Communications
Regulatory Authority
State of Qatar

هيئــة تنظيــم
الاتصـــالات
دولــة قطــر

ANNUAL
REPORT
2017

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His Highness Sheikh Tamim bin Hamad Al Thani
Emir of the State of Qatar

His Highness Sheikh Hamad bin Khalifa Al Thani
The Father Emir

MESSAGE FROM THE MINISTER

H.E. JASSIM SAIF AHMED AL SULAITI
MINISTER OF TRANSPORT AND COMMUNICATIONS

> *"Looking forward to the next year, CRA will work with the stakeholders and service providers on one of the major goals of 2018, which is to be one of the first countries in the world to have the fifth-generation Mobile technology (5G)"*

In 2017, the Communications Regulatory Authority (CRA) continued to make considerable strides towards achieving one of Qatar National Vision 2030 goals, which is to enable the development of a sustainable digital society in the State of Qatar. To this end, CRA have worked towards establishing a regulatory framework and environment that ensures that all consumers in Qatar have access to a broad range of innovative and high-quality services and that fair competition thrives in the market by balancing the rights of consumers and the needs of the service providers.

As consumer demand for telecommunications services continued to grow and mature, CRA works to ensure the availability of advanced fixed and mobile telecommunications networks, through its converged regulatory frameworks. A good indicator is that fixed and mobile Internet connections in Qatar are in robust health, 99% of Qatar's households are in areas covered by a fiber optic network and the 4G wireless broadband network covers all Qatar.

In Q1 2017, Qatar ranked the first in the Middle East and Africa (MEA) region for 15 Mbps fixed broadband adoption, seventh in the world for average peak fixed connection speed at 107.9 Mbps and ranked the second in the MEA region for average mobile connection speeds at 13.6 Mbps. Further evidence of the nation's progress towards its stated goals, is that at the end of 2017 mobile penetration rate in Qatar was one of the highest in the region at 168% and the total mobile numbers that had been allocated to service providers reached 8.1 million and 1.46 million for fixed line numbers.

Looking forward to the next year, CRA will work with the stakeholders and service providers on one of the major goals of 2018, which is to be one of the first countries in the world to have the fifth-generation Mobile technology (5G). In order to achieve this goal, it will need a lot of work and collaboration from a range of related parties. Furthermore, 2018 plans include progressing the transition from IPv4 to IPv6.

The IPv6 implementation will aim to improve the connectivity and ensuring the deployment of an advanced, secure infrastructure. It will also boost the capacity and foster the economic development enhancing the digital literacy and developing skills to enable innovation. Furthermore, it will enhance the public service delivery by ensuring the use of innovative applications to improve delivery of public services.

I would like to thank CRA's employees and management for their efforts and all the stakeholders for their collaboration helping us to achieve this progress, and looking forward to another successful year ahead.

MESSAGE FROM THE PRESIDENT

H.E. MOHAMMED ALI AL-MANNAI
PRESIDENT OF COMMUNICATIONS REGULATORY AUTHORITY

> " **We believe that the employees of an institution are core for the institution's success** "

The Communications Regulatory Authority's (CRA) mandate is to regulate access to digital media, Postal sector, Telecommunications sector and Information Technology sector (ICT). Since its inception in 2014, CRA has been committed to supporting Qatar's National Vision 2030 of a diversified digital economy that ensures stability and Gross Domestic Product (GDP) growth. CRA is contributing to the achievement of this goal through the adoption of flexible regulatory frameworks and a converged approach to regulation. In 2017, the overall contribution of the ICT sector to Qatar's GDP was 1.6%.

In recent years, Qatar has become recognized as an early adopter of new technology in the region, and is now well positioned to leverage the opportunities offered by ICT. We work to ensure that we have the most advanced technologies, to help us work effectively and reach our goals. For example, in 2017, we launched the Automated Spectrum Monitoring System (ASMS) and the Automated Frequency Management System (AFMS), both systems empower CRA to manage and monitor the legitimate use of radio spectrum in the country, especially for key sectors like oil & gas, aviation, maritime, infrastructure development, among others.

Telecom sector saw major changes and improvements in 2017 as some provisions of the Telecommunications Law were amended. These amendments are aimed at strengthening CRA's executive powers and give CRA's the power to establish a penalty committee for Qatar's licensed service providers. The amendments along with the frameworks regulation will contribute to regulating the sector in a more effective manner, and to enhancing the sector performance and for a sustainable competition, benefitting both consumers and service providers.

In terms of revenues, Qatar's overall telecom sector remained very stable during the last three years, with total revenues of more than QAR 10 billion on an annual basis. The postal sector also saw developments from a regulatory standpoint, as CRA worked in close collaboration with the Ministry of Transport and Communications (MoTC) on drafting of the new Postal Law.

We believe that the employees of an institution are core for the institution's success, and one of CRA's goals is to build our institutional capabilities through investing in and developing our staff, expertise and resources. To further this goal, in 2017, CRA continued to support the Qatarization initiative of the Government, the Qatarization rate at CRA increased by 20% in comparison with 2016.

Looking forward to 2018, our focus on delivery against our objectives will continue to support the growth of a knowledge-based economy, foster sustainable competition, promote a fair market place and improve consumers' protection and experience. The coming year will be the year of the postal sector and fifth Generation Mobile technology (5G), as it will be reflected in CRA's preparation of preliminary frequency plans that can accommodate the demand of Qatar's telecom service providers for the use of the 5G, expected in late 2018 and early 2019, opening the door for Internet of things (IoT) services. CRA will also continue to develop sector specific regulation such as the new Postal Law, and implementation of fixed number portability, which is aimed to be implemented in 2019.

CRA would not achieve the achievements presented in this annual report without the support and commitment of Qatar's leadership and the continued dialogue with key stakeholders. I would like to thank you in advance for being part of this success, as we look forward to another productive year.

OUR VISION

Qatar – a smart connected nation, enabled through effective and innovative ICT and postal regulation.

OUR MISSION

- To enable the development of a digital society and the postal sector for the social and economic benefit of Qatar, through a forward looking, transparent and consistent regulatory framework.

- To foster sustainable competition to promote a fair marketplace and improve customer experience through the ubiquitous availability of smart, innovative and high quality services.

- To continue building our institutional capabilities through investing in and developing our staff, expertise and resources.

INTRODUCTION

which is under development and the interactive Arsel mobile app are further aimed at enhancing the consumers' experience.

During the year, we published various consumer awareness alerts, including the need to be aware of unsolicited or 'spam' electronic messages, and are in the process of drafting a spam law that will form part of the Consumer Protection Regulation above. Several

> *"* **In line with Qatar's 2030 vision to drive forward as a knowledge-based information society, CRA is always forward-looking** *"*

notices and orders were also published. These included violation notices to retailers for selling illegal telecoms equipment, and orders issued to services providers to maintain fair competition rules.

In 2017, the Telecoms Law was amended, in line with the assuming the responsibilities of the ICT Qatar.

There were two milestone awards in 2017. In February, we won the Best Mobile App for ICT Sector award at the 8th Smart Government Excellence Awards Ceremony for the newly upgraded version our Arsel app. In September, our e-Spectrum Service

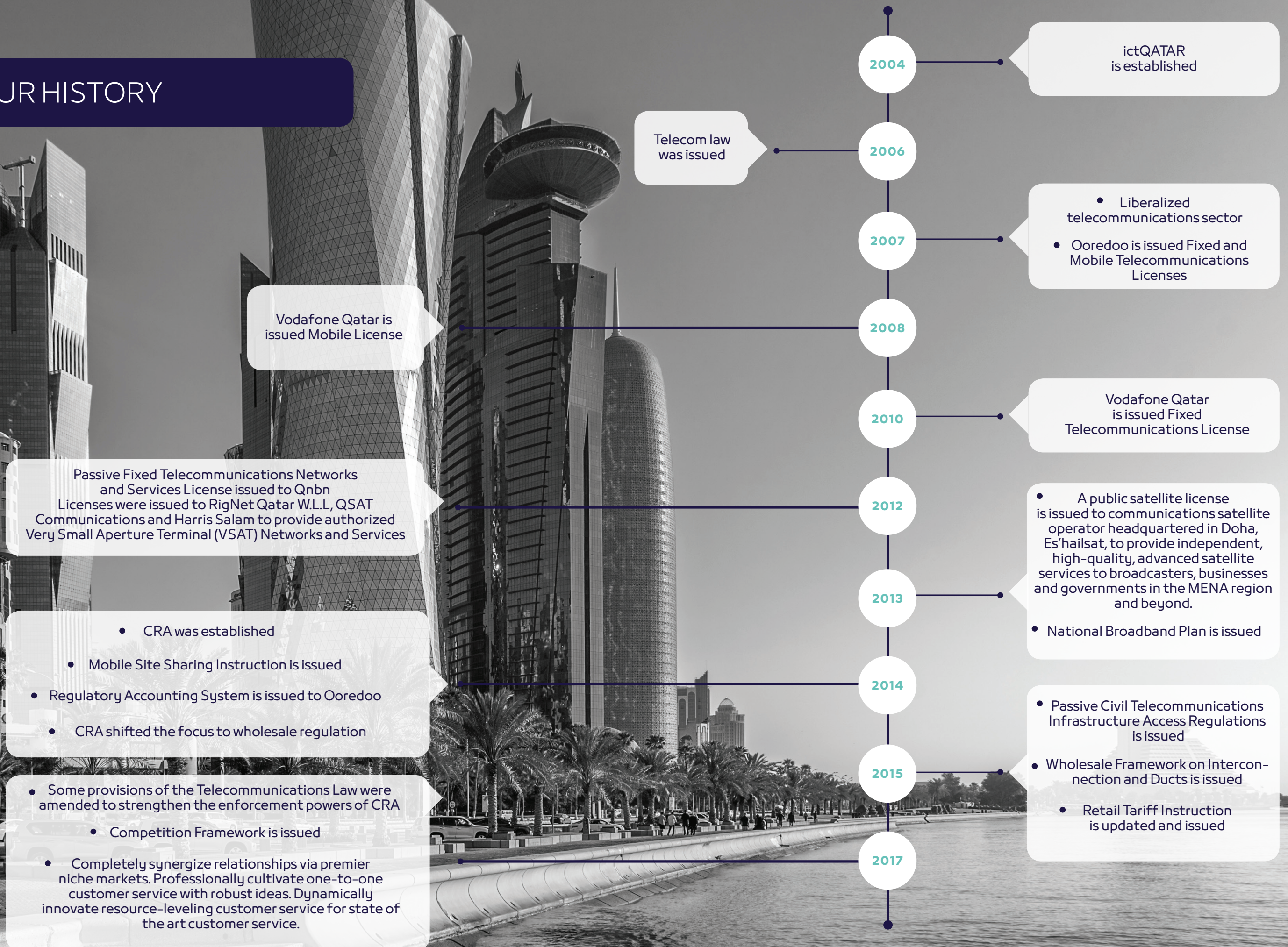Portal, was recognized through an Arab Government Achievement Award from the Pan Arab Excellence Awards Academy. The Portal allows spectrum users to submit applications online for issuing, modifying, or cancelling their spectrum licenses.

In line with Qatar's 2030 vision to drive forward as a knowledge-based information society, CRA is always forward-looking, and the last section of this report, Projects and Plans 2018, outlines several initiatives planned for the years ahead. In 2017, 3,272 new Qatari domains were registered, along with 9,358 requests for infrastructure projects. We are continuing to drive domain growth by introducing dedicated domains for target sectors. Our emerging (.doha) portal will be an all-encompassing and interactive information source about Qatar.

A phased strategy is being rolled out for the upcoming 5G broadband in consultation with all service providers and other key stakeholders, and a new law has been drafted to take Qatar's postal service into the digital age. Crucially, we have reviewed and upgraded our data protection measures in line with new General Data Protection Regulation (GDPR), and are working on several major projects to ensure Qatar's infrastructure is ready for the telecoms growth we anticipate in the years ahead.

The following pages cover all the developments we seen over the year, as well as providing some comprehensive market insights.

In 2017, the Communications and Regulatory Authority (CRA) has seen one of its busiest and most eventful years.

CRA continues to build a strong relationship with Qatar's telecoms service providers, while ensuing they promote fair competition and work strongly in the interest of their consumers. For this, we are pleased that we continue to be ranked high ranking in the top published global technology indexes as shown in the Market Development & Competition section.

Protecting the interests of consumers always remains at the top of our agenda. We actively measure customer enquiries and complaints, and monitor the degree to which service providers are closing these out satisfactorily. The results of this are shown within the report. The Consumer Protection Regulation,

OUR HISTORY

2004 — ictQATAR is established

2006 — Telecom law was issued

2007
- Liberalized telecommunications sector
- Ooredoo is issued Fixed and Mobile Telecommunications Licenses

2008 — Vodafone Qatar is issued Mobile License

2010 — Vodafone Qatar is issued Fixed Telecommunications License

2012 — Passive Fixed Telecommunications Networks and Services License issued to Qnbn
Licenses were issued to RigNet Qatar W.L.L, QSAT Communications and Harris Salam to provide authorized Very Small Aperture Terminal (VSAT) Networks and Services

2013
- A public satellite license is issued to communications satellite operator headquartered in Doha, Es'hailsat, to provide independent, high-quality, advanced satellite services to broadcasters, businesses and governments in the MENA region and beyond.
- National Broadband Plan is issued

2014
- CRA was established
- Mobile Site Sharing Instruction is issued
- Regulatory Accounting System is issued to Ooredoo
- CRA shifted the focus to wholesale regulation

2015
- Passive Civil Telecommunications Infrastructure Access Regulations is issued
- Wholesale Framework on Interconnection and Ducts is issued
- Retail Tariff Instruction is updated and issued

2017
- Some provisions of the Telecommunications Law were amended to strengthen the enforcement powers of CRA
- Competition Framework is issued
- Completely synergize relationships via premier niche markets. Professionally cultivate one-to-one customer service with robust ideas. Dynamically innovate resource-leveling customer service for state of the art customer service.
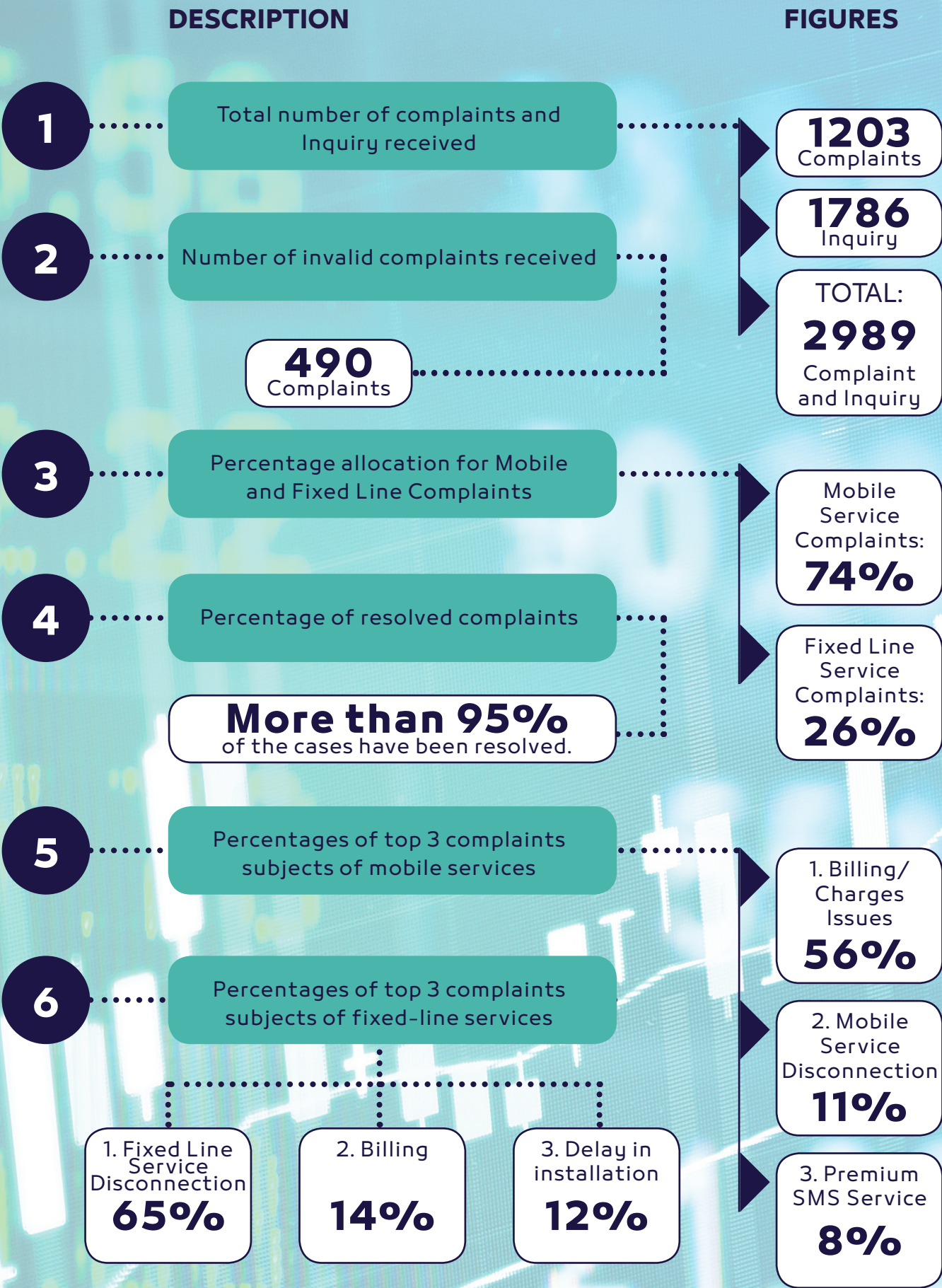
TECHNICAL AFFAIRS DEPARTMENT ANNUAL FIGURES

	DESCRIPTION	FIGURES
1	Total mobile numbers allocated in 2017	100 000
2	Total fixed numbers allocated in 2017	10 000
3	Total mobile numbers allocated so far	8 100 000
4	Total fixed numbers allocated so far	1 460 000
5	Total mobile numbers ported under mobile number portability	29 466
6	Total mobile numbers returned under mobile number portability so far	145 549

QATARI DOMAINS

7	Total number of registered domain in 2017	3 272
8	Percentage growth of increase in domain registration compared to 2016	9.76%
9		

TICKETS HANDLED BY CALL CENTER

Total No.		Answered
666	◀▶	580

TICKETS HANDLED BY SUPPORT TEAM

Total No.		Resolved
555	◀▶	533

INFRASTRUCTURE

11	Number of issued approvals for the requests of construction of new mobile sites in 2017	127
12	Percentage of increase in requests for approvals for the construction of new mobile sites in compared to 2016	+138%
13	Number of rejected requests of construction of new mobile sites	6
14	Total number of no objection requests that CRA has handled on Q-PRO system	9358 Applications
15	Total number of applications that CRA has handled on Qatar Online Design Review System (Q-DRS)	1155 Applications

Percentage of top 3 domain extensions that domains were registered during 2017 compared to all registered domains.

- .qa **76.89%**
- .com.qa **15.49%**
- .sch.qa **6.02%**

CONSUMER AFFAIRS FIGURES

DESCRIPTION

FIGURES

1 — Total number of complaints and Inquiry received

1203 Complaints

1786 Inquiry

2 — Number of invalid complaints received

490 Complaints

TOTAL: **2989** Complaint and Inquiry

3 — Percentage allocation for Mobile and Fixed Line Complaints

Mobile Service Complaints: **74%**

4 — Percentage of resolved complaints

More than 95% of the cases have been resolved.

Fixed Line Service Complaints: **26%**

5 — Percentages of top 3 complaints subjects of mobile services

1. Billing/ Charges Issues **56%**

6 — Percentages of top 3 complaints subjects of fixed-line services

2. Mobile Service Disconnection **11%**

1. Fixed Line Service Disconnection **65%**

2. Billing **14%**

3. Delay in installation **12%**

3. Premium SMS Service **8%**

SPECTRUM MANAGEMENT DEPARTMENT FIGURES

Spectrum Assignment and Licensing

25770 applications processed for station and network based radio frequency licenses (including new issuances, renewals and cancellations)

649 Frequencies assigned in different radiocommunication systems

46 Frequencies assigned for 22 VIP visits

5 Major Events supported by assigning the frequencies that meet their radiocommunication requirements:
- National Day Celebrations
- Final round of the Superbike World Championship
- FIA World Touring Car Championship
- 2017 Commercial Bank Qatar Masters Golf Tournament
- AJYAL Youth Film Festival

Spectrum Coordination

26 BR IFICs were examined and **506** letters have been prepared and sent to ITU/ Notifying Administrations.

101 letters have been sent on coordination of QATARSAT satellite networks with other administrations' satellite networks

Type Approval

1082 Type Approval certificates issued for Radio and Terminal Telecom Equipment (RTTE)

Import Authorization

- **407** import authorization approval (up by 12% from 363 in 2016), were issued and received **22,317** customs clearance applications.
- CRA conducted **two routine inspections on 546 shops t**hat are selling radio and telecommunication equipment (up by 180% from 195 shops in 2016) and issued **257 violation notices** for shops that were selling telecoms devices and equipment without having the required licenses

Spectrum Interference Cases

- **51 interference complaints** were received in 2017. **48** of which have been investigated and resolved. Necessary actions are being taken to resolve the remaining 3 cases.

e-Spectrum Services Portal

Total no of applications received through portal	New License Request	Cancellation Request	Modification Request	Registration of equipment Request	Renewal requests	Equipment write-off Request	User Registration Request	No of frequencies assigned (including re use)	No of Call sign assigned	No of Licenses for Temporary Events
16598	1567	262	499	2393	11528	349	6200	6311	6792	44

Along with ensuring appropriate regulation of Qatar telecoms industry, our key mandate is to promote fair competition, this is for the benefit of consumers, and to foster robust and sustainable competition practices between market operators moving forward.

Below we give an overview, over 2017 and historically, of Qatar's telecoms sector in terms of revenues, market share, penetration rates and subscriptions – across both the mobile and fixed markets.

STRUCTURE AND STATE OF QATAR TELECOMMUNICATIONS MARKET
It is important that Qatar's service providers offer a broad range of services to individuals, businesses and government entities. For clarity, we outline Qatar's Service Providers below:
- Mobile and fixed services: Ooredoo QPSC (Ooredoo); Vodafone Qatar QPSC (Vodafone)

- Infrastructure for fixed services: Qatar National Broadband Network (QNBN QPJSC)
- Satellite services: Speedcast (Harris Salam LLC); QSAT WLL; RigNet Qatar WLL; Qatar Satellite Company (Es'hailSat QPSC)

A key pillar within Qatar's 2030 vision is to increase the country's standing as a knowledge-based information society. We fully understand that the telecoms sector plays an important role in achieving this ambitious goal and we promote the sector's progression as far as possible in this respect.

In the latest published Global Information Technology Report's (GITR) Networked Readiness Index 2016 from the World Economic Forum (WEF), Qatar ranked 27th globally out of 139 countries and second among the Arab countries. Qatar ranked in the top five regarding indicators for both skills and e-government usage.

OVERALL TELECOMMUNICATIONS SECTOR

Qatar's overall telecoms sector has been very stable during the last three years, with total revenues of more than QAR 10 billion on an annual basis, as illustrated in Figure 1. Ooredoo and Vodafone remain the principal service providers with a total combined market share of 97%.

FIGURE 1. REVENUES OF THE OVERALL TELECOMMUNICATIONS SECTOR

- Other Licensed Operators
- Ooredoo Qatar Fixed Revenue
- Vodafone Qatar Mobile + Fixed Revenue
- Ooredoo Qatar Mobile Revenue
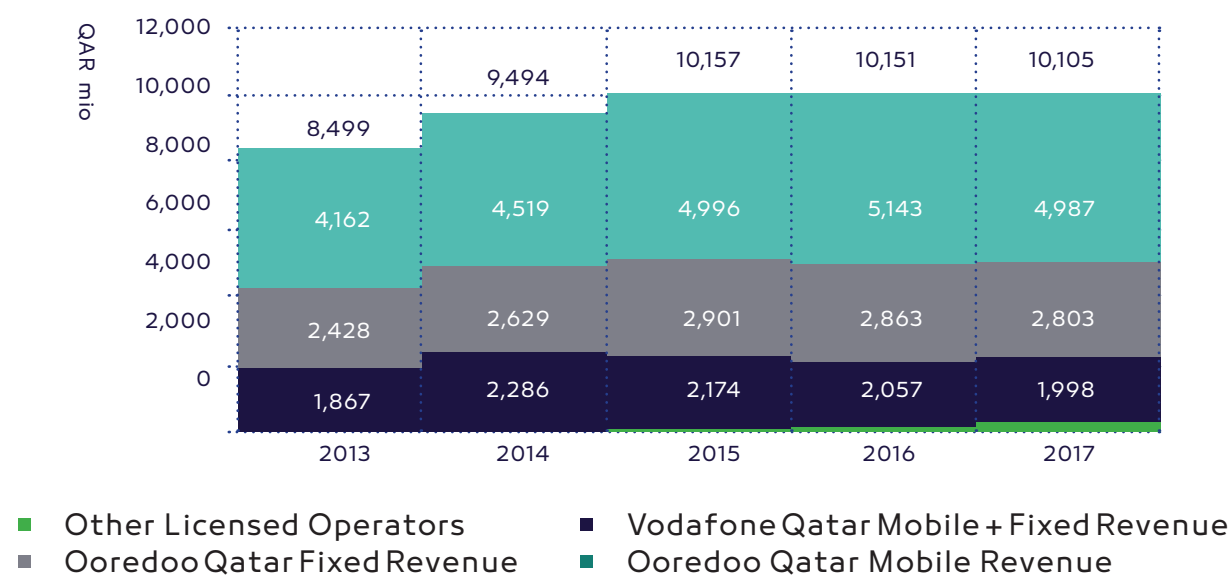
Sources: Service providers' financial data; CRA calculations

The contribution of Qatar's ICT sector continues to add to the diversification of the country's overall economy. The sector contributed to 1.6% of Qatar's total GDP, up from 1.1 percent in 2013. The slight decrease in contribution in 2017 is attributed to Qatar's overall GDP increase of 9.9% from 2016 to 2017.

Qatar's overall GDP increase and the sector contribution are illustrated in Figure 2.

FIGURE 2. QATAR GDP AND ICT SECTOR CONTRIBUTION

- GDP at Current Prices (Nominal)
- % Contribution of Information and Communication Sector
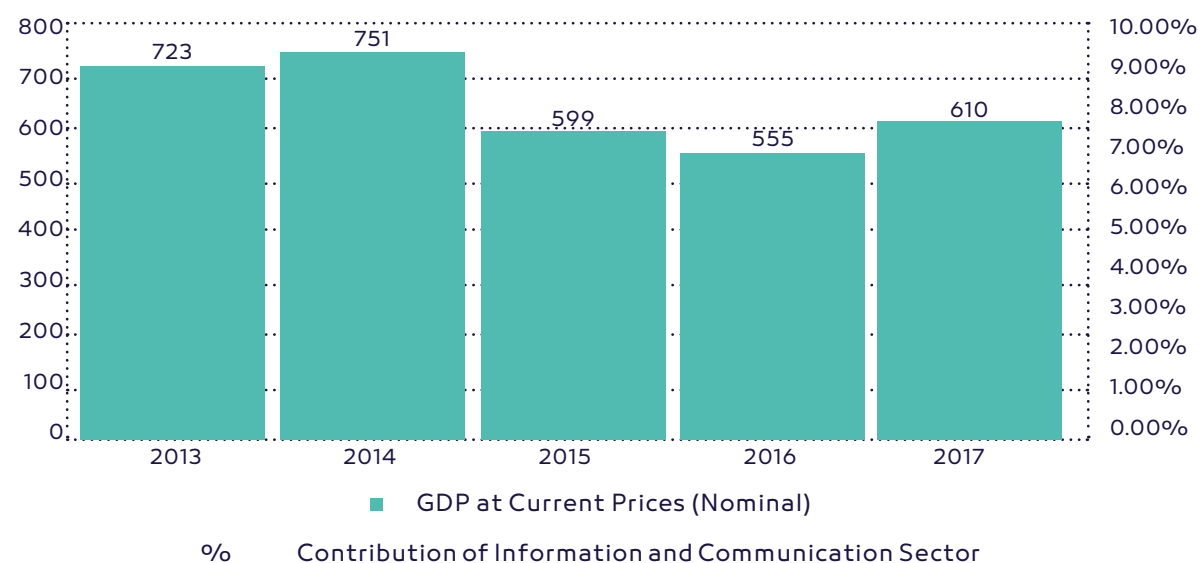
Source: Ministry of Development Planning and Statistics (MDPS); CRA calculations

FIXED AND MOBILE SERVICES PROVIDED TO THE PUBLIC

Between 2016 and 2017, Qatar's population increased by 2% to 2.6 million, while the total number of subscriptions to fixed and mobile services decreased by 3% from 5.0 to 4.8 million.

At the same time, total quarterly revenue for fixed and mobile services has remained stable since Q1 2015 at close to QAR 2.6 million per quarter. The share of Ooredoo and Vodafone fixed and mobile revenue has also remained stable during the same period. This indicates that Qatar's telecommunications market has found an equilibrium, both in terms of total market size and market share.

In Figure 3, we compare Qatar's total population with number of subscriptions to, and revenue from, fixed and mobile services. As shown, for most years there is a natural decrease in revenue for Q3 mainly due to the holiday season. However, in Q3 2017 there was a bigger decrease than normal, due to an outage in Vodafone's mobile network system.

FIGURE 3. POPULATION, TOTAL SUBSCRIBERS AND REVENUE FOR FIXED AND MOBILE MARKETS

- Other Operators (Left Axis)
- Ooredoo Qatar (Fixed) (Left Axis)
- Population (Right Axis)
- Vodafone Qatar (Fixed and Mobile) (Left Axis)
- Ooredoo Qatar (Mobile) (Left Axis)
- Total Industry Subscribers (Right axis)
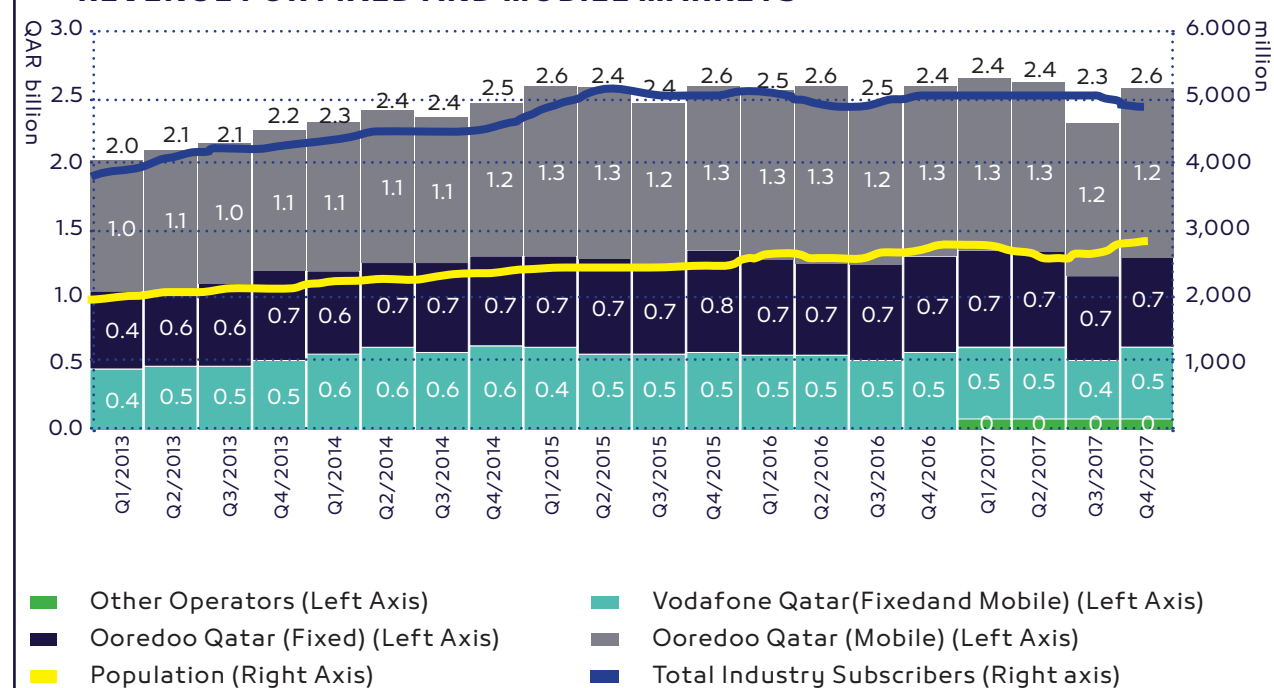
Source: Ministry of Development, planning and statistics (MDPS) Qatar for population figures; SP's financial data

In terms of revenue market share, Ooredoo continues to have a very high share of the fixed market, while Vodafone has a solid foothold in the mobile market, see Figure 4.

FIGURE 4. MARKET SHARES FOR THE FIXED AND MOBILE MARKETS

Legend:
- Ooredoo Mobile Market Share
- OoredooFixed Market Share
- Vodafone Mobile Market Share
- Vodafone Fixed Market Share
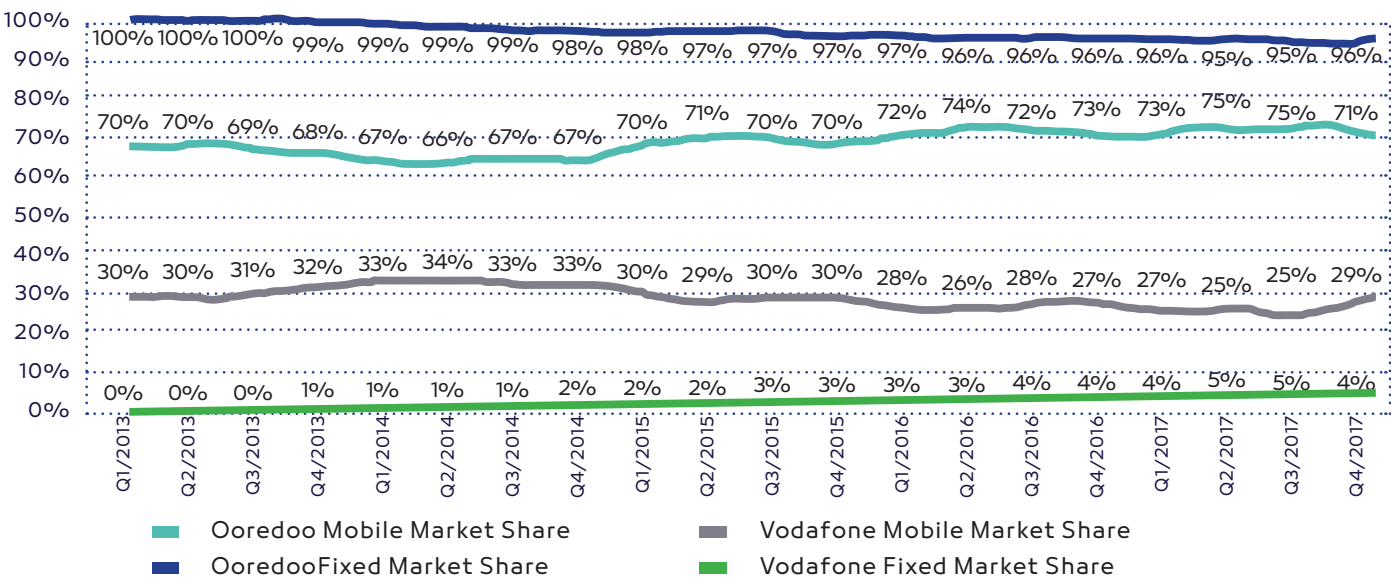
Source: Service providers' financial data

Ooredoo's significant revenue share in the fixed market has had no detrimental effect on service levels. As Figure 5 shows, Qatar has emerged as one of the world leaders in the rollout of Fiber to the Home/Building (FTTH/B) with a household penetration rate of 90%. Furthermore, 93% of fixed broadband connections on fiber are at speeds of 10 Mbps or higher

This high fiber penetration is underpinned by a strong national vision of telecoms development, thorough planning on both state and municipal level, a supportive regulatory framework that has found a sound balance between regulation and investment incentives, and an ambitious, forward-looking telecommunications sector.

FIGURE 5. FTTH/B PENETRATION RATE FOR HOUSEHOLDS, Q3 2017

Country	FTTH	FTTB
UAE	94%	0%
Qatar	82%	8%
Singapore	68%	22%
South Korea	31%	51%
Hong Kong	6%	70%
Japan	43%	24%
China	16%	46%
USA	12%	3%
EU28	12%	12%
Saudi Arabia	14%	0%
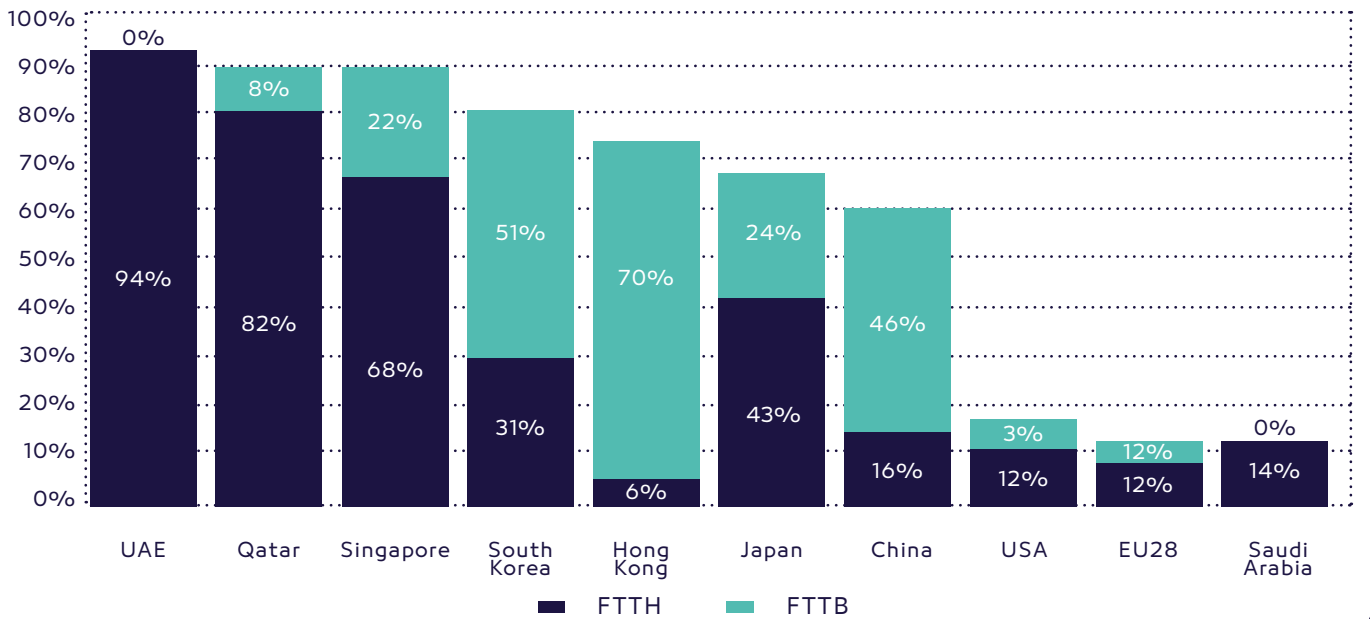
Source: FTTH Council Europe

Most recently, there has been decreasing number of mobile subscriptions. As Figure 6 shows, Mobile subscriptions peaked in Q2 2015 at 4.7 million with a penetration rate of 198 per cent. As of Q4 2017, they have decreased to 4.5 million and a 168 per cent penetration ratio.

FIGURE 6. MOBILE SUBSCRIPTIONS AND PENETRATION RATES

Source: Service providers' financial data
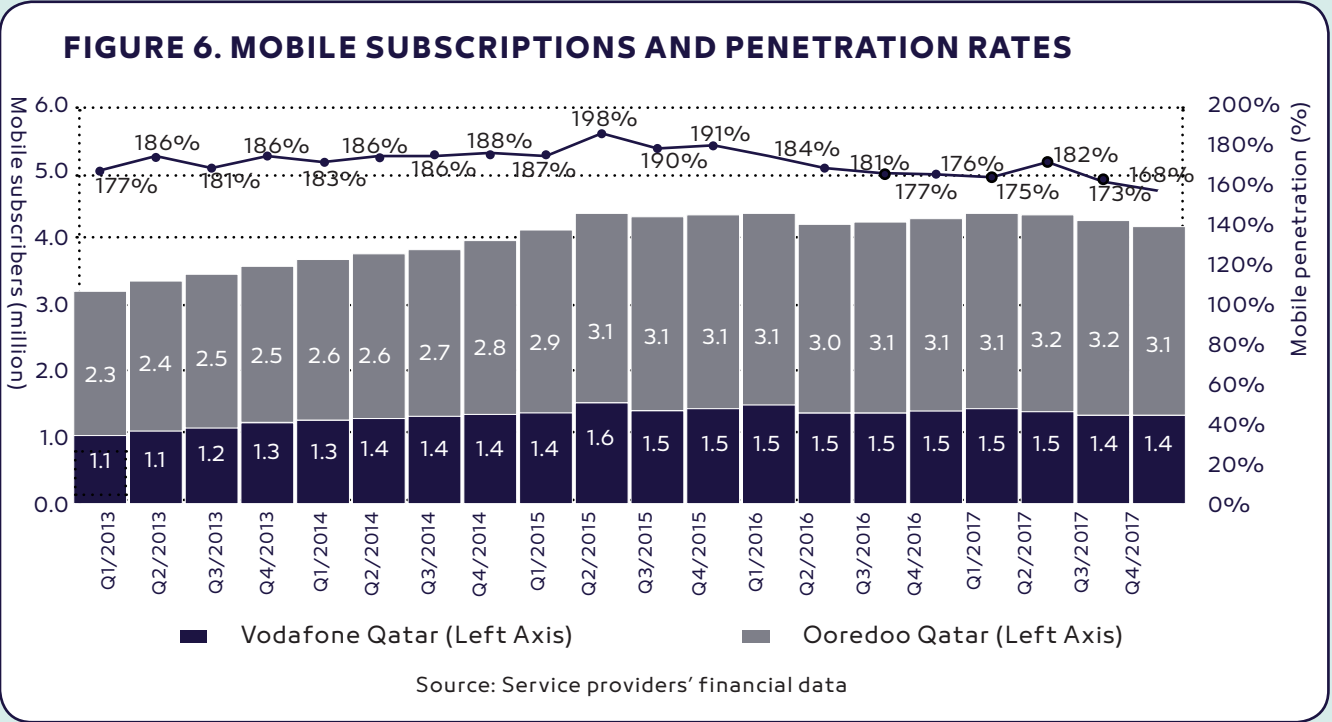
Historically, as Figure 7 shows, the MENA region has high mobile penetration rates. However, as mentioned, penetration rates in Qatar have decreased during the last years. This is both due to the service providers changing policy on issuing SIM cards and local regulatory tightening of SIM card issuance policies.

FIGURE 7. MOBILE PENETRATION RATES IN MENA Q1 2017

Source: Arab Advisors
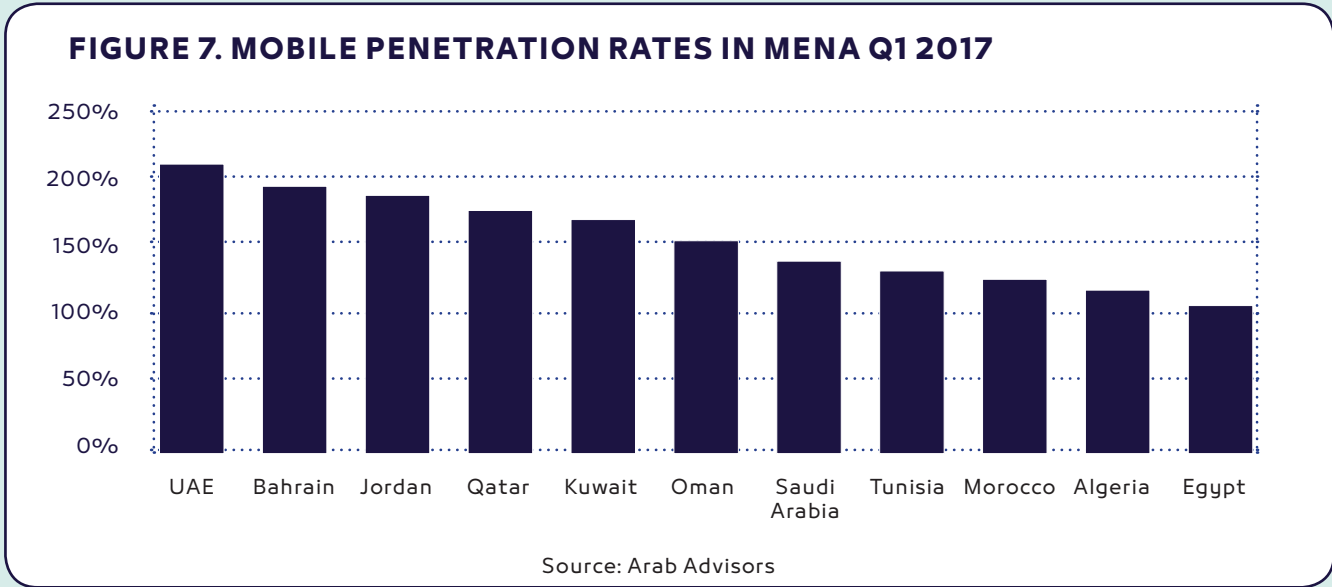
However, despite the overall declining penetration rates, the proportion of postpaid subscriptions have increased to 23% from 14% five years ago. One in four subscriptions is now postpaid compared to one in seven five years ago. See Figure 8.

FIGURE 8. PROPORTION OF POSTPAID AND PREPAID MOBILE SUBSCRIPTIONS IN QATAR

Source: Service providers' financial data
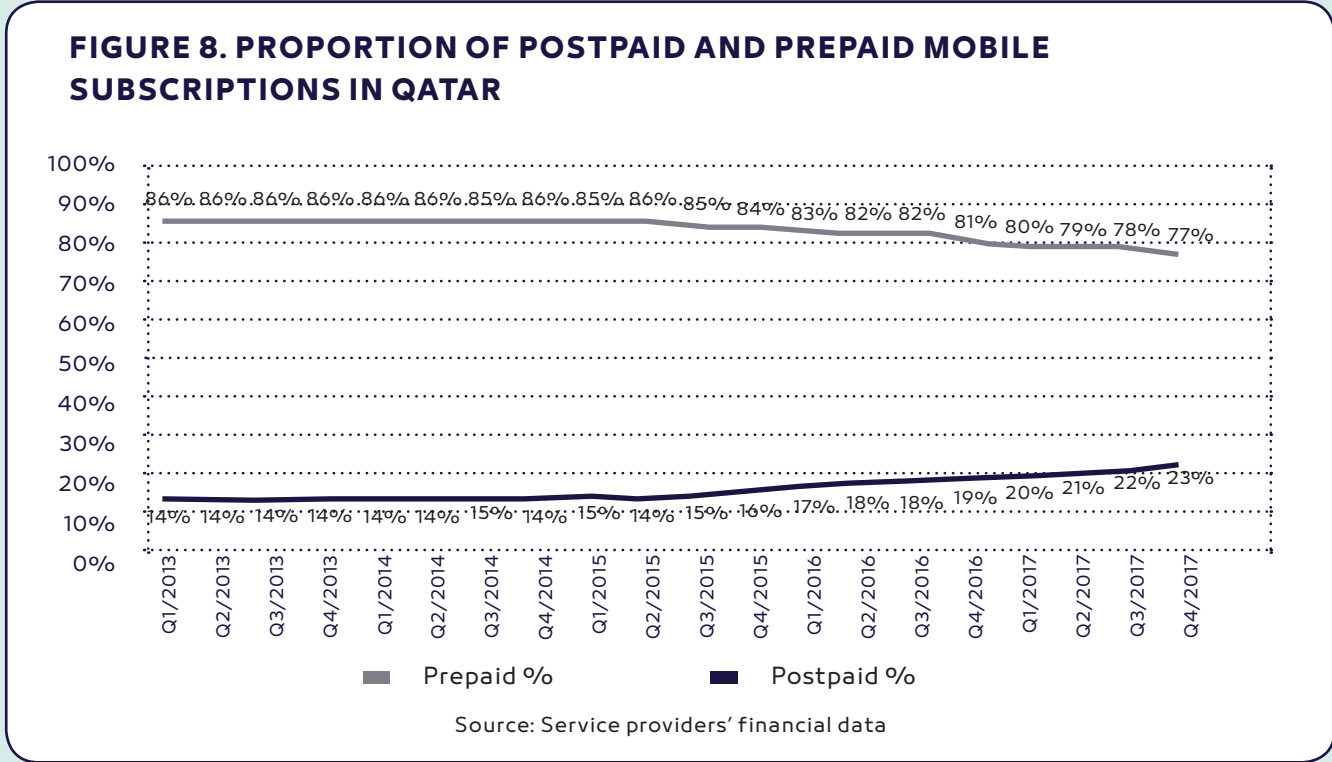
Looking closer at the financials of the mobile market, Average Revenue Per User (ARPU) is a widespread ratio that shows how much revenue each subscriber generates on average per month. As shown in Figure 9, ARPUs for both Vodafone and Ooredoo have shown a declining trend since their peak in Q2 2014. This is a common phenomenon in mobile mature markets.

FIGURE 9. MOBILE ARPUS FOR OOREDOO AND VODAFONE

Source: Service providers' financial data
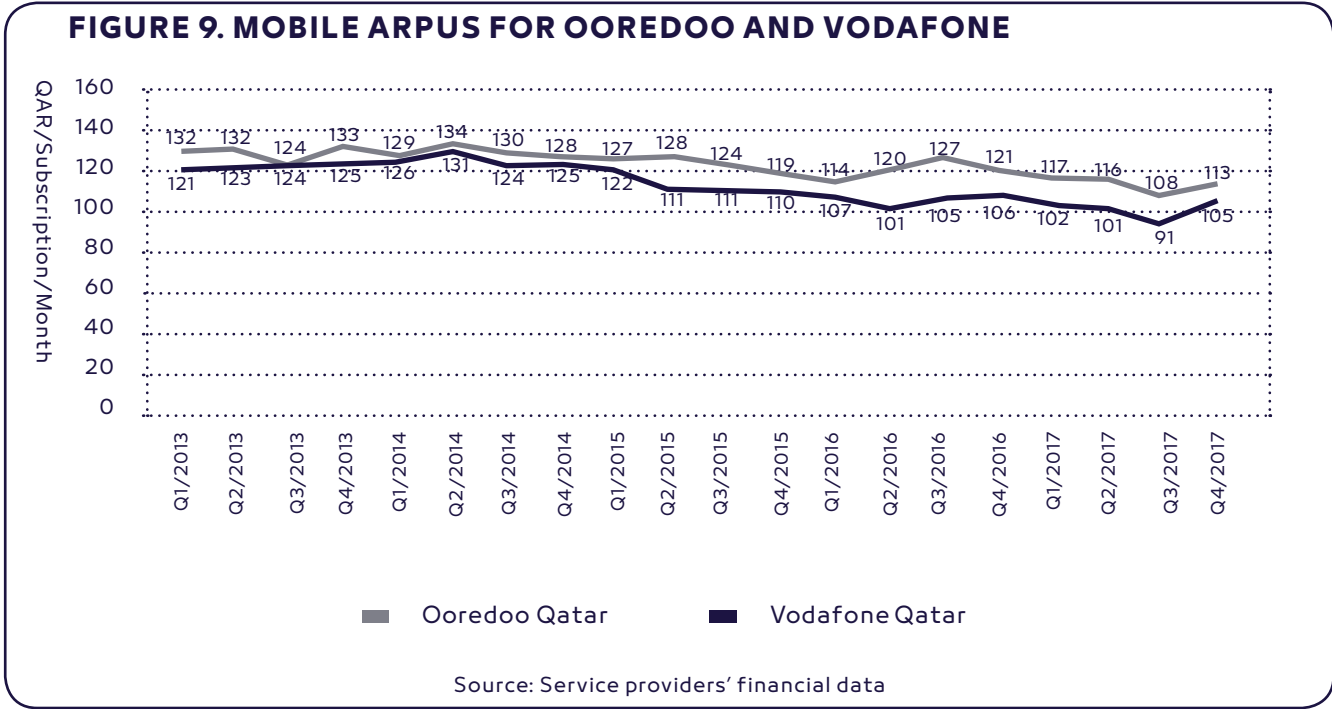
Figure 10 shows the mobile ARPUs for Ooredoo and Vodafone in Qatar, as compared to the MENA region.

FIGURE 10. MOBILE ARPUS IN THE MENA REGION Q1 2017

Q1/2017

Source: Arab Advisors
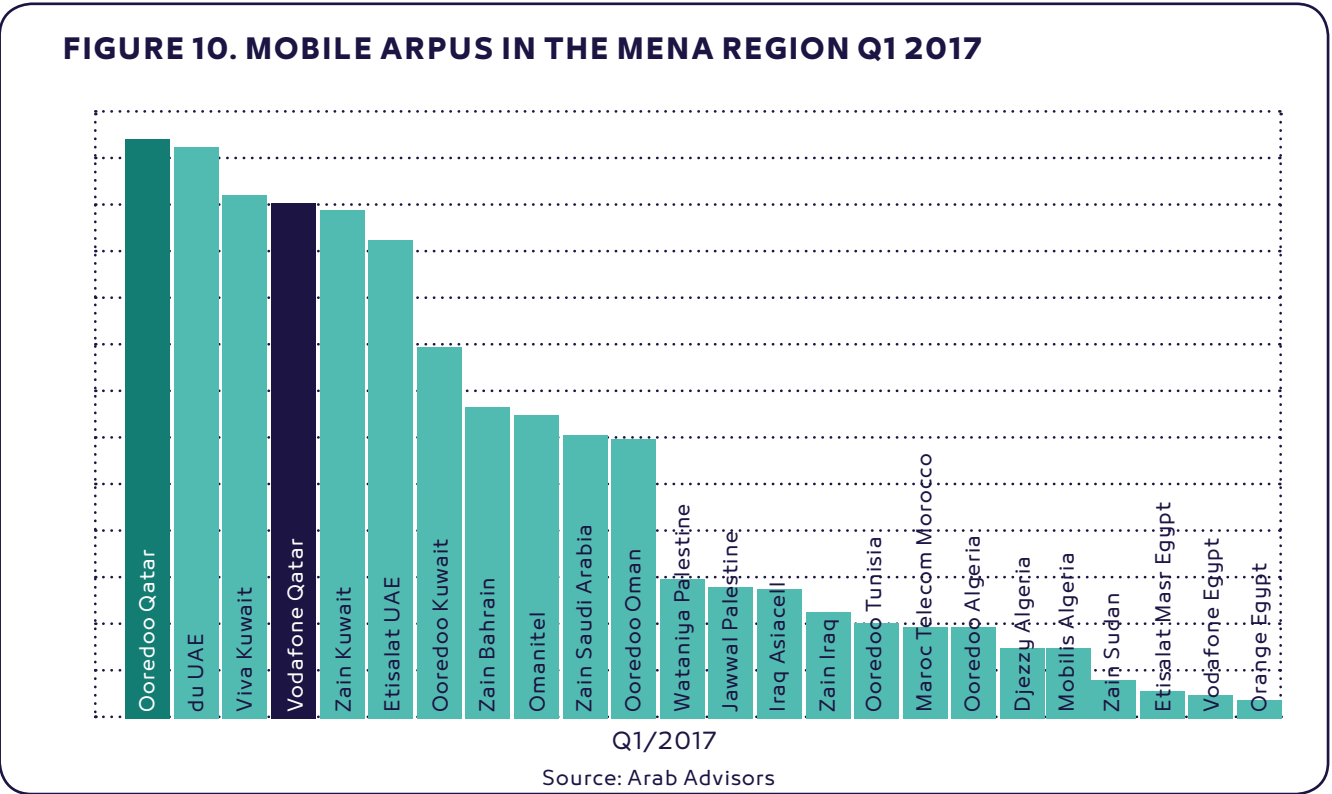
ARPUs in Qatar, the UAE and Kuwait remain on a similar level, while non-GCC Arab countries are substantially lower. This profound difference in ARPUs is mainly due to the relative size of GDP and service levels.

Historically, Ooredoo has experienced higher profitability than Vodafone. See Figure 11 for a comparison of the financial results of the two Service Providers.

Because Vodafone continuously did not make a profit, CRA did an economical study and took some actions that may improve Vodafone's profitability, like for example, its mobile license was extended from 20 to 60 years resulting in decreasing annual amortizations of immaterial assets from QAR 400 million to an estimated QAR 100 million.

FIGURE 11. POPULATION, TOTAL SUBSCRIBERS AND REVENUE FOR FIXED AND MOBILE MARKETS
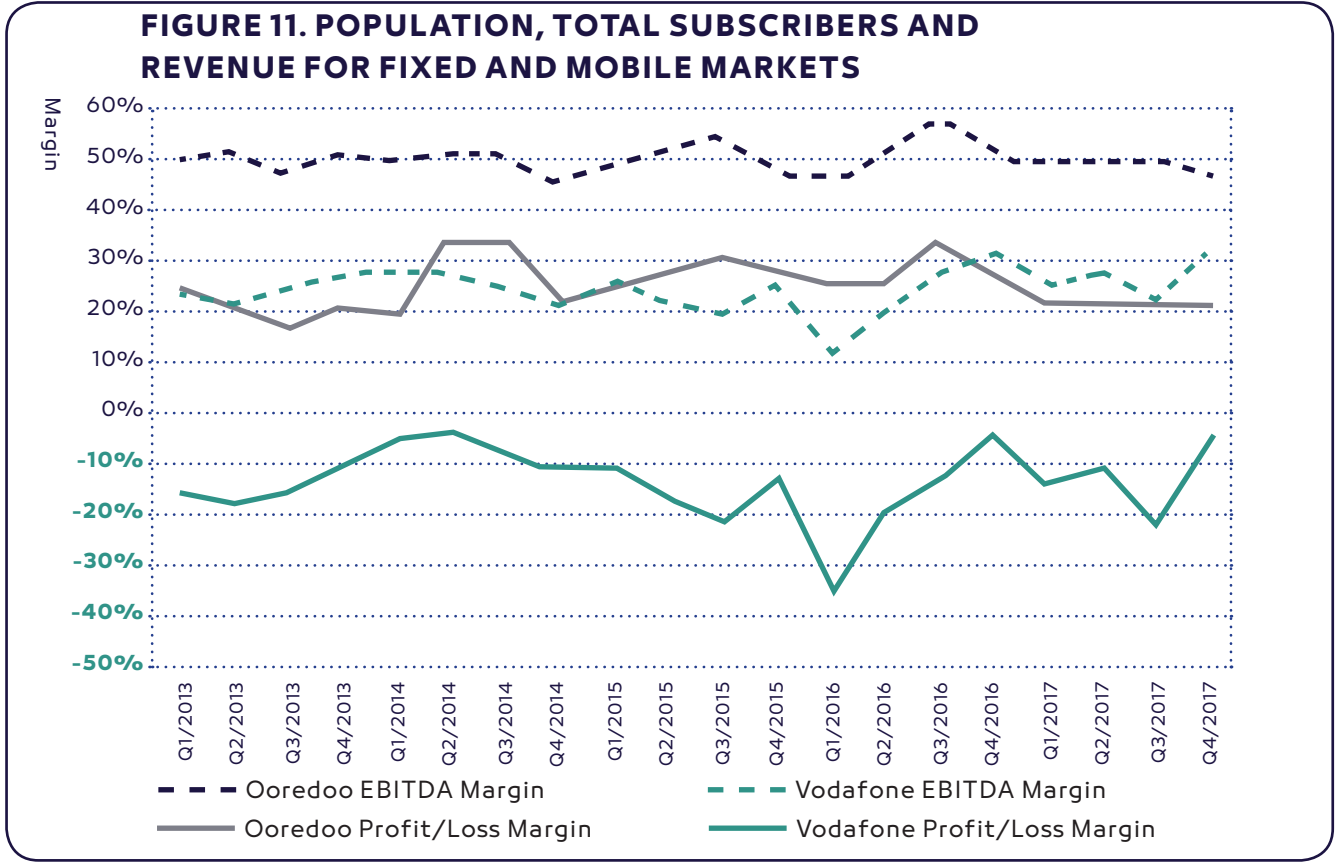
Source: Service providers' financial data; CRA estimation and calculation. Ooredoo's quarterly profit margin from Q4/2016 onwards is estimated, as Ooredoo has ceased publishing profits on a quarterly basis.

CRA'S RESOLUTION OF TELECOM CONSUMERS' COMPLAINTS 2017

TOTAL NUMBER OF **COMPLAINTS** RECEIVED

1203

NUMBER OF **INVALID COMPLAINTS** RECEIVED

490

PERCENTAGE OF RESOLVED **COMPLAINTS**

95%

PERCENTAGE ALLOCATION FOR MOBILE AND FIXED LINE **COMPLAINTS**

74% MOBILE SERVICE COMPLAINTS

26% FIXED LINE SERVICE COMPLAINTS

PERCENTAGE OF TOP 3 COMPLAINTS SUBJECTS OF MOBILE SERVICES

1. **BILLING/CHARGES ISSUES 56%**

2. **SERVICE DISCONNECTION 11%**

3. **PREMIUM SMS SERVICE 8%**
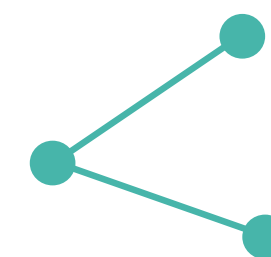
TOP 3 COMPLAINTS SUBJECTS OF FIXED-LINE SERVICES

1 SERVICE DISCONNECTION **65%**

2 BILLING **14%**

3 DELAY IN INSTALLATION **12%**

TELECOM CONSUMER COMPLAINTS AND INQUIRES

- 713 Valid Complaints – 95% resolved
- 74% Mobile Service Complaints
- 26% Fixed Line Service Complaints
- 1,786 Inquiries

COMPLAINTS RESOLUTION AND AWARENESS CAMPAIGNS

It is our absolute priority to monitor and continually improve both our own service provision and that of Qatar's telecoms providers. This starts with measuring the number and nature of all consumer complaints, and addressing them. In 2017, we received 1,786 inquiries and 1,203 consumer complaints. Once investigated, 713 complaints were deemed valid. We work hard to close out complaints satisfactorily, and in 2017 95% were successfully resolved.

74% of valid complaints related to mobile services and 26% to fixed line. For mobile, 56% related to billing issues, 11% to service disconnections and 8% to Premium SMS services. For fixed line, 65% related to service disconnections, 14% to billing and 12% to installation delays.

So we can maintain the highest delivery levels to Qatar telecom consumers, we have continued to engage with Qatar's service providers to discuss relevant and achievable solutions to the challenges they face. Equally, we have processes to ensure complaints are escalated if they have not been resolved within a defined timeframe. If consumers have a complaint that remains unresolved for more than 30 days or are dissatisfied with the resolution offered, they can lodge it directly with the CRA. We will then assess these against a set of defined criteria. We work with both consumers and service providers to establish validity, then find a fair and mutually acceptable resolution.

CONSUMER SATISFACTION SURVEY 2017

Collecting valuable consumer insights is key to us implementing actionable measures relevant to customers' views and concerns. We worked with an independent market research firm during 2017 to conduct the second large-scale CRA Consumer Satisfaction Survey. The first such survey was conducted in 2014. Its findings greatly enhanced cooperation between our organization and Qatar service providers to address consumers' challenges and concerns.

Looking forward, we are already planning topics for the 2018 survey agenda. They will include network coverage, network availability, voice quality and clarity, call drop rate, data services, ease of activation, mobile number portability and Internet speed.

COMPLAINT MANAGEMENT SYSTEM

In 2017, CRA developed a comprehensive system to manage all telecoms-related consumer complaints within Qatar, which is straightforward to use for all service providers and stakeholders. We have connected it with the CRA website, Arsel mobile app, email and social media, to directly capture consumer complaints and inquiries and loop them in to an integrated complaint handling process. This will be fully up and running during 2018.

The system tracks complaints from initiation to closure, enabling us to monitor service provider performance, and enhance the consumer experience through the way complaints are handled and processed. Consumers can lodge their complaints and get updates electronically once the system is integrated with the CRA website and Arsel applications.

ARSEL APP

One of CRA's key initiatives has been our award-winning Arsel mobile app. Through Arsel's extensive range of features, consumers have a user-friendly direct communication channel to voice feedback and concerns through an easy-to-use interface. They can check any network coverage issues reported in their area, their Internet speed, and report these directly to us.

As part of our Complaint Management System above, users can also lodge complaints against service providers using accurate location-based information. They can follow-up on their complaints, send relevant documents and receive updates.

By analyzing collected measures/data collected through Arsel, we can manage the enhancement of service provider delivery within Qatar.

CONSUMER AWARENESS ALERTS

We take our responsibility seriously in bringing any aspects of consumer protection to telecoms users, and in 2017, we continued to be active in this respect. We conducted extensive awareness campaigns and outreach events to ensure consumers know their rights and responsibilities, and how we can help them.

As part of this initiative, we published awareness alerts on topics such as roaming, scam calls, monitoring data usage, and protecting personal information against potential risks.

As a point to note, telecom consumers can contact us in a variety of ways: through email, our 24/7 hotline number (103), our Arsel mobile application, tweeting directly to @CRAqatar, using the CRA online complaint form or by visiting our headquarters at Al Nasr Tower B.

We summarize our 2017 alerts and the dates they were issued in the paragraphs below.

RANSOMWARE MALWARE

In May 2017, the world saw a sudden and devastating ransomware malware, which attacked more than 99 countries over two days and continued to proliferate. The Ministry of Transport and Communications (MOTC)'s Qatar National Information Security Center (Q-CERT) acted swiftly, cautioning all entities and institutions in Qatar against the risks.

Q-CERT published several advisories and security tips on precautionary measures and the necessary actions to take in the case of a malware infection. A team of Q-CERT specialists was on alert to contain/eradicate any reported infections by the malware.

PROTECTION OF PERSONAL INFORMATION

Through our 103 hotline, media reports and social media comments, we were alerted to an increase in complaints regarding scam calls. Significant numbers of consumers reported receiving scam calls through apps such as WhatsApp and Viber, from people claiming to represent their service provider asking for private details such as QID numbers, bank account details, passwords and PIN codes.

To address this, in May 2017 we issued a news alert for consumers to protect their personal information against potential risks. We alerted consumers to take caution that these calls are illegitimate. We advised that service providers in Qatar do not contact them through WhatsApp or any similar VoIP applications.

We will continue to caution consumers in this respect against sharing their personal details to avoid risking fraudulent activity.

Typically, scammers allegedly representing telecom service providers call consumers to notify them about 'winning' a large financial prize in a raffle draw. The aim of the scam is to discover personal information from the receiver such as bank account details in order to 'transfer the prize money' to them.

ROAMING PACKAGES

Our timely alerts and reminders are designed to help consumers make informed decisions when using roaming packages and services available to them while travelling out of the country. Despite this, we typically receive a high volume of complaints from consumers related to roaming following the holiday season. Hence in June 2017, coinciding with the summer vacation season, we issued an alert that consumers should familiarize themselves with their service providers' roaming packages and services if they plan to use their Qatari SIM cards aboard.

Both the service providers operating in Qatar have products catering to travelling consumers. However, it remains important for us to highlight the consumer's responsibility in understanding the terms and conditions of their specific package, the cost of their roaming services and the process to monitor usage.

DATA PACKAGES

The issue of data packages applies equally to roaming services and local data use. Both Qatar's service providers have a variety of data packages. But consumers should also be able to familiarize themselves with the data package that best suits their needs, monitor their data allowance and understand the related terms and conditions such as Fair Usage Policy.

In August 2017, we issued a consumer alert to increase consumers' awareness about their rights and responsibilities in terms of data usage and to improve their experience of communications services across Qatar.

SOCIAL MEDIA AND ADVERTISING AWARENESS

We continued to conduct regular social media awareness campaigns during 2017 on important topics that concern telecoms consumers. These included data roaming, scam calls, spam messages and consumer rights and obligations.

We also launched our first major advertising campaign to create more awareness about our organization's role and mandate, and how it assists telecom consumers in Qatar. The campaign included advertisements on City Center Shopping Mall, Karwa double decker buses, and mupis (advertising light boxes) on selected streets. The campaign's key components were our hotline 103, and .qa domain registration services.

TELECOMMUNICATIONS LAW

In 2017, amendments to the Telecoms Law were enacted (Law No. 17 of 2017). The new law is based on the fact that CRA has now taken over the role of what was ICTQATAR General Secretariat in its entirety. Its three main aims are to:

- Clarify that any references to ICTQATAR General Secretariat now mean CRA
- Clarify the roles and responsibilities between CRA and MOTC
- Establish a penalty committeewhich grants CRA enforcement powers over Qatar's seven licensed service providers, as named in the Market Development & Competition section

REGULATION AFFAIRS & COMPETITION CONSULTATIONS

During 2017, we published a number of areas, all based on encouraging and maintaining competitive pricing. While consultation and orders as shown were completed in 2017, these are ongoing concerns which we regularly revisit and review. They are published in consultation with service providers and other relevant stakeholders. For 2017 they are summarized below and on the following page:

COST OF CAPITAL

In May and September 2017, we consulted with service providers on what they need to charge consumers to yield a 'fair' rate of return on their investment, otherwise known as the 'cost of capital'. Following these two rounds of consultations, in December we set the pre-tax cost of capital at 10.45% according to Order CRARAC 2017/12/06. We set this using the international best practice method known as the Weighted Average Cost of Capital.

RETAIL TARIFF

Service providers are obliged to submit their retail tariffs, or consumer prices, for our approval before introducing them. In 2017, we issued three such orders to Ooredoo (the country's dominant service provider) against Fiber Broadband Services in July (CRARAC 2017/07/18), October (CRARAC 2017/10/22) and November (CRARAC 2017/11/07).

MARKET DEFINITION AND DOMINANCE DESIGNATION

This is a framework for identifying the dominant service providers within the market, then establishing the reporting requirements they need to submit, so we can monitor the market and ensure sufficient regulation. Following a consultation process we carried out with service providers in 2016, an appropriate framework was agreed. In May 2017, the new reporting framework, CRARAC 2017/05/02 was issued. Service providers have followed the new format since.

COST ACCOUNTING AND ACCOUNTING SEPARATION

This determines the profit service providers yield across different markets. Markets in this case are the different telecoms segments such as retail (consumer and business), wholesale (where service providers sell services to each other), fixed and mobile. In August, we issued Order CRARAC 2017/08/21 to Ooredoo for the Closure of the Regulatory Accounting System for Financial Year 2015 (RAS 2015) and additional requirements related to RAS 2016. We had issued the same order for previous years.

ACCESS AND INTERCONNECTION

To provide integrated services to consumers, service providers also need to integrate with each other, so their services can communicate. This includes fixed and mobile termination, and interconnection links. Through the Access and Interconnection framework, we can regulate the price one service provider charges another, known as a wholesale charge, to access its network. In September (CRARAC 2017/09/27) and December (CRARAC 2017/12/13), we held consultations with service providers on Setting Wholesale Charges for the years 2018 to 2020.

AUTOMATED SPECTRUM MONITORING AND FREQUENCY MANAGEMENT SYSTEMS

Our first notice came in January 2017 with the launch of two milestone systems – both designed to ensure the seamless management and monitoring of radio spectrum usage across Qatar.

Through our Automated Spectrum Monitoring System (ASMS) and Automated Frequency Management System (AFMS), we are able to achieve the highest quality of radio services. These systems identify and eliminate sources of interference that degrade public or private telecommunication networks.

They are monitored by our team of CRA experts and coordinated through the National Monitoring Center (NMC), which accesses, monitors and controls servers in four Fixed Monitoring Stations and two Mobile Monitoring Stations across the country.

As mentioned in the Serving Consumers section, we want to optimize existing applications for spectrum users. We have now fully digitized the process through our portal, which has become the main interface for all applicants: **www.e-spectrum.cra.gov.qa.**

To help us maximize the effectiveness of the new systems, we encourage all consumers of radio communication devices to submit all their spectrum license requests through the portal, and report any interference issues or concerns through our CRA Hotline – 103, or via email at **spectrumaffairs@cra.gov.qa**

SPECTRUM MONITORING QUALITY OF SERVICE AUDIT

In 2017, Spectrum QoS Team completed benchmark the Coverage and Quality of Service levels offered by the Mobile Service Providers Ooredoo and Vodafone. It covers Key Performance Indicators (KPI) of the services viz. Voice calls, Short message service (SMS) and Data service offered to the consumers.

Audit conducted during busy hours (Morning – Night) on working days, audit covered all streets and highways, frequently accessed off-road routes popularly used for fishing and camping seasons, Major Pedestrian Areas and Indoor locations during the measurement phase from May 2017 to December 2017 utilizing 3864 man-hours to complete the data collection. Findings then summarized based on huge quantity of samples for each KPI.

Summary of the 2017 Network Audit finding can be found in CRA website in addition to an interactive web portal that show the collected samples locations on Map.

CRA shall continue to monitor the network performance of both operators on a regular basis in the coming years. It is in the process of establishing a robust Quality of Service Framework that will ensure that the services provided to the consumers in Qatar are among the best in the world.

MISLEADING ADVERTISING CLAIMS

In April 2017, we issued an order to both Ooredoo and Vodafone regarding misleading claims. This followed Ooredoo's claims of being 'Qatar's best network for six years in a row' as voted by 'actual customers'.

We found the statement did not meet the compliance requirements of Clauses 30, 31, 37 and 48 of the Advertising Code, and that Ooredoo was in breach of the CRA Decision and Order dated August 5, 2015 on 4G and Network related Misleading Advertising.

We requested that Ooredoo remove all the advertising, marketing, branding and promotional materials related to the speed, coverage and network claims from the various media channels. We also requested both Ooredoo and Vodafone to ensure strict compliance with the CRA Regulatory Framework when quoting research, surveys and statistics, with specific reference to Clause 48 of the Advertising Code.

VIOLATION NOTICES TO RETAILERS

For the safety of consumers and businesses within Qatar, we are continuously proactive in monitoring the illegal sale of telecoms equipment and devices. In this regard, our technical inspectors carried out a round of inspections across retail outlets in May 2017. In particular, they targeted popular locations that sell these devices including malls, souks, commercial areas and neighborhood grocery stores.

These routine inspections are crucial to ensure that consumers are buying certified telecoms devices in compliance with the law, as customers may lose their rights if they buy unlicensed goods. Commercially registered companies in Qatar who want to import radio and telecoms devices and equipment are required to gain the necessary prior approvals from CRA, have the correct import authorization licenses, type-approval and customs clearance certificates.

Approvals are mandatory to ensure the equipment meets the right safety and technical standards. Such equipment includes, but is not limited to, mobile phones, wireless local area networks and short-range devices.

The May 2017 inspection resulted in 159 written violations for shops selling telecoms devices and equipment without having the required license. The most common violations were shops selling mobile phones without licenses. We issued notices for these outlets to regularize their licenses within a specified period.

In November 2017, we conducted a similar round of inspections on 300 retailers, which resulted in 98 violations. This yielded a very positive result, with notice served to just 30% of the shops inspected, compared to 74% the previous April.

INVESTIGATION INTO VODAFONE OUTAGE

On 18 July 2017, Vodafone customers were left without access to voice calls and data services because of a network outage. It started around 3.30am and was partially restored later that evening. The CRA took immediate steps to engage with Vodafone and to provide some assurance to customers that the network problem was being investigated and that all parties were working endlessly to rectify the problem.

We requested Vodafone to provide a detailed investigation report within three days, addressing violations of service continuity and customer information obligations stated in its license.

Within the report, we requested Vodafone to address the main cause of the outage, the nature and extent of its impact on customers, steps taken to resolve the issue, and the measures and procedures put in place to avoid future outages. Vodafone was also bound by its license to provide customers with appropriate compensation for the service disruption. The CRA further took necessary steps to confirm that customers had received some compensation for the interruption in services.

While Vodafone had its own experts working on the matter, the CRA conducted an independent assessment of the cause of the outage.

CRA reports concluded that the outage was due to fault in a main server during a routine upgrade operation.

To ensure that the technical concerns around the network failure was fully addressed and to act on the recommendations of the findings from the investigation, the CRA issued a Decision and Order to Vodafone on October 24, 2017. The Order set out in some detail the various steps and measures Vodafone would be required to implement to its network going forward.

In this regard, Vodafone had fully co-operated with the CRA, and together were able to agree a plan of action on how the network issues could be resolved. A specified time frame was established for this process. Since then Vodafone has worked extensively towards achieving this plan of action and has demonstrated to the CRA that these measures have been successfully implemented.

GUIDELINES ON USE OF NUMBERS FOR M2M/IOT

In July 2017, we finalized the requirements of numbering resources for emerging services such as machine-to-machine (M2M) and the Internet of Things (IoT). We provided both Ooredoo and Vodafone with the draft version of the guidelines and necessary steps for their allocation.

To ensure the adoption of national numbers for M2M and IoT-type services, we have given service providers the option to use either the national numbering plan or International Telecommunication Union (ITU) numbers, as M2M/IoT services demand different governance than normal consumer numbers.

ADDITIONAL FREQUENCIES FOR SHORT-RANGE TECHNOLOGIES

As part of our mission to ensure the provision of advanced, innovative and reliable ICT services across Qatar, it is critical that there is enough spectrum to accommodate the rapidly evolving technological environment. In July 2017, we issued revisions to the Class License for Short Range Devices (SRDs).

The changes specifically related to Annexure 2 of the class license, and proposed the addition of new frequency bands for SRDs such as wide range of machine-to-machine (M2M) and Internet of things (IoT) applications, in response to numerous recent advancements in these technologies. The additional frequencies were allocated to allow for a greater variety of short range devices being sold and used in the country, ultimately for the benefit of consumers.

The revision was designed around enabling stakeholders to introduce new technologies and devices in the market and be better prepared for the future demands. A separate section within the revision covered wireless access systems, including radio local area networks (WAS/RLANs), the corresponding authorized frequency ranges and maximum allowed output power.
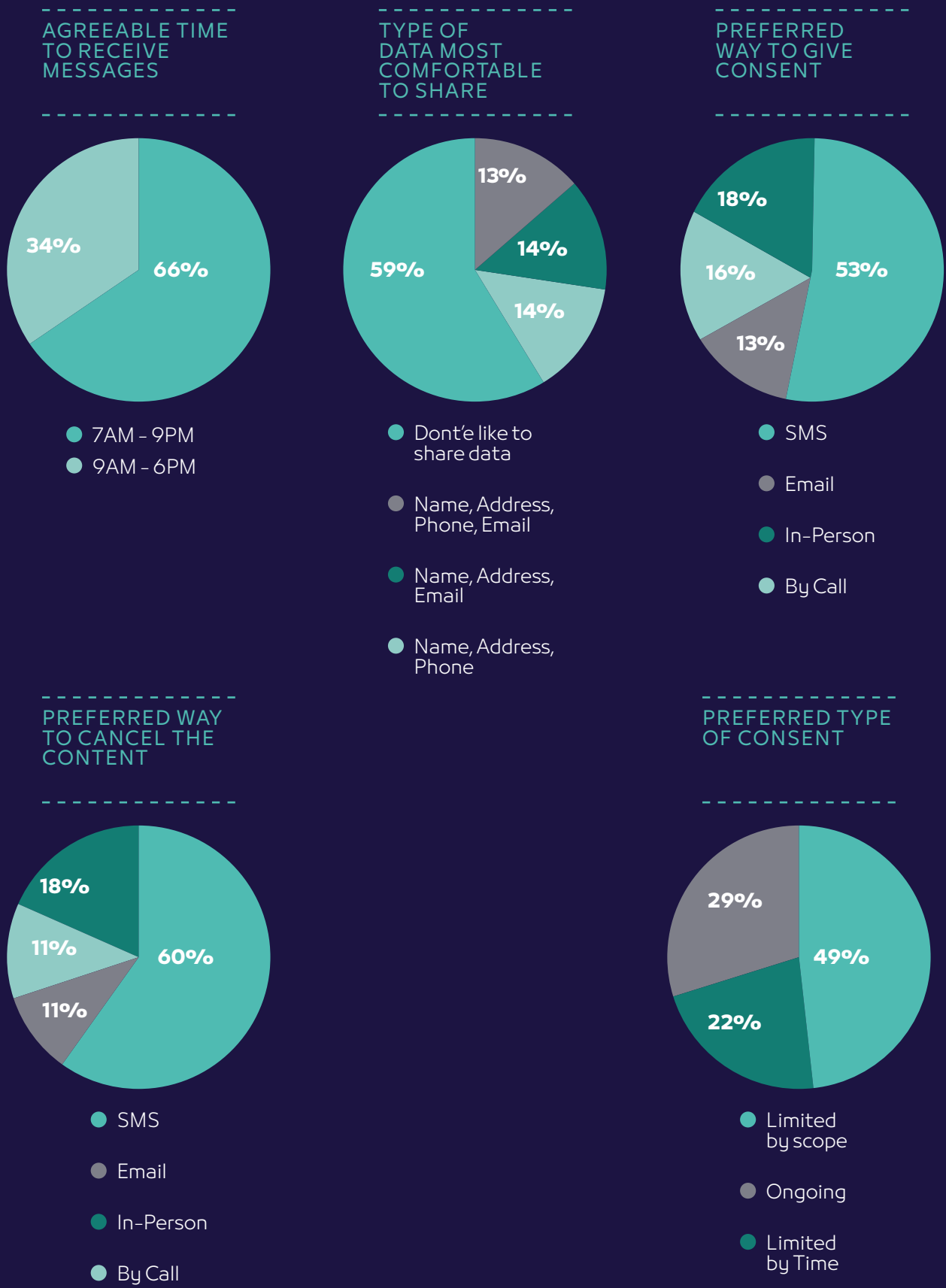
Public consultation was a crucial part of the process, allowing us to understand and consider the needs of all stakeholders in an organized and transparent way. Interested stakeholders were given until August 16 to comment on the proposed changes published on our website.

SOCIAL MEDIA SURVEY ON SPAM

AGREEABLE TIME TO RECEIVE MESSAGES

34%
66%

- 7AM - 9PM
- 9AM - 6PM

TYPE OF DATA MOST COMFORTABLE TO SHARE

13%
14%
14%
59%

- Dont'e like to share data
- Name, Address, Phone, Email
- Name, Address, Email
- Name, Address, Phone

PREFERRED WAY TO GIVE CONSENT

18%
16%
13%
53%

- SMS
- Email
- In-Person
- By Call

PREFERRED WAY TO CANCEL THE CONTENT

18%
11%
11%
60%

- SMS
- Email
- In-Person
- By Call

PREFERRED TYPE OF CONSENT

29%
22%
49%

- Limited by scope
- Ongoing
- Limited by Time

PUBLIC CONSULTATION ON REVISED SPAM REGULATION

With the large number of complaints we have received, unsolicited or 'spam' electronic messages have continued to be a cause of frustration for many Qatar consumers. As we mentioned in the Serving Consumers section, they included fraudulent emails which claimed to be from reputable companies, designed to trick individuals into revealing personal information.

In December 2017, we initiated a public consultation on the Spam Regulation we first drafted in December 2016. In the spirit of transparency and collaboration, we invited all stakeholders and interested parties to provide their comments. Accordingly, we made amendments that align the Regulation more closely with the Data Privacy Law published by the Ministry of Transport & Communications (MOTC) in December 2016.

The 2017 revision was designed to reduce the number of complaints about spam, direct marketing, and cybercrime lodged with ourselves and service providers, with the main aim of enhancing the overall experience of consumers in Qatar.

The amended 2017 regulation set out the particular obligations of service providers and users of electronic communications for direct marketing purposes. It expanded on the issues of consumer privacy, personal data and cybercrime, in accordance with the relevant Qatar regulatory frameworks. The regulation is now undergoing a legal review.

USE OF UNAPPROVED WIRELESS DEVICES

As mentioned in the Serving Consumers section, in October 2017 we issued a public notice to create awareness about certain wireless devices not purchased in the State of Qatar. Whether through personal use or otherwise, these may cause disruption and degradation in Qatar's licensed mobile networks, coverage and general service quality.

These devices include cordless phones, wireless headsets and microphones operating on DECT 6 standards (1900MHz), as well as RFID devices, and mobile signal boosters or repeaters. While they are purchased overseas, they still operate on frequency bands exclusively allocated for mobile networks in Qatar.

We explained that that import, sale or use of mobile signal boosters or repeaters which enhance mobile coverage must be compliant with CRA standards and is allowed only through licensed telecom service providers in Qatar.

The notice outlined that the import, sale and use of such devices are illegal, that we can identify their use through our monitoring systems and will take the necessary action, including confiscation.

In the same notice, we highlighted that we can issue a Class License for the use and operation of short range devises (SRDs). These include RFID devices such as wireless access control for parking gates and doors. We also pointed out however, that these devices are only permitted for use within the authorized frequency bands and power levels, and that the specifications are available in Annexure 2 of this Class License on our website. We noted that the frequency band 900MHz is assigned exclusively to service providers and should not be used on SRDs.

PUBLIC TELECOMMUNICATION SERVICES ON-BOARD AIRCRAFT

With the growth of worldwide 'gate-to-gate connectivity', we launched a public consultation in November 2017 with revisions to the Class License for the Provision of Public Telecommunication Services On-Board Aircraft. We gave interested stakeholders until December 10 to comment on the proposed changes published on our website.

The current class license, issued in March 2014, authorized operators of aircraft registered in Qatar to provide public telecoms services, Internet access, GSM mobile voice calls, SMS and mobile data accessed via satellite roaming services, but only when the aircraft is flying at least 3000 meters above sea level. This had been since been successfully operated without causing harmful interference to either aircraft operations or terrestrial commercial wireless networks.

The 2017 modifications to the Class License were proposed to enable authorized aircraft operators to provide wi-fi connectivity below 3000 meters. It was based on testing which showed that this can happen without causing harmful interference as described above.

We published the 2017 consultation document to hear the views of telecoms service providers, key stakeholders and other interested parties about whether the amendments should be applied and extend to GSM mobile voice and data services.

As with previous years, we hosted and sponsored a number of events throughout 2017. These were a combination of landmark industry events and consumer outreach events. We were also proud to win two prestigious awards in 2017, which we present along with some of our most key events below:

EVENTS

QITCOM

March was a particularly busy month for CRA-related events, starting with our Gold Sponsorship of QITCOM, Qatar's biggest digital event. The event was an invaluable platform for visitors to get direct, hands-on experience of our public services and initiatives. These included our e-Spectrum Services Portal, Qatari domain registration, award-winning mobile application Arsel, and mobile number portability.

Most notably, our offer of complimentary Qatari domains received an overwhelming response. More than 400 local businesses and individuals submitted their applications for domains under .qa extensions.

Our experts took part in a plenary session about the future of smart cities. They discussed smart cities concept, related challenges and opportunities for sustainable growth.

TELECOMMUNICATION & DIGITAL MEDIA FORUM

From March 22 to 23, we co-hosted the International Institute of Communication's Telecommunications and Digital Media Forum (TDMF) in Qatar. The Forum brought together both regional and international policy and decision makers tackling a range of issues. Some of the topics included stimulating investment in telecom and digital media innovation, content digitization, convergence, consumer protection, OTT services, net neutrality principles and encouraging competition. The Forum was well-attended by high-level dignitaries from GCC members states as well as regulators from around the world. Senior regulator representatives included those from Bosnia and Herzegovina, Germany, Hong Kong, Nigeria, Sweden, Switzerland, Tunisia, United Kingdom and Singapore, amongst others.

Amongst the panel speakers were private sector experts from Cisco, Dentons, Etisalat, Ericsson, Facebook, Nokia and Microsoft. The two days of the event were highly informative and productive for all concerned.

WORLD CONSUMER RIGHTS DAY

On March 17 and 18, we marked World Consumer Rights Day at an outreach event by launching our revamped award-winning Arsel app.

The occasion gave us an excellent opportunity to engage with telecom consumers in Qatar. Our team of experts was on hand to provide useful tips which helped telecom consumers better understand their rights and responsibilities, and further familiarize them with our complaints resolution process.

We were also able to give visitors the opportunity to lodge telecom complaints against their service providers onsite.

WORKSHOP ON COMPETITION SUPPORTING DEVELOPMENT & INNOVATION

As part of our Competition Framework Implementation Plan, in May we conducted a high-level workshop in collaboration with the Ministry of Economy and Commerce. The workshop brought together government entities and relevant stakeholders to discuss initiatives, challenges and benefits of competition in ICT and other sectors and how they can collaborate to nurture and encourage open and fair competition.

TELECOM CONSUMERS OUTREACH EVENT

As mentioned in the Serving Consumers section, we continued to conduct ongoing initiatives throughout 2017, aimed at educating consumers about their rights, responsibilities and issues related to their protection.
On December 9, we organized an outreach event in Aspire Park. Through the event, we were able to raise awareness amongst consumers about their rights and responsibilities, as well as roaming, spam SMS messages and scam calls. We did this through awareness activities, interactive screens and face-to-face consultations.

Taking the opportunity to gain valuable consumer feedback, we made a point at the event of connecting with consumers who follow our social media accounts. They gave us useful insights about our e-awareness campaigns and the topics they wanted to know more about.

AWARDS

BEST MOBILE APP FOR ICT SECTOR

In February, we were proud to win the Best Mobile App for ICT Sector award at the 8th Smart Government Excellence Awards Ceremony held by Pan Arab Excellence Awards Academy. We won the award for the newly upgraded version our Arsel app (meaning 'send' in Arabic), which is compatible with both iOS and Android platforms.

The app contains an extensive range of useful features such as network status updates, speed testing and notifications. Arsel also gives users the ability to check if there are any network coverage issues reported anywhere in Qatar.

Users can filter by service provider, and lodge complaints against service providers using accurate location-based information. They can also follow up on their complaints, send relevant documents and receive updates.

ARAB GOVERNMENT ACHIEVEMENT AWARD

In September we were delighted that one of our key 2017 initiatives, our e-Spectrum Service Portal, was recognized through an Arab Government Achievement Award from the Pan Arab Excellence Awards Academy.

We launched the Portal in January 2017 as the public interface of our Automated Frequency Management System (AFMS). It allows spectrum users to submit applications online for issuing, modifying, or cancelling their spectrum licenses.

The AFMS was designed in line with international best practices. It has since played a crucial role in the efficient management of Qatar's radio frequency spectrum.

Further information on our AFMS can be gained from the Published Plans and Licenses section.

We continue to initiate new projects, plans and infrastructure improvements in line with Qatar's 2030 vision of driving a knowledge-based information society.

Through our continued efforts to enhance the services we bring to our consumers, the Global Information Technology Report's (GITR) Networked Readiness Index 2016 from the World Economic Forum (WEF), ranked Qatar ranked 27th globally out of 139 countries in 2016 and second among Arab countries.

While we are proud to have achieved this, our benchmark aims stretch much further as we continually strive to bring new technologies, innovations and services to both businesses and communities.

Below and on the following pages we outline some of the initiatives we are working towards in 2018:

CONSUMER PROTECTION AND SPAM REGULATION

In addition to the customer services we outlined in the Serving Consumers section, we also developed our Consumer Protection Regulation. Currently in development, this will allow consumers to obtain clear, accurate and relevant information about service provider obligations.

When finalized later in 2018, the Consumer Protection Regulation will be a single regulatory instrument encompassing the various CRA-issued codes and policies toward consumer protection, such as the Consumer Protection Policy (CPP), Advertising Code, and Retail Tariff Instruction. Benchmarked against international best practice, its aim is to further enhance consumer confidence and their overall telecoms experience. It will also help service providers in delivering their obligations effectively and promptly.

Included within the above will be the issuance and publication of a new Spam regulation.

In July, we issued Decision No 2 for the Year 2017, "Organizing Consumer Complaints Procedures". We published it on our website to manage complaints handling procedures between the CRA and service providers.

5G SPECTRUM ALLOCATION AND CONSORTIUM

Qatar has been one of the leading countries for identifying spectrum bands for emerging 5G broadband technologies. We have initiated consultations with all service providers to formulate a 5G spectrum roll-out plan.

Following our discussions, we have developed a plan for rolling out the assignment of spectrum bands on a phase-wise basis during 2017 and will continue implementing it during 2018. This way, service providers can systematically conduct trials to identify and address any issues as they arise.

NEW POSTAL LAW

Within our scope of responsibilities, we are the regulator for the postal sector. Since 2016, we have worked in close collaboration with the Ministry of Transport and Communications (MOTC) on a new legislative process for this sector. Drafting was completed in 2017. The new law is based on a three-pronged policy:

- To clarify new roles and responsibilities between all relevant stakeholders (the authorities, Qatar Postal Services Company (Q-Post) and authorized courier services)
- To set the minimum requirements for postal services (named 'Universal Service Obligations)
- Introduce new regulations to promote competition in international express courier.

A key aspect to consider within the new law is the significant decrease of traditional mail globally, but at the same time providing a model for the postal sector as an increasing part of the e-commerce and digital economy.

FIXED NUMBER PORTABILITY

CRA is currently managing and regulating Mobile Number Portability that allows mobile subscribers to port and transfer their mobile numbers from one service provider to another while retaining their existing mobile numbers. Moreover, soon in early 2019 as this project is already ongoing, fixed numbers subscribers will be capable to do porting to fulfill and serve consumers' needs.

Fixed Number Portability will be an important component of a competitive telecommunications market. A liberalized, competitive market leads to greater innovation and enhanced services for consumers.

GDPR DATA PRIVACY

In line with the recently issued GDPR (General Data Protection Regulation) laws, we have updated our policy regulations from the previous Local Privacy Law. Our data protection is now in full compliance with the new international regulations while at the same time we are fully compliant with local privacy low issued on 2016 as well as other local security regulations and guidelines developed by QCERT like National Information Assurance policy.

SECURITY ENHANCEMENT OF QATAR DOMAINS REGISTRY

We are working to enhance domain name security by the end of 2018 by implementing the DNSSEC (Domain Name System Security Extension) protocol. The purpose of DNSSEC is to authenticate Internet traffic the DNS traffic in order to make sure end user receive their responses from the right sources.

ESTABLISHMENT OF IPV6 TASKFORCE

CRA, alongside with all government departments, non-government entities, service providers, and stakeholders, to implement IPv6 in Qatar.IPv6 is the most recent Internet Protocol version, which is specialized in numbering of cyber networks, in 2018 the transition from IPv4 to IPv6 will start in a phased manner.

MULTIPLE PROJECT HANDOVER

We are currently working with Ashghal Public Works Authority to build the infrastructure for 23 passive infrastructure (duct) projects. The projects will be handed over phase-wise between 2018 and 2021 for allocation to service providers, with the aim of ensuring all service providers have fair access to Qatar's telecoms infrastructure.

DEVELOPMENT OF TELECOMS INFRASTRUCTURE CODE

Previously, Qatar's building codes have not covered telecoms infrastructure codes and standards in details. By the end of 2018, CRA will issue the practiced standards required for passive infrastructure development, internal building wiring and mobile site construction. To this end, we are working collaboratively with an engineering clarification committee and the Ministry of Commerce to license consultants and contractors that work on telecoms infrastructure and internal wiring.

Thank you for taking an interest in the various initiatives, plans and orders we have issued during 2017, and the exciting developments we have planned for 2018 and beyond. We hope you enjoyed reading our 2017 Annual Report as much as we enjoyed writing it.