serves to show the intrinsic price trend which results in ARPU slightly declining in the long run. The Wholesale ARPU indeed does not correctly reflect the 50% discount in the figure. However the 50% discount is correctly incorporated in the model.

16. Table 7.4 shows the effect of a lower ARPU for entrant 1. Yet the market share doesn't really change for entrant 1. Didn't NERA model any price elasticity effects?

The market capture and churn do not have any direct relationship with ARPU in the model. Therefore Table 7.4 might underestimate the business case of entrants in this scenario if one considers a price elasticity effect. Incorporating a price elasticity may lead to a higher market churn and an increase in market share for some entrants.

Section C: WBA

17. Did NERA assume that the WBA tariffs for national transmission remain unchanged for the period of 25 years? If not, what are the transmission tariffs for 2039?

NERA assumes that the WBA tariffs for national transmission remain unchanged in real terms for the period of 25 years. However, NERA has provided a sensitivity analysis to a decrease in the average WBA tariff over the entire period by 20% (implying a reduction of 1.3% per year) and a reduction in the annual data growth rate from 33% under base case assumptions to 15%. The results of this sensitivity are below, and show that the business case remains viable for entrant 1 and also becomes viable for entrant 2.

Table 1
Results - Entry over WBA with Lower WBA Tariff and Lower Annual Data Growth

	1. Entrant 1				Entrant 2			
	2014	2015	2016	2017	2014	2015	2016	2017
Homes in Netherlands	7,898,886	7,909,944	7,921,018	7,932,107	7,898,886	7,909,944	7,921,018	7,932,107
HP by Reggefiber	1,976,253	2,183,091	2,389,274	2,600,062	1,976,253	2,183,091	2,389,274	2,600,062
% of Netherlands passed by Reggefiber	25%	28%	30%	33%	25%	28%	30%	33%
Number of APs built by Reggefiber	1,219	1,291	1,365	1,437	1,219	1,291	1,365	1,437
Number of CPs built by Reggefiber	472	489	509	528	472	489	509	528
Number of APs passed by Entrant	1,216	1,288	1,362	1,434	1,212	1,284	1,358	1,430
Number of CPs passed by Entrant	471	488	508	527	467	484	504	523
HA by entrant	44,293	77,595	111,186	146,177	10,777	24,353	39,603	56,584
% of Reggefiber network activated by entrant	2.2%	3.6%	4.7%	5.6%	0.5%	1.1%	1.7%	2.2%
HP by entrant	1,976,249	2,183,087	2,389,270	2,600,057	1,976,105	2,182,940	2,389,121	2,599,907
% of Netherlands passed by entrant	25%	28%	30%	33%	25%	28%	30%	33%
% of Reggefiber network passed by entrant	100%	100%	100%	100%	100%	100%	100%	100%
HA by entrant	44,293	77,595	111,186	146,177	10,777	24,353	39,603	56,584
% of HP by entrant activated	2.2%	3.6%	4.7%	5.6%	0.5%	1.1%	1.7%	2.2%
AP Costs as % of Total Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CP Costs as % of Total Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Network Costs as % of Total Costs	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: NERA analysis

18. Table 6.2 shows that the CityPoP costs are 0%. Yet the percentage of Area Pop costs is quite high. How must this be interpreted? What are Area PoP costs and network costs when it comes to WBA?

As explained in section 5.3 of the report, the WBA costs comprise a number of different elements. The Area PoP costs include the recurring charges for the end user service. The network costs include the setup charge for the national point of interconnect, the WBA service implementation cost and the recurring national transmission tariff.

19. Why did NERA assume 40% higher WBA costs in Table 6.4? Why didn't NERA assume a rise in costs of 10% or a decrease in WBA costs?

In the base case, the model assumes the overall cost WBA remains flat in real terms over the 25-year modelling period. Given the uncertainty over the WBA cost over a 25-year period, NERA modelled the scenario of 40% higher WBA costs *on average* over the 25-year period. Note that this implies WBA costs grow by approximately 1.5% annually above the rate of inflation.

20. Did NERA model exactly the same retail costs and network core cost for entry on ODF and WBA?

Yes, only the access costs differ between the ODF case and WBA case.

21. An entrant has a 100% national coverage when interconnecting with KPN based on WBA. Why does the entrant have a lower percentage of homes passed in Table 6.2?

NERA has modelled the WBA business case per City-PoP. Another option is to model WBA entry on a national scale. This does not really differ much as entrant 1 already goes to virtually all PoP's in the base case. However Table 2 below shows results for entry using WBA modelled on a national scale. The entrant passes all the homes within the Reggefiber network, implying 100% rollout.

Table.2
Results - Entry Using WBA

	1. Entrant 1				Entrant 2			
	2014	2015	2016	2017	2014	2015	2016	2017
Homes in Netherlands	7,898,886	7,909,944	7,921,018	7,932,107	7,898,886	7,909,944	7,921,018	7,932,107
HP by Reggefiber	1,976,253	2,183,091	2,389,274	2,600,062	1,976,253	2,183,091	2,389,274	2,600,062
% of Netherlands passed by Reggefiber	25%	28%	30%	33%	25%	28%	30%	33%
Number of APs built by Reggefiber	1,219	1,291	1,365	1,437	1,219	1,291	1,365	1,437
Number of CPs built by Reggefiber	472	489	509	528	472	489	509	528
Number of APs passed by Entrant	1,216	1,288	1,362	1,434	-	-	-	-
Number of CPs passed by Entrant	471	488	508	527	-	-	-	-
HA by entrant	44,293	77,595	111,186	146,177	-	-	-	-
% of Reggefiber network activated by entrant	2.2%	3.6%	4.7%	5.6%	0.0%	0.0%	0.0%	0.0%
HP by entrant	1,976,249	2,183,087	2,389,270	2,600,057	-	-	-	-
% of Netherlands passed by entrant	25%	28%	30%	33%	0%	0%	0%	0%
% of Reggefiber network passed by entrant	100%	100%	100%	100%	0%	0%	0%	0%
HA by entrant	44,293	77,595	111,186	146,177	-	-	-	-
% of HP by entrant activated	2.2%	3.6%	4.7%	5.6%	0.0%	0.0%	0.0%	0.0%
AP Costs as % of Total Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CP Costs as % of Total Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Network Costs as % of Total Costs	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: NERA analysis

Section D: Sensitivity analyses & other questions

22. *It is assumed that each CityPoP on average connects 5 AreaPoP's (see paragraph 6.1). This is an important assumption in the business case although the actual number of AreaPoP's per CityPoP is lower. Why didn't NERA do any sensitivity analysis on this parameter?*

This assumption only holds for new PoP's. The number (as well as the size) of existing PoP's is directly derived from the actual numbers Reggefiber reported to NERA.

23. *Table 7.1 shows that entrant 1 gains approximately 42.000 customers more than in the base case (in 2017). This is actually more than entrant 2 loses. How is it possible that one entrant attracts more customers than two entrants combined?*

The overall FttH market is not solely comprised of entrant 1 and entrant 2; it also includes the incumbent (KPN). With two entrants, some of the entrant 1 (the larger premium operator) customers churn out to entrant 2 *and* entrant 1 also has to compete with entrant 2 for the incumbent's churning customers. If on the other hand there is just one entrant, the entrant can take all of the incumbent's churning customers whilst not losing any of its own churning customers to entrant 2. Although the overall number of FttH customers stays the same with one or two entrants, with one entrant, the entrant enjoys the double benefit of not losing customers to entrant 2 and capturing all of the incumbent's churning customers. Therefore, with just one

entrant, that entrant is able to gain more customers than the combined number of customers if there are two entrants.

The intuition is that with the additional competition of two entrants, the combined ability of the entrants to gain customer share is reduced. By contrast, with just one entrant, it can focus on capturing customers from the incumbent without any other competitive threat from an alternative FttH entrant.

Note that under both scenarios, the total number of FttH customers would remain the same, once the incumbent's customers are accounted for.

24. Table 7.2 shows the effect of a slower roll-out by Reggefiber. The effect of a slower roll-out can only be measured in later years while the table only reaches till 2017. Therefore what does Table 7.2 add to the report?

Indeed the effect of a slower roll-out probably increases in time and therefore the roll-out of entrants doesn't change much till 2017. Apart from that this sensitivity analysis shows that the business case remains positive as long as other factors (ARPU, market capture, churn and PoP size) are unchanged.

25. Why didn't NERA do a sensitivity analysis on the penetration rate of FttH subscriptions. A 55% penetration seems ambitious.

NERA is of the opinion that the assumption of a 55% FttH penetration in long term is realistic or even cautious. Also the expected effect of a lower FttH penetration would be comparable to the scenario with smaller PoP's. In both scenarios entrants have fewer customers to spread their fixed costs. NERA already shows the effect of smaller PoP's in Table 7.3 of the report.

26. Table 7.3 shows the effect of smaller AreaPoP's. Why didn't NERA use the current actual PoP size (which is below 1.159 homes passed) for this analysis?

The current actual PoP size is part of the model. Table 7.3 only shows the effect of a smaller size for *new* PoP's.

27. Table 7.6 shows the effect of higher ODF tariffs. In that scenario entrant 2 drops 50 CityPoP's and 246 AreaPoP's. Why would entrant 2 not roll-out to these larger CityPoP's (with each about 5 AreaPoP's)?

This observation only concerns the size of the CityPoP's in terms of the number of AreaPoP's they aggregate. In this scenario entrant 2 actually drops the smaller PoP's in terms of homes passed.

28. Is the 20% market capture rate a percentage of the total market or just the FttH-lines?

The market capture is measured as a percentage of FttH churn. For example, under the base case, in the long term the market share of entrant 1 will be 20% of 55% (FttH penetration), which is a 11% share of the total market. See page 11: "The market capture proportion for churning customers is derived in our model from the market capture of customers new to FttH".

29. How did NERA use the churn and market capture parameters in their model. Is cable included in these calculations?

Yes, the churn from cable is also included in the model. The penetration of FttH increases over time. This increase in homes activated comes from existing cable and DSL subscribers. The market capture of entrants is measured as percentage of new and churning FttH subscribers and therefore implicitly also includes churning cable subscribers. Also see footnote 8 in the report.

30. Why does the entrant with the highest price attract the most customers?

See the bullets on page 11 of the report. This leads to a lower market capture for entrant 2 (10% in 2018). Additionally entrant 2 connects to substantially less PoP's than entrant 1.

31. The budget-entrant offers analogue TV. This is curious because:

- *the demand for analogue TV is currently decreasing; and*
- *analogue TV has relatively high costs which make it less attractive for a smaller operator.*

NERA does not think this assumption is unrealistic. Different telecom operators in the Netherlands currently offer analogue TV via FttH. An entrant has to compete with those offers. However NERA assumes that the proportion of customers taking analogue TV will decline by **(confidential: XXX)**% each year, as the demand for analogue TV falls in future.

*32. It is stated in paragraph 6.1 that each AreaPoP on average reaches 87% of all homes passed ($87\% * 3.696 = 3215$ HP's). Yet Table 6.1 shows that Reggefibers network grows with 210.788 homes passed and 51 AreaPoP in the period 2014-2017. This means that the new AreaPoP's deployed in this period on average reach 4.133 homes passed. How can this be?*

The bullet in paragraph 6.1 about the capacity of 3.696 homes refers specifically to new homes. In paragraph 3.2 of the report it is explained that Reggefiber doesn't only roll-out their network in new areas. They also roll-out new homes passed in existing FttH areas.

33. Table 6.2 and table 7.3 show that the number of PoP's the entrant interconnects to is actually higher than the total number of PoP's in Reggefiber's network. How is this possible?

Table 6.2 and table 7.3 contain minor reporting errors for the number of AreaPoP's and CityPoPs built by Reggefiber. The corrected forecasts are provided in the tables below. Please note that these do not change any of NERA's findings and conclusions.

Table 6.2
Results - Entry using WBA

	1. Entrant 1				Entrant 2			
	2014	2015	2016	2017	2014	2015	2016	2017
Homes in Netherlands	7,898,886	7,909,944	7,921,018	7,932,107	7,898,886	7,909,944	7,921,018	7,932,107
HP by Reggefiber	1,976,253	2,183,091	2,389,274	2,600,062	1,976,253	2,183,091	2,389,274	2,600,062
% of Netherlands passed by Reggefiber	25%	28%	30%	33%	25%	28%	30%	33%
Number of APs built by Reggefiber	1,219	1,291	1,365	1,437	1,219	1,291	1,365	1,437
Number of CPs built by Reggefiber	472	489	509	528	472	489	509	528
Number of APs passed by Entrant	1,216	1,288	1,362	1,434	-	-	-	-
Number of CPs passed by Entrant	471	488	508	527	-	-	-	-
HA by entrant	44,293	77,595	111,186	146,177	-	-	-	-
% of Reggefiber network activated by entrant	2.2%	3.6%	4.7%	5.6%	0.0%	0.0%	0.0%	0.0%
HP by entrant	1,976,249	2,183,087	2,389,270	2,600,057	-	-	-	-
% of Netherlands passed by entrant	25%	28%	30%	33%	0%	0%	0%	0%
% of Reggefiber network passed by entrant	100%	100%	100%	100%	0%	0%	0%	0%
HA by entrant	44,293	77,595	111,186	146,177	-	-	-	-
% of HP by entrant activated	2.2%	3.6%	4.7%	5.6%	0.0%	0.0%	0.0%	0.0%
AP Costs as % of Total Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CP Costs as % of Total Costs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Network Costs as % of Total Costs	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 7.3
Results - Lower Homes Passed at New Area-PoPs

	1. Entrant 1				Entrant 2			
	2014	2015	2016	2017	2014	2015	2016	2017
Homes in Netherlands	7,898,886	7,909,944	7,921,018	7,932,107	7,898,886	7,909,944	7,921,018	7,932,107
HP by Reggefiber	1,976,253	2,183,091	2,389,274	2,600,062	1,976,253	2,183,091	2,389,274	2,600,062
% of Netherlands passed by Reggefiber	25%	28%	30%	33%	25%	28%	30%	33%
Number of APs built by Reggefiber	1,334	1,495	1,678	1,881	1,334	1,495	1,678	1,881
Number of CPs built by Reggefiber	488	519	554	597	488	519	554	597
Number of APs passed by Entrant	1,119	1,393	1,575	1,778	168	225	264	282
Number of CPs passed by Entrant	364	426	461	505	25	76	106	116
HA by entrant	41,779	76,166	109,305	143,969	2,435	6,265	10,236	14,051
% of Reggefiber network activated by entrant	2.1%	3.5%	4.6%	5.5%	0.1%	0.3%	0.4%	0.5%
HP by entrant	1,600,100	1,936,190	2,143,953	2,351,391	440,094	554,986	610,372	639,599
% of Netherlands passed by entrant	20%	24%	27%	30%	6%	7%	8%	8%
% of Reggefiber network passed by entrant	81%	89%	90%	90%	22%	25%	26%	25%
HA by entrant	41,779	76,166	109,305	143,969	2,435	6,265	10,236	14,051
% of HP by entrant activated	2.6%	3.9%	5.1%	6.1%	0.6%	1.1%	1.7%	2.2%
AP Costs as % of Total Costs	52.92%	86.14%	87.39%	90.03%	38.43%	80.78%	81.91%	80.79%
CP Costs as % of Total Costs	42.04%	13.39%	11.56%	9.68%	25.01%	16.36%	16.03%	14.43%
Network Costs as % of Total Costs	5.04%	0.47%	1.05%	0.29%	36.56%	2.86%	2.06%	4.78%

Source: NERA analysis

Memo Qualifications/Assumptions & Limiting Conditions

This memo sets forth the information required by the terms of NERA's engagement by Netherlands Authority for Consumers and Markets and is prepared in the form expressly required thereby. This memo is intended to be read and used as a whole and not in parts. Separation or alteration of any section or page from the main body of this memo is expressly forbidden and invalidates this memo.

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