Rewheel / research

3.6 GHz 5G spectrum valuation in Poland

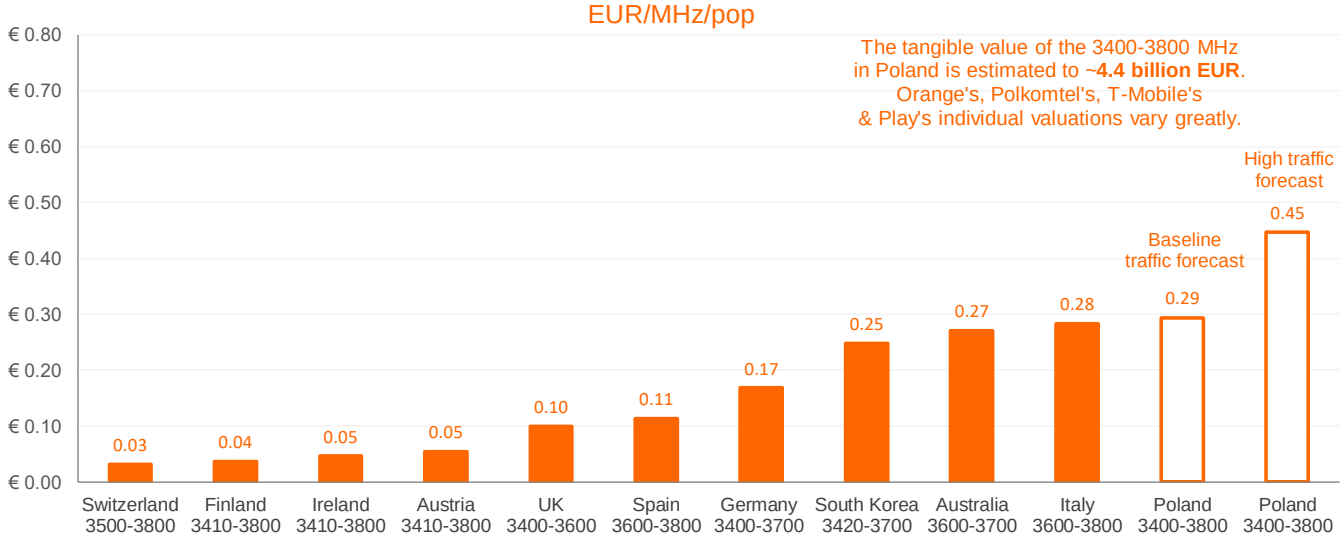
The value of 3400-3800 MHz 5G band is substantially higher in Poland than in other large EU markets. The spectrum valuations of the four Polish operators are highly asymmetrical.

- The tangible[1] value of 3.6 GHz 5G spectrum in Poland, assuming a 4-MNO market, is more than 4 billion EUR.
- The value of 3.6 GHz spectrum in Poland will be significantly lower though if the market was to consolidate back to 3-MNOs.
- 5G home broadband, alongside with fibre, will be an essential technology for delivering affordable high-speed connectivity to every Polish household by 2030.
- Connecting a substantial share of households with 5G broadband, video-on-demand & TV services, during the next 10 years will put significant strain on the four Polish mobile networks.
- Polish operators have rather weak radio site grids. They serve 5x more pop with an average macro site than Nordic operators. Unsurprisingly, Play was the European operator with the highest[2] 4G capacity utilization in 2018, 63% up from 55% in 2017.
- 5G network costs could spiral out of control if Polish operators do not acquire sizable (~80 MHz) 3.6 GHz spectrum holdings.
- But irrespective of the amount of 3.6 GHz spectrum they acquire, the transition to 5G will most likely compel Polish operators to densify their macro site grids in order to improve network performance, peak speed availability and deep indoor coverage.

Rewheel research PRO study, December 2019

Estimated 5G (3400-3800 MHz) spectrum valuation in Poland and paid auction prices in EU and OECD markets

EUR/MHz/pop



Total paid proceeds normalized for 15 years converted in EUR divided by assigned MHz and by country population.
The cost reduction spectrum valuations shown above for Poland are the average valuation for the entire 400 MHz for 10 years assuming EMF limits are relaxed and each Polish operator acquires 100 MHz of nationwide license.

Key spectrum valuation questions addressed

- Why is the 3400-3800 MHz spectrum 5G band worth more in Poland than in other large EU markets?
- Why do Polish operators have highly asymmetrical spectrum valuations?
- Which is the Polish operator that has by far the highest valuation and which one has by far the lowest?
- How large is the *core* smartphone subscriber business valuation for each of the four Polish operators?
- Are the 5-year palpable valuations significant or are valuations back-loaded?
- If the government's planned EMF relaxation fails, would the EMF impeded valuations of Polish operators still be significant?
- How much lower will the Polish operator valuations be if they were to densify their macro site grids to 15,000 sites?
- Is the mobile-centric convergence (MCC) business case positive? If so, is that still the case assuming a high-traffic scenario?
- Are the mobile broadband valuations equally significant for all four Polish operators?
- How much 3.6 GHz spectrum will Polish operators need to run a positive MCC business case and at what price?
- How much will operator X and Y save if they were to acquire 3400-3800 MHz spectrum independently, then merge and − in what will certainly be a controversial decision – are allowed to keep their entire 3400-3800 MHz spectrum holdings?

[1]Value realized through tangible network cost savings assuming nationwide licenses and no timing or EMF restrictions. Excludes commercial value from speculative market share gain/losses, higher revenues or incremental revenues from new services such as verticals, etc.
[2]http://research.rewheel.fi/downloads/2018_capacity_utilization_potential_macro_site_grids_PUBLIC.pdf

Context

On the 9th of December 2019 the Polish Office of Electronic Communications (UKE) published[3] on its website the draft terms for the upcoming 3400-3800 MHz spectrum auction. UKE proposed to distribute four general exclusive frequency licences, each for 80 MHz in the 3480-3800 MHz band. The licences will be valid until the end of May 2035 and the proposed starting price for each block is PLN 450 million (~105 million EUR).

3.6 GHz 5G spectrum auctions raised ~6.5 billion EUR for the Italian and German governments in 2019. The four Italian mobile network operators paid an average of 0.28 EUR/MHz/pop for 200 MHz of 3600-3800 MHz spectrum while the three incumbent German operators and 1&1 Drillish, the 4th entrant aspirant, paid an average of 0.17 EUR/MHz/pop for 300 MHz of 3400-3700 MHz spectrum. A year earlier the four UK operators paid an average of 0.10 EUR/MHz/pop for 150 MHz of 3400-3600 MHz spectrum while is Spain operators paid 0.11 EUR/MHz/pop for 200 MHz of 3600-3800 MHz spectrum. Ofcom in the UK is planning to auction[4] and additional 120 MHz of 3600-3800 MHz spectrum in 2020 while in France the 3400-3800 MHz auction has been pushed[5] back to 2020 due to reported[6] disagreements between the government and ARCEP (regulator) regarding the reserved price.

In March 2017 in a study[7] titled '*Capacity utilization and fixed-to-mobile broadband substitution potential – A study of 64 European operators*' we asserted that 2.6 and 3.6 GHz TDD spectrum is very valuable. Our analysis showed that mobile operators that already hold 2600 MHz and/or will gain access to sizable 3400-3800 MHz TDD spectrum holdings will have enough capacity in the near future − TDD spectrum deployed in massive MIMO mode in the existing 1800/2100 MHz macro site grids – to carry 200 GB per person per month or 500 GB per household. In October 2019 we further reported[8] that the introduction of 5G has supercharged the transition to a *basically unlimited everything* model and will accelerate fixed-to-mobile broadband substitution in many markets.

How much is 3400-3800 MHz spectrum worth? Should the entire band be assigned to mobile operators? see Finnish auction, or should 100 MHz be reserved for local and/or private use? see German auction. What is the minimum amount of TDD 2600 and/or 3400-3800 MHz spectrum that each operator will need to acquire to stay competitive? Should a floor of 50 MHz floor and a cap of 100 MHz be set as contemplated in France or should the available spectrum be packaged in 3 (or 4) equal size blocks, see Finnish auction? These sorts of questions are probably keeping the relevant ministries and national regulators up at nights.

How much is 5G TDD spectrum worth in Poland? Is it worth as much as in Germany and Italy? After all isn't Poland a typical large 4-MNO European market?

Not really. In many ways the Polish market is very different from other large 4-MNO EU markets.

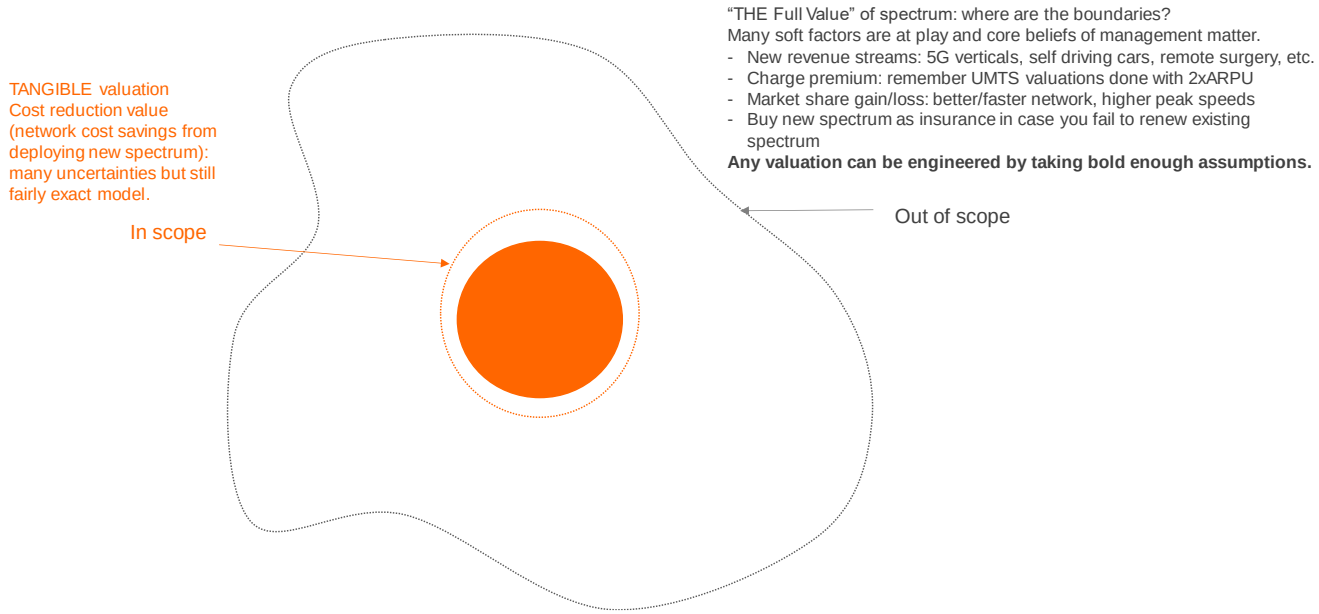
For starters, Poland is probably the only market where a 4th mobile operator (Play) entrant went from zero to market share leader in 12 years without making any major acquisitions. More importantly though, the fragmented structure of the Polish fixed broadband infra market coupled with high population dispersion creates an ideal environment for mobile-centric convergence (MCC), similar to that we have observed in Finland where roughly 4 in 10 households[9] are mobile broadband only households. Unsurprisingly, roughly half of all internet access users in Poland used a mobile connection in 2018 according[10] to UKE while mobile-centric bundles represented 51.3% of all bundled services in 2018 (only 4.9% of all bundled services were typical FMC bundles).

In light of the upcoming 5G spectrum auction, planned for the first half of 2020, we set out to appraise the value of the 3400-3800 MHz bands in Poland. In particular we estimate the *tangible* spectrum valuation (i.e. cost reduction value) for Orange, Polkomtel, T-Mobile and Play assuming that each operator acquires 30, 50, 80 or 100 MHz of 3400-3800 MHz spectrum.

[3] https://uke.gov.pl/en/newsroom/consultation-procedure-on-5g-auction-is-underway,242.html
[4] https://www.ofcom.org.uk/about-ofcom/latest/media/media-releases/2019/releasing-airwaves-for-mobile-services
[5] https://www.arcep.fr/actualites/les-communiques-de-presse/detail/n/5g-7.html
[6] https://www.reuters.com/article/us-france-telecoms-5g/frances-5g-spectrum-auction-delayed-to-march-2020-sources-idUSKBN1XT117
[7] http://research.rewheel.fi/downloads/Capacity_utilization_fixed_mobile_broadband_substitution_potential_21032017_PUBLIC.pdf
[8] http://research.rewheel.fi/downloads/The_state_of_4G_pricing_DFMonitor_12th_release_2H2019_PUBLIC.pdf
[9] https://www.traficom.fi/en/statistics/broadband-penetration-households
[10] https://www.uke.gov.pl/download/gfx/uke/en/defaultaktualnosci/36/210/1/report_on_the_state_of_the_telecommunications_market_in_poland_in_2018.pdf

In the cost reduction method, the value of new spectrum is the difference between the net present value (ΔNPV) of the projected mobile data traffic driven network costs that an operator would incur with and without new spectrum. The value of the spectrum derived by the cost reduction method is quite tangible. A fairly exact model is used to calculate the network cost savings an operator may realize by deploying the new spectrum in existing sites and thus avoiding the higher cost of having to build many new capacity sites.

Rewheel spectrum valuation fried egg diagram



The tangible value we calculate in this study (i.e. cost reduction valuation) does not include any additional commercial value that operators may realize by acquiring new spectrum or preventing their competitors to acquire new spectrum. A commercial spectrum valuation is a speculative valuation that hypothetically may generate additional value on top of the cost reduction value. By acquiring spectrum operators may realize market share gains or avoid market share losses, charge a premium and realize higher revenues from their existing services and/or generate incremental revenues from launching new services. The underlining hypothesis in the commercial valuation is that a relative higher spectrum holding may allow an operator to target and realize a higher market share than its current share and/or charge more for its services and/or launch new services.

For example, if an operator acquires more spectrum than its competitors and deploys that newly acquired spectrum, it could claim higher peak speeds and subject to many other factors it may also achieve higher average download speeds. Its customers might take notice, might decide not to switch to another operator and/or might be willing to pay more for the service. Customers from its competitors' might also take notice and decide to switch, hence increasing the operator's market share and consequently its gross profit compared to the counterfactual where the operator does not acquire new spectrum or compared to the counterfactual where it acquires less spectrum than its competitors.

We have calculated the cost reduction valuation − network cost savings that an operator may realize by avoiding to build new capacity sites through the deployment of the new spectrum in existing sites – for each of the four Polish operators assuming each acquires 30, 50, 80 or 100 MHz of 3400-3800 MHz spectrum. We have carried out the cost reduction valuation calculations for both a baseline and a high traffic forecast assuming an unchanged 4-MNO market structure. We have repeated the cost reduction valuation calculations in a 4-MNO market structure both for the baseline and high traffic forecasts for a hypothetical scenario whereby each of the four Polish operators ahead of the 5G deployment densifies its macro site grid to 15,000 sites for non-capacity related reasons (e.g. improved network performance, wider availability of 5G gigabit peek speeds, improved indoor coverage, etc.).

In addition to the 4-MNO market scenarios we assessed the potential impact of in-market (4 to 3) consolidation on spectrum valuations. In the consolidation scenario we hypothesize that two of the four Polish operators will merge and consolidate the market down to 3 network operators as of 2021.

Our main objective in considering a 4 to 3 consolidation scenario was to assess and quantify the potential spectrum and radio network capacity efficiencies and associated financial benefits that operator X and operator Y may realize by merging their radio access networks in Poland and − in what will certainly be a controversial decision – are allowed to keep their entire 3400-3800 MHz spectrum holdings.

For all of the scenarios we have calculated the cost reduction valuation contributions from the smartphone subscriber *core* business and as well from the mobile broadband (also referred herein as mobile-centric convergence) *side* business. Furthermore, for each scenario we present the 10-year valuation, the 5-year palpable (less uncertain) valuation and as well the EMF impeded valuation. That is the spectrum valuation assuming the strict Polish EMF limits are not relaxed and 3.6 GHz cannot be deployed in high-traffic sites i.e. where it will be needed the most.

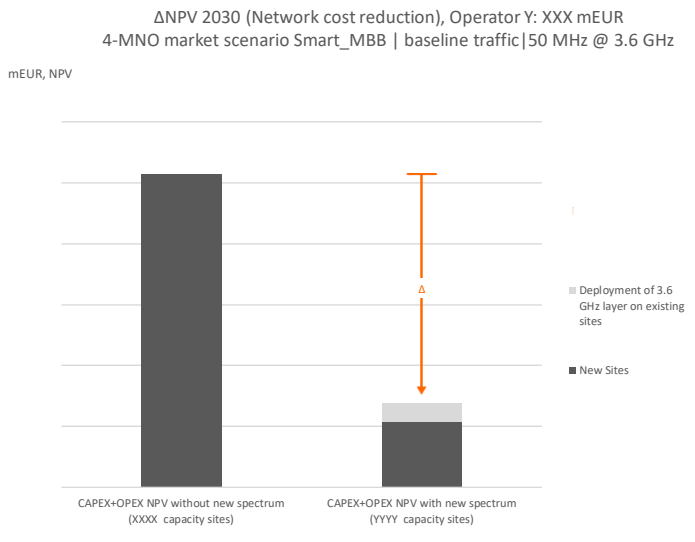
Undeniably, Play's mobile-centric convergence strategy has profoundly shaped the mobile and broadband markets in Poland. So, going forward it requires careful consideration. Is there a positive business case for a mobile-centric convergence strategy if few years down the line the 5G connected Polish households will be using 10x more gigabytes per month than smartphone subscribers?

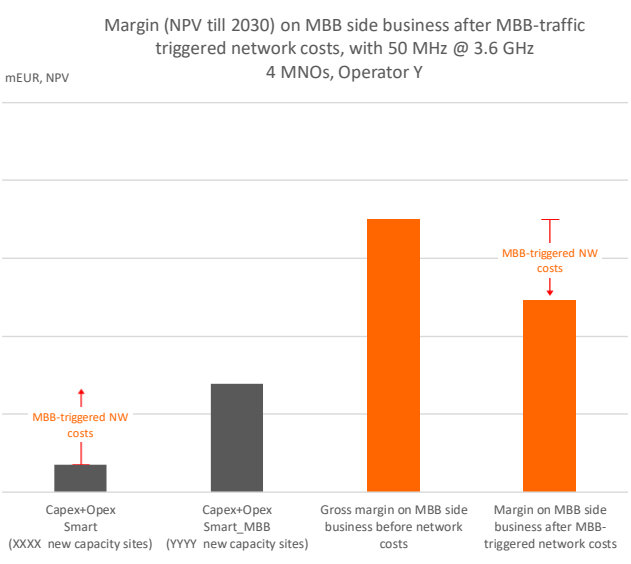
If Play and other Polish operators were to actively pursue mobile-centric convergence and connect a significant share of Polish households with 5G broadband, video-on-demand & TV services data traffic will swell, putting the mobile networks under immense strain. That is, if Polish operators do not gain sufficient access in the 3400-3800 MHz bands. If Polish operators were to acquire sizable holdings of 3400-3800 MHz spectrum and deploy the 5G spectrum with massive MIMO in their densified macro site grids they could realize very significant network cost savings (i.e. very significant cost reduction valuations).

However, it is reasonable to expect that Polish operators will actively pursue mobile-centric convergence only if the business case is positive. That is, if the net present value of the operator's projected mobile broadband gross revenues minus the incremental network related costs directly attributable to mobile broadband customers (i.e. excluding network costs generated by the smartphone subscriber core business) referred herein as MCC business case margin, or simply MCC margin, is sufficiently positive.

If Polish operators cannot generate a positive margin from their mobile broadband business then they will most likely not pursue it. They will probably switch to a fixed-mobile convergence (FMC) strategy or focus in their smartphone subscriber core business. In that case the projected mobile data traffic in their network will be substantially lower and hence the network cost savings they can realize by acquiring 3400-3800 MHz spectrum will be as well substantially lower.

Therefore, in addition to the cost reduction valuations described above we have also carried out a mobile-centric convergence valuation and where applicable (i.e. high traffic forecast for some but not all four operators) we adjusted the cost reduction valuation to take into account the operator MCC profitability.





We used a streamlined version of our techno-economic radio network capacity and spectrum valuation framework to carry out the spectrum valuations presented herein. Most recently, we used the full framework to carry out a comprehensive spectrum valuation ahead of the January 2019 Swiss 700/1400/3400-3800 2018 multi-band 5G auction[11] for Sunrise, the second largest operator in Switzerland.

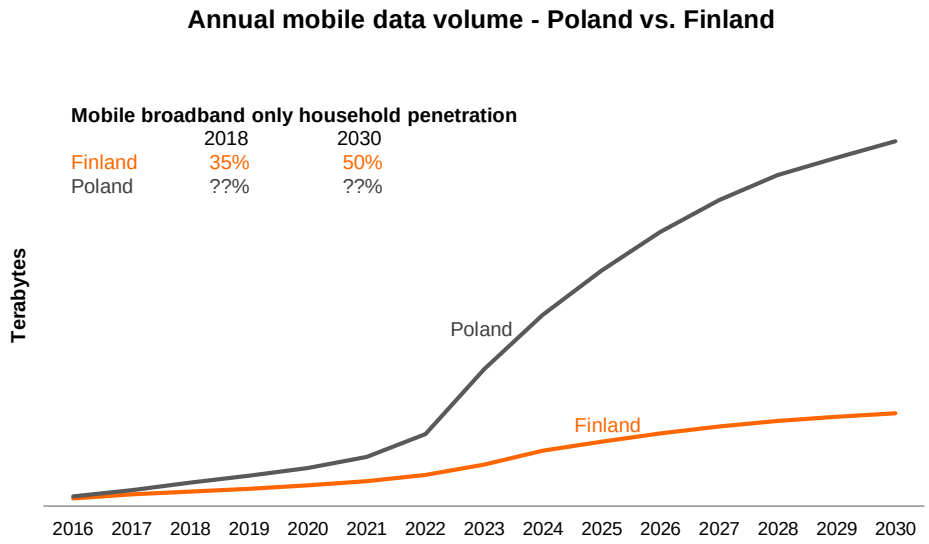
Our methodology and recommendations incorporate the invaluable knowledge we accumulated the last three years by working closely with Sunrise[12] Switzerland and Elisa[13] Finland, two mobile-centric operators that are the European leaders in 5G. Moreover, with the help of Tutela, a mobile data and analytics company, we recently conducted an in-depth analysis[14] of live network statistics and assessed the performance of 99 European mobile networks including the four Polish networks. Our findings concerning the network architecture, radio utilization and 4G LTE performance that vary greatly between the four Polish mobile networks have considerable significance in the context of their 5G spectrum valuations.

All the input data we used herein in the spectrum valuation calculations are taken from public sources.

[11] https://e3.marco.ch/publish/sunrise/821_3795/20190208_MM_frequency_auction_result_EN-final.pdf, Sunrise gave its permission to be named as a reference client
[12] https://e3.marco.ch/publish/sunrise/821_4278/20190918_MM_5G_Home_EN.pdf
[13] http://research.rewheel.fi/downloads/Rewheel%20trying%20Elisa's%205G%20network%20in%20Tampere_17082018_PUBLIC.pdf
[14] http://research.rewheel.fi/downloads/Rewheel_Tutela_LTE_5G_performance_drivers_Europe_17022019_FINAL.pdf

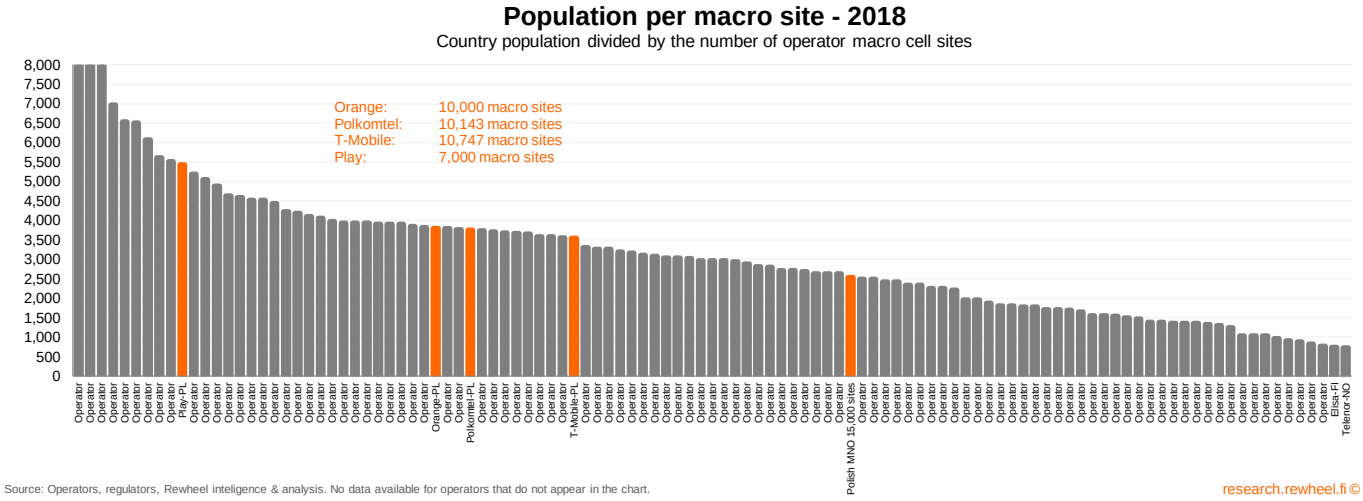
Mobile data traffic forecast

– Mobile data volume in Poland will grow by a double-digit compound annual rate during the modelled period. The main driver of growth will be the substantial increase in the number of mobile broadband only households (4G/5G as primary broadband connection at home).



Polish mobile operator macro site grid density

– Polish operators have rather weak radio site grids, they serve 5x more pop with each macro site compared to Nordic operators.



Source: Operators, regulators, Rewheel inteligence & analysis. No data available for operators that do not appear in the chart.

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Polish site grid analysis based on crowd sourced data from BTSearch.pl (extracts)

% of LTE cell site locations compared to best

	Country	InsideTop10	OutSideTop10	Warszawa	Kraków	Łódź	Wrocław	Poznań	Gdańsk	Szczecin	Bydgoszcz	Lublin	Katowice
Polkomtel	68%	57%	72%	54%	52%	64%	68%	28%	59%	55%	96%	67%	78%
T-Mobile	100%	100%	100%	100%	97%	100%	100%	100%	97%	100%	100%	99%	95%
Orange	94%	100%	92%	99%	100%	100%	100%	95%	100%	100%	100%	100%	90%
Play	58%	63%	57%	59%	79%	83%	67%	7%	61%	56%	94%	90%	100%

% of HB LTE cell site locations compared to best

	Country	InsideTop10	OutSideTop10	Warszawa	Kraków	Łódź	Wrocław	Poznań	Gdańsk	Szczecin	Bydgoszcz	Lublin	Katowice
Polkomtel	79%	53%	90%	47%	50%	59%	66%	26%	58%	56%	90%	66%	73%
T-Mobile	100%	100%	100%	100%	97%	100%	100%	100%	97%	100%	100%	100%	94%
Orange	100%	100%	100%	99%	100%	100%	100%	95%	100%	100%	100%	100%	89%
Play	77%	63%	83%	59%	79%	83%	67%	7%	62%	57%	94%	92%	100%

% of site where # ops > 1

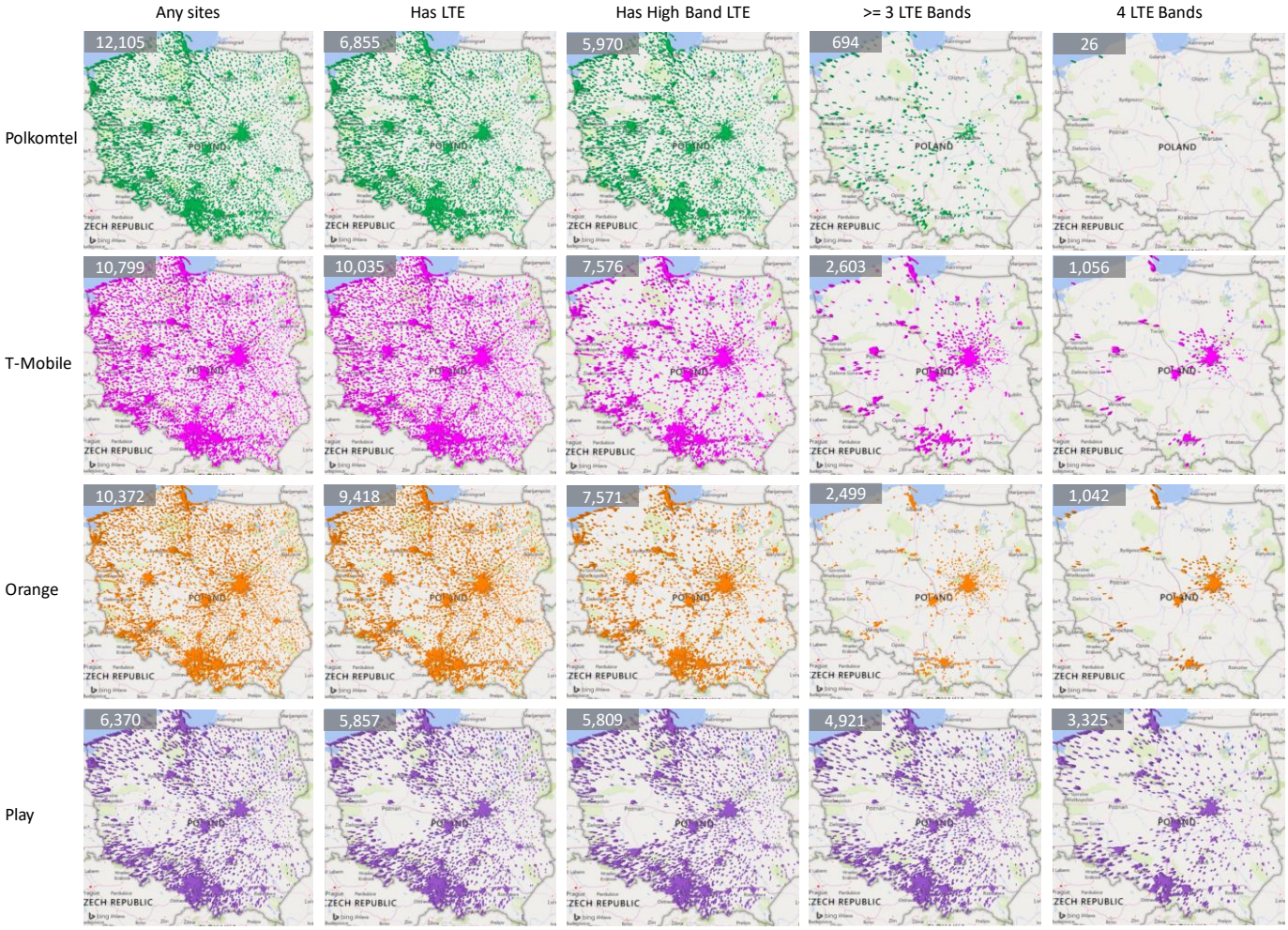
	Country	InsideTop10	OutSideTop10	Warszawa	Kraków	Łódź	Wrocław	Poznań	Gdańsk	Szczecin	Bydgoszcz	Lublin	Katowice
Polkomtel	28%	30%	27%	35%	33%	28%	18%	12%	44%	33%	31%	36%	21%
T-Mobile	96%	98%	96%	98%	99%	100%	96%	92%	100%	100%	100%	99%	99%
Orange	99%	99%	100%	98%	97%	100%	100%	100%	98%	100%	100%	100%	100%
Play	34%	37%	32%	49%	41%	32%	22%	9%	60%	30%	27%	55%	21%

% of site where # ops > 2

	Country	InsideTop10	OutSideTop10	Warszawa	Kraków	Łódź	Wrocław	Poznań	Gdańsk	Szczecin	Bydgoszcz	Lublin	Katowice
Polkomtel	23%	24%	23%	29%	26%	23%	12%	8%	39%	23%	26%	22%	13%
T-Mobile	35%	36%	34%	45%	39%	38%	18%	10%	54%	28%	51%	45%	23%
Orange	36%	37%	36%	45%	38%	38%	19%	11%	53%	27%	51%	46%	24%
Play	26%	28%	26%	41%	32%	25%	11%	4%	50%	13%	19%	37%	9%

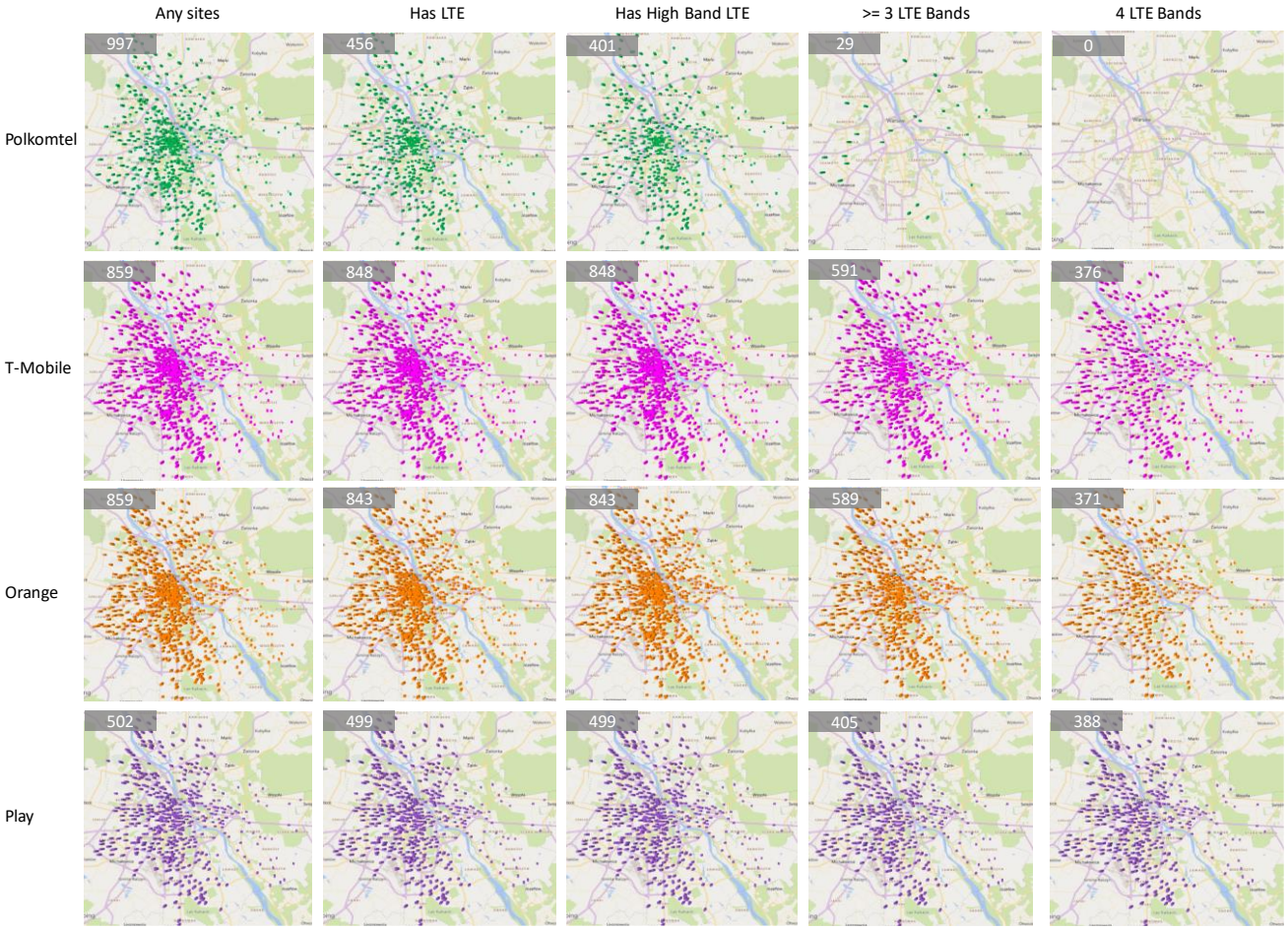
Average # of operators per site

	Country	InsideTop10	OutSideTop10	Warszawa	Kraków	Łódź	Wrocław	Poznań	Gdańsk	Szczecin	Bydgoszcz	Lublin	Katowice
Polkomtel	1.57	1.62	1.56	1.75	1.70	1.60	1.32	1.20	1.99	1.60	1.64	1.69	1.37
T-Mobile	2.38	2.44	2.36	2.56	2.49	2.49	2.17	2.02	2.71	2.32	2.62	2.57	2.26
Orange	2.43	2.45	2.42	2.56	2.46	2.49	2.21	2.11	2.66	2.32	2.62	2.59	2.27
Play	1.72	1.79	1.69	2.12	1.87	1.69	1.37	1.13	2.36	1.50	1.58	2.07	1.33



Source: Raw database BTSearch.pl, Rewheel post processing and analysis

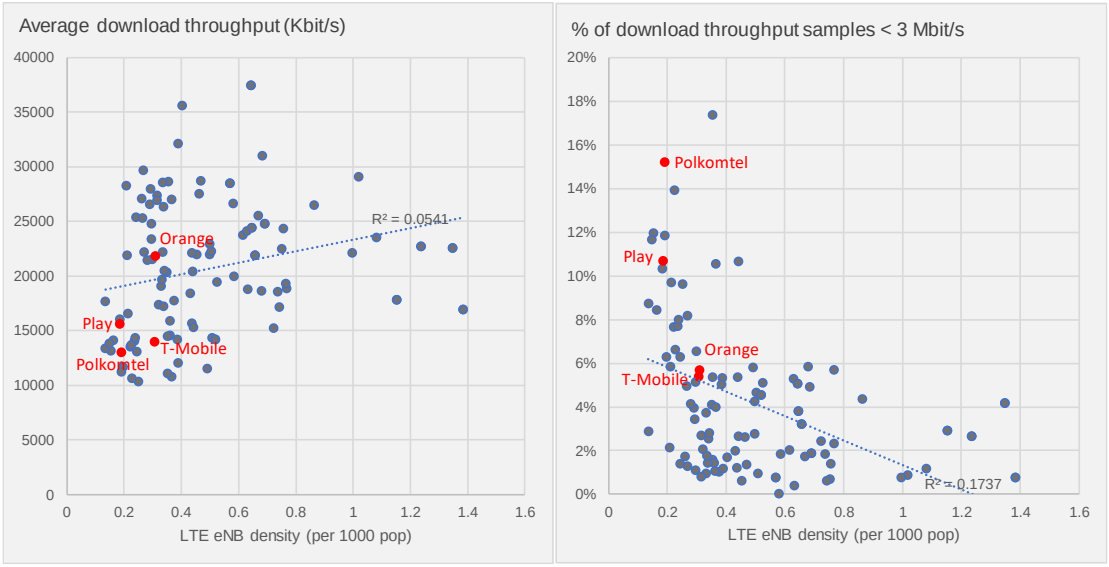
Warsaw



Source: Raw database BTSearch.pl, Rewheel post processing and analysis

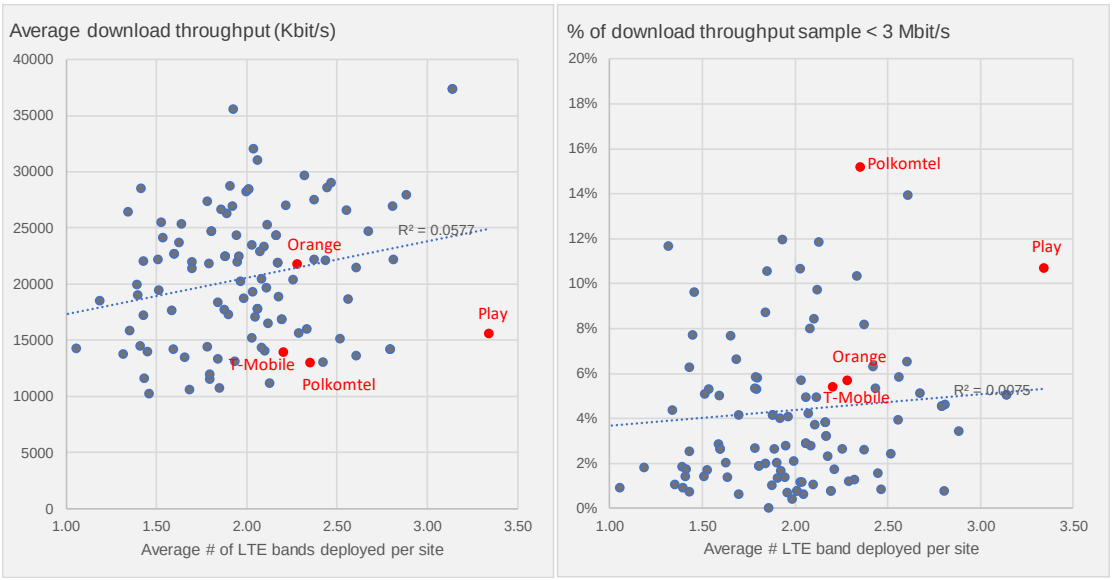
Polish site grid analysis based on crowd sourced data from Tutela, January 2019 (extracts)

The scatter plots[15] below above indicate that directionally, more LTE cell sites per population tends to lead to higher average download throughput (left side) and lower probability of sub-3 Mbit/s throughput (right side).



Source: Tutela Explorer based on January 2019 measurements, Tutela database post processing, Rewheel analysis

Play has the most LTE bands deployed per LTE cell site on average in Europe



Source: Tutela Explorer, Tutela database post processing, Rewheel analysis

[15] http://research.rewheel.fi/downloads/Rewheel_Tutela_LTE_5G_performance_drivers_Europe_17022019_FINAL.pdf

Cost reduction valuations for Orange, Polkomtel, T-Mobile and Play as a function of mobile data forecast, number of macro sites, EMF restrictions and market scenario (4- versus 3-MNO market), extracted empty tables

ΔNPV2030 (mEUR)	30 MHz @ 3.6 GHz	50 MHz @ 3.6 GHz	80 MHz @ 3.6 GHz	100 MHz @ 3.6 GHz
4-MNO market scenario Smart_MBB | baseline traffic	4|SM|B|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|B|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|B|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|B|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play
4-MNO market scenario Smart | baseline traffic	4|S|B|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|B|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|B|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|B|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play
4-MNO market scenario Smart_MBB | high traffic	4|SM|H|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|H|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|H|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|H|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play
4-MNO market scenario Smart | high traffic	4|S|H|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|H|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|H|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|H|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play

ΔNPV2030 (mEUR)	30 MHz @ 3.6 GHz	50 MHz @ 3.6 GHz	80 MHz @ 3.6 GHz	100 MHz @ 3.6 GHz
4-MNO market scenario Smart_MBB | baseline traffic|15K Sites	4|SM|B|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|B|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|B|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|B|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play
4-MNO market scenario Smart | baseline traffic|15K Sites	4|S|B|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|B|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|B|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|B|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play
4-MNO market scenario Smart_MBB | high traffic|15K Sites	4|SM|H|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|H|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|H|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|SM|H|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play
4-MNO market scenario Smart | high traffic|15K Sites	4|S|H|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|H|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|H|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play	4|S|H|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel T-Mobile Orange Play

ΔNPV2030 (mEUR)	30 MHz 60 MHz for T-Mobile_Play @ 3.6 GHz	50 MHz 100 MHz for T-Mobile_Play @ 3.6 GHz	80 MHz 160 MHz for T-Mobile_Play @ 3.6 GHz	100 MHz 200 MHz for T-Mobile_Play @ 3.6 GHz
Consolidation market scenario: Smart_MBB | baseline traffic	C|SM|B|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play	C|SM|B|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play	C|SM|B|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play	C|SM|B|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play
Consolidation market scenario: Smart | baseline traffic	C|S|B|30 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play	C|S|B|50 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play	C|S|B|80 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play	C|S|B|100 NPVno3.6 NPV3.6 ΔNPV Polkomtel Orange T-Mobile_Play

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