

4G International Roaming Coverage - Operator Comparison

A Report for Vodafone

January 2017

Summary: Vodafone the clear leader in terms of the number of 4G roaming destinations offered

In November 2016 Ovum was asked by Vodafone to gather data on the number of international roaming destinations offered by the major mobile network operators across 18 countries in the Vodafone Group footprint.

The available data shows that Vodafone offers more 4G roaming destinations than any other operator in these countries, and in the order of double or more the number of destinations in most countries. In almost half the countries, the number of destinations offered by Vodafone was found to be even more than this.

Of the 18 countries we examined, based on the information available, only in Germany did another operator (T-Mobile) offer a number of destinations approaching that offered by Vodafone, and even here Vodafone offered 20% more than the operator offering the next highest number of destinations.

Table A: Top three Operators ranked by number of 4G roaming destinations offered

| Country | Rank | | |
|----------------|----------------|---------------------|-----------------|
| | #1 | #2 | #3 |
| Germany | Vodafone (101) | T Mobile (84) | O2 (64) |
| UK | Vodafone (113) | EE (41) | O2/Three (0) |
| Italy | Vodafone (102) | TIM (60) | WIND (31) |
| Spain | Vodafone (103) | Orange (63) | Yoigo (52) |
| Romania | Vodafone (101) | Orange (47) | Telekom (22) |
| Netherlands | Vodafone (101) | T Mobile (51) | KPN (31) |
| Greece | Vodafone (98) | Cosmote (59) | n/a |
| Czech Republic | Vodafone (97) | T Mobile (58) | O2 (39) |
| Portugal | Vodafone (102) | NOS (34) | n/a |
| Hungary | Vodafone (100) | T Mobile (36) | Telenor (50) |
| Ireland | Vodafone (100) | Meteor (8) | Three (0) |
| Albania | Vodafone (89) | Telekom Albania (5) | n/a |
| Malta | Vodafone (29) | Go (0) | Melita (0) |
| Turkey | Vodafone (100) | Turkcell (42) | Avea (42) |
| South Africa | Vodafone (101) | MTN (5) | n/a |
| Tanzania | Vodafone (14) | TTCL (0) | Tigo (0) |
| New Zealand | Vodafone (98) | Spark (27) | Two Degrees (0) |
| Lesotho | Vodafone (13) | n/a | n/a |

Source: Ovum based on operator data at November 2016

Why roaming coverage matters

Simply put, roaming enables mobile customers to use their phones while abroad without buying a subscription to a local service or relying on Wi-Fi.

Data from the Body of European Regulators for Electronic Communications (BEREC)^[1] indicates that roaming usage is increasing in Europe and this trend is expected to continue. This follows a number of regulatory developments, notably EU policy stipulating that local tariffs should apply for travelers within the EU from June 2017. Ovum believes that pricing innovation will encourage additional customers to start using roaming services and that they will be the main contributors to anticipated growth in roaming traffic and revenue. Ovum expects global outbound roaming traffic will continue to increase, with data accounting for almost two thirds of roaming revenues by 2020.

Customers' data service expectations tend to be set by their experience with fixed line broadband at home. 4G mobile technology gives customers the opportunity to enjoy similar speeds on the move, both in their home country and when travelling abroad. However, before customers can enjoy super-fast data abroad, their mobile providers need to enable 4G roaming, destination by destination, network by network. **As a result, 4G roaming footprints vary significantly by operator.**

Many operators have already launched 4G for domestic use, but at present, not all have made the investment required to enable roaming. Operators have to develop a 4G roaming delivery chain from scratch which includes amending their international roaming and discount agreements, upgrading their network and billing engines, as well as establishing and testing technical connectivity with each roaming partner. While some of these functions can be outsourced, significant resources are nonetheless required.

^[1] International Roaming BEREC Benchmark Data Report October 2015 – March 2016

Methodology

Data was gathered on 4G roaming destinations for customers in two sets of countries. The first set comprised all thirteen European countries where Vodafone operates plus five others drawn from Vodafone's footprint across Africa, Middle East and Asia Pacific ("AMAP").

Countries covered were as follows:

- Europe: Germany, UK, Italy, Spain, Romania, Netherlands, Greece, Czech Republic, Portugal, Hungary, Ireland, Albania, Malta.
- AMAP: Turkey, South Africa, Tanzania, New Zealand, Lesotho.

Data was available for 49 of the 57 mobile network operators who compete with Vodafone in the above markets.

Data was gathered on roaming destinations offered, that is to say, the number of countries and territories in which the customer's home network operator offers a roaming facility for 4G.

Information was based on operator websites as at November 2016 and supplementary information from operators.

A small number of territories were excluded from our counts, primarily due to their reliance on the mobile networks of their sovereign nations. Examples include Hawaii (counted as USA), Vatican City (counted as Italy) and Åland Islands (counted as Finland), Svalbard and Jan Mayen (counted as Norway).

Only 4G destinations were considered; 4G offers the highest speeds and therefore, all other things being equal, the fastest experience for subscribers.

4G is as described by the individual operators but understood to use existing LTE technology, defined by 3GPP standards. It is not HSPA, which is understood to be 3.5G, or other 3G standards.

Results

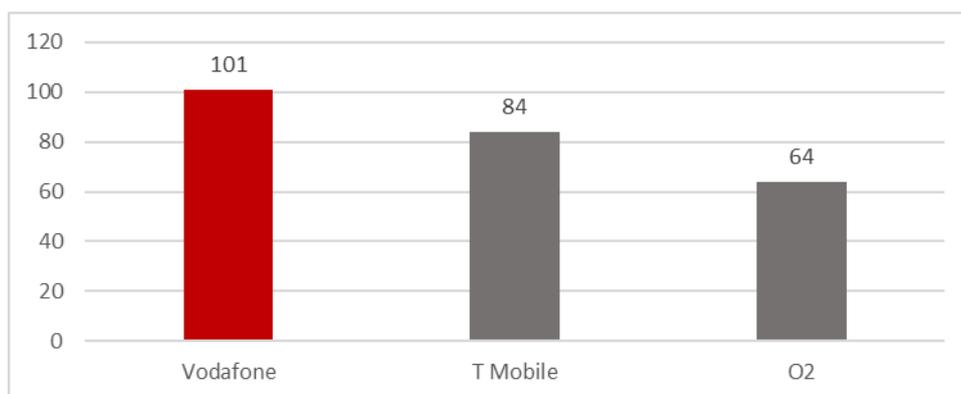
In the sections below we summarize the results of our work. We list the thirteen European countries first, then the five from AMAP. Countries are listed in descending order of population.

European Countries

Germany

In Germany, Ovum examined the 4G roaming offers from Vodafone, O2 and T Mobile. Based on the information available Vodafone provides 4G international roaming services to 101 destinations while T-Mobile provides 4G roaming to 84 and O2 to 64 destinations. Vodafone is the clear leader in this market and provides 4G roaming coverage to 20% more destinations than T-Mobile and nearly 60% more destinations compared to O2. This was due to better coverage globally, including the Caribbean, Middle East and Eastern Europe.

Figure 1: Germany 4G Roaming Destinations

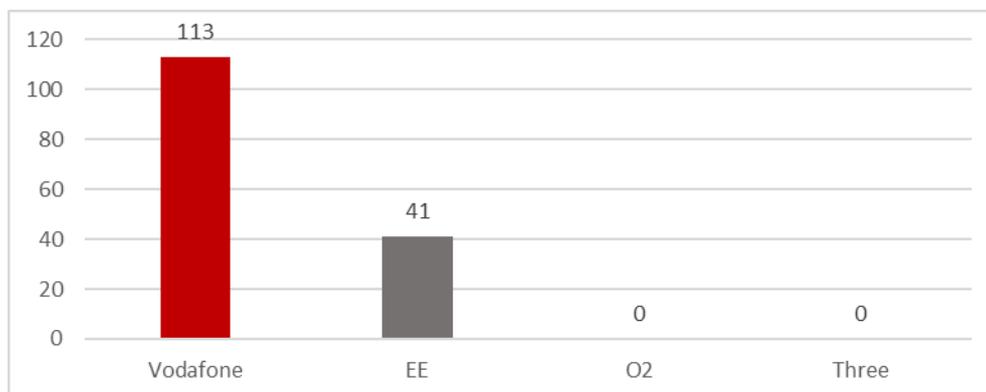


Source: Ovum, based on operator data

United Kingdom

In the UK, Ovum looked at the 4G roaming offers from Vodafone, EE, O2 and Three. Based on the information available, Vodafone provides 4G international roaming services to 113 destinations while EE provides 4G roaming to 41 destinations. Three and O2 do not currently offer 4G roaming to destinations outside the UK. Based on the information available, Vodafone is the clear leader in terms of destinations offered, with more than double the destinations of EE. This was due to better coverage globally, in particular the Middle East, less developed countries within Asia and also more extensive coverage in Europe.

Figure 2: United Kingdom 4G Roaming Destinations

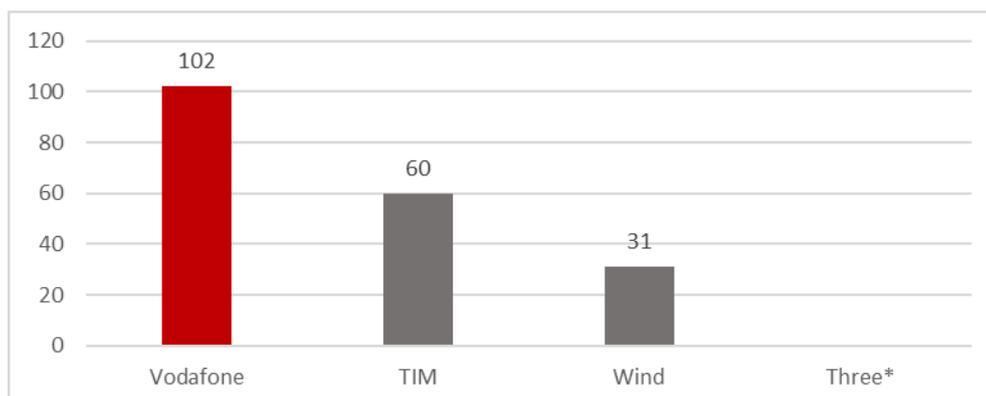


Source: Ovum, based on operator data

Italy

In Italy, Ovum examined the 4G roaming offers from Vodafone, TIM (Telecom Italia), Wind and Three. Based on the information available Vodafone provides 4G international roaming services to 102 destinations while TIM provides 4G roaming to 60 destinations and Wind provides 4G roaming to 31 destinations. There was no information available on Three's roaming coverage. Vodafone is the clear leader in this market for destinations and provides 4G roaming coverage to 70% more destinations than Telecom Italia and more than three times the number offered by Wind. This was due to better coverage globally, in particular Middle East, South America, South and South Eastern Asia, and Africa.

Figure 3: Italy 4G Roaming Destinations

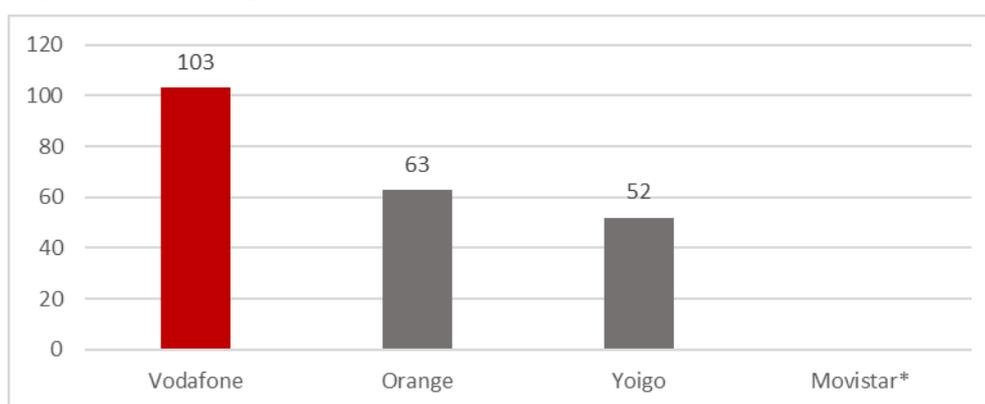


Source: Ovum, based on operator data. Asterisk denotes no data available

Spain

In Spain, Ovum examined the 4G roaming offers from Vodafone, Orange, Yoigo and Movistar. Based on the information available Vodafone provides 4G international roaming services to 103 destinations while Orange provides 4G roaming to 63 destinations and Yoigo provides 4G roaming to 20 destinations. There was no information available on Movistar's roaming coverage. Based on the information available, Vodafone is the leader in this market as well and provides 4G roaming coverage to over 60% more destinations than Orange and almost double the number of destinations offered by Yoigo. This was due to better coverage globally, in particular Middle East, South and South East Asia, South America and Africa.

Figure 4: Spain 4G Roaming Destinations

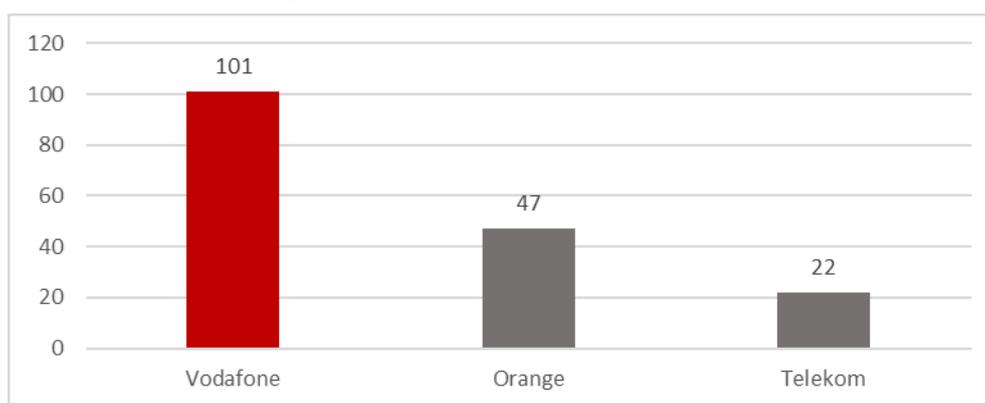


Source: Ovum, based on operator data. Asterisk denotes no data available

Romania

In Romania, Ovum examined the 4G roaming offers from Vodafone, Orange and Telekom. Based on the information available Vodafone provides 4G international roaming services to 101 destinations while Orange provides 4G roaming to 47 destinations and Telekom provides 4G roaming to 22 destinations. Vodafone is the clear leader in this market and provides 4G roaming coverage to more than double the destinations of Orange and more than three times the number offered by Telekom. This was due to better coverage globally, in particular Middle East, South and South East Asia, South America, Africa and more extensive coverage in Europe.

Figure 5: Romania 4G Roaming Destinations

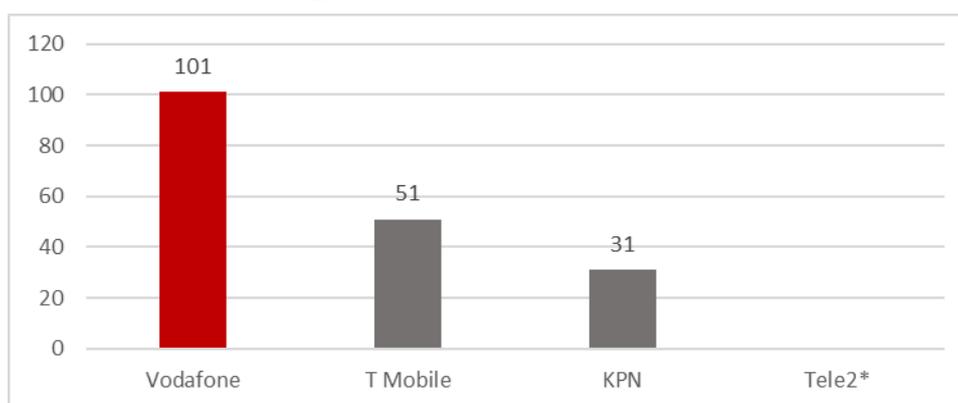


Source: Ovum, based on operator data

Netherlands

In the Netherlands, Ovum examined the 4G roaming offers from Vodafone, T Mobile, KPN and Tele2. Based on the information available Vodafone provides 4G international roaming services to 101 destinations while T-Mobile provides 4G roaming to 51 destinations and KPN provides 4G roaming to 31 destinations. There was no information available on Tele2's roaming coverage. Based on the information available, Vodafone is the clear leader in this market and provides 4G roaming coverage to nearly double the destinations of its rival T Mobile and over three times the number offered by KPN Mobile. This was due to better coverage globally, in particular South America, Middle East, South Asia and more extensive coverage in South Eastern Europe.

Figure 6: Netherlands 4G Roaming Destinations

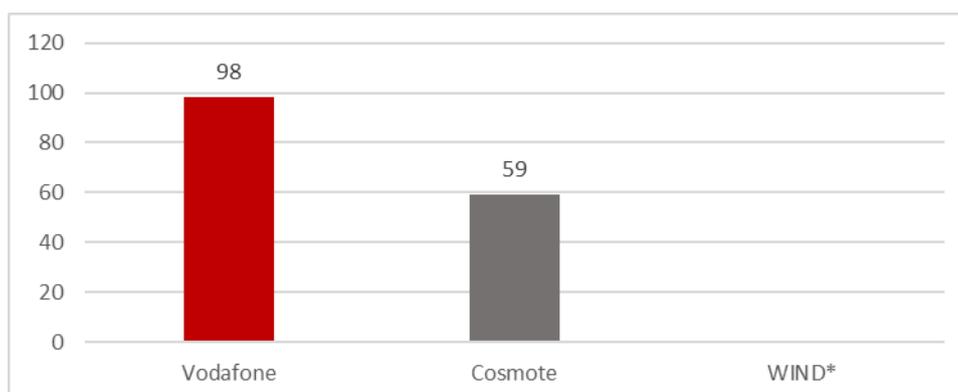


Source: Ovum, based on operator data. Asterisk denotes no data available

Greece

In Greece, Ovum examined the 4G roaming offers from Vodafone, Cosmote and WIND. Based on the information available Vodafone provides 4G international roaming services to 98 destinations while Cosmote provides 4G roaming to 59 destinations. We were unable to find information for WIND Greece. Based on the information available, Vodafone is the clear leader in this market and provides 4G roaming coverage to 66% more destinations than its rival Cosmote. This was due to better coverage globally, in particular Middle East, East and South East Asia, South Africa, South America and more extensive coverage in Europe.

Figure 7: Greece 4G Roaming Destinations

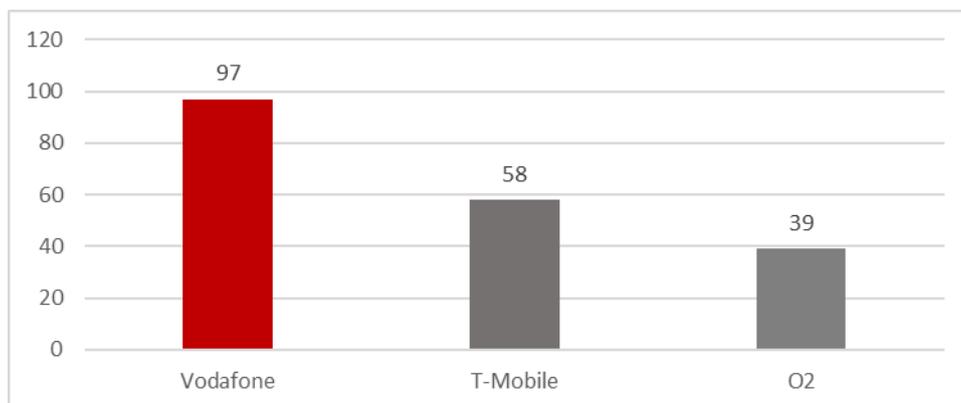


Source: Ovum, based on operator data. Asterisk denotes no data available

Czech Republic

In the Czech Republic, Ovum examined the 4G roaming offers from Vodafone, T Mobile and O2. Based on the information available, Vodafone provides 4G international roaming services to 97 destinations while T-Mobile provides 4G roaming to 58 destinations and O2 to 39 destinations. Vodafone is the clear leader in this market and provides 67% more coverage compared to its rival T-Mobile and more than double the destinations offered by O2. This was due to better coverage globally, in particular Middle East, East and South East Asia, South America and more extensive coverage in Europe.

Figure 8: Czech Republic 4G Roaming Destinations

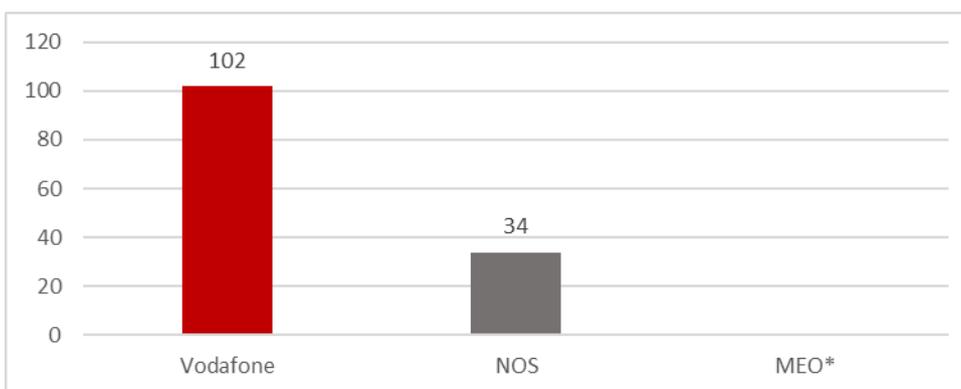


Source: Ovum, based on operator data

Portugal

In Portugal, Ovum examined the 4G roaming offers from Vodafone, NOS and MEO. Based on the information available Vodafone provides 4G international roaming services to 102 destinations while NOS provides 4G roaming to 34 destinations. There was no information available for MEO's roaming coverage. Based on the information available, Vodafone is the clear leader in this market and provides 4G roaming coverage to three times more destinations than NOS. This was due to better coverage globally, in particular Middle East, East and South East Asia, South America and more extensive coverage in Europe.

Figure 9: Portugal 4G Roaming Destinations

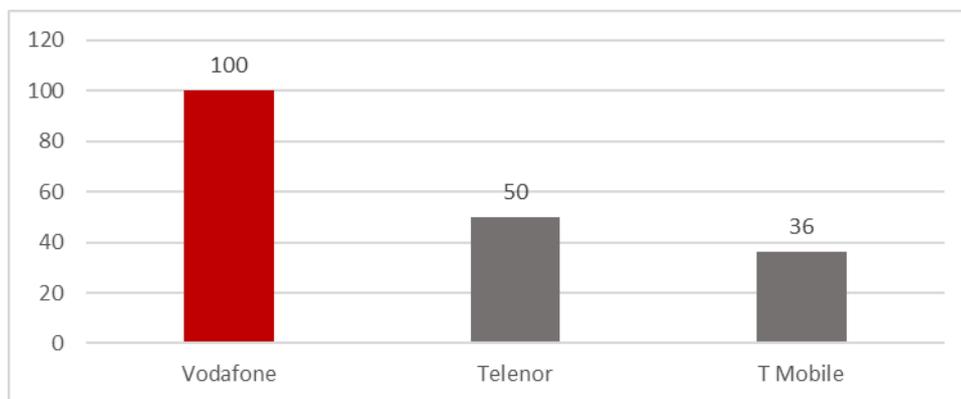


Source: Ovum, based on operator data. Asterisk denotes no data available

Hungary

In Hungary, Ovum examined the 4G roaming offers from Vodafone, Telenor and T-Mobile. Based on the information available Vodafone provides 4G international roaming services to 100 destinations while Telenor provides 4G roaming to 50 destinations and T-Mobile to 36 destinations. Vodafone is the clear leader in this market and provides double the destinations offered by Telenor and nearly three times the number offered by T-Mobile. This was due to better coverage globally, in particular South America, Middle East, East and South Asia, South and East Africa, and more extensive coverage in Europe.

Figure 10: Hungary 4G Roaming Destinations

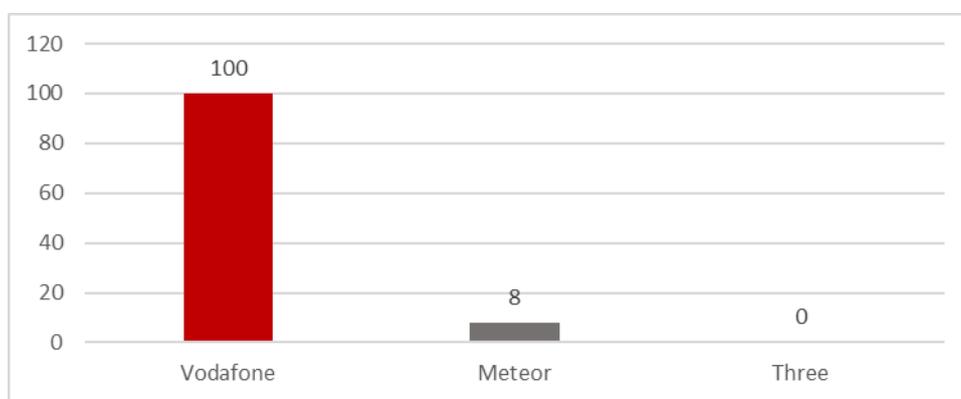


Source: Ovum, based on operator data

Ireland

In Ireland, Ovum examined the 4G roaming offers from Vodafone, Meteor and Three. Based on the information available Vodafone provides 4G international roaming services to 100 destinations while Meteor provides 4G roaming to 8 destinations. Three Ireland does not offer 4G roaming to international destinations currently; it expects this to be introduced in 2017. Vodafone is the clear leader in this market and provides far and away more 4G roaming destinations than Meteor.

Figure 11 Ireland 4G Roaming Destinations

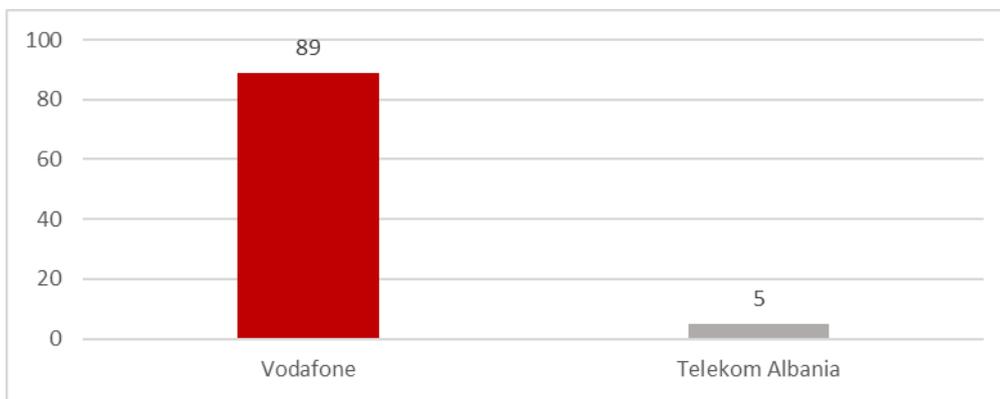


Source: Ovum, based on operator data

Albania

In Albania, Ovum examined the 4G roaming offers from Vodafone and Telekom Albania. Based on the information available Vodafone provides 4G international roaming services to 89 destinations while Telekom Albania provides 4G roaming to 5 destinations. Vodafone is the clear leader in this market and provides by far more 4G roaming destinations.

Figure 12: Albania 4G Roaming Destinations

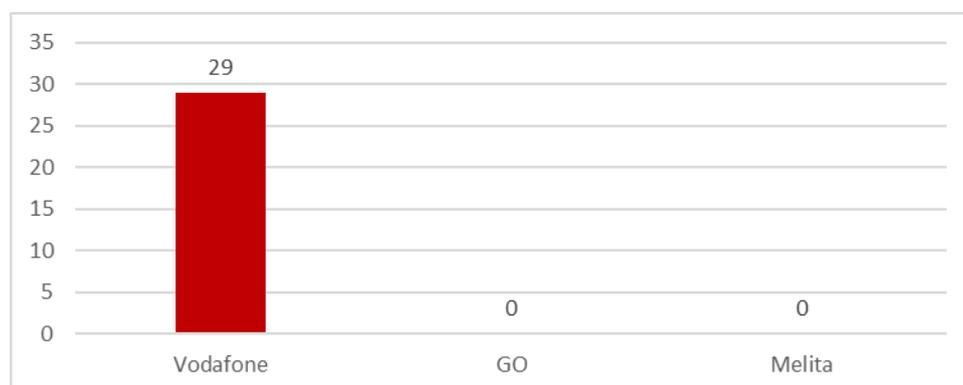


Source: Ovum, based on operator data

Malta

In Malta, Ovum examined the 4G roaming offers from Vodafone, GO and Melita. Based on the information available Vodafone provides 4G international roaming services to 29 destinations. GO's 4G services will initially be only available on the local network and will not be supported whilst roaming. Melita does not currently provide 4G roaming services. Vodafone is therefore the only provider and clear leader in this market.

Figure 13: Malta 4G Roaming Destinations



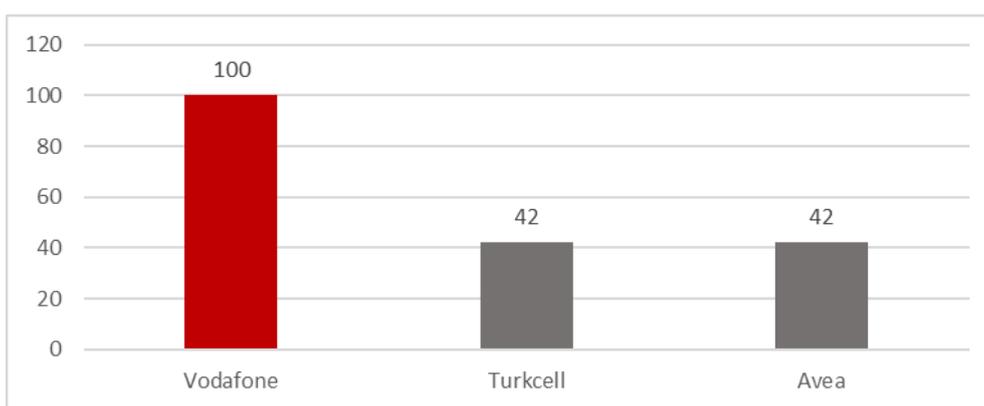
Source: Ovum, based on operator data

AMAP Countries

Turkey

In Turkey, Ovum examined the 4G roaming offers from Vodafone, Turkcell and Avea. Based on the information available Vodafone provides 4G international roaming services to 100 destinations while Turkcell and Avea both provide 4G roaming to 42 destinations. Vodafone is the clear leader in this market and provides more than double the coverage of the other two operators. This was due to better coverage globally, in particular South America, Middle East, East and South Asia, South and East Africa, and more extensive coverage in Europe.

Figure 14: Turkey 4G Roaming Destinations

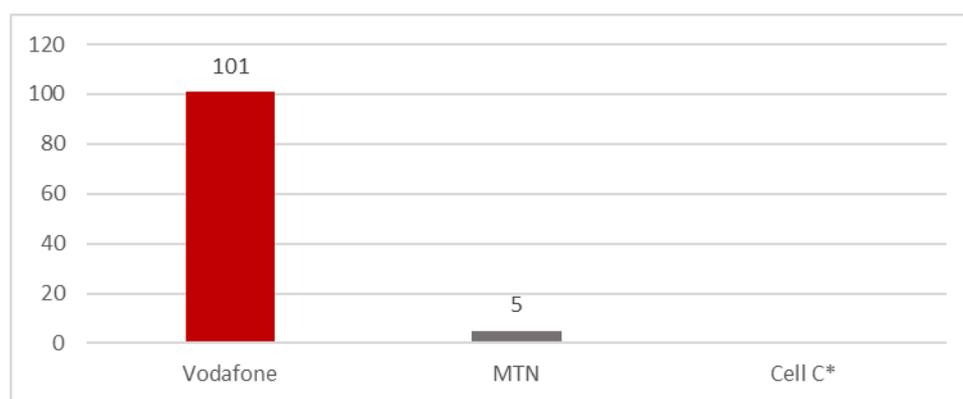


Source: Ovum, based on operator data

South Africa

In South Africa, Ovum examined the 4G roaming offers from Vodafone (Vodacom), MTN and Cell C. Based on the information available Vodafone provides 4G international roaming services to 101 destinations while MTN provides 4G roaming to 5 destinations. There was no information available concerning Cell C's 4G roaming coverage. Vodafone is the clear leader in this market and provides far more 4G roaming coverage to international destinations than MTN.

Figure 15 South Africa 4G Roaming Destinations

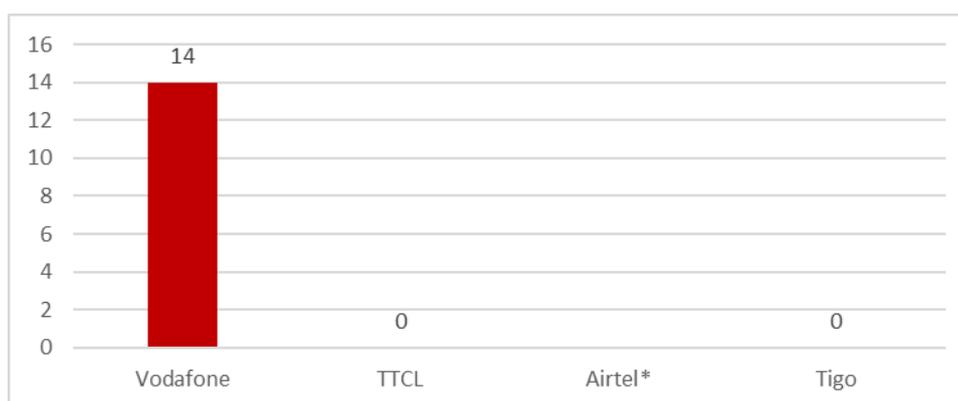


Source: Ovum, based on operator data. Asterisk denotes no data available

Tanzania

In Tanzania, Ovum examined the 4G roaming offers from Vodafone (Vodacom), TTCL, Airtel Tanzania and Tigo. Based on the information available Vodafone provides 4G international roaming services to 14 destinations. TTCL and Tigo do not currently offer 4G roaming services. There was no information available on Airtel Tanzania's roaming coverage. Vodafone is therefore the only provider and clear leader in this market.

Figure 16: Tanzania 4G Roaming Destinations

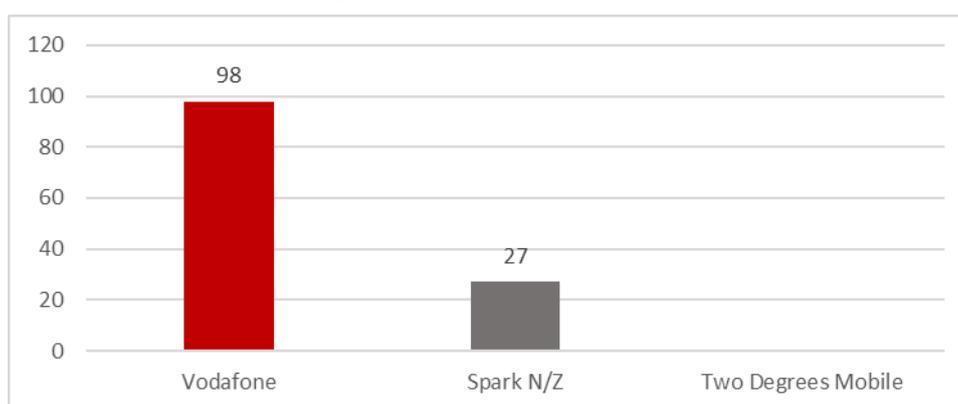


Source: Ovum, based on operator data. Asterisk denotes no data available

New Zealand

In New Zealand, Ovum examined the 4G roaming offers from Vodafone, Spark N/Z and Two Degrees Mobile. Based on the information available Vodafone provides 4G international roaming services to 98 destinations while Spark provides 4G roaming to 27 destinations. Two Degrees Mobile does not offer 4G roaming to international destinations. Based on the information available, Vodafone is the clear leader in this market and provides 4G roaming coverage to more than three times the destinations offered by Spark N/Z. This was due to better coverage globally, in particular Middle East, South East Asia, South America and more extensive coverage in Europe.

Figure 17: New Zealand 4G Roaming Destinations

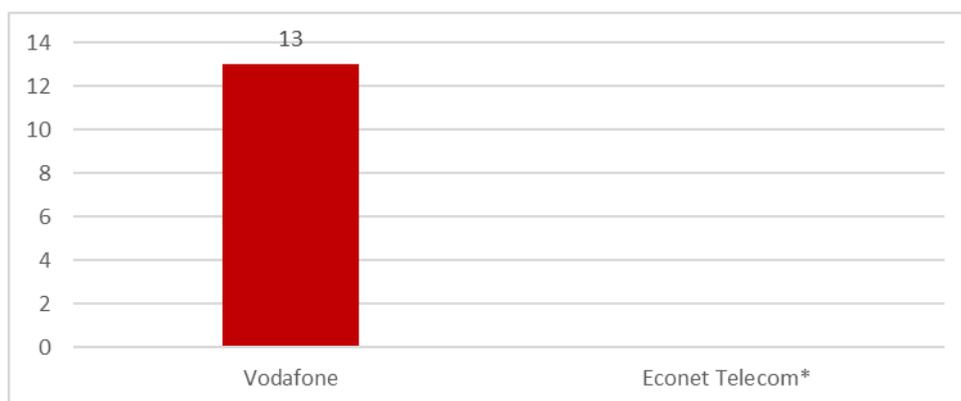


Source: Ovum, based on operator data

Lesotho

In Lesotho, Ovum examined the 4G roaming offers from Vodafone (Vodacom) and Econet Telecom. Based on the information available Vodafone provides 4G international roaming services to 13 destinations. There was no information available on Econet Telecom's roaming coverage. Vodafone is therefore the only provider and clear leader in this market.

Figure 18: Lesotho 4G Roaming Destinations



Source: Ovum, based on operator data

Appendix

About Ovum Consulting

Ovum is a market-leading global research, analysis, consulting and advisory business focused on the converging telecoms, media and technology markets. Through its 150+ analysts worldwide, Ovum provides clients with independent and objective analysis, consulting and advisory services that enables them to make better business and technology decisions.

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