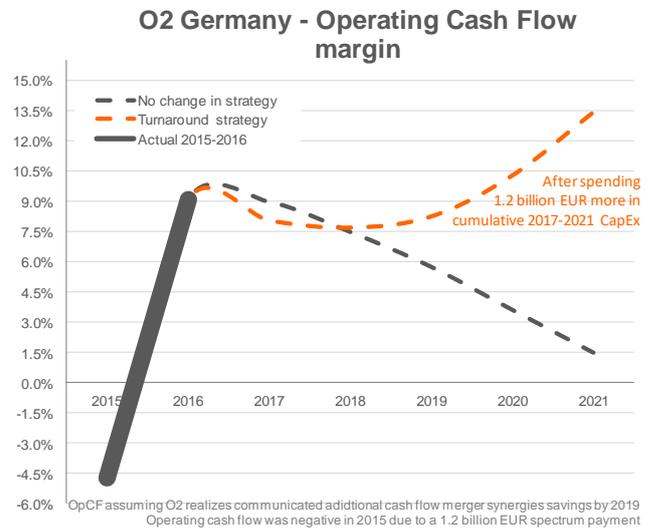
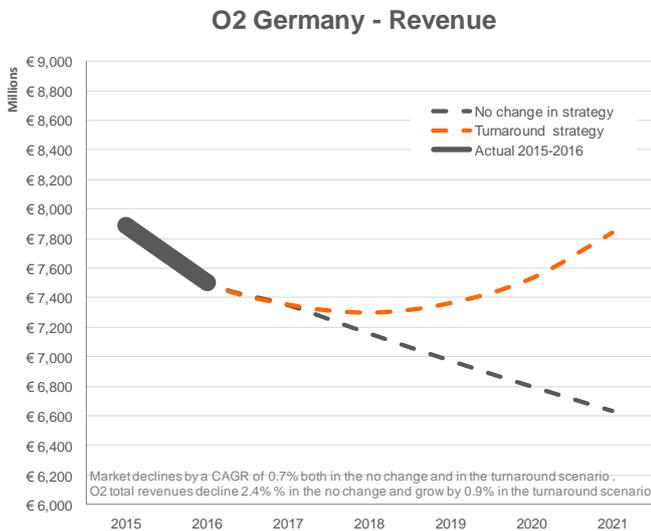


### O2 – Ready to disrupt the German tight oligopoly market

O2 could drive fixed-to-mobile broadband substitution in Germany by connecting millions of households with HD TV service on its high capacity LTE network

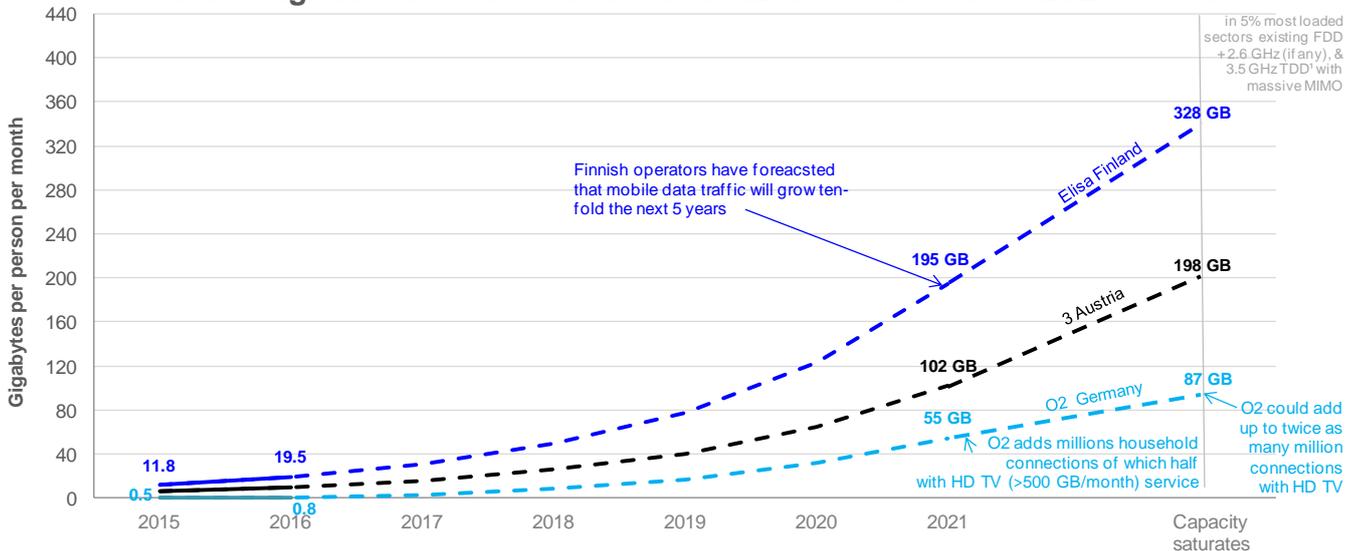
- The 'me too' strategy that O2 executed after the 4 to 3 German merger has been a failure
- Can O2 escape the self-inflicted distraction of ultra-low MVNO prices for data-light plans (i.e. €7.99 for 2GB)?
- Can it neutralize Drillisch's ultra-low fixed cost advantage?
- Can it turn its fortune around in the broadband market and start growing again?
- Can it return to revenue and profitability growth?
- Will O2's 84 MHz of 3.5 GHz spectrum become a game changer if deployed with LTE massive MIMO?
- Can O2's high capacity LTE network support large scale deployment of 4K TV in the foreseeable future?
- What are the valuation drivers in the upcoming 700 (SDL), 2100 and 3.4 GHz – 3.8 GHz German auctions?
- Will O2 significantly boost its low frequency capacity by acquiring 5, 10 or 15 MHz of 700 SDL spectrum?
- Who will be the winners and losers if O2 executes a mobile-centric 'unlimited everything' strategy?

Rewheel / Digital Fuel Monitor-PRO research study, 17<sup>th</sup> April 2017



O2's high capacity LTE network, if put in use, could drive fixed-to-mobile broadband substitution and disrupt the German oligopoly market with a mobile-centric 'unlimited everything' strategy

### O2 could drive fixed-to-mobile broadband substitution in Germany by connecting millions of households with HD TV service on its LTE network



<sup>1</sup>Assuming Elisa and 3 Austria acquire 80MHz of 3.4GHz - 3.6GHz TDD spectrum (O2 already holds 84 MHz of 3.5 GHz spectrum)

## Context of study

### A little bit of history

In November 2010 we published<sup>1</sup> our first premium study titled “E-Plus Germany – Ready to disrupt the market”. Therein, we assessed E-Plus network coverage and capacity capabilities in the aftermath of the 2010 multiband auction where E-Plus failed to win any 800 MHz spectrum. Our analysis showed that despite the competitive 800 MHz handicap E-Plus had at the time the potential (i.e. significant 1800 and 2100 MHz spectrum holdings) to disrupt the German market with a mobile-centric (i.e. speed tiered unlimited volume) strategy and thrive on its own as a fourth challenger mobile-only operator.

Our E-Plus 2010 study received a lot of interest from many German mobile operators, the German telecom regulator and many other operators across Europe. While tempted, the heavily indebted KPN decided in the end to take the money and run: in July 2013 it sold E-Plus to Telefonica Deutschland. O2 and E-Plus were set to merge, consolidate the German mobile market from 4 down to 3 network operators and create the biggest operator in term of subscribers.

### The German mobile market consolidated in 2014 from 4 down to 3 network operators

The European Commission under the helm of Joaquin Almunia ignored the objections<sup>2</sup> of the German and many other national competition authorities and controversially approved the 4 to 3 merger in Germany in 2014 by relying only on behavioural upfront MVNO wholesale access remedies which could not remove the competition concerns entirely<sup>3</sup>. In June 2015 Airdata AG, a regional wireless German operator, filed<sup>4</sup> an appeal in front of the ECJ challenging the European Commission’s 2014 decision to approve the merger.

### Market consolidation was no panacea – The ‘me too’ strategy has been a failure and O2 is underperforming the market

In November 2016 Handelsblatt reported<sup>5</sup> that Telefonica Deutschland’s CEO Thorsten Dirks resigned unexpectedly and decided to pursue other challenges. According to Handelsblatt while Thorsten Dirks “*did well in cutting costs O2 is still under a lot of pressure in terms of sales and has been reporting red numbers almost all the time*”.

In 2016 O2’s mobile service revenue fell by 1.7%, while Telekom’s (T-Mobile) and Vodafone’s only by 0.6%. O2’s fixed revenues fell by 5.9% in 2016 while Telekom’s fell by 1.5%. Vodafone grew its fixed revenue by 4.8% in 2016. Overall O2’s revenues fell in 2016 by 4.9%, Telekom’s revenues fell by 1.7% while Vodafone’s revenues grew by 2.0%.

### O2 – Ready to disrupt the German tight oligopoly market?

Six years later from our E-Plus study we turn our attention again to Germany and examine O2’s prospects in the consolidated German tight<sup>6</sup> oligopoly market. We first look at the main market developments and assess the effectiveness of O2’s ‘me too’ post-merger strategy. We conclude that O2’s ‘me too’ post-merger strategy has been a failure and it has been dragging down its revenues and profitability.

We propose a mobile-centric ‘unlimited everything’ fixed-to-mobile broadband substitution turnaround strategy that will put O2 in the driving seat, re-ignite revenue growth in its mobile business and greatly improve its profitability prospects.

We substantiate our revenue growth projections in a 5-year subscriber, ARPU, service revenue and data traffic model. In our model we specify the “unlimited everything” pricing points and the busy hour network throughput generated by the millions of household connections with HD TV service that are forecasted to be served by O2’s high capacity LTE network. The busy hour network throughput (Gbit/s) generated by the million mobile broadband household connections with an HD TV service is

<sup>1</sup>[http://www.dfmonitor.eu/insights/2010\\_nov\\_eplus/](http://www.dfmonitor.eu/insights/2010_nov_eplus/)

<sup>2</sup><https://www.ft.com/content/d10483aa-f8a0-11e3-befc-00144feabdc0>

<sup>3</sup>[http://www.dfmonitor.eu/insights/2016\\_jan\\_premium\\_mvno\\_remedies/](http://www.dfmonitor.eu/insights/2016_jan_premium_mvno_remedies/)

<sup>4</sup><http://www.airdata.ag/telefonica-droht-erneutes-aufrollen-des-fusionsverfahrens/>

<sup>5</sup><http://www.handelsblatt.com/unternehmen/management/telefonica-deutschland-o2-thorsten-dirks-macht-ueberraschend-schluss/14875096.html>

<sup>6</sup>[http://www.dfmonitor.eu/insights/2016\\_dec\\_pro\\_tightoligopoly/](http://www.dfmonitor.eu/insights/2016_dec_pro_tightoligopoly/)

forecasted bottom-up by assuming typical busy hour activity ratios observed in fixed broadband IPTV connections and by applying the required minimum bitrates for smooth video streaming.

### Estimating O2's network capacity utilisation

In the next step we assess if O2's projected network capacity can cope with the forecasted data traffic demand (i.e. busy hour network throughput in Gbit/s) that will be generated by tens of millions of unlimited smartphone connections and millions of unlimited mobile broadband household connections with an HD TV service.

The network capacity dimensioning methodology we use herein is an expanded version of the methodology we used in our March 2017 study<sup>7</sup> titled "*Capacity utilization and fixed-to-mobile broadband substitution potential – A study of 64 European operators*".

We estimate the radio network capacity utilization in O2's network in Germany for the next five years (2017-2021) in the 5% of its most loaded sectors and across the entire network using five site types and a typical geo-distribution profile based on our consulting experience in other European LTE networks (i.e. certain sites carry much higher share of data traffic). Separately, we repeat the capacity model for a scenario where a flat traffic geo-distribution is assumed. We assume an initial site configuration and a 5-year site upgrade path i.e. activating additional frequencies and technologies such 4X4 MIMO, massive MIMO, etc. by taking into account O2's existing FDD and TDD spectrum holdings. We use O2's reported number of macro BTS sites, the reported 2016 traffic volume converted in busy hour network throughput, the bottom-up forecasted 2017-2021 busy hour network throughput and a typical busy hour and spectrum efficiency profile corresponding to conservative 4x4 MIMO, 256QAM and massive MIMO macro sector capacity.

We perform the operation described above separately for the low frequency layer (700, 800 and 900 MHz), high frequency layer (1800, 2100, 2600 and 3600 MHz) and as well for the combined low and high frequency layers. Mobile operators tend to reach a higher percentage of population with their low frequency layer which typically is the bottle neck due to its smaller capacity.

Our calculations show that O2's 5-year projected mobile network capacity can cope with the data traffic demand that will be generated by the tens of millions of unlimited smartphone subscribers and the millions of unlimited mobile broadband household connections with HD TV service we have forecasted.

### Fixed-to-mobile broadband substitution potential

In the next step we reverse calculate how many millions of mobile broadband household connections with HD or 4K TV service O2 can add without saturating its LTE network. Our calculations show that O2 could drive fixed-to-mobile broadband substitution and disrupt the German fixed broadband market by connecting twice as many households with an HD TV service on its high capacity LTE network versus the millions of households with an HD TV service connected in O2's LTE network we forecasted in our market modelling. The number of mobile broadband households with a 4K TV service that O2 could add without saturating 5% of its most loaded sectors is considerably lower than the millions of households with an HD TV service it could add. However, if O2 selectively targets households in areas outside the 5% most loaded sectors (i.e. tactically prioritise sales of 4K video services in the less loaded network areas) its network could cope with millions of mobile broadband connections with a 4K TV service.

### Incremental CapEx, revenue and profitability projections

In the last step we make an estimate of the incremental radio network CapEx that will be required to accommodate the 5-year site upgrade plan we have assumed in the turnaround scenario and make 5-year projections of key financial indicators (Revenues, OIBDA, OpCF) for the no change and turnaround scenarios. Our calculations show that with a mobile-centric 'unlimited everything' strategy O2 could gain the upper hand in the German market, return to revenue growth and greatly improve its profitability even after spending 1.2 billion EUR more in cumulative 2017-2021 CapEx compared to the no change scenario.

<sup>7</sup>[http://www.dfmonitor.eu/insights/2017\\_mar\\_pro\\_network\\_utilisation\\_mimo/](http://www.dfmonitor.eu/insights/2017_mar_pro_network_utilisation_mimo/)

# Table of Contents

<b>1</b>	<b>O2's failed post-merger strategy in Germany – 2014 to 2016</b>	<b>6</b>
1.1	Rationale of the 4 to 3 merger between O2 and E-Plus and O2's post-merger 'me too' strategy	6
1.2	Post-merger main market developments	7
1.2.1	Drillisch's ultra-low priced smartphone plans – O2's self inflicted distraction	7
1.2.2	Multi-band (700 MHz, 900 MHz, 1500 MHz and 1800 MHz) 2015 spectrum auction	11
1.2.3	Upcoming spectrum auctions in the 700 MHz centre gap, 2 GHz, 3.4 GHz – 3.8 GHz, 26 GHz and 28 GHz	12
1.3	O2's post-merger financial and operational performance – The 'me too' strategy has been a failure	14
<b>2</b>	<b>O2's turnaround strategy in Germany – 2017 to 2021</b>	<b>18</b>
2.1	German mobile operators flirted with unlimited mobile data in 2016	18
2.2	Telekom launched zero-rated music and video streaming in April 2017	19
2.3	O2 turnaround mobile-centric 'unlimited everything' fixed-to-mobile broadband substitution strategy	20
<b>3</b>	<b>Subscriber, ARPU, revenue and data traffic forecasts – 2017 to 2021</b>	<b>24</b>
3.1	Mobile-only broadband households in EU28 and US	24
3.2	No change scenario	27
3.3	Turnaround scenario	31
3.3.1	Traffic forecast for an HD TV scenario	35
3.3.2	Traffic forecast for a 4K TV scenario	36
<b>4</b>	<b>O2 network capacity utilization projections – 2017 to 2021</b>	<b>37</b>
4.1	Capacity modelling approach	37
4.1.1	Number of macro sites and sectors	37
4.1.2	Spectrum used for mobile data	37
4.1.3	Massive MIMO in the 2600 and 3500 MHz TDD bands	38
4.1.4	Sector spectral efficiency in the FDD bands and the TDD/Massive MIMO sectors	40
4.1.5	Sector capacity	40
4.1.6	Traffic geo-distribution, the 5% most loaded sectors frame network capacity	40
4.1.7	Uplink/Downlink traffic ratio	41
4.1.8	TD-LTE configuration	41
4.1.9	Other assumptions	41
4.2	Capacity model outputs for three traffic scenarios	41
4.2.1	No change scenario	41
4.2.2	Turnaround mobile-centric 'unlimited everything' HD TV scenario	42
4.2.3	Turnaround mobile-centric 'unlimited everything' HD 4K scenario	42
4.2.4	Low and high frequency layer traffic split	42
4.2.5	700 MHz SDL (FDD centre-gap)	43
4.3	CapEx impact estimations	44
4.3.1	Radio access network	44
4.3.2	Backhaul and transport	46
<b>5</b>	<b>O2's fixed-to-mobile broadband HD/4K TV substitution potential – 2017 to 2021</b>	<b>47</b>
5.1	Fixed-to-mobile broadband substitution potential for an HD TV service	47
5.2	Fixed-to-mobile broadband substitution potential for a 4K TV service	48
<b>6</b>	<b>Projections of O2's key financial indicators – 2017 to 2021</b>	<b>49</b>
6.1	O2's financial turnaround	49

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## About Rewheel

Founded in 2009, Rewheel is a Helsinki-Finland based boutique management consultancy specialising in the appraisal of mobile data-centric business models with emphasis on network economics, spectrum, capacity, regulatory analysis and competition assessments.

Rewheel's clients are mainly *pro-competitive* mobile network operators, telco groups, MVNO groups, sector regulators, governments, global internet firms, mobile data-centric start ups, PE and VC investors.

### Spectrum and network economics of unlimited data

Our clients include a number of *'unlimited data'* mobile operators, some of them carrying the heaviest mobile data traffic load in the world.

We delivered spectrum valuation, mobile data strategy and network economics management consultancy work for clients in the United Kingdom, United States, Ireland, Switzerland, Finland, Sweden, Belgium, Greece, Poland, Slovenia, Hungary, Russia, Romania. Buyers of our research reports (see: Digital Fuel Monitor) and related strategic workshops include many companies and authorities across Europe and worldwide.

Since 2010 we have been supporting many European challenger mobile operators in multiband (800, 900, 1800, 2600MHz) spectrum auctions. During 2017 we are supporting a Western European challenger operator in an upcoming 700, 1500 and 3400 to 3800 MHz multiband auction.

To learn more about our consultancy's profile visit [rewheel.fi](https://rewheel.fi)