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Roaming Solutions

# eSIM For The Roaming Consumer

Strategy Report 2018

A large graphic of the text "eSIM" is centered in the middle of the page. The "e" is blue, "S" is purple, "I" is pink, and "M" is red. The background is a photograph of a modern building with a curved glass facade, reflecting the sky and clouds. A person is visible walking on a balcony or walkway in front of the building.

eSIM

“

**Knowledge is power. Information is liberating.  
Education is the premise of progress, in every society, in every family.**

*-Kofi Annan*

# Table of Contents

<b>Contents</b>	<b>1</b>
<b>About the Authors</b>	<b>2</b>
<b>Introduction</b>	<b>3</b>
The Objective of this Report	3
<b>Executive Summary</b>	<b>4</b>
Consumer eSIM Approaches	4
<b>Research Background</b>	<b>5</b>
The Short Story of eSIM	5
The eSIM Timeline	6
MNO Participation in this Survey	7
Consumer eSIM - Positive or Negative?	9
<b>Strategic Analysis</b>	<b>11</b>
Is eSIM an Opportunity or Threat for MNOs?	11
<b>MNO Views</b>	<b>13</b>
SIMs vs. eSIMs – Present Day Ratio	13
eSIM Percentage – IoT vs. Consumer	14
IoT eSIM Rollout	15
Consumer eSIM Rollout – Device Types	16
eSIM Devices	17
Consumer eSIM Utilization by Types of Vendors	19
Regions where Consumer eSIM is Expected to be Popular	20
International Roaming Scenarios	20
eSIM for Roaming	21
Inbound Roaming	22
Outbound Roaming	22
Timeline for Support for Roaming Scenarios	23
From Roaming Subscribers to Domestic Subscribers via eSIM	24
MNOs' Investment in eSIM	25
Conclusion & Key Takeaways	26
<b>Notes on Our Report</b>	<b>27</b>
Eligibility for Taking Part in this Report	27
Your Feedback, Our Future Reports	27

## About the Authors

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# Introduction

The ROCCO 'eSIM for the Roaming Consumer' Strategy Report 2018 investigates eSIM in the context of international roaming, more specifically in the consumer environment. Smartphones and mobile devices are at the center of the research conducted among Mobile Network Operators (MNOs) globally.

ROCCO undertakes research to support MNOs and other interested parties in understanding the Roaming and Interconnect Industry today. Furthermore, ROCCO's aim is to help the industry strategically with relevant and valuable findings on the position of processes, industry challenges and industry suppliers to mention a few.

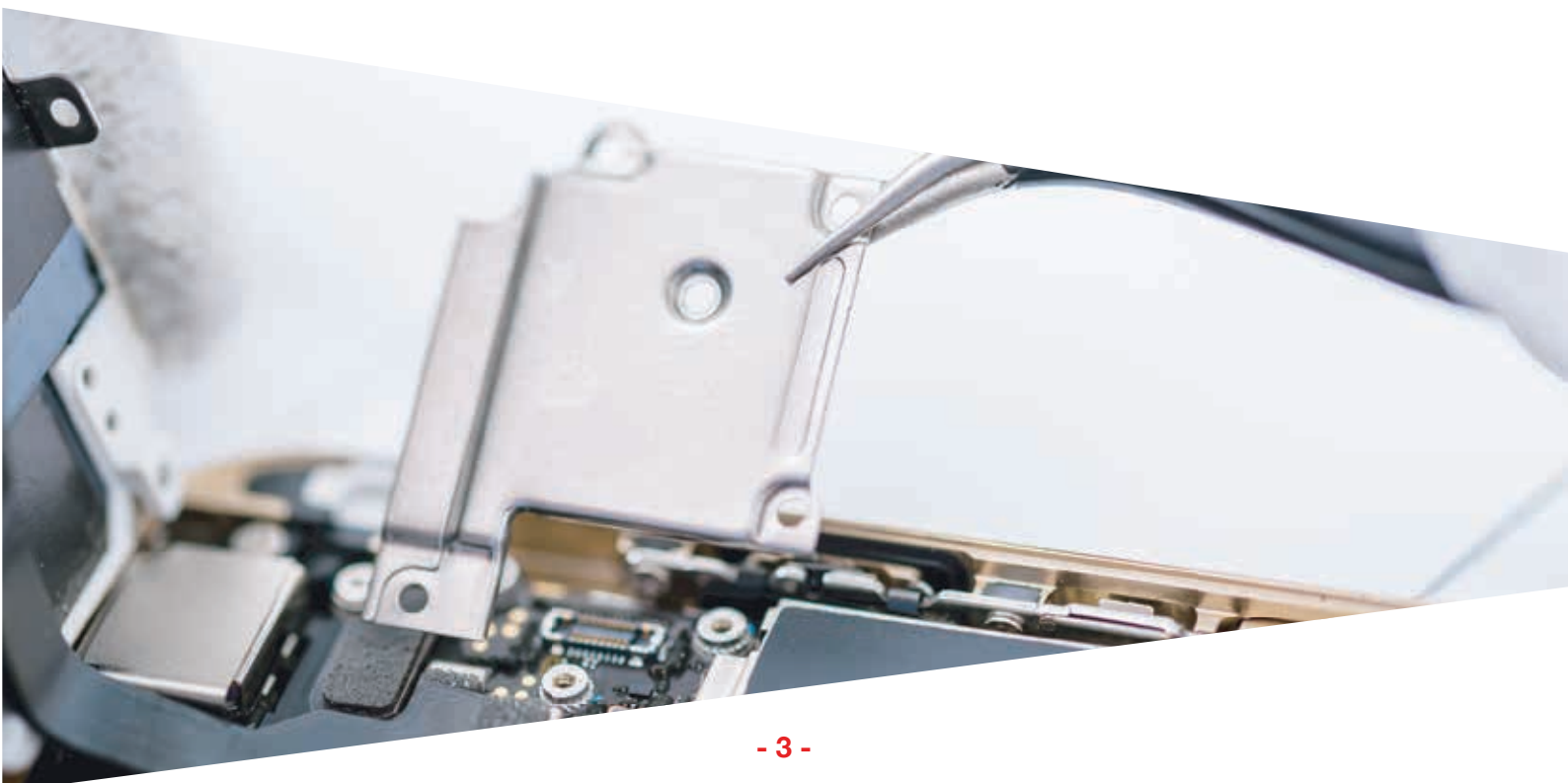
This report provides MNO insights for a wider and more conclusive perspective. MNOs took part in this research confidentially and received a copy of the research results for their time.

All ROCCO studies are conducted independently. This research was carried out in cooperation and partnership with **UROS - Uni-fi Roaming Solutions**. UROS also has a full license for its distribution.

## The Objective of this Report

This report provides the opinions of 107 MNOs on the status of eSIM for the roaming consumer. The aim of this report is to give all MNOs and other interested parties an understanding of the current strategic opinions and an estimated timeline for the roll-out of eSIM services. Information on MNOs' strategic plans for eSIM was collected from key roaming executives from 107 MNOs in 92 countries. The data was captured in October and November of 2017.

This report also reviews input from various MNO sources to summarize the evolution of eSIM.



# Executive Summary

## Consumer eSIM Approaches

Although the chapter of eSIM is still just in its beginning, one doesn't need to skip to the end in order to have an idea of what will happen next.

You could say handset manufacturers are being fair. The likes of Samsung and Apple have waited patiently for the GSMA's standards provision. They have known MNOs would not endorse eSIM for the masses, due to the potential impact on processes and revenues. However, they are also keen to differentiate in a market with weak device innovation.

Inevitably, all MNOs will engage with eSIM and move towards Consumer eSIM adoption. In a matter of 3-5 years, it is unlikely that devices with SIM cards will remain common in the market. There are several reasons why eSIM makes sense in a domestic setting. The fact that online consumer engagement is strong leads to the understanding that eSIM would make a natural development for MNOs in online sales channels and stores.

In the roaming setting, there is less suspense as to what will happen next. The current trend of 'roam like at home' regulations and practice reinforces the sentiment that consumers today are less likely to accept high roaming charges. The argument behind this is that if domestic customers are given certain rates, why do visiting subscribers get treated so differently, most often presented with significantly less competitive rates. This brings up the question of how MNOs will compete with smartphone manufacturers who introduce devices with eSIM, meaning the user can become a temporary local subscriber of a visited network instead of paying the high premium roaming charges. The global mobile experience is also likely to benefit from the adoption of consumer eSIM, effectively remaining active connected consumers even when crossing borders.

This research was conducted with the objective to discover MNOs approaches to Consumer eSIM. There will be first movers and late adopters, as sometimes even though these new solutions exist in the market, it doesn't yet make financial sense for MNOs to promote them, just as with Wi-Fi in the past. All in all, what matters in the end is what consumers demand, how handset manufacturers answer, and ultimately how MNOs will be able to differentiate their offering from that of the competition.



**Mika Alamartimo**  
eSIM Program Manager  
UROS Ltd.



**eSIM will provide great opportunities for MNOs to create new and innovative products and solutions for consumers.**

# Research Background

## The Short Story of eSIM

The introduction of the SIM card (Subscriber Identification Module) triggered the mass adoption of mobile phones in the 1990s. This became the main method for consumers to connect to mobile networks for the next 25 years.

Simply put, the SIM is a circuit intended to securely store the International Mobile Subscriber Identity (IMSI) number and its related key. These are used to identify and authenticate subscribers on mobile devices and for provisioning in mobile networks.

The eSIM (embedded SIM) was introduced several years ago, as a non-replaceable embedded chip in devices, soldered directly onto a circuit board, providing remote provisioning and device management capabilities.

More recently, eSIM has been used for IoT (Internet of Things) devices for example in the automotive industry. Car manufacturers have engaged with eSIM as it has helped them avoid being bound to a single MNO for a potentially long-term contract. The lifespan of a device may vary greatly. It can be anywhere from five to twenty-five years. Enterprise solutions need to support systems, which allow them the flexibility they need to avoid being tied to a specific vendor. This is consistent with the consumer market, where migration between MNOs is frequent and based on using mobile number portability solutions. Several complex commercial, technical and operational environments are associated with enterprise customers, that need flexibility to ultimately find the right solution.

Since the beginning of IoT and M2M, the complex connectivity of roaming has been a challenge, most importantly due to the tariffs related to it. MNOs have encountered the trialing task of keeping roaming tariffs low for devices that are used across borders. This is very much the

case especially in the IoT context, with potentially permanent roaming scenarios and very little data consumption. To learn more about Roaming IoT, download [Roaming Internet of Things Strategy Report 2017](#).

Because of brand politics and competition issues, the ability to choose between MNOs in the roaming context has always been contentious, often leaving enterprise customers without the flexibility they need. This issue will likely not disappear completely with eSIM, however it is certainly going to improve the options available to enterprise customers.

eSIM has resolved many of the above described issues, as it has enabled the possibility to switch between MNO profiles both domestically and internationally. This allows devices to land on a network as a local and helps avoid the premium of roaming charges all while permitting device manufacturers to build solutions that are immune to SIM-switching operations. This could lead to disruption in many verticals, for instance the car industry.

As a consequence of these options being available, it wasn't long before eSIM for consumer devices was developed. With the introduction of wearable devices such as smart watches and VR (Virtual Reality) wearables, eSIM technology allows consumers the choice of network in a quick and easy manner, especially when compared to smartphones.

In fact, MNOs are about to enter a very interesting and different chapter for consumer eSIM products. It could be said that eSIM will allow MNOs to become increasingly virtual with their customer relationships, moving away from the era of in-store consumer touch points.

The eSIM will make it much easier for MNOs to provide potentially completely digital solutions and for consumers to switch between network providers.



## The eSIM Timeline

In September of 2017, Google released its latest smartphone, the Pixel2. It was the first consumer eSIM smartphone to enter the market. Google Project Fi's Product Manager Joy Xi, listed the advantages the eSIM specifications bring for the consumer:

“You no longer need to go to a store to get a SIM card for wireless service, wait a few days for your card to arrive in the mail, or fumble around with a bent paper clip to coax your SIM card into a tiny slot. Getting wireless service with eSIM is as quick as connecting your phone to Wi-Fi.”

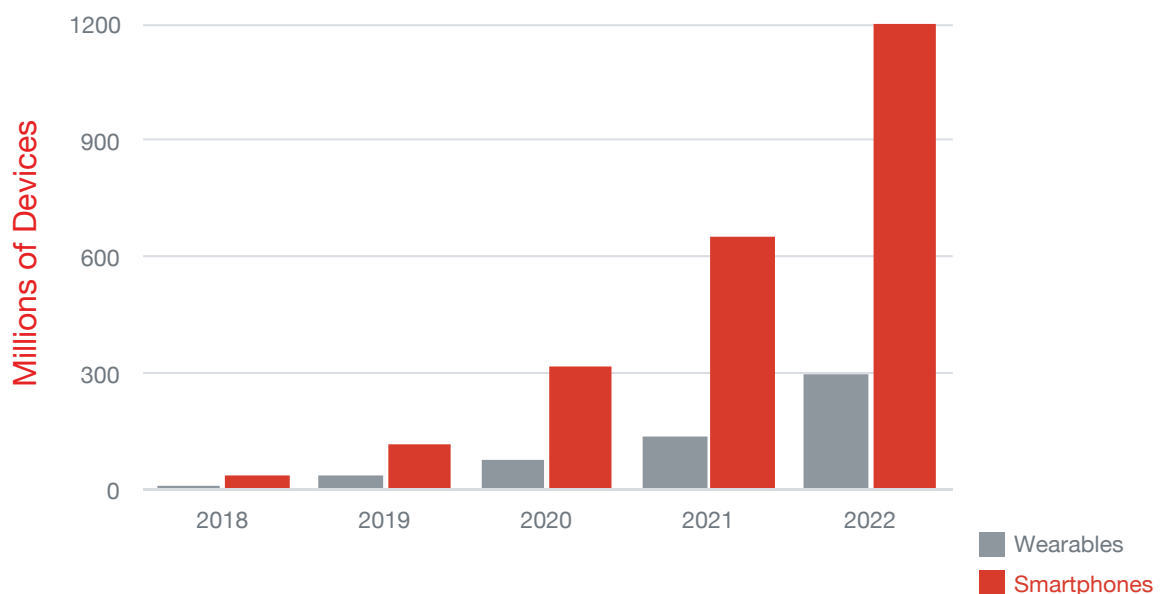
The effect of Google's launch is relevant as it brings domestic customers the opportunity to switch MNO easily.

Although there is a lot of speculation on the rate of adoption of eSIM, no consensus has been reached. Analysts remain vague on figures, however a 6-8 times growth over the next five years appears to be a common estimate.

Let's examine the setting and growth drivers in more detail. While tablets and wearables such as the iPad Pro and Apple Watch have been introduced by Apple, and consequently led to its entry into the consumer eSIM space, it is unlikely that an eSIM compatible iPhone will be introduced before 2019. This is not likely, due to Apple not being ready technically. Rather, it's more about the industry not being ready, specifically MNOs that hold off on the operational architecture to support the introduction of eSIM supported smartphones.

When companies launch new wearables and other companion devices with eSIM at an increasing pace, MNOs are incentivized to develop and enhance their eSIM architecture beyond the current state, which they have for IoT. Clearly, the adoption of this technology will not happen overnight. For instance, the updating of MNP (Mobile Number Portability) processes is one area in which country specific efforts are needed to ensure fundamental eSIM functionalities.

**eSIM Growth Estimated by ROCCO™**



It is probable that physical SIM and eSIM technology will co-exist for a long period of time despite the so called hype of eSIM taking over the world. In order to introduce eSIM technology, the GSMA has aligned all ecosystem participants with a standardised reference architecture and is working with MNOs and handset manufacturers to enhance and enforce these standards.

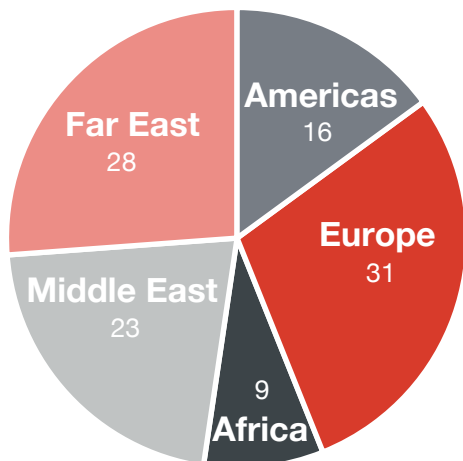
The GSMA released the second version of its global specification in Q2 2017, enabling Remote SIM Provisioning via eSIM in any consumer device. The second version of the specification enables a consumer device to store more than one MNO profile concurrently, although only one MNO profile can actively be in use at any one time.

The specifications have extended the ability to remotely provision a consumer device e.g. smartphones. While the initial specifications were for single companion devices like wearables, now device manufacturers and MNOs will be able to offer consumers the ability to select and securely download an MNO's eSIM profile onto their devices. In turn, this paves the way for consumer eSIM for roaming.

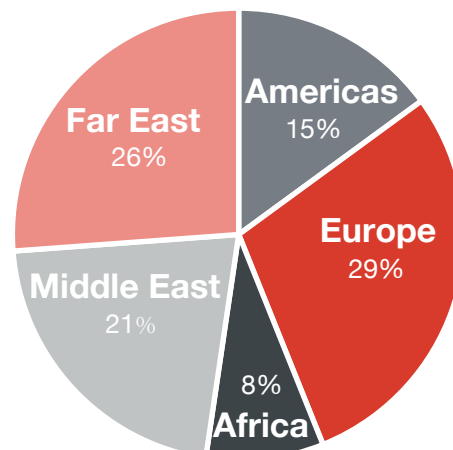
## MNO Participation in this Survey

- 107 MNOs in 92 countries took part in the research.
- Respondents consist of independent MNOs and MVNOs.

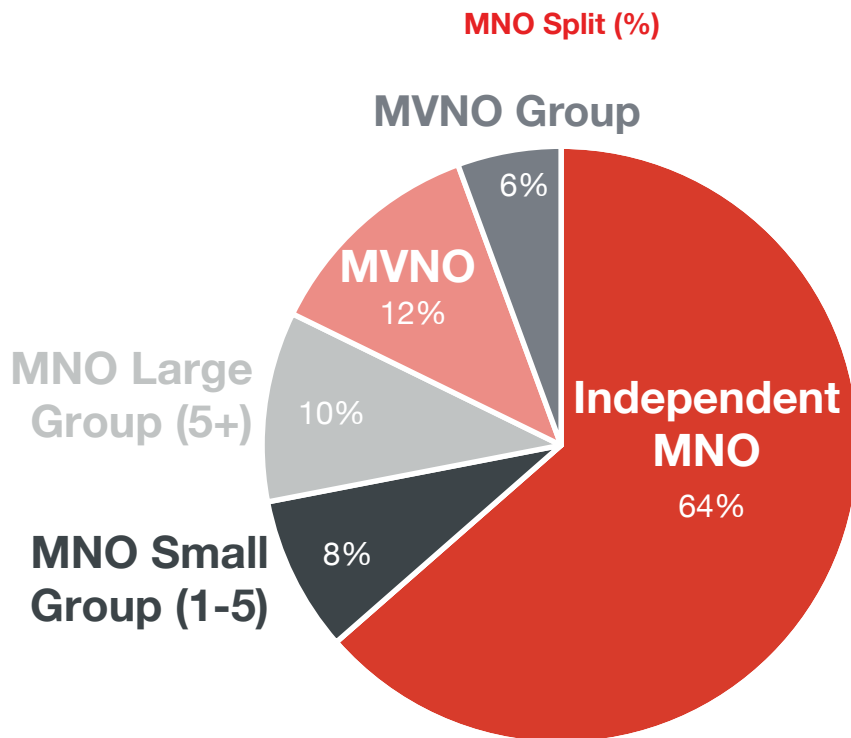
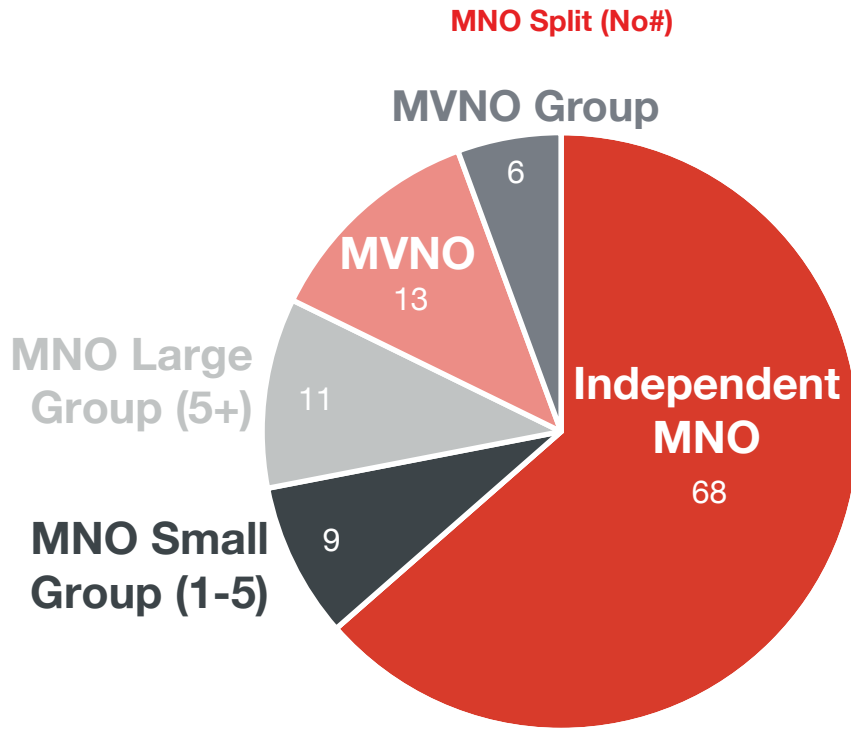
### Geographical Split of MNO Respondees (No#)



### Geographical Split of MNO Respondees (%)





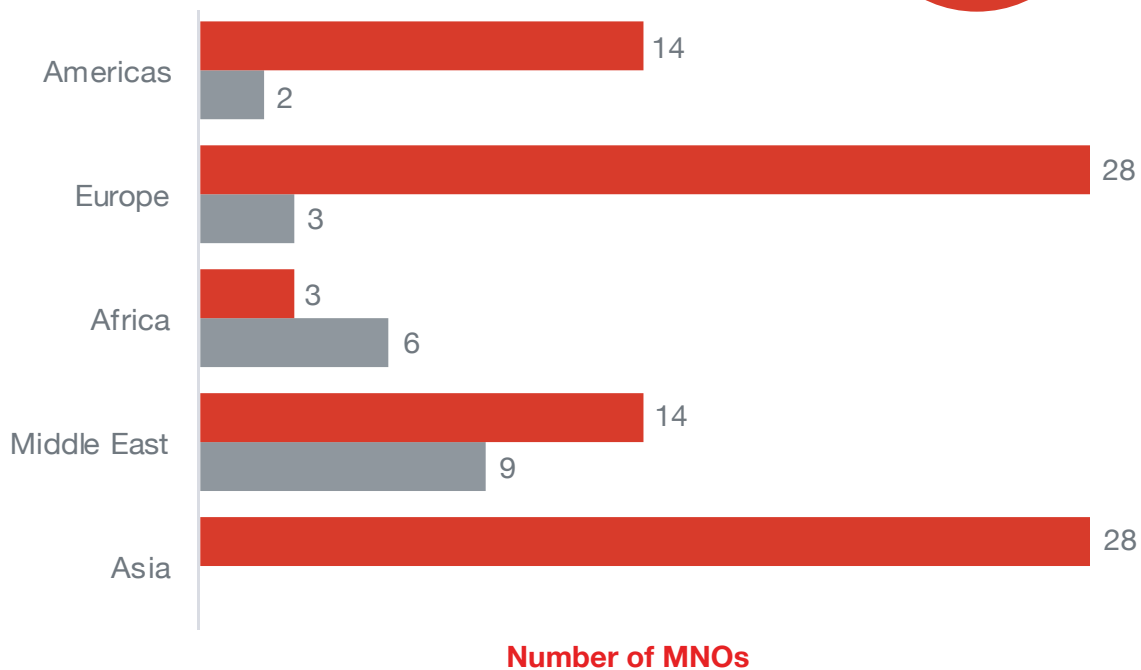
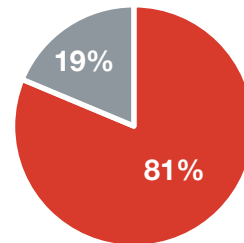


## Consumer eSIM - Positive or Negative?

When asked about whether domestic consumer eSIM was an opportunity or a threat MNOs had the following responses.

**Positive (87)**

**Negative (20)**



Many MNOs had comments.



In New Zealand we are positive, but we cannot imagine this will happen soon, MNOs are simply not ready.



eSIM will have a negative impact on some operators of real interest, operating income will be reduced and system construction costs are high, thus it is a big challenge. However, it is an industry trend.



This will allow us to develop the Sales Channels in the digital domain, digital is where the people are so this helps, no one wants to go into a high street store, deal with a person who doesn't really care for them and spend a lot of time waiting.

“

It is both a threat and an advantage where churn is easier meaning stickiness with subscribers are much harder as well as fierce competitions.

“

This is a tragedy, for everyone subscribers and MNOs.

“

It will stimulate the “pace of moving” between operators on non-binding contracts. Denmark will be more affected since you cannot “lock” your subscribers for more than 6 months. Sweden is still on 24 month cycles but the market of SIM-only is growing and this is where the eSIM fits perfectly.

“

In Israel, number portability is already very easy - eSIM might add some fuel to the crazy competition that’s already taken place.

“

Positive and might increase churn.

“

Positive for the consumer, however not for the operators. Where operators could previously guarantee/commit roaming traffic to each other, this solution overrides the traditional roaming steering solutions.

“

In Japan, we see this will have a positive effect on the market, we are not afraid to engage with our subscribers via apps and through their typical shopping channels.

# Strategic Analysis

## Is eSIM an Opportunity or Threat for MNOs?

Device manufacturers, as well as OTT players like Facebook, Viber and WhatsApp, expect that eSIM will help them directly manage subscription, provisioning an access to mobile networks for their customers.

This would suggest that eSIM plays into the hands of MNOs' competitors, and that MNOs can only assume a passive role in the eSIM value chain. This prompts the question, whether MNOs are destined to be the bit-pipe everyone has been talking about so long. This is up for debate, although ROCCO is not convinced that such a dreary fate would befall them. MNOs also believe that eSIM will lead to many business opportunities.

### Developing new digital sales channels

MNOs will need to offer a great customer experience to their subscribers using eSIM, which can be done by providing online services, but in reality, it's more likely that they'll offer new digital interfaces in the form of specific apps.

The launch of this technology can enable MNOs to build new interfaces with their customers and expand sales channels in ways that haven't been possible before. With eSIM, MNOs can extend their sales of data plans to any device through unique digital marketplaces, and also collaborate with digital players to expand their channels to a broader audience. Furthermore, companion devices represent a segment where MNOs have apparent growth opportunities.



With the introduction of eSIM, companion device bundling will become easier for consumers to adopt and modify. Shared data plans with split device and service fees can attract consumers who do not wish to commit to separate plans for each companion device.

Jason Bryan, ROCCO CEO

### Taking a stronger role in the development of IoT related sales channels

Once MNOs develop a better understanding in eSIM, they will be open to engaging with all types of opportunities in IoT through Cellular IoT and LTE-M, which both require eSIM solutions. A fully equipped MNO would have more success at understanding the future market.

## **Building new wholesale partnerships**

Although eSIM presents MNOs with many opportunities, it may also bring to the table some challenges. For instance, the dynamics of industry rivalry may be affected, as MVNOs will be able to enter the market with more ease. Factors supporting this include the decreased importance of physical sales channels and MVNOs' reduced demand for physical SIM cards.

Many MVNOs are already equipped for this new environment, especially if they also handle device management. However, this also means that MNOs may also venture into MVNO roles in other countries or domains and start competing with their brands without the strong physical presence associated with the current market. All you need to have is a strong online brand and great marketing savvy to explore new markets.

## **Companion device bundling**

eSIMs are expected to help expand the device ecosystem beyond smartphones by utilising the opportunity of companion devices. By allowing all kinds of devices to be connected – through shared data plans, for example, which is a growing trend in the US – the bundle offers are expected to grow internationally, allowing MNOs to provide multiple accounts connected to a single data plan. A bundle could be created to support the following devices:

- Smartphone
- Wearables (smartwatch, activity bracelet etc.)
- Tablet
- Personal Computer

## **MNOs in the driver's seat**

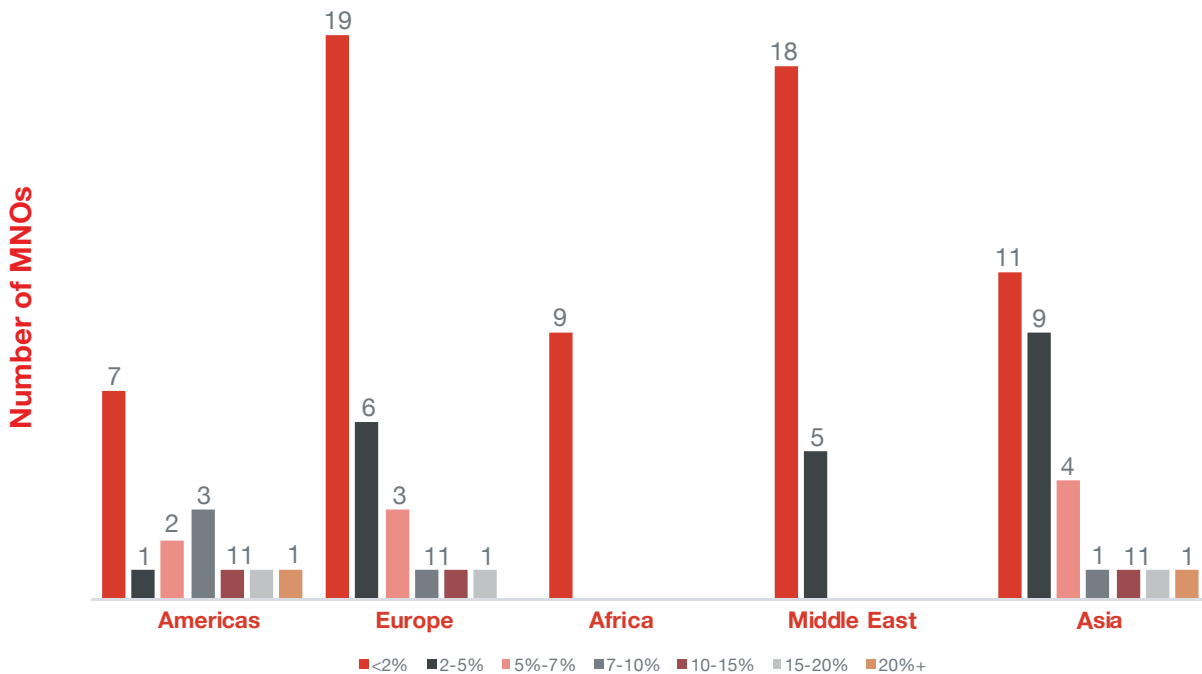
The introduction of eSIM will not directly change the fact that MNOs will remain in control of their network as well as its users, pricing and service quality. Consumers will still be demanding a combination of quality networks and reasonable pricing, instead of always sacrificing the former to the latter.

# MNO Views

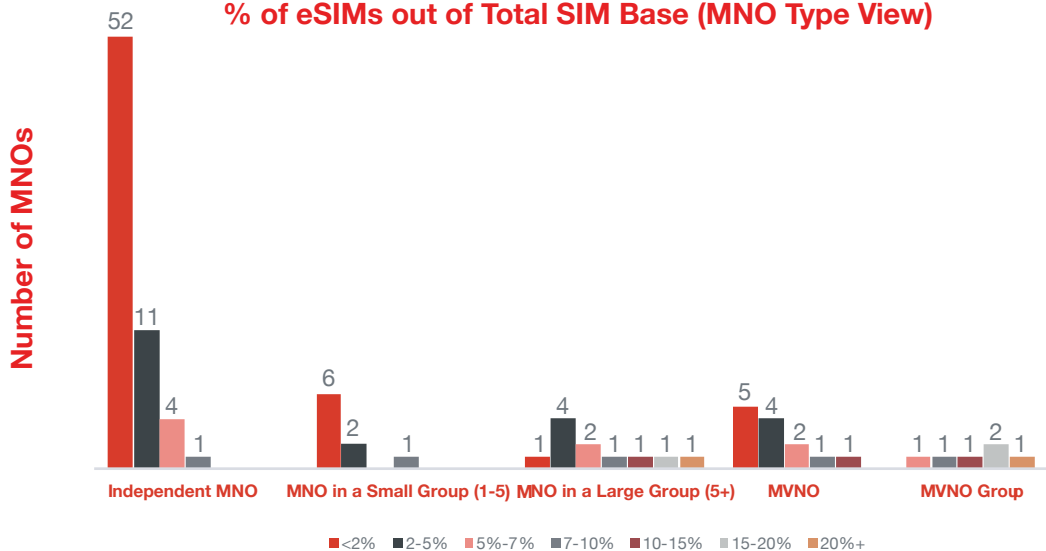
## SIMs vs. eSIMs – Present Day Ratio

Research participants were asked to identify the percentage of eSIMs out of their total SIM base. As demonstrated in the following two graphs, large MNO Groups and MVNO Groups have a higher ratio of eSIM in regard to their overall SIM base. However, with Independent MNOs, the data shows that most have less than 2%. This trend is reflected in the Independent MNO category globally.

**% of eSIMs out of Total SIM Base (Global Breakdown)**



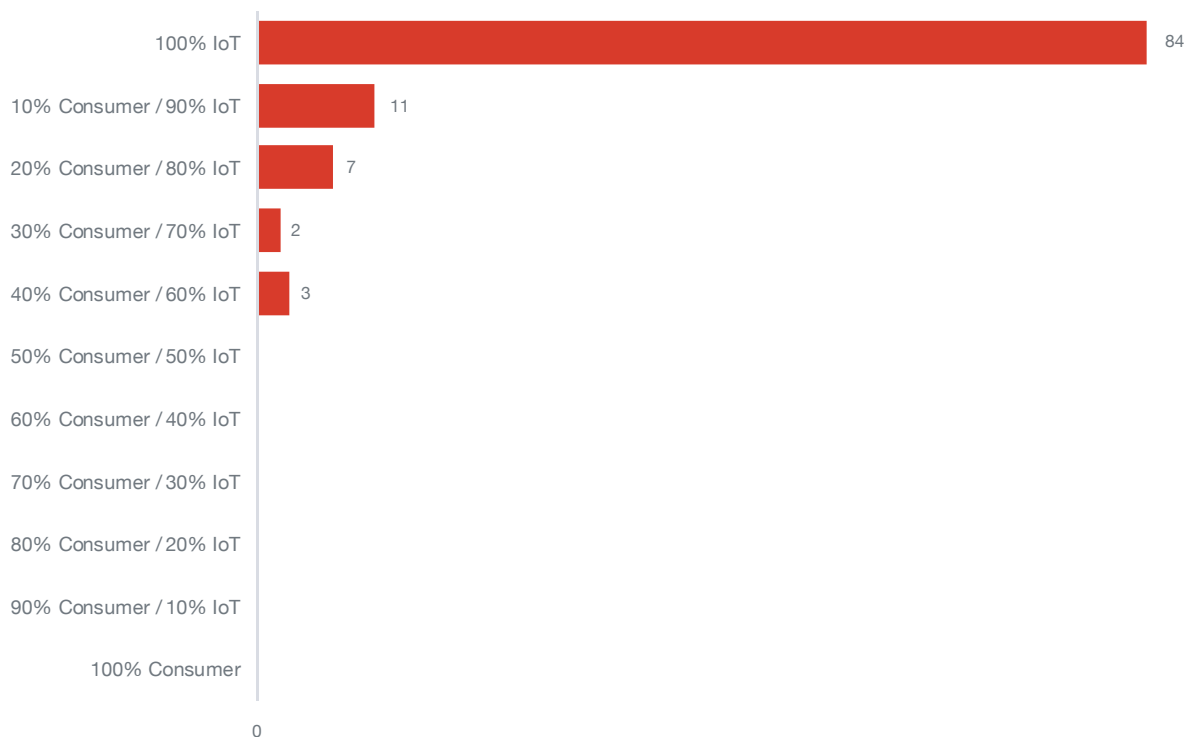
**% of eSIMs out of Total SIM Base (MNO Type View)**



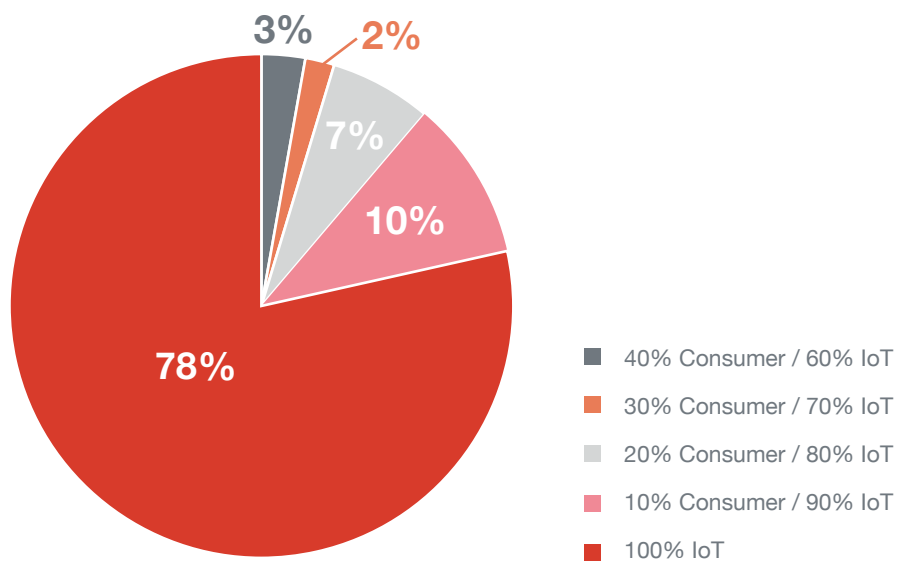
## eSIM Percentage – IoT vs. Consumer

MNOs were asked to disclose the split of eSIM provisions between Consumer and IoT. Only a few MNOs have begun offering Consumer eSIM packages. The following illustrations visualize that there are very few applications of eSIM for Consumers in 2017. A large majority of MNOs report 100% of their eSIM base being for IoT.

**eSIM Percentages for IoT versus Consumer (No# MNOs)**



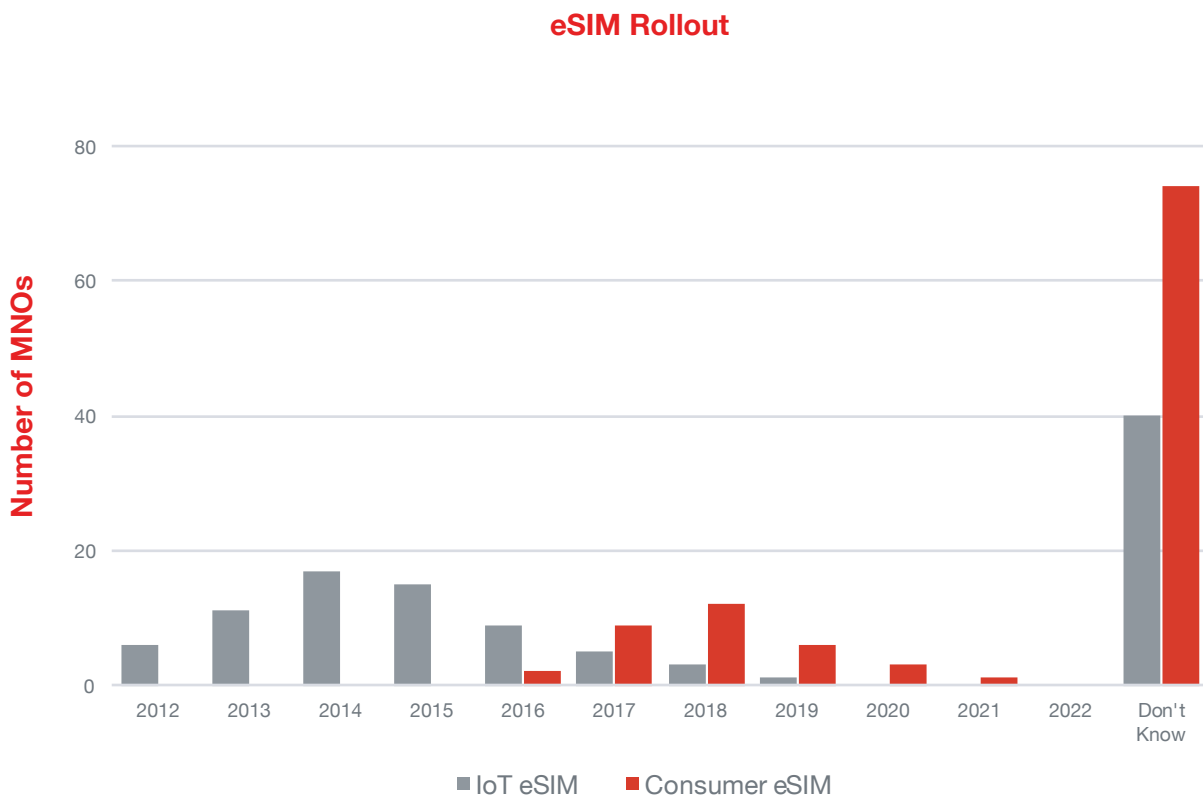
**eSIM Percentages for IoT Versus Consumer (% of MNOs)**





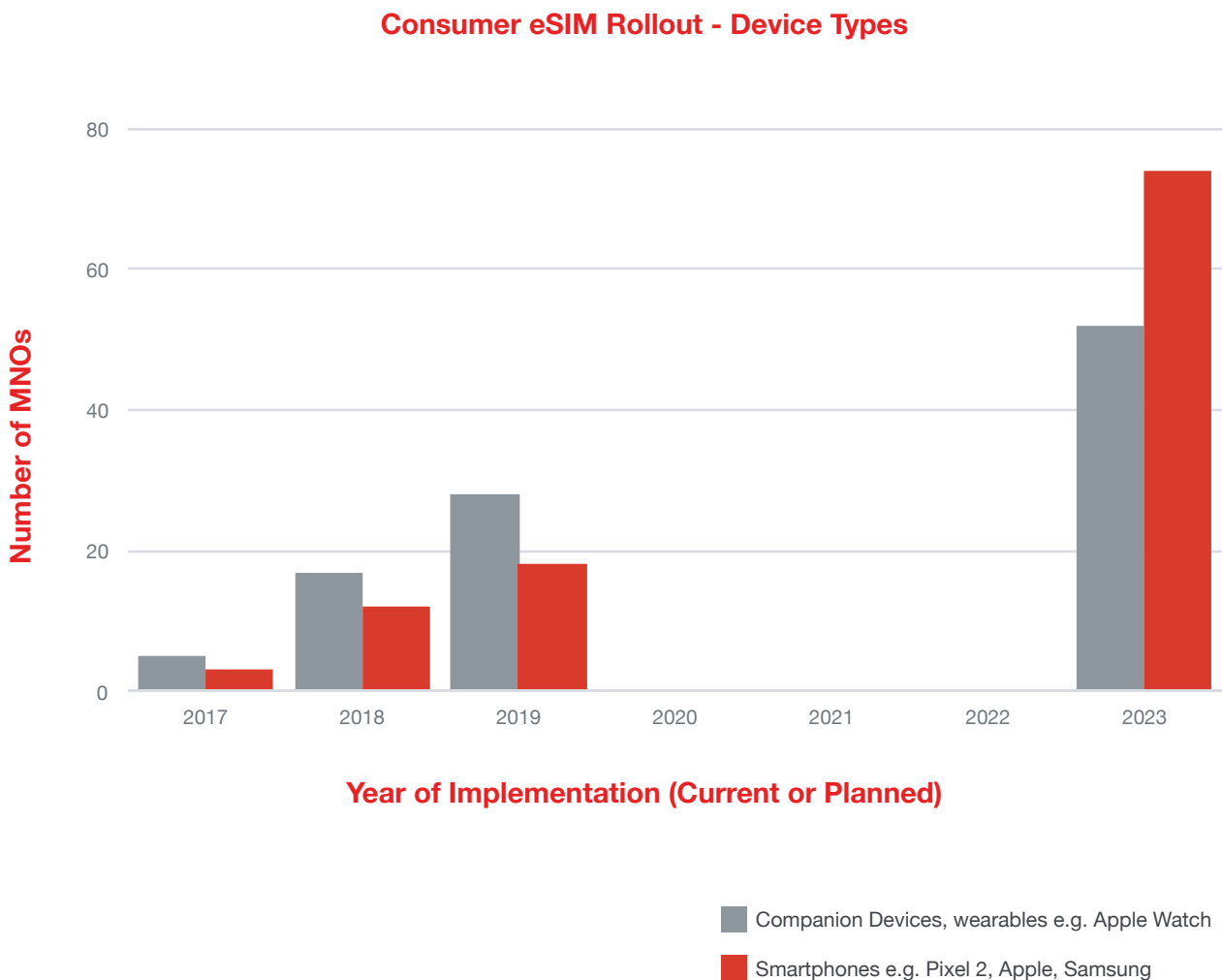
## IoT eSIM Rollout

The following timeline shows when MNOs have deployed eSIM solutions. It also expresses that many MNOs do not yet have eSIM and as outlined earlier, instead fall into the bracket of having an eSIM percentage of less than 2%. Four MNOs stated that they have no plans for future eSIM rollout for Consumers to be supported in their networks.



## Consumer eSIM Rollout - Device Types

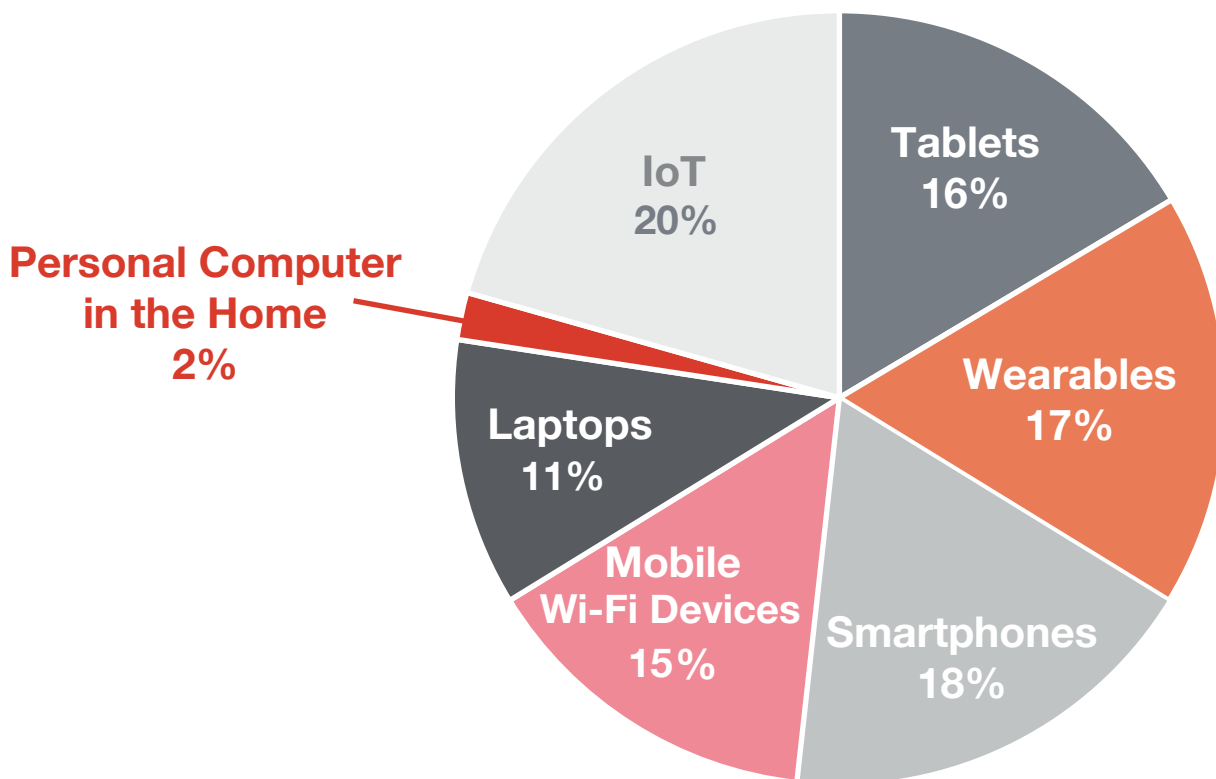
The following timeline shows the split between device types. The majority of MNOs have not yet identified a timeline for their support of eSIM rollouts. Some, however, have already engaged with eSIM for companion devices or for smartphones.



## eSIM Devices

MNOs were asked to name the device categories they expected to be eSIM compatible. Currently, the majority of the research participants associate eSIM more strongly with the IoT domain. Smartphones represent the second largest single device category despite the previous statement.

**eSIM Device Expectations**



MNOs also had a number of Comments.

---



**All types as eSIM is now part of the manufacturing process for everything.**

**Only IoT related.**

**Apple is enemy number 1 and we will be fighting back.**

**Wearables, connected cars.**

**Standardisation of porting process, covering home packages, traditional SIMs & eSIMs for Consumer or Commercial IoT.**

**I believe that the devices manufacturers are doing another step towards turning the MNO's into dumb pipes - it's not good for us or for the competition in the long run - only for the big corporations like apple, google etc.**

**There are many consumer and IoT multi-IMSI solution providers. It's particularly apparent in vehicle IoT solutions where the embedded device crosses many countries/networks.**

**Google will fail with its Pixel 2, no one can come to the market with a single eSIM device and succeed.**

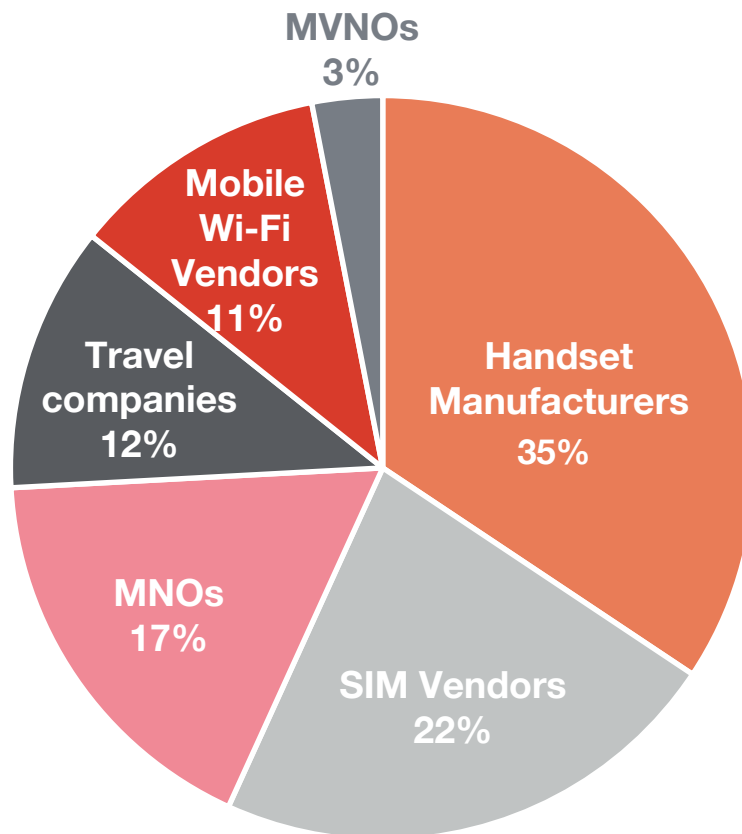
## Consumer eSIM Utilization by Types of Vendors

MNOs recognise several vendor types who will venture into the use of eSIM to develop new solutions or expand their current solutions in the market. It is expected that MNOs will be able to enter the market with MVNO solutions in other countries faster and with lower expenditure.

Vendors mentioned directly by MNOs include:

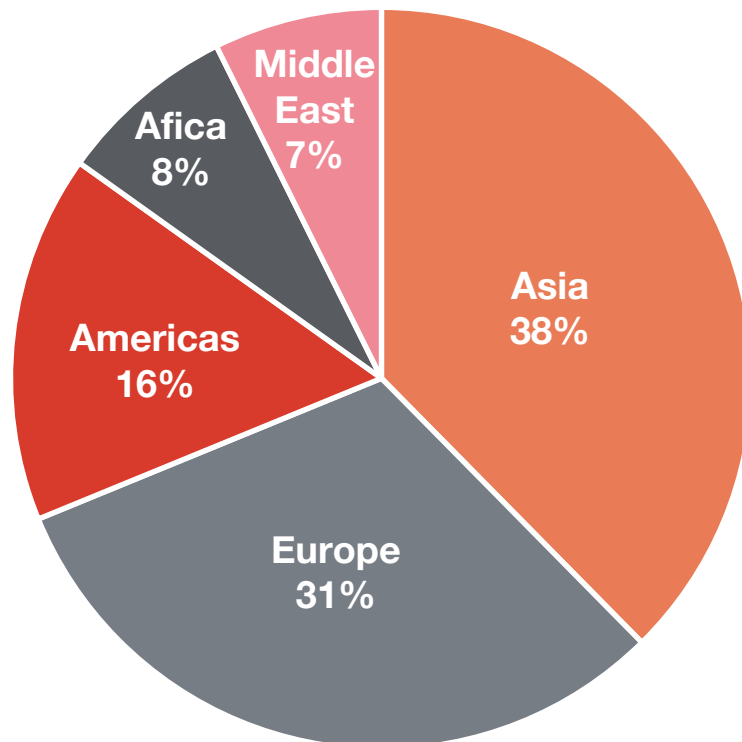
Apple, ARCH, Chatsim, China Mobile, Flexiroam, G&D, Gemalto, Globetouch, Google, Red Tea, Samsung, Tele2, Telit, and UROS.

**Vendor Types that Will Utilise eSIM**



## Regions where Consumer eSIM is Expected to be Popular

MNOs identified regions that are interesting to them from an eSIM standpoint. Europe and Asia were identified as core markets for eSIM developments by MNOs.



## International Roaming Scenarios

With the evolution of Consumer eSIM there will be a possibility for a consumer to switch their provider to a local one when travelling, thus becoming a domestic customer for the duration of the trip.

## eSIM for Roaming

As travelling is predicted to increase in popularity over time, it could be said that people are more global than ever. Services such as Airbnb, TripAdvisor and GoogleMaps have started to give travellers a sense of being locals by removing various obstacles previously hindering this type of experience.

Consumers and travellers simply want the best local experience possible. Custom experiences are becoming more favoured in comparison to 'package deals' that are sold in bulk. It is only natural to ponder upon the lack of similar logic applied to connectivity as well – what if the high roaming rates were also removed to enhance the travelling experience? The question is globally relevant, as with the exception of the EU/EEA, these barriers still exist in the majority of the world.

Last spring, the world's MNO community met in Macau to discuss International Roaming standards at the same time as a GSMA meeting on the other side of the world was trialing important new standards for eSIM.

As it happens, Macau makes a fitting example for the need for a roaming consumer eSIM. Macau has the highest penetration of smartphones in the world, with an average of 3.2 devices per capita – one for Hong Kong, one for China and one for Macau. Thus, the Macanese have 'beaten the system' when it comes to roaming charges. However, this means they have been stuck with the cumbersome process of juggling smartphones and SIM cards, with the added risk of human error (bringing the wrong phone). Consequently, Macau is a textbook target for roaming consumer eSIM.

In practice, it could already be possible to offer a travelling subscriber the opportunity to switch to a local network as a domestic user, essentially eliminating the term 'roamer'.

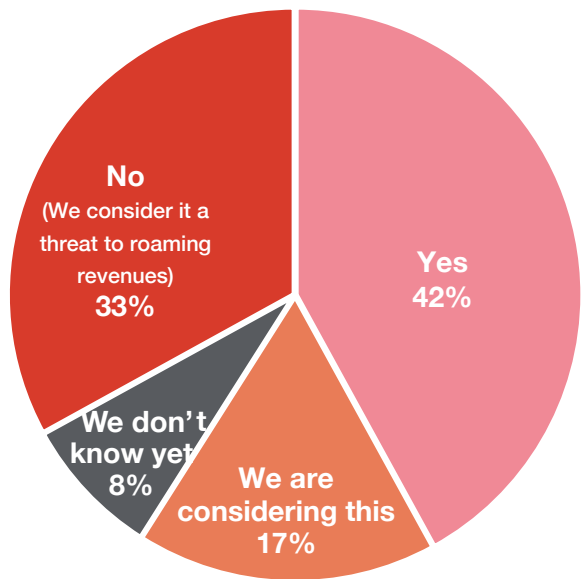
The following illustrations analyse the participant MNO's views on eSIM for roaming.



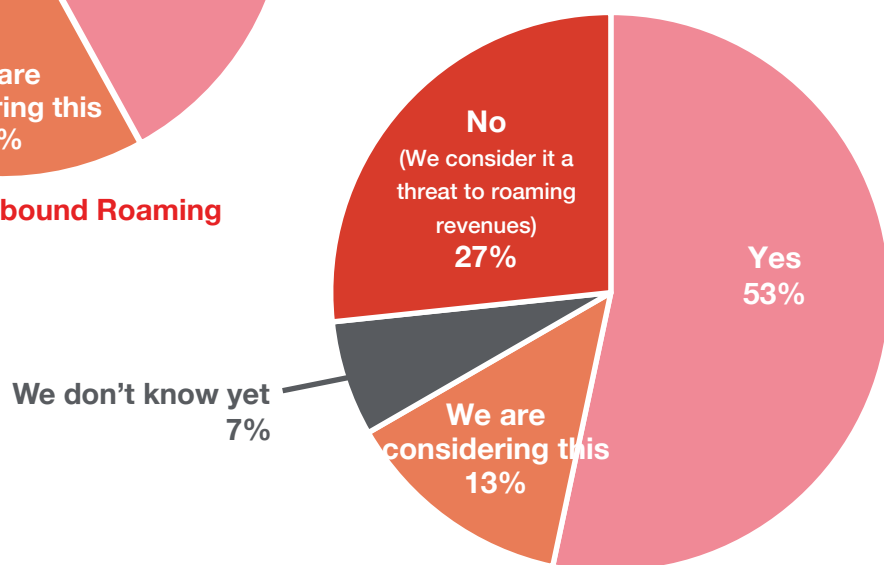
## Inbound Roaming

Inbound Roaming is the support for roaming subscribers from their local network onto the visited network (your network). We asked MNOs “Would you support eSIM within a roaming scenario for inbound? I.e. to offer the inbound roamers the opportunity to change their profile to to one of your customers directly?”

The majority of MNOs reported they would support this scenario or were considering it.



**Support for Inbound Roaming**



**Support for Outbound Roaming**

## Outbound Roaming

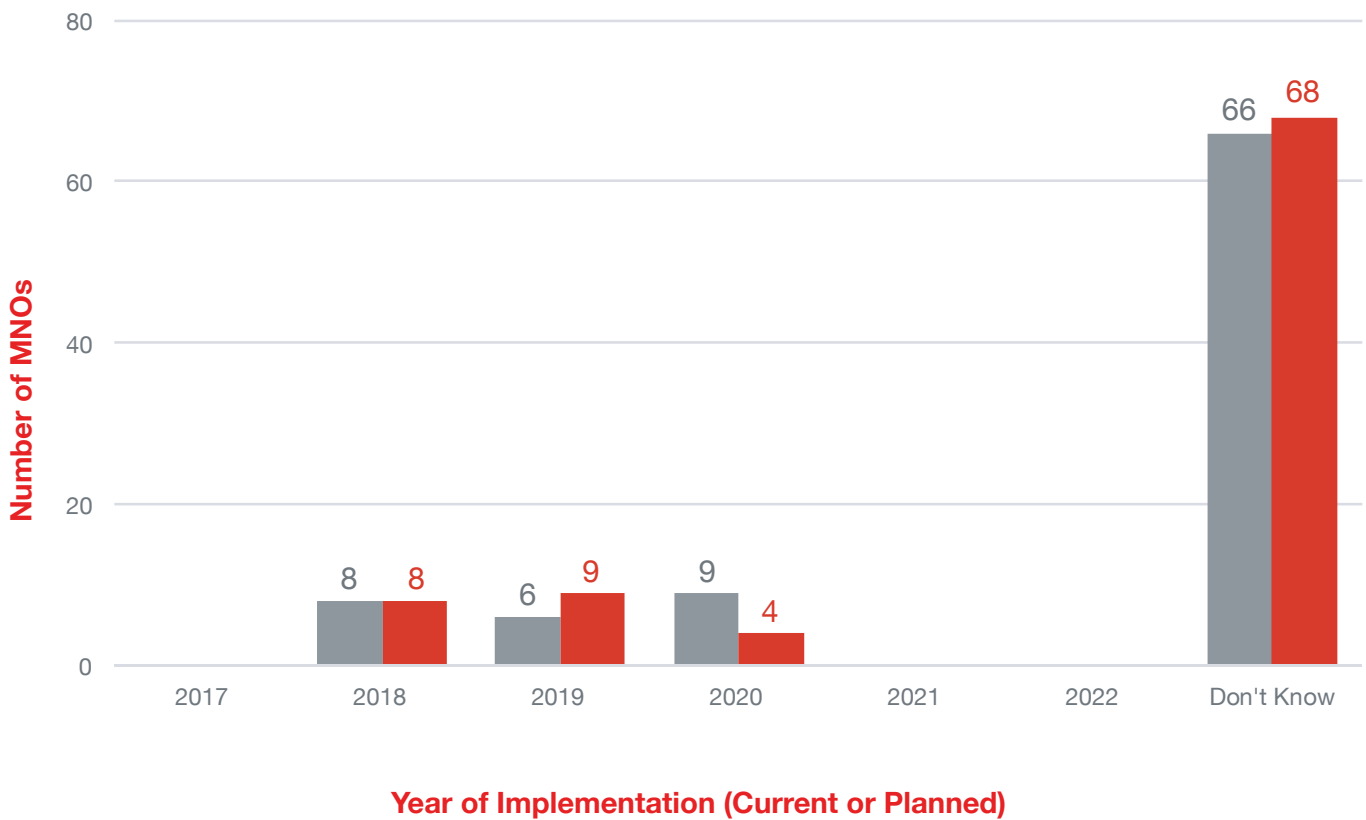
Outbound Roaming is the support for roaming subscribers from your local network onto another network abroad. We asked MNOs “Would you support eSIM within a roaming scenario for outbound? I.e. to offer your subscribers the chance to change their profile and connect with local MNOs instead of using your roaming partners?”

The majority of MNOs said they would support this scenario or were considering it.

## Timeline for Support for Roaming Scenarios

We asked MNOs “Approximately when do you think you will support consumer eSIM for the inbound and outbound subscriber types?”. It was clear from the responses that many MNOs do not know when they will start to support eSIM for Roaming scenarios even though in general, they are supportive.

**Consumer eSIM Rollout by Subscriber Type**



Roaming Subscribers Inbound  
 Roaming Subscribers Outbound

## From Roaming Subscribers to Domestic Subscribers via eSIM

The research participants were asked “When considering consumer eSIM in a roaming scenario, where the subscriber simply chooses and pays for services from a local provider, how likely is it that consumer eSIM could eradicate the need for international roaming completely?”

There has been speculation surrounding this scenario for a number of years. It is likely to become a legitimate alternative to International Roaming as it is today. MNOs see it happening, and can foresee a future where roaming services with high rates and complex billing will disappear.

MNOs’ additional comments:

“It has great impact and hence, not many operators in Middle east WOULD consider it.”

“Let’s be clear there’s nothing MNOs can do to prevent it”

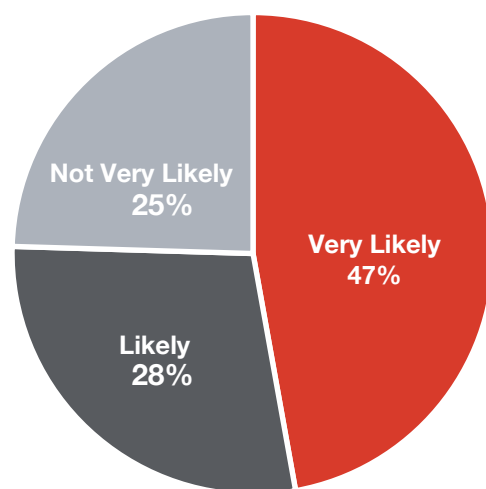
“If you wanted to fight this you would have to have done that before the GSMA allowed the project to be started”

“MNOs will not have a choice because they are not handset manufacturers”

“MNOs are not fast moving enough, Apps will appear in the market which support payment for services easily with a choice of networks, it is not for MNOs to decide just do what the consumer wants”.

“It is well known Apple is determined to make this scenario happen, hence the Apple SIM, this would be a great win for their brand to support, they solutions are already in the market with multiple IMSI solutions so the technology is not new it’s just with Apple will become common”

“It is a disaster for every roaming team of operators”



**Consumer eSIM Could Eradicate International Roaming**

“There will be benefits and drawbacks, I only hope that MNOs are strategically ready”

“This is about to happen, MNOs need to be a part of it”

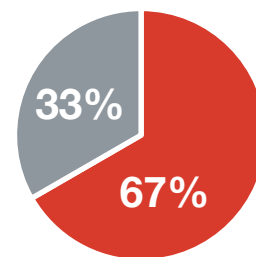
“Facebook, Google, Amazon, Whatsapp, Line, are all planning Apps which will allow the subscriber to choose a network of choice when they roam and become a domestic customer, paying through the app for the service. Maybe OTTs will replace Data Clearing Houses”

## MNOs' Investment in eSIM

When asked “From an MNO perspective, do you think that investing in eSIM is obligatory, when considering that major handset manufacturers are likely to be promoting eSIM for your subscribers as a potential tool for efficiency gain and to eliminate roaming fees?”

# Obligatory (#72)

# Not Obligatory (#36)



It's not mandatory.



OTT players and manufacturers like Apple and Google may soon become a service provider that deals directly with the end users as they look to increase their offering to end users. Investing in eSIM will provide some competition and a mean to acquire customers



I believe that the only way to fight this is by not launching eSIM devices. The regulators will most likely force us to support eSIM but they can't force us to sell them. The era of roaming is about to end - the only question is will it take 3 years or 5-7 years.



Investigate only on M2M roaming is obligatory. But for consumers roaming, it is not allowed.

## Conclusion & Key Takeaways

eSIM Strategies from this Report

### Consumer eSIM MNO Approaches

MNOs Fall into Two Positions



**20%**  
of MNOs

#### First Engagers

- The SIM card format is obsolete, most devices will now be built with eSIM
- Subscribers are digital and we need new digital sales channels
- We do not want to be seen as not evolving alongside devices
- Because of IoT, the architecture for eSIM provision is available
- Processes for MNP are draining resources
- Roaming revenues are declining so impacts from domestication are negligible



**80%**  
of MNOs

#### Fast Followers

- The SIM card is good
- We know eSIM devices are coming
- Strategically we have not evaluated fully the impacts
- We evaluated the impacts and see threats to revenues
- We are not ready for mass adoption
- We will slow it down
- We will experiment with tablets and wearables
- We will engage when market demands

## Conclusions

- MNOs are aware of eSIM's evolution and first engagers are involved in major projects to bring it to the market
- First engagers will play off device evolution to create differentiation and digital interfaces
- Standard SIMs will remain common for at least a few more years
- Roaming has between 3-5 years before extinction

# Notes on Our Report

## Eligibility for Taking Part in this Report

Only MNOs and MVNOs were applicable to take part in this research. Feedback from Vendors, companies that were not MNOs was removed.

## Your Feedback, Our Future Reports

This report presented the first Roaming Consumer eSIM study conducted by ROCCO.

As we progress with our research, we intend to continuously refine questions and results, but we are also aware that our being able to capture this data depends purely on the MNOs and their willingness to participate.

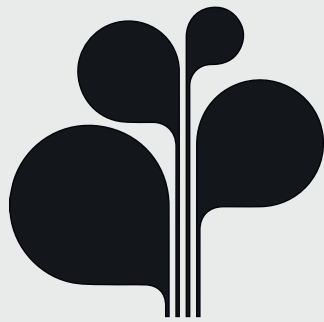
There are 700+ MNOs within the GSMA Membership. ROCCO made more than 3000 individual e-mails and calls to reach the feedback within this document and reach respondees at their most available.

It should be noted that it is important to identify respondents who know who the providers are and can actively comment.

We have received a lot of feedback on this survey which we intend to use in the revision of this survey for next year.

Nevertheless we welcome further feedback on our questions, research, interpretation of the results and our presentation of the results. Please contact [HQ@roamingconsulting.com](mailto:HQ@roamingconsulting.com) to give your view.

Later this year we intend to repeat several questions we have created here and then understand how perceptions are changing with regard to eSIM and how the performance of eSIM players has evolved.



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