



### Key market developments

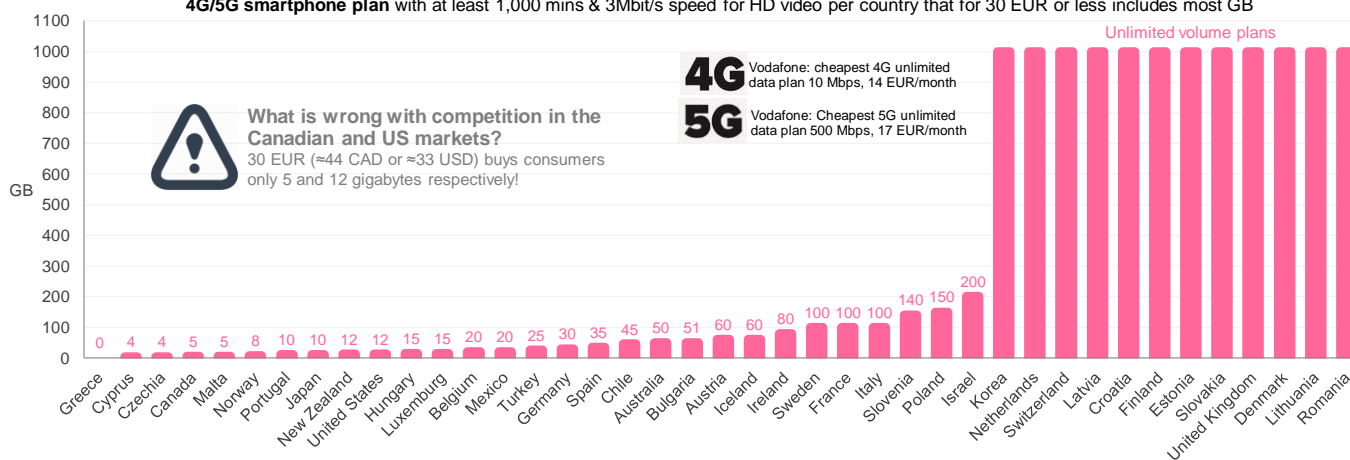
- While the Canadian median gigabyte price in smartphone plans fell during the second half of 2019, Canada’s competitiveness among the EU28 & OECD countries further worsened. Canada was ranked as the country with the fourth highest median gigabyte price in April 2019. In October 2019 Canada became the second most expensive country.
- Italian gigabyte prices continued to fall off a cliff following Iliad’s seismic launch as the new 4<sup>th</sup> MNO. The country median gigabyte price was down 22% compared to April 2019, 66% compared to October 2018 and 90% compared to April 2018.
- Dutch gigabyte prices have stopped falling after the unconditional approval of the T-Mobile and Tele2 4 to 3 merger. The country median gigabyte price in the Netherlands was marginally higher in October compared to April 2019.
- In Czechia the recently launched 4G smartphone plans – some of which include unlimited data volume – did not significantly improve the overall competitiveness of the mobile market. Czechia’s October 2019 rankings were worse than those we presented in September 2019 public study<sup>2</sup> that was commissioned by the Ministry of Industry and Trade of Czechia.

### How many gigabytes 30 EUR buys in 4G & 5G smartphone, mobile broadband and home broadband plans?

- During October 2019 in 12 EU28 & OECD countries 30 EUR bought a smartphone plan with truly<sup>3</sup> unlimited data volume.
- 59 operators sold 4G or 5G smartphone plans that packed truly unlimited mobile data volume in 27 out of 41 EU28 & OECD countries during October 2019.
- Vodafone sold the cheapest 4G (14 EUR) and as well cheapest 5G (17 EUR) smartphone plan with unlimited data volume.

#### How many gigabytes 30 EUR bought in EU28 & OECD - October 2019

4G/5G smartphone plan with at least 1,000 mins & 3Mbit/s speed for HD video per country that for 30 EUR or less includes most GB

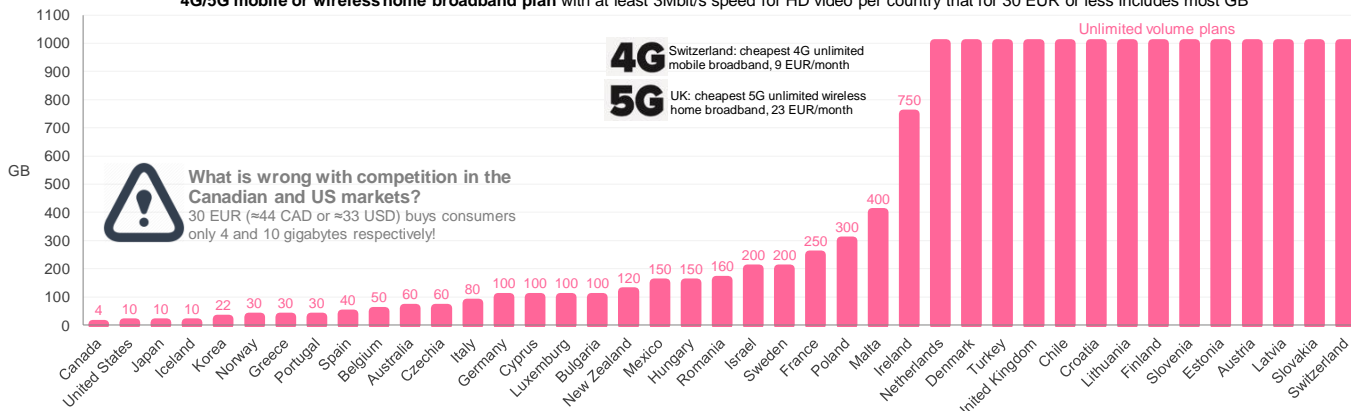


Truly unlimited (>=1,000 or no FUP) volume plans were assigned 1,000 GB finite volume. Operator main, sub-brands and MVNOs included. If gigabytes were the same ranked by lowest price. Prices: October 2019, research.rewheel.fi ©

- During October 2019 in 14 EU28 & OECD countries 30 EUR bought a mobile or wireless home broadband plan with truly unlimited data volume.
- 32 operators sold 4G or 5G mobile or wireless home broadband plans with truly unlimited mobile data volume in 19 out of 41 EU28 & OECD countries during October 2019.
- The cheapest 4G mobile broadband plan that packed unlimited data volume was sold in Switzerland (9 EUR/month)
- The cheapest 5G wireless home broadband plan that packed unlimited data volume was sold in the UK (23 EUR/month)

#### How many gigabytes 30 EUR bought in EU28 & OECD - October 2019

4G/5G mobile or wireless home broadband plan with at least 3Mbit/s speed for HD video per country that for 30 EUR or less includes most GB



Truly unlimited (>=1,000 or no FUP) volume plans were assigned 1,000 GB finite volume. Operator main, sub-brands and MVNOs included. If gigabytes were the same ranked by lowest price. Prices: October 2019, research.rewheel.fi ©





<sup>2</sup>https://www.mpo.cz/rozcestnik/pro-media/tiskove-zpravy/v-neomezenych-tarifech-ceska-republika-dohnala-evropu--250064/

<sup>3</sup>Unlimited data volume plans in this 12<sup>th</sup> release are 4G or 5G plans with at least 1,000 gigabytes of volume where the speed is not throttled below 3 Mbps before the depletion of the 1,000 gigabytes volume or plans without a named finite volume and a speed of at least 3 Mbps at all times.








## How many gigabytes €5, €10, €15, €20, €25, €30, €40, €50, €60, €70 and €80 could buy in EU & OECD markets? – smartphone plans

| How many gigabytes consumers could buy in 4G or 5G smartphone plans with at least 1,000 mins and at least 3Mbps for HD video in EU28 & OECD markets? - October 2019 |      |              |   |           |            |            |            |            |            |            |            |            |            |            |
|---|------|--------------|---|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| EU28  | OECD | Country code | Country name  | GB for €5 | GB for €10 | GB for €15 | GB for €20 | GB for €25 | GB for €30 | GB for €40 | GB for €50 | GB for €60 | GB for €70 | GB for €80 |
|   |      |              |   | 50        | 80         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 13         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 40         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 3          | 15         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 5          | 30         | 60         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 5          | 7          | 40         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 1          | 5          | 15         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
| No  | Yes  | CH           |  Switzerland | 0         | 0          | 1          | 10         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | 5          | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
| Yes   | Yes  | FI           |  Finland     | 0         | 0          | 0          | 0          | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 5          | 5          | 5          | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 10        | 100        | 100        | 100        | 100        | 100        | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 5          | 5          | 5          | 15         | 15         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | 3          | 5          | 10         | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 4          | 8          | 15         | 50         | 100        | 100        | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 15         | 35         | 40         | 45         | 70         | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 10         | 20         | 20         | 40         | 60         | 60         | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 3          | 7          | 25         | 28         | 35         | 50         | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 1          | 3          | 5          | 8          | 25         | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | 0          | 5          | 15         | 15         | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | 1          | 4          | 4          | 14         | Unlimited  | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | 10         | 60         | 60         | 100        | 100        | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 4          | 6          | 10         | 18         | 30         | 60         | 60         | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 0         | 0          | 0          | 0          | 5          | 5          | 10         | 30         | Unlimited  | Unlimited  | Unlimited  |
|   |      |              |   | 10        | 100        | 200        | 200        | 200        | 200        | 300        | 300        | 300        | 300        | 300        |
|   |      |              |   | 0         | 50         | 60         | 100        | 100        | 100        | 100        | 100        | 100        | 150        | 150        |
|   |      |              |   | 10        | 30         | 30         | 150        | 150        | 150        | 150        | 150        | 150        | 150        | 150        |
|   |      |              |   | 0         | 30         | 60         | 100        | 120        | 140        | 140        | 140        | 140        | 140        | 140        |
|   |      |              |   | 0         | 4          | 6          | 30         | 50         | 50         | 80         | 120        | 120        | 150        | 150        |
|   |      |              |   | 0         | 0          | 0          | 1          | 1          | 4          | 10         | 100        | 100        | 100        | 100        |
|   |      |              |   | 0         | 1          | 3          | 8          | 12         | 12         | 25         | 60         | 60         | 60         | 100        |
|   |      |              |   | 0         | 80         | 80         | 80         | 80         | 80         | 80         | 80         | 80         | 80         | 80         |
|   |      |              |   | 1         | 15         | 25         | 25         | 25         | 25         | 50         | 50         | 60         | 60         | 60         |
|   |      |              |   | 0         | 10         | 10         | 24         | 25         | 51         | 51         | 51         | 51         | 51         | 51         |
|   |      |              |   | 0         | 0          | 1          | 5          | 5          | 10         | 14         | 14         | 24         | 50         | 50         |
|   |      |              |   | 0         | 0          | 0          | 0          | 5          | 12         | 30         | 40         | 40         | 40         | 40         |
|   |      |              |   | 0         | 0          | 4          | 10         | 15         | 20         | 30         | 30         | 30         | 30         | 30         |
|   |      |              |   | 5         | 10         | 10         | 20         | 20         | 20         | 26         | 26         | 26         | 30         | 30         |
| No  | Yes  | CA           |  Canada    | 0         | 0          | 0          | 2          | 2          | 5          | 12         | 15         | 25         | 30         | 30         |
| Yes   | Yes  | EL           |  Greece    | 0         | 0          | 0          | 0          | 0          | 0          | 0          | 2          | 5          | 6          | 15         |

**How many gigabytes €5, €10, €15, €20, €25, €30, €40, €50, €60, €70 and €80 could buy in EU & OECD markets? – mobile broadband or wireless home broadband plans?**

| How many gigabytes consumers could buy in 4G or 5G mobile broadband or wireless home broadband plans with at least 3Mbps for HD video in EU28 & OECD markets? - October 2019 |      |              |   |           |            |            |   |            |            |            |            |            |            |            |           |           |           |           |
|--|------|--------------|---|-----------|------------|------------|---|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|
| EU28   | OECD | Country code | Country name  | GB for €5 | GB for €10 | GB for €15 | GB for €20  | GB for €25 | GB for €30 | GB for €40 | GB for €50 | GB for €60 | GB for €70 | GB for €80 |           |           |           |           |
| No   | Yes  | CH           |  Switzerland | 1         | Unlimited  | Unlimited  | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |           |           |           |           |
|  |      |              |   | 0         | Unlimited  | Unlimited  | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 25        | 30         | Unlimited  | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 3         | 15         | Unlimited  | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 0         | 20         | 200        | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 25        | 100        | 120        | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 0         | 15         | 50         | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 0         | 0          | 0          | Unlimited   | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 20        | 50         | 50         | 50  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 0         | 5          | 20         | 50  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 0         | 0          | 20         | 40  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | 0         | 3          | 6          | 10  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited |           |           |           |
|  |      |              |   | Yes       | Yes        | FI         |  Finland | 3          | 6          | 60         | 60         | 100        | Unlimited  | Unlimited  | Unlimited | Unlimited | Unlimited | Unlimited |
| 0  | 0    | 1            | 5   |           |            |            |   | 5          | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |           |           |           |           |
| 0  | 0    | 10           | 20  |           |            |            |   | 30         | 250        | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |           |           |           |           |
| 0  | 5    | 20           | 100   |           |            |            |   | 200        | 200        | Unlimited  | Unlimited  | Unlimited  | Unlimited  | Unlimited  |           |           |           |           |
| 0  | 2    | 2            | 100   |           |            |            |   | 100        | 100        | 100        | 200        | Unlimited  | Unlimited  | Unlimited  |           |           |           |           |
| 0  | 10   | 20           | 22  |           |            |            |   | 22         | 22         | 22         | 22         | 22         | Unlimited  | Unlimited  |           |           |           |           |
| 0  | 0    | 1            | 5   |           |            |            |   | 10         | 10         | 25         | 50         | 150        | 150        | Unlimited  |           |           |           |           |
| 0  | 0    | 15           | 25  |           |            |            |   | 25         | 750        | 750        | 750        | 750        | 750        | 750        |           |           |           |           |
| 0  | 5    | 25           | 25  |           |            |            |   | 50         | 60         | 100        | 200        | 500        | 500        | 500        |           |           |           |           |
| 0  | 10   | 15           | 15  |           |            |            |   | 400        | 400        | 400        | 400        | 400        | 400        | 400        |           |           |           |           |
| 10   | 50   | 250          | 300   |           |            |            |   | 300        | 300        | 300        | 300        | 300        | 300        | 300        |           |           |           |           |
| 0  | 0    | 1            | 3   |           |            |            |   | 60         | 120        | 240        | 300        | 300        | 300        | 300        |           |           |           |           |
| 0  | 0    | 7            | 7   |           |            |            |   | 15         | 30         | 50         | 100        | 300        | 300        | 300        |           |           |           |           |
| 1  | 3    | 6            | 30  |           |            |            |   | 30         | 100        | 125        | 250        | 250        | 250        | 250        |           |           |           |           |
| 0  | 20   | 100          | 200   |           |            |            |   | 200        | 200        | 200        | 200        | 200        | 200        | 200        |           |           |           |           |
| 0  | 60   | 75           | 100   |           |            |            |   | 100        | 150        | 200        | 200        | 200        | 200        | 200        |           |           |           |           |
| 10   | 20   | 80           | 160   |           |            |            |   | 160        | 160        | 160        | 160        | 160        | 160        | 160        |           |           |           |           |
| 1  | 5    | 30           | 60  |           |            |            |   | 150        | 150        | 150        | 150        | 150        | 150        | 150        |           |           |           |           |
| 30   | 100  | 100          | 100   |           |            |            |   | 100        | 100        | 100        | 100        | 100        | 100        | 100        |           |           |           |           |
| 0  | 1    | 2            | 2   |           |            |            |   | 100        | 100        | 100        | 100        | 100        | 100        | 100        |           |           |           |           |
| 0  | 0    | 4            | 60  |           |            |            |   | 60         | 60         | 100        | 100        | 100        | 100        |            |           |           |           |           |
| 0  | 2    | 2            | 2   |           |            |            |   | 6          | 10         | 50         | 100        | 100        | 100        |            |           |           |           |           |
| 0  | 60   | 80           | 80  |           |            |            |   | 80         | 80         | 80         | 80         | 80         | 80         |            |           |           |           |           |
| 0  | 0    | 0            | 0   |           |            |            |   | 0          | 40         | 60         | 60         | 60         | 60         |            |           |           |           |           |
| 0  | 2    | 15           | 50  |           |            |            |   | 50         | 50         | 50         | 50         | 50         | 50         |            |           |           |           |           |
| 0  | 0    | 3            | 5   |           |            |            |   | 10         | 10         | 20         | 20         | 50         | 50         |            |           |           |           |           |
| 0  | 0    | 10           | 30  |           |            |            |   | 30         | 30         | 40         | 40         | 40         | 40         |            |           |           |           |           |
| 0  | 0    | 15           | 30  |           |            |            |   | 30         | 30         | 30         | 30         | 30         | 30         |            |           |           |           |           |
| No   | Yes  | CA           |  Canada    |           |            |            |   | 0          | 0          | 4          | 4          | 4          | 4          | 4          | 6         | 15        | 25        | 30        |

### 5G smartphone plans sold in EU28 & OECD countries during October 2019

| Collection date | EU28   | OECD   | Country code | Operator group name | Mobile Network Operator (MNO) name | Brand name | Brand type | Local currency | Price local currency | Price € | GB        | Unlimited GB | Minutes   | SMS       | Speed Mbps | Fully allocated €/GB | 5G  | Tariff plan name & handset subsidy if any |
|-----------------|--------|--------|--------------|---------------------|------------------------------------|------------|------------|----------------|----------------------|---------|-----------|--------------|-----------|-----------|------------|----------------------|-----|---|
| 13.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 44.99   | Unlimited | Yes          | Unlimited | Unlimited | 150.0      | 0.04                 | Yes | Tariff plan name and other comments       |
| 13.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 59.99   | Unlimited | Yes          | Unlimited | Unlimited | 300.0      | 0.06                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.60   | 100.00    | No           | Unlimited | Unlimited | 150.0      | 0.50                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 62.00   | 150.00    | No           | Unlimited | Unlimited | 150.0      | 0.41                 | Yes | Tariff plan name and other comments       |
| 02.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 82.80   | Unlimited | Yes          | Unlimited | Unlimited | 1000.0     | 0.08                 | Yes | Tariff plan name and other comments       |
| 02.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 92.00   | Unlimited | Yes          | Unlimited | Unlimited | 700.0      | 0.09                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 24.95   | 3.00      | No           | Unlimited | Unlimited | 300.0      | 8.32                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 39.95   | 6.00      | No           | Unlimited | Unlimited | 300.0      | 6.66                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.95   | 12.00     | No           | Unlimited | Unlimited | 300.0      | 4.16                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 59.95   | 24.00     | No           | Unlimited | Unlimited | 300.0      | 2.50                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 84.95   | Unlimited | Yes          | Unlimited | Unlimited | 300.0      | 0.08                 | Yes | Tariff plan name and other comments       |
| 18.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 34.99   | 12.00     | No           | Unlimited | Unlimited | 500.0      | 2.92                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 42.49   | 24.00     | No           | Unlimited | Unlimited | 500.0      | 1.77                 | Yes | Tariff plan name and other comments       |
| 07.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 45.99   | Unlimited | Yes          | Unlimited | Unlimited | 10.0       | 0.05                 | Yes | Tariff plan name and other comments       |
| 07.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.99   | Unlimited | Yes          | Unlimited | Unlimited | 300.0      | 0.05                 | Yes | Tariff plan name and other comments       |
| 04.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 31.90   | Unlimited | Yes          | Unlimited | Unlimited | 300.0      | 0.03                 | Yes | Tariff plan name and other comments       |
| 04.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 39.90   | Unlimited | Yes          | Unlimited | Unlimited | 600.0      | 0.04                 | Yes | Tariff plan name and other comments       |
| 04.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.90   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.05                 | Yes | Tariff plan name and other comments       |
| 10.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 39.90   | Unlimited | Yes          | Unlimited | Unlimited | 450.0      | 0.04                 | Yes | Tariff plan name and other comments       |
| 10.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.90   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.05                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 29.97   | 5.00      | No           | Unlimited | Unlimited | 300.0      | 5.99                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 38.97   | 10.00     | No           | Unlimited | Unlimited | 300.0      | 3.90                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 47.97   | Unlimited | Yes          | Unlimited | Unlimited | 300.0      | 0.05                 | Yes | Tariff plan name and other comments       |
| 06.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 30.00   | 20.00     | No           | Unlimited | Unlimited | 300.0      | 1.50                 | Yes | Tariff plan name and other comments       |
| 06.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 40.00   | 50.00     | No           | Unlimited | Unlimited | 300.0      | 0.80                 | Yes | Tariff plan name and other comments       |
| 06.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 80.00   | 60.00     | No           | Unlimited | Unlimited | 300.0      | 1.33                 | Yes | Tariff plan name and other comments       |
| 06.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.99   | 100.00    | No           | Unlimited | Unlimited | 2 000.0    | 0.50                 | Yes | Tariff plan name and other comments       |
| 06.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 18.99   | 40.00     | No           | Unlimited | Unlimited | 1 000.0    | 0.47                 | Yes | Tariff plan name and other comments       |
| 06.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 39.99   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.04                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 42.35   | 9.00      | No           | Unlimited | Unlimited | 2700.0     | 4.71                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 57.75   | Unlimited | Yes          | Unlimited | Unlimited | 2700.0     | 0.06                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 68.53   | Unlimited | Yes          | Unlimited | Unlimited | 2700.0     | 0.07                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 61.60   | Unlimited | Yes          | Unlimited | Unlimited | 2000.0     | 0.06                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 42.35   | 9.00      | No           | Unlimited | Unlimited | 2700.0     | 4.71                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 57.75   | Unlimited | Yes          | Unlimited | Unlimited | 2700.0     | 0.06                 | Yes | Tariff plan name and other comments       |
| 15.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 65.45   | Unlimited | Yes          | Unlimited | Unlimited | 2700.0     | 0.07                 | Yes | Tariff plan name and other comments       |
| 12.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.37   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.05                 | Yes | Tariff plan name and other comments       |
| 08.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 38.65   | Unlimited | Yes          | Unlimited | Unlimited | 10.0       | 0.04                 | Yes | Tariff plan name and other comments       |
| 08.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 48.65   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.05                 | Yes | Tariff plan name and other comments       |
| 11.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 17.00   | Unlimited | Yes          | Unlimited | Unlimited | 500.0      | 0.02                 | Yes | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 49.28   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.05                 | Yes | Tariff plan name and other comments       |
| 18.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 28.00   | 100.00    | No           | Unlimited | Unlimited | 1 000.0    | 0.28                 | Yes | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 33.60   | Unlimited | Yes          | Unlimited | Unlimited | 1 000.0    | 0.03                 | Yes | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 11.20   | 4.00      | No           | Unlimited | Unlimited | 150.0      | 2.80                 | Yes | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 14.56   | 12.00     | No           | Unlimited | Unlimited | 150.0      | 1.21                 | Yes | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 20.16   | 30.00     | No           | Unlimited | Unlimited | 150.0      | 0.67                 | Yes | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 19.60   | Unlimited | Yes          | Unlimited | Unlimited | 150.0      | 0.02                 | Yes | Tariff plan name and other comments       |
| 16.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 72.80   | 25.00     | No           | Unlimited | Unlimited | 300.0      | 2.91                 | Yes | Tariff plan name and other comments       |
| 16.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 81.90   | 75.00     | No           | Unlimited | Unlimited | 300.0      | 1.09                 | Yes | Tariff plan name and other comments       |
| 16.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 63.70   | 50.00     | No           | Unlimited | Unlimited | 300.0      | 1.27                 | Yes | Tariff plan name and other comments       |
| 16.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 72.80   | 100.00    | No           | Unlimited | Unlimited | 500.0      | 0.73                 | Yes | Tariff plan name and other comments       |

### 5G mobile or wireless home broadband plans sold in EU28 & OECD countries during October 2019

| Collection date | EU28   | OECD   | Country code | Operator group name | Mobile Network Operator (MNO) name | Brand name | Brand type | Local currency | Price local currency | Price € | GB        | Unlimited GB | Minutes | SMS | Speed Mbps | Fully allocated €/GB | 5G  | Stationary MBB | Tariff plan name & handset subsidy if any |
|-----------------|--------|--------|--------------|---------------------|------------------------------------|------------|------------|----------------|----------------------|---------|-----------|--------------|---------|-----|------------|----------------------|-----|----------------|---|
| 13.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 46.00   | Unlimited | Yes          | N/A     | N/A | 200.0      | 0.05                 | Yes | Yes            | Tariff plan name and other comments       |
| 13.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 99.00   | Unlimited | Yes          | N/A     | N/A | 500.0      | 0.10                 | Yes | Yes            | Tariff plan name and other comments       |
| 18.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 54.28   | Unlimited | Yes          | N/A     | N/A | 2000.0     | 0.05                 | Yes | No             | Tariff plan name and other comments       |
| 04.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 34.90   | Unlimited | Yes          | N/A     | N/A | 300.0      | 0.03                 | Yes | No             | Tariff plan name and other comments       |
| 04.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 34.90   | Unlimited | Yes          | N/A     | N/A | 600.0      | 0.03                 | Yes | No             | Tariff plan name and other comments       |
| 04.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 44.90   | Unlimited | Yes          | N/A     | N/A | 1 000.0    | 0.04                 | Yes | No             | Tariff plan name and other comments       |
| 10.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 44.90   | Unlimited | Yes          | N/A     | N/A | 1 000.0    | 0.04                 | Yes | No             | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 56.00   | 50.00     | No           | N/A     | N/A | 1 000.0    | 1.12                 | Yes | Yes            | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 84.00   | 100.00    | No           | N/A     | N/A | 1 000.0    | 0.84                 | Yes | Yes            | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 33.60   | 100.00    | No           | N/A     | N/A | 1 000.0    | 0.34                 | Yes | Yes            | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 44.80   | 200.00    | No           | N/A     | N/A | 1 000.0    | 0.22                 | Yes | Yes            | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 56.00   | Unlimited | Yes          | N/A     | N/A | 1 000.0    | 0.06                 | Yes | Yes            | Tariff plan name and other comments       |
| 03.10.2019      | Yes/No | Yes/No | Country      | Name                | Name                               | Name       | Name       | Currency       | Price                | 23.52   | Unlimited | Yes          | N/A     | N/A | 1 000.0    | 0.02                 | Yes | Yes            | Tariff plan name and other comments       |









## Context

Rewheel's Digital Fuel Monitor bi-annual releases have been tracking mobile data prices in the EU28 & OECD mobile markets since 2014. In this Digital Fuel Monitor 12<sup>th</sup> release 2H2019 we tracked and analysed the state of 4G **and for the first time the state of 5G** pricing during the second half of 2019 (October 2019) and reported the main price developments compared to the first half of 2019 (April 2019) and as well compared to 2018.

As with every release, in this 12<sup>th</sup> release we have collected and analysed thousands of eligible 4G and 5G smartphone, mobile broadband and wireless home broadband plans suitable for fixed-to-mobile broadband substitution from 41 countries in accordance with Digital Fuel Monitor's methodology<sup>5</sup>.

In this 12<sup>th</sup> release we analysed the gigabyte prices and ranked the EU28 & OECD countries using the maximum gigabytes for 30 EUR price metric, as we have done since 2016. Similarly, to the 10<sup>th</sup> and 11<sup>th</sup> releases in this 12<sup>th</sup> release we have also ranked the EU28 & OECD countries using the maximum gigabytes that €5, €10, €15, €20, €25, €30, €40, €50, €60, €70 and €80 could buy and as well using the fully allocated country median gigabyte price.

The focus of this 12<sup>th</sup> release is the introduction of 5G plans – most of which packed truly unlimited data volume – and the unabated spread of speed-tiered plans that packed truly unlimited mobile data volume. The *speed-tiered unlimited data volume* model was pioneered by the Finnish mobile operators such as Elisa in the early years of 4G and proved very profitable.

We examine if operators sold 5G at a premium or they bundled it in at no extra cost. Were operators successful in executing *more-for-more* commercial strategies i.e. charge a higher monthly fee for higher gigabyte allowances? Has the introduction of 5G reverse the decline of smartphone plan monthly prices? Has it accelerated the introduction of affordable plans with truly unlimited data volume that are tiered on speed? And what about fixed-to-mobile broadband substitution? How many operators have so far launched mobile broadband or wireless home broadband plans suitable for fixed-line broadband substitution? Which are the mobile operators that have launched 5G home box with up to 2 Gbps speeds that support 4K TV?

Furthermore, we take a look back and examine the development of 4G gigabyte prices the last 6 years in a number of EU28 & OECD countries and compare the 4G gigabyte prices of 2019 against the 5G gigabyte prices of 2019.

We also present and discuss Vodafone's group 4G & 5G smartphone, mobile and wireless home broadband plans across its 12 EU28 & OECD markets. Vodafone, in these early days of 5G, is the incumbent telco group that has launched 4G & 5G smartphone plans with truly unlimited data volume across most of its 12 EU28 & OECD markets. How many of Vodafone 5G plans have data caps and how many pack unlimited data volume? Has Vodafone priced its 5G plans at a premium or has it included 5G at no extra cost?

In the last section of this report we examine the competitiveness of the Czech mobile market during October 2019. In September 2019 the Ministry of Industry and Trade of Czechia commissioned Rewheel to conduct a public study and examine the competitiveness of the Czech mobile market in light of the recently launched (summer and September 2019) 4G smartphone plans by all three Czech mobile operators – some of which include unlimited data volume. In our September 2019 study<sup>6</sup>, we concluded that the recently launched 4G smartphone plans did not significantly improve the overall competitiveness of the Czech mobile market. However it is important to highlight, that in our September 2019 study we compared the Czech September 2019 prices against the April 2019 prices of the remaining 40 EU28 & OECD countries and we noted that any improvements in the rankings of Czechia should be interpreted as the *best-case* scenario given that prices have been falling across the board the last six years. Hence, we warned that one cannot exclude the possibility that the *like-for-like* rankings of Czechia might actually be worse than what was shown in our September 2019 study. Herein, as predicted, we show that Czechia's October 2019 rankings were worse than those we presented in our September 2019 public study.

<sup>5</sup>[http://research.rewheel.fi/downloads/Methodology\\_DFMonitor\\_12th\\_release\\_2H2019.pdf](http://research.rewheel.fi/downloads/Methodology_DFMonitor_12th_release_2H2019.pdf)

<sup>6</sup><https://www.mpo.cz/cz/rozcestnik/pro-media/tiskove-zpravy/v-neomezenych-tarifech-ceska-republika-dohnala-evropu--250064/>

## Plans with truly unlimited data volume

In earlier releases, when calculating the fully allocated gigabyte price per country or per operator we assigned to plans with truly unlimited volume (plans with no defined fair usage volume limit) a finite volume that was determined by the maximum finite gigabyte volume that 30 EUR bought in any of the EU28 & OECD countries. In DFMonitor's 8<sup>th</sup> release 2H2017 the finite volume assigned in smartphone plans with unlimited volume was 100 gigabytes.

In DFMonitor's 9<sup>th</sup> release 1H2018 the finite volume assigned in smartphone plans with unlimited volume was 200 gigabytes. 200 gigabyte volume was the maximum finite gigabyte volume that 80 EUR bought across the 41 markets. The reason for this change was the fact that while 30 EUR bought during April 2018 at most a finite volume of 120 gigabytes in smartphone plans across all EU28 & OECD countries 80 EUR bought a higher finite volume of 200 gigabytes. Hence, if we were to stick to the 30 EUR rule, we would have created an artefact whereby truly unlimited volume plans that cost considerably less than 80 EUR (e.g. 50 EUR) could end up having a higher fully allocated gigabyte price than more expensive plans with a large finite volume. This rule change ensured that cheaper plans with a truly (i.e. 3 Mbps speed at all time for HD video) unlimited volume are always ranked higher than more expensive plans with large finite gigabyte volumes.

In the 10<sup>th</sup> release 2H2018 we assigned to plans with unlimited volume the maximum finite gigabyte volume that 80 EUR bought which was 250 gigabytes. We applied the same principle for mobile broadband and/or wireless home broadband plans. 1,000 gigabyte volume was the maximum finite gigabyte volume that 80 EUR bought and was the finite volume we assigned to both unlimited volume mobile broadband and wireless home broadband plans.

In the 11<sup>th</sup> release 1H2019 we assigned to smartphone plans with truly unlimited volume the maximum finite gigabyte volume that 80 EUR bought which was 500 gigabytes. Oister, a sub-brand of Hutchison-3 the no.4 operator in Denmark sold a smartphone plan with 500 gigabytes for 129 DKK ≈ 17 EUR. 1,000 gigabyte volume was the maximum finite gigabyte volume that 80 EUR bought in mobile broadband or wireless home broadband plans. Oister sold for 220 DKK ≈ 29 EUR a mobile broadband plan with 1,000 gigabytes.

In this 12<sup>th</sup> release any plan that was marketed as *unlimited* where the operator named a finite volume that was smaller than 1,000 gigabytes (1 terabyte) and reserved the right to throttle the speed below 3 Mbps or deprioritize the traffic, has been designated as a finite volume plan with a volume equal to the named de-prioritization/throttling volume (e.g. 22, 32, 35, 50 or 75, 100 GB for US operator unlimited plans). Unlimited data volume plans in this 12<sup>th</sup> release are 4G or 5G plans with at least 1,000 gigabytes of volume where the speed is not throttled below 3 Mbps before the depletion of the 1,000 gigabytes volume or plans without a named finite volume and a speed of at least 3 Mbps at all times. TDC, Telenor, Telia, and Hutchison 3 in Denmark (see screenshot below) and as well operators in other countries sold smartphone and mobile broadband plans with a high-speed volume of 1,000 gigabytes (thereafter the speed was throttled below 3 Mbps).

Please note that the increase of the finite volume assigned to smartphone plans that have truly unlimited volume from 500 gigabytes in the 11<sup>th</sup> release to 1,000 gigabytes in this 12<sup>th</sup> release had no or negligible effect in the country median gigabyte prices for all 41 EU28 & OECD countries except Finland. In Finland, all eligible smartphone plans we logged in the database have a truly unlimited data volume. Hence, in this 12<sup>th</sup> release the country median gigabyte price in Finland was 50% lower than in the 11<sup>th</sup> release (0.03/GB versus 0.06/GB in the 11<sup>th</sup> release) because the finite volume assigned to Finnish unlimited volume smartphone plans doubled from 500 to 1,000 gigabytes.

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## About Rewheel

*New radio spectrum bands, 4.5G and 5G technology, unlimited mobile data plans and the Internet of Things radically change mobile network operators' cost, revenue and profitability dynamics. **Rewheel's mission is to help operators prepare for the paradigm shift in network and spectrum strategy, spectrum valuation, network sharing, M&A, MVNO economics and mobile data pricing.***

Founded in 2009, Rewheel is a Finland based boutique management consultancy. Our clients are mainly European mobile network operators, telco groups, MVNO groups, sector regulators, competition authorities, governments, global internet firms, mobile data-centric start-ups, PE and VC investors.

We delivered management consultancy work for clients in the United Kingdom, United States, Ireland, Switzerland, Finland, Sweden, Belgium, Greece, Poland, Slovenia, Hungary, Russia, Romania.

The following authorities have acquired access to our research: The European Commission Directorate for Competition, the United States Department of Justice, the New York, California and many other US State Attorney General Offices, the national competition authorities of Canada, Australia and the Netherlands, the Ministry of Economic Affairs of the Netherlands, the Ministry of Industry and Trade of Czechia, the Korean Electronics and Telecommunication Research Institute, the sector regulators of the United Kingdom, Germany, the Netherlands, Finland, etc.

Rewheel's mobile data technology, network-economics, spectrum, profitability and competitiveness focused reports have been cited by OECD Economic Surveys, The Economist, The Financial Times, The New York Times, Reuters, Bloomberg, WSJ and publicly referenced by the UK telecoms regulator Ofcom, BIPT, Vodafone, Telefonica, Tele2, Elisa, DNA, GSMA, VPs of the EU Commission responsible for Competition, MEPs, IEEE, ITU.

Since 2010 we have been supporting a number of European challenger mobile operators in multiband (700, 700 SDL, 800, 900, 1400 SDL, 1800, 2600, 3.5 GHz) auctions with spectrum valuation and strategic advisory services.

### Network economics metrics

For comprehensive data usage, spectrum usage and capacity utilisation metrics in EU28 and OECD markets visit

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**The state of 4G pricing – 1H2018 – Digital Fuel Monitor 9<sup>th</sup> release**

⇒ [http://research.rewheel.fi/insights/2018\\_may\\_pro\\_1h2018\\_release/](http://research.rewheel.fi/insights/2018_may_pro_1h2018_release/)

**Gigabyte price development in 4 to 3 consolidated versus 4-MNO European markets – September 2013 to March 2018**

⇒ [http://research.rewheel.fi/insights/2018\\_apr\\_pro\\_4to3\\_consolidation\\_vs\\_4MNO/](http://research.rewheel.fi/insights/2018_apr_pro_4to3_consolidation_vs_4MNO/)

**The state of 4G pricing – 2H2017 – Digital Fuel Monitor 8<sup>th</sup> release**

⇒ [http://research.rewheel.fi/insights/2017\\_nov\\_pro\\_2h2017\\_release/](http://research.rewheel.fi/insights/2017_nov_pro_2h2017_release/)

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