

Vodafone Technology

Investor Briefing

June 2021



Agenda

Welcome & introduction

p3

1 Our customer demand continues to accelerate

Johan Wibergh
Chief Technology Officer

p9

2 We have a strong technology roadmap

Scott Petty
Digital and IT Director

p18

3 We allocate capital to drive returns

John Otty
Group Financial Controller

p36

4 We are transforming to deliver growth

Johan Wibergh
Chief Technology Officer

p49

Appendices

p64

Vodafone Technology : A globally scaled operator



34 thousand
employees



>400 million
connected
devices



>140 million
NGN homes
passed



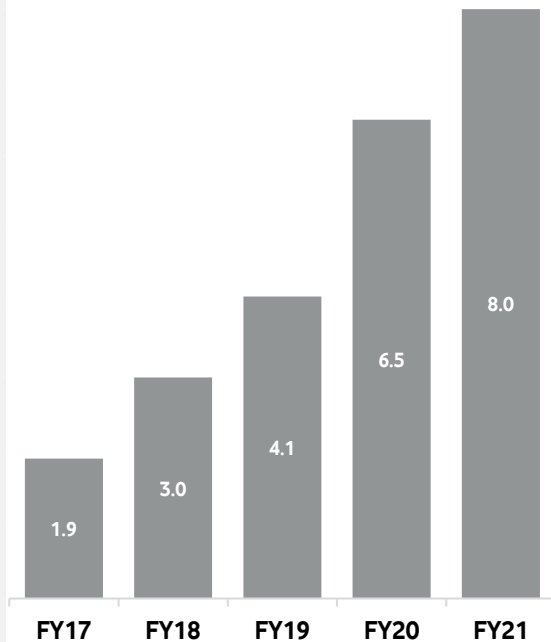
21
countries



1 : Our customer demand continues to accelerate

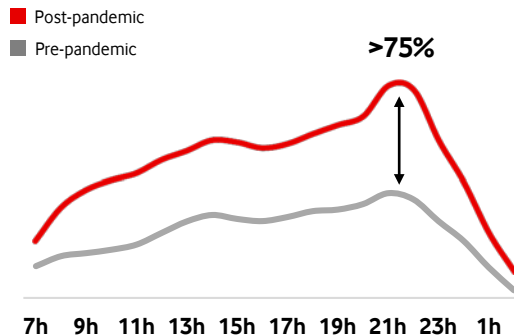
Customer usage is growing rapidly

Europe mobile smartphone data usage
(GB/customer/month)¹

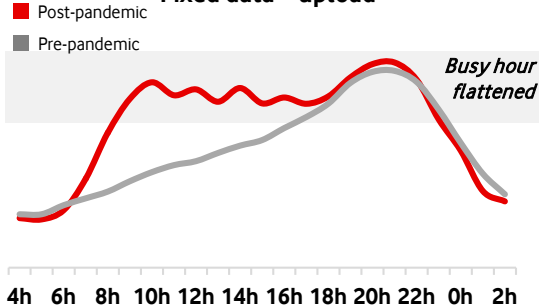


Networks are critical for work

Mobile data



Fixed data – upload



Demand drivers

Consumer



4K video streaming



Cloud gaming



Consumer IoT



Financial services



Download and cloud file storage



Video calling



AR/VR services

Business



Enterprise in the cloud



Big data/AI analytics

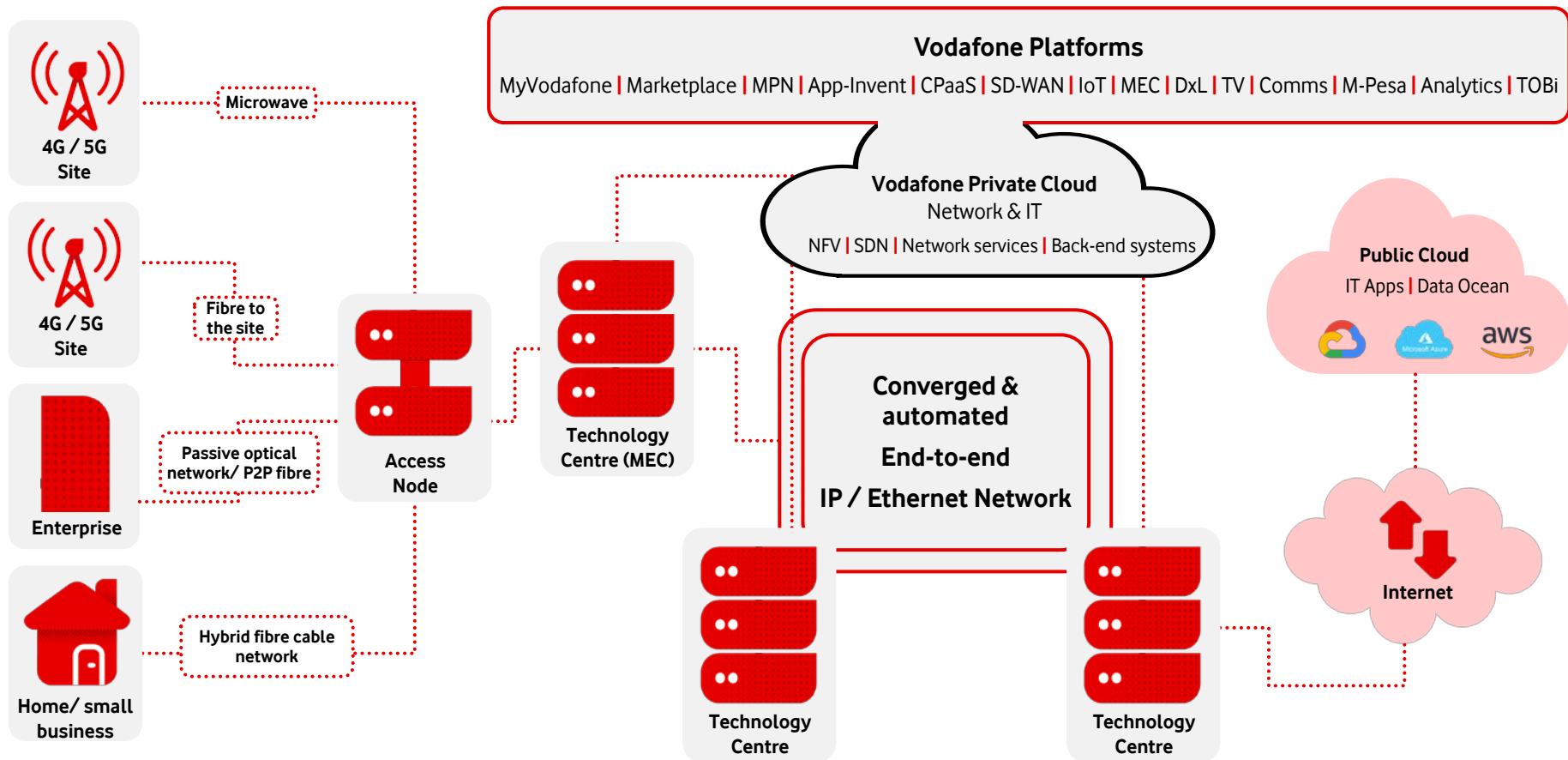


Unified communications



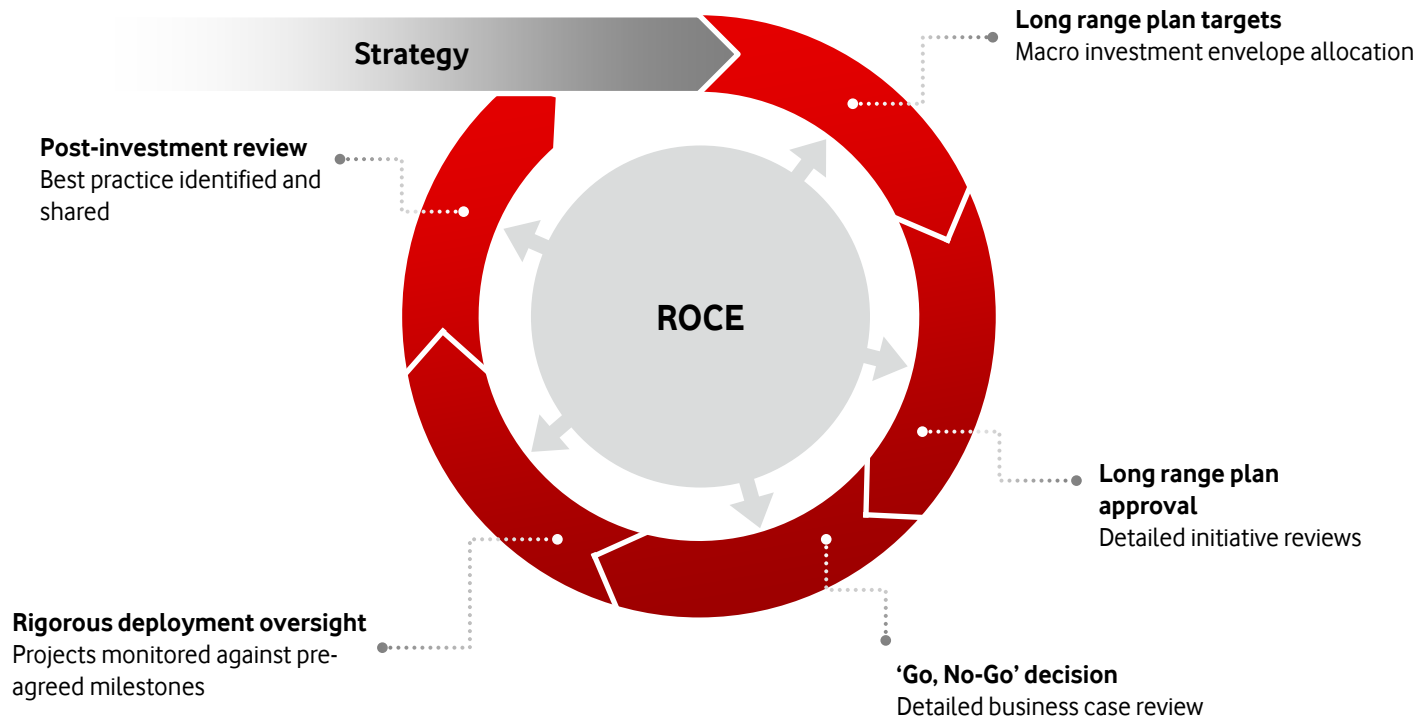
Low latency services

2 : We have a strong technology roadmap



3 : We allocate capital to drive returns

Capital allocation review process built around ROCE



4: We are transforming to deliver growth

Tech:2025

What we'll look like



Reliable, high-speed & efficient convergent networks



Always-on & zero-touch operational excellence



Most efficient and simplified operator



Product operating model & scaled platform architecture with standard APIs



Culture of innovation & collaboration, embedding leading practice

Our ambition



60% 5G built-right population coverage, >51m on-net gigabit homes in Europe



80% of network incidents automated end-to-end



Data volume growth met or exceeded by cost per GB reduction



50% reduction in product lead times



Enabling consistent revenue and ROCE growth

Our vision : The new generation connectivity & digital services provider

We connect for a better future

Our Purpose

Inclusion for All

Ensuring everyone has access to the benefits of a digital society

Planet

Reducing our environmental impact and helping society decarbonise

Digital Society

Connecting people and things and digitalising critical sectors

Our Vision

The new generation connectivity & digital services provider, growing in Europe and Africa

Our Strategy

Deep & trusted customer relationships



Best connectivity products & services



Leading innovation in digital services



Outstanding digital experiences

Enabled through Group scale & expertise



Simplified & most efficient operator



Social Contract shaping the digital society



Leading gigabit networks

The Spirit of Vodafone

Earn customer loyalty

Create the future

Experiment & learn fast

Get it done, together

1 : Our customer demand continues to accelerate

Johan Wibergh
Chief Technology Officer



Key messages : Our customer demand continues to accelerate

A

Our customer demand has accelerated over the last year

B

Cloudification of communication is driving data growth

C

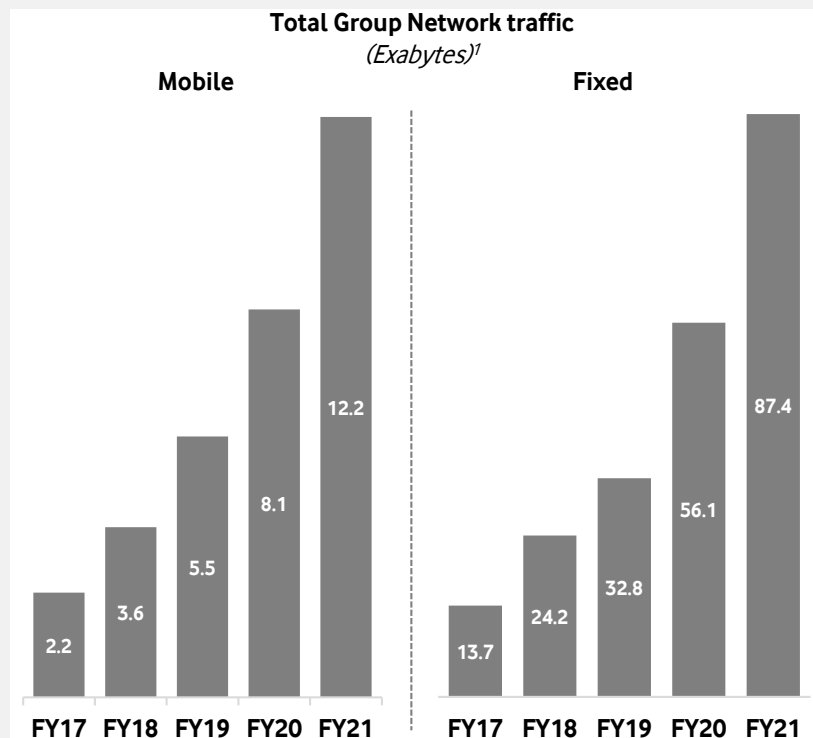
Device and service proliferation will drive further demand

D

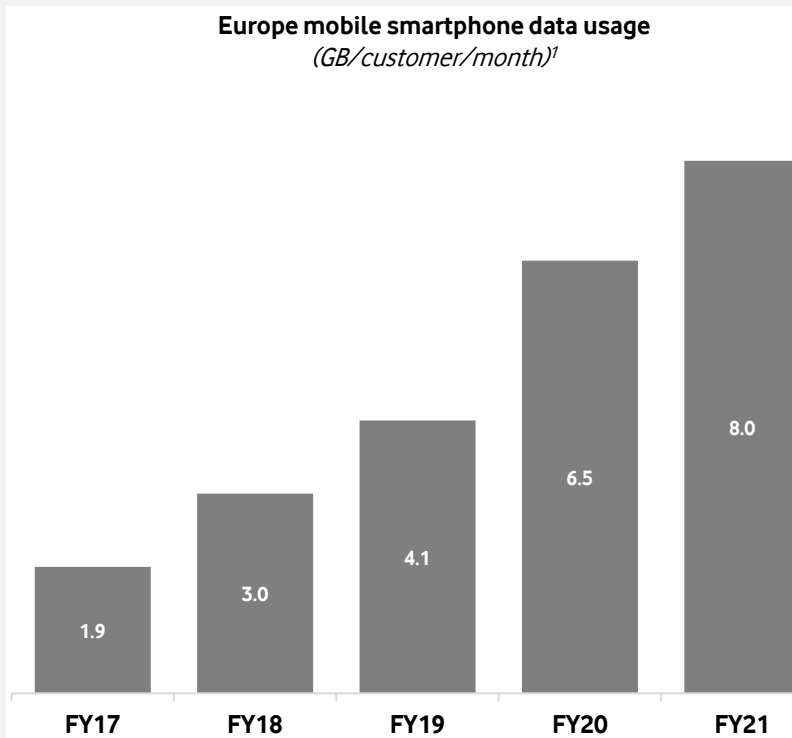
Connectivity and digital payments are shaping demand in Africa

A: Our customer demand has accelerated over the last year

Our network data traffic continues to accelerate



Customer usage is growing rapidly

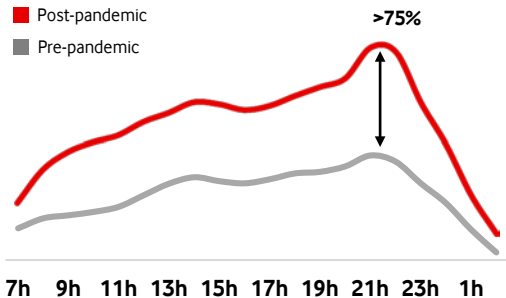


A : Our customer demand has accelerated over the last year

Peak demand has increased

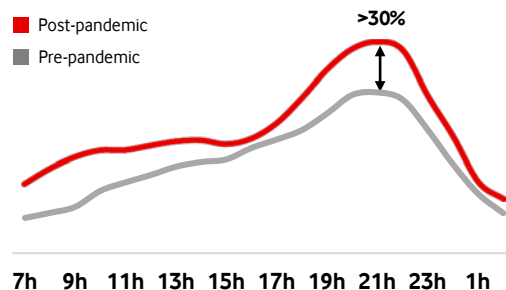
Mobile data

■ Post-pandemic
■ Pre-pandemic



Fixed data – download

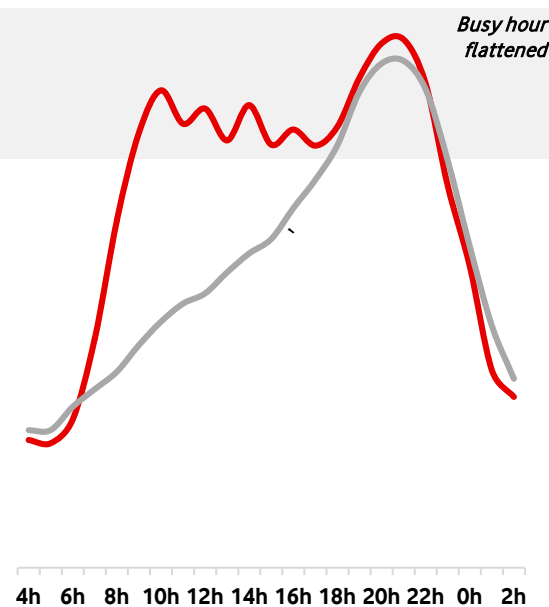
■ Post-pandemic
■ Pre-pandemic



Networks are critical for work

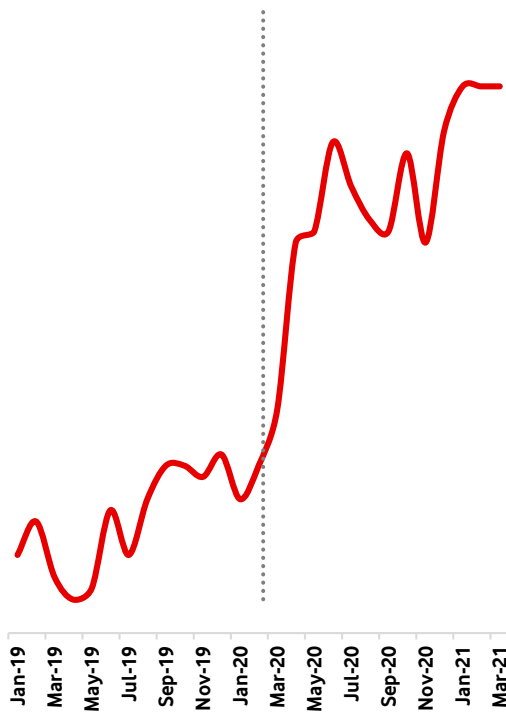
Fixed data – upload

■ Post-pandemic
■ Pre-pandemic



Customers are focused on reliability

Google searches for “Speed Test”¹



B: Cloudification of communication is driving data growth

Demand drivers

Consumer

4K 4K video streaming

Cloud gaming

Consumer IoT

Financial services

Business

Enterprise in the cloud

Big data/AI analytics

Unified communications

Low latency services



Download and cloud file storage



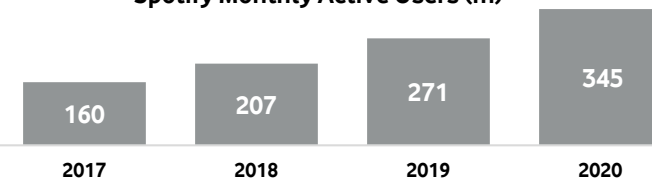
Video calling



AR/VR services

Music streaming operating at scale

Spotify Monthly Active Users (m)



1 hour of HiFi quality music: >500 Megabytes of data

Video streaming customers ramping up

Netflix customers in EMEA (m)



1 hour of 4K video: c.10 Gigabytes of data

Cloud gaming



Launched:
Nov 2019



Launched:
Feb 2020



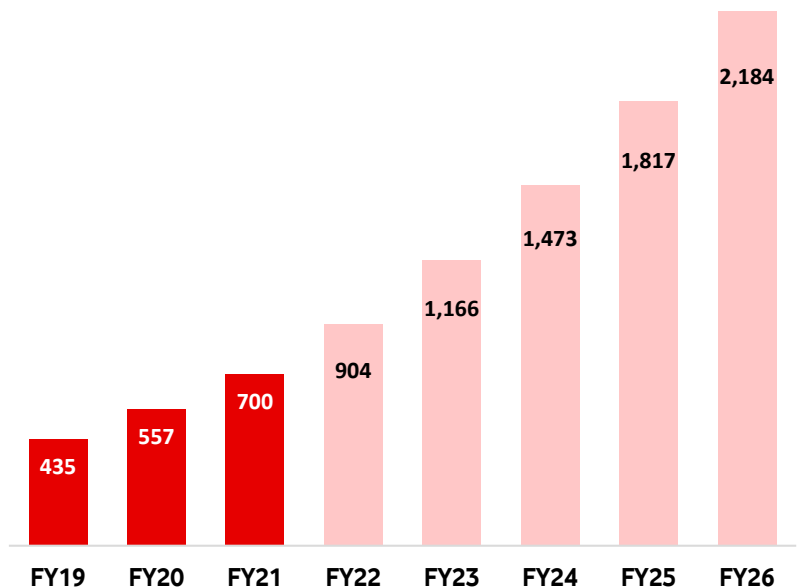
Launched:
Sep 2020

1 hour of 4K gaming: c.20 Gigabytes of data

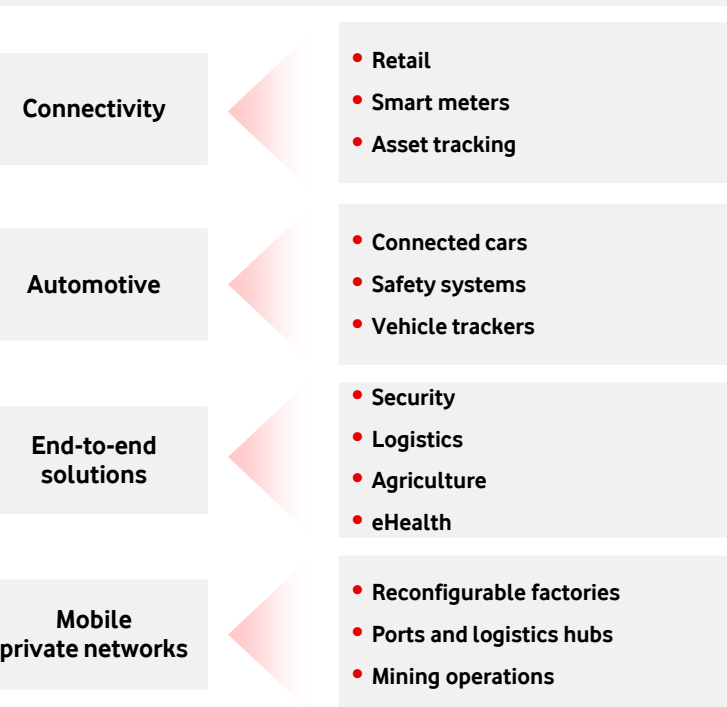
C: Device and service proliferation will drive further demand

IoT connections forecast to grow rapidly

IoT SIMs
(millions, globally excluding China)¹



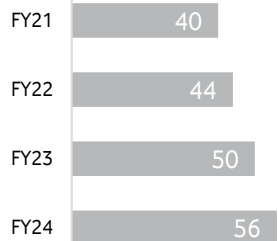
Driven by expanding scope of business IoT



C : Device and service proliferation will drive further demand

Business Cloud - €40bn market; 12% CAGR

Market size (€bn)

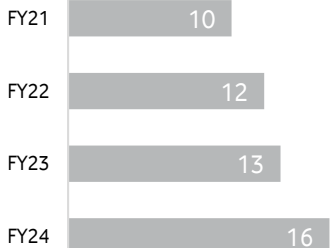


Growth drivers

- Managed hosting
- SaaS / Managed SaaS
- Multi-cloud
- Edge computing / low latency applications

Business IoT - €10bn market; 16% CAGR

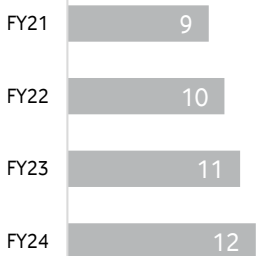
Market size (€bn)



Growth drivers

- Industry vertical solutions
- End-to-end solutions
- Mobile private networks

Market size (€bn)

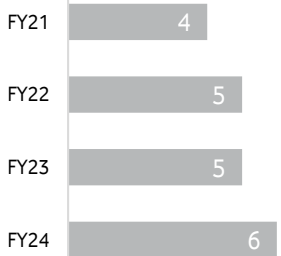


Growth drivers

- Digital collaboration tools
- Video
- Application integration
- AI-enabled support

Business Unified Comms - €9bn market; 12% CAGR

Market size (€bn)



Growth drivers

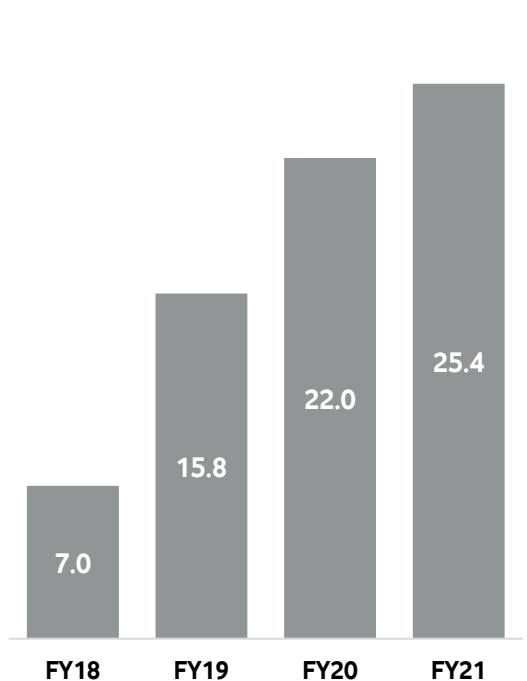
- Network security
- Security SaaS
- Workforce protection
- Managed security services
- Virtual SOC/CISO

Business Security - €4bn market; 12% CAGR

D: Connectivity and digital payments are shaping demand in Africa

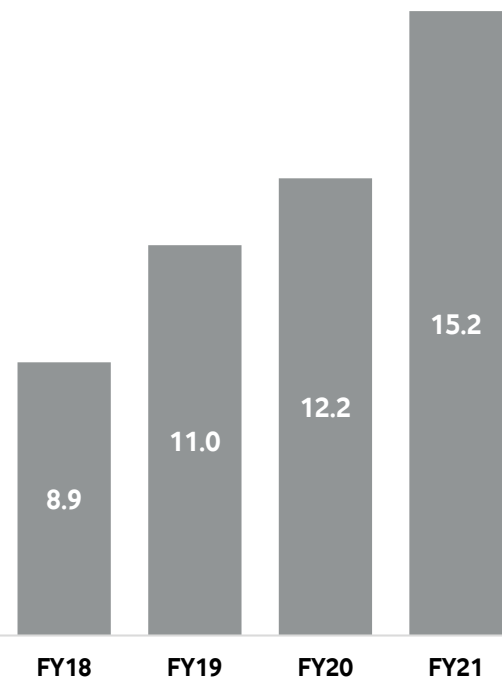
4G is still underpenetrated

Africa 4G penetration
(customer, %)¹



M-Pesa volumes are growing rapidly

M-PESA transaction volumes
(bn)¹



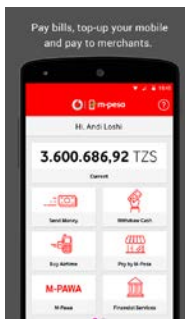
Our financial technology roadmap



- **VodaPay smartphone app** to launch in South Africa
- **Full service financial platform**, supported by strong partnerships

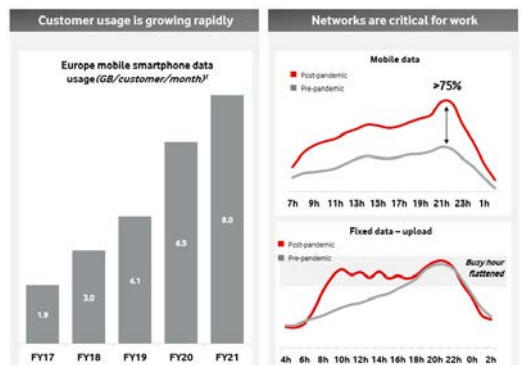
Platforms for both Consumer and Business

- **M-Pesa mini-apps** expand platform beyond payments
- **New areas** include insurance, loans, savings

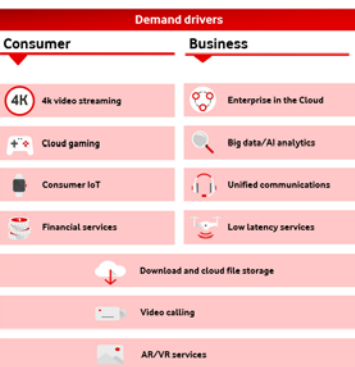


Summary: Our customer demand continues to accelerate

1 Our customer demand has accelerated over the last year



2 Cloudification of communication is driving data growth



B2B Cloud - €40bn market; 12% CAGR



B2B IoT - €10bn market; 16% CAGR



B2B UC - €9bn market; 12% CAGR

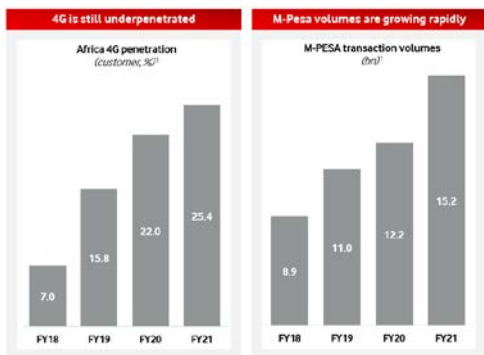


B2B Security - €4bn market; 12% CAGR



3 Device and service proliferation will drive further demand

4 Connectivity and payments are shaping Africa demand



2 : We have a strong technology roadmap

Scott Petty

Digital & IT Director

Key messages : We have a strong technology roadmap

A

Providing a leading mobile experience

B

Delivering gigabit fixed connectivity

C

Cloud native digital architecture for radical change

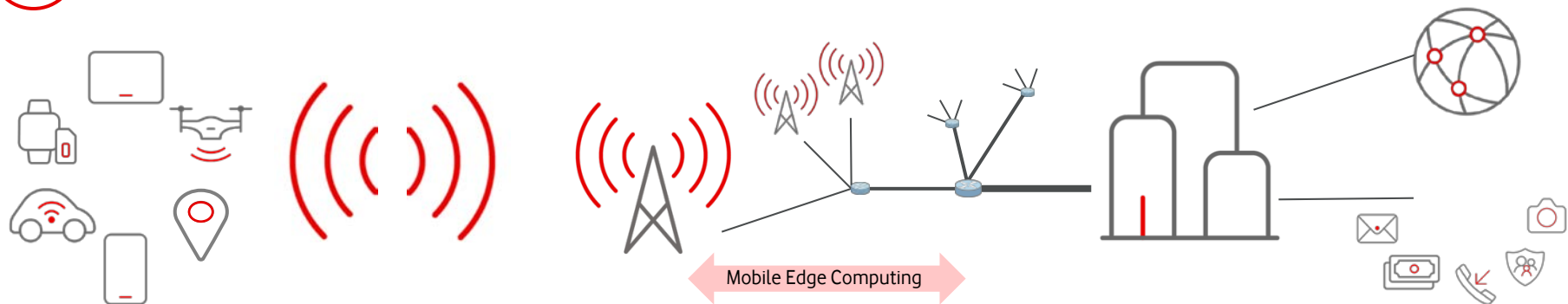
D

Advanced analytics allow zero-touch intelligent networks

A: Providing a leading mobile experience



How our mobile networks work



Wireless devices

- Devices transmit and receive signals over spectrum to and from radio base stations

>400 million devices

Spectrum

- The radio frequencies or airwaves over which data is transmitted

c.200MHz of spectrum per market

Radio base stations

- Transmit and receive signals to and from wireless devices
- Multiple base stations are known as the Radio Access Network (RAN)

169 thousand base station sites

Backhaul

- Transports data back to and from the core network, typically via a fibre connection

>80% of high-demand nodes with fibre

Core

- The smart part of the network
- Directs traffic around the network
- Configures the network for different use cases
- Identifies issues

2 pan-European NOCs

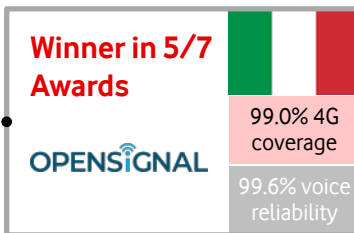
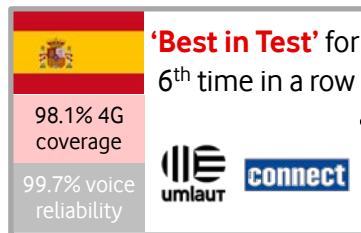
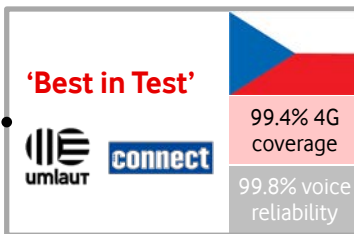
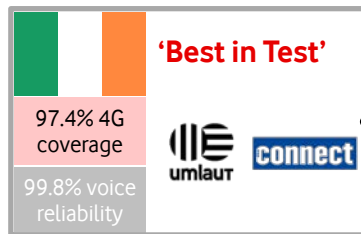
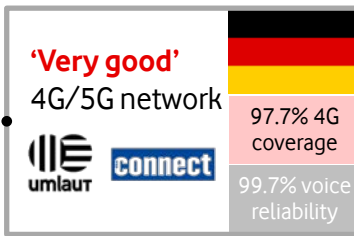
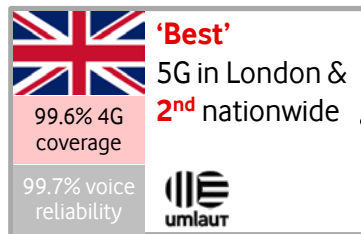
Services

- The core network provides a gateway to Vodafone services and to third-party services on the wider internet

>500 Global Vodafone services

A : Providing a leading mobile experience








One of the leading mobile operators in our markets



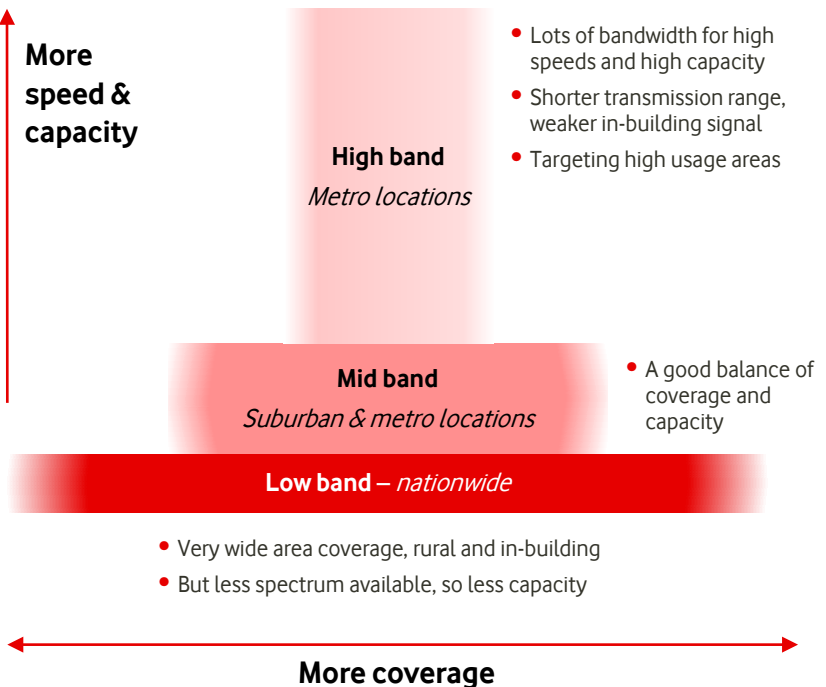
5G 240 5G cities in Europe

A : Providing a leading mobile experience

Strong spectrum holdings¹

	Low	Mid	High	Operators ²
	35%	34%	30%	4
	35%	24%	25%	4
	30%	20%	23%	4
	31%	29%	24%	4
	31%	28%	30%	3
	36%	39%	N/A	3
	37%	33%	36%	3

Across all three key bands



A : Providing a leading mobile experience

Managing technology evolution effectively

2G

- 'Thin' layer retained
- Legacy voice & IoT support

~~3G~~

- Accelerated phase out
- Spectrum re-farmed for 5G

4G

- Broadest coverage
- Wide handset support in Europe

5G

DSS

- Targeted deployments
- Lighting up additional spectrum

5G

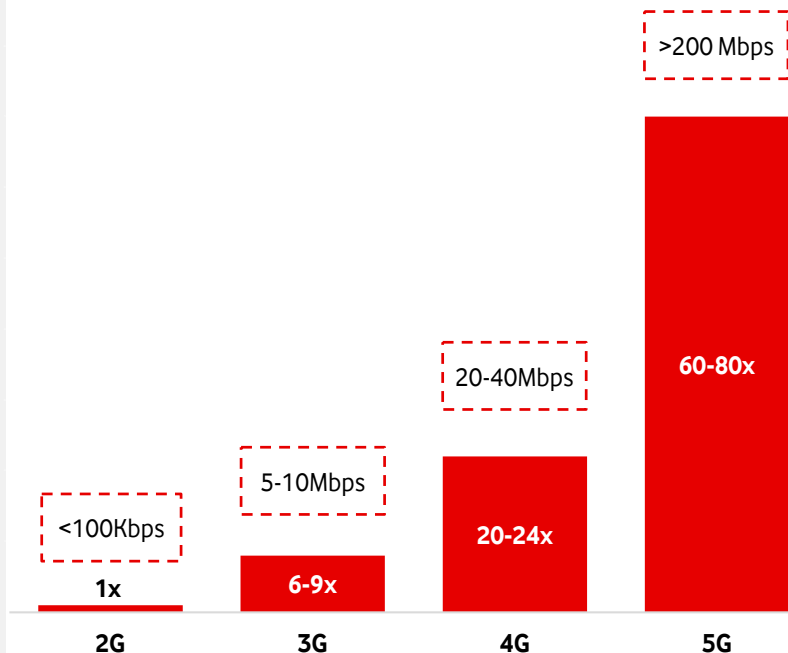
- Focus on 3.5GHz in urban/industrial areas
- Much higher capacity efficiency vs. 4G

Focusing on more efficient technology

Spectral efficiency compared to 2G

(multiple)

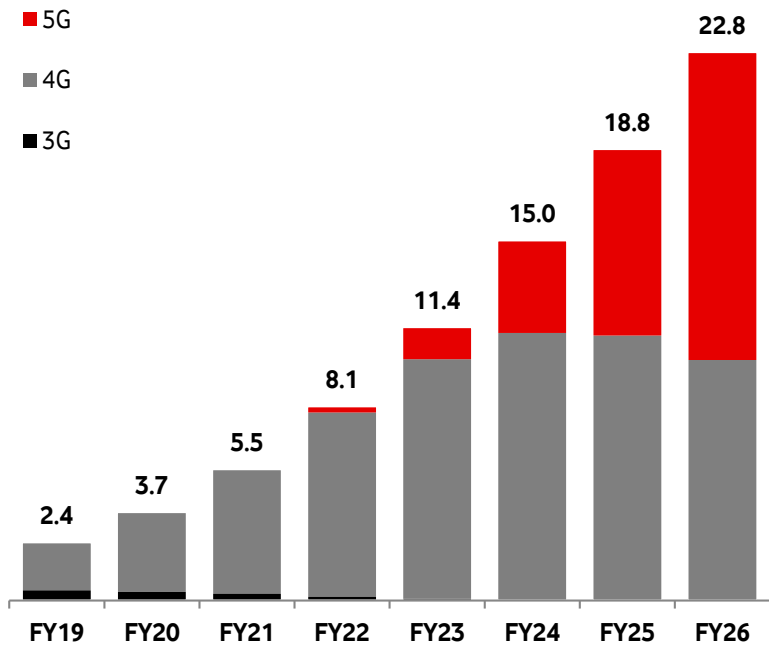
typical realised speed



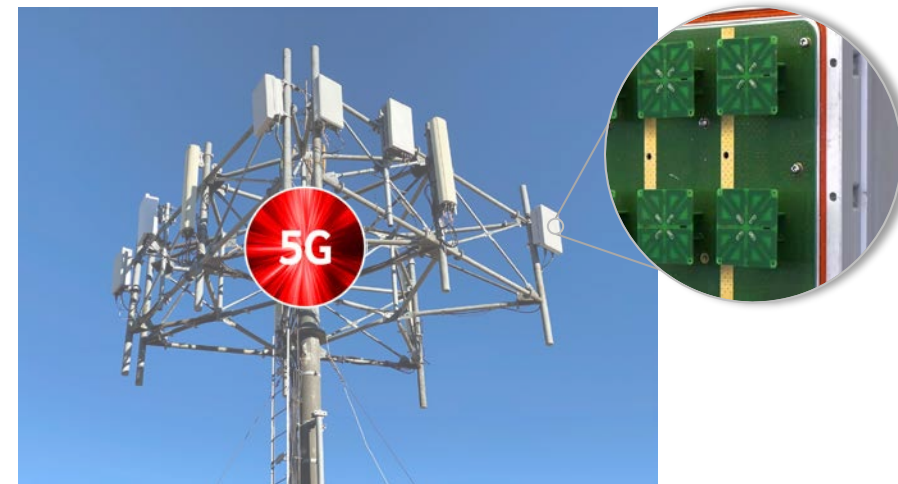
A : Providing a leading mobile experience

Future mobile data traffic growth served by 5G

Total mobile downstream traffic in Germany, UK, Italy and Spain
(Exabytes per year)



Supported by Massive MIMO efficiencies



- **Massive MIMO** on **3.5GHz** provide higher coverage and capacity, and better spectral efficiency, by spreading many antennas across a single device – e.g. arrays of 64 antennas
- **Signal-to-noise ratio** benefits of Massive MIMO means we can deploy 3.5GHz 5G on the same tower grid as used for 1.8GHz 3G
- **High reliability** and **greater efficiency** with 4-5x lower cost/GB compared to 4G, mainly because of Massive MIMO efficiency gains

A : Providing a leading mobile experience

Customer and investor demands

High speed



Low latency



High reliability



Broad coverage



Capex and Opex efficiency



Delivered through our 5G approach: 'Building it right'



Massive MIMO antennas and **high band spectrum** deliver **10x faster speeds than 4G**



New **5G Core** with network slicing and real-time latency edge computing



Network slicing provides dedicated resources to support critical applications



Low band spectrum deployed for wide area and deep indoor 5G coverage



Most efficient network with **4-5x lower cost/GB** than 4G

A : Providing a leading mobile experience

We are a European leader in 5G mobile private networks



- We leverage 5G to help industry digitalise and transform
- We provide significantly scaled private and secure IoT, with high speed, low latency, and high reliability enabling thousands of connections in a single site
- We open up new opportunities for autonomous digital operations in areas such as ports, mining operations, and reconfigurable factory production lines

Mobile private network key benefits



5G standalone core enabling network slicing and high efficiency



Real-time end-to-end latency built in



Secure private connectivity for critical systems and processes



Scaled private IoT capability with high reliability and full local control

A : Providing a leading mobile experience

We have established new network sharing models

Passive sharing only

Active sharing

(Active sharing outside biggest cities + passive everywhere else)

National active sharing

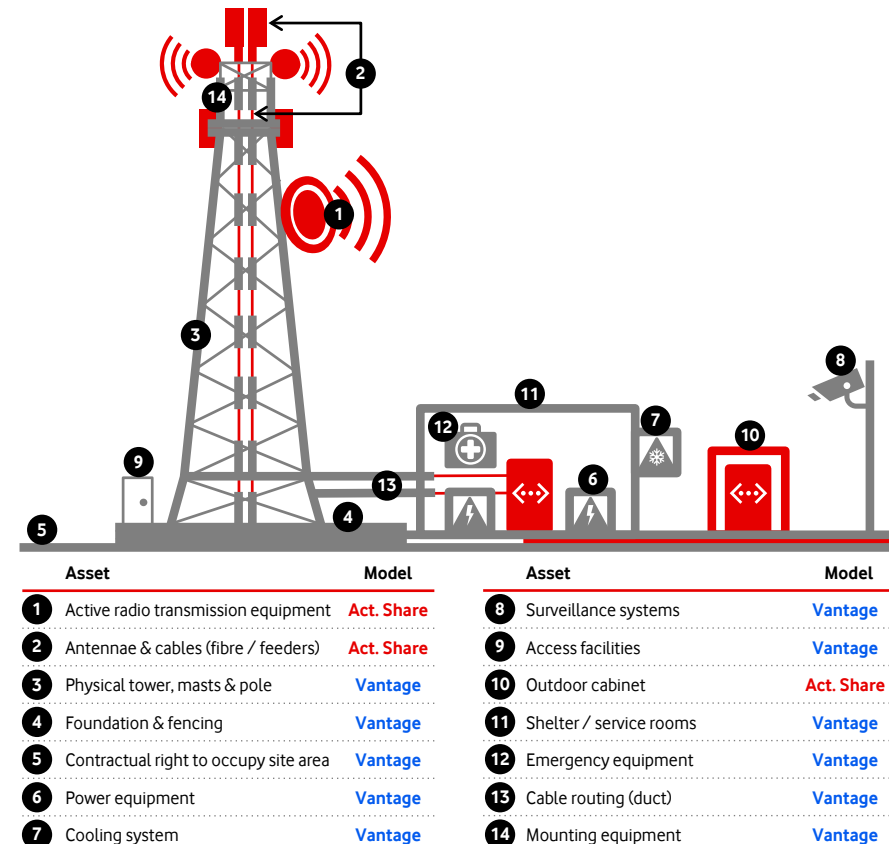
Full sharing (inc. spectrum)

Target model

- Improving asset utilisation by sharing our Radio Access Network infrastructure, whilst improving rural coverage
- No active sharing in major cities where capacity is key

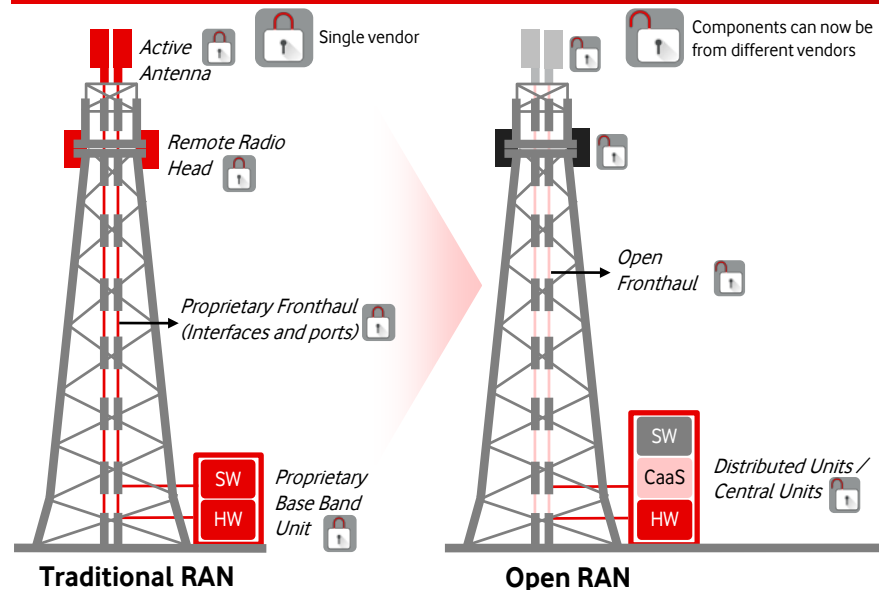
Vantage Towers

- 82,200 sites across Europe
- Improves asset utilisation through increasing the number of operators with active equipment on our towers in exchange for a fee







A : Providing a leading mobile experience

We are a founding partner of Open RAN



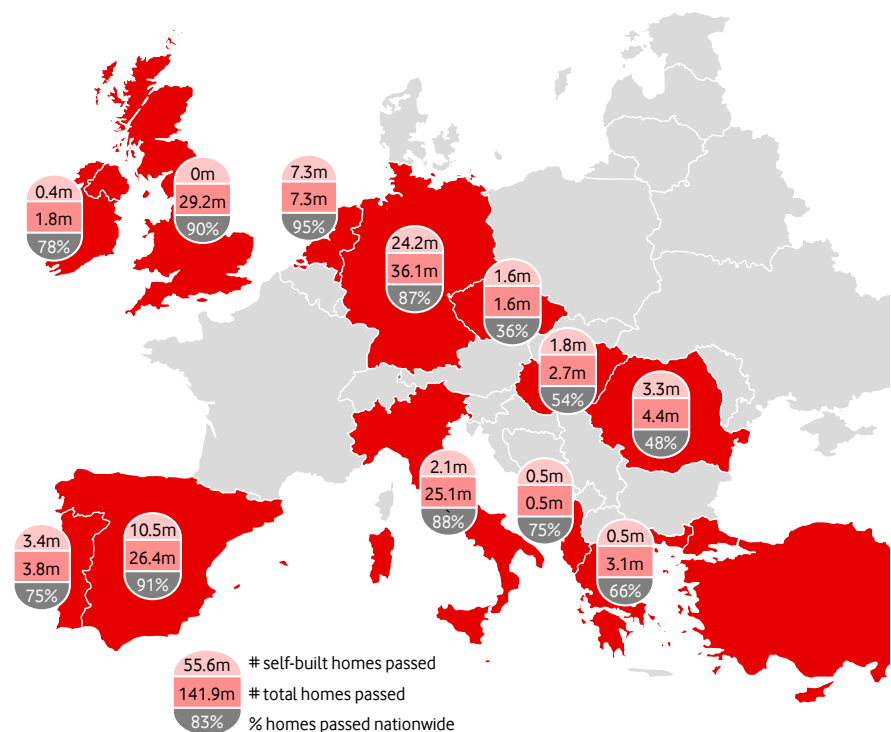
- Traditional vendor hardware (HW) and software (SW) is integrated; with no inter-operability with other vendors within the same RAN
- Open RAN separates hardware and software through a Container as a Service (CaaS) layer, and provides open interfaces between all key network elements. This enables third-party software to be embedded

Open RAN benefits

-  **Significantly grows vendor pool** by lowering entry barriers for specialised software developers
-  **Platform for innovation** with significantly accelerated development and specialisation
-  **General purpose hardware** processing platforms increase flexibility and reduce costs
-  **Flexible networks** with ability to upgrade and swap out individual components with ease

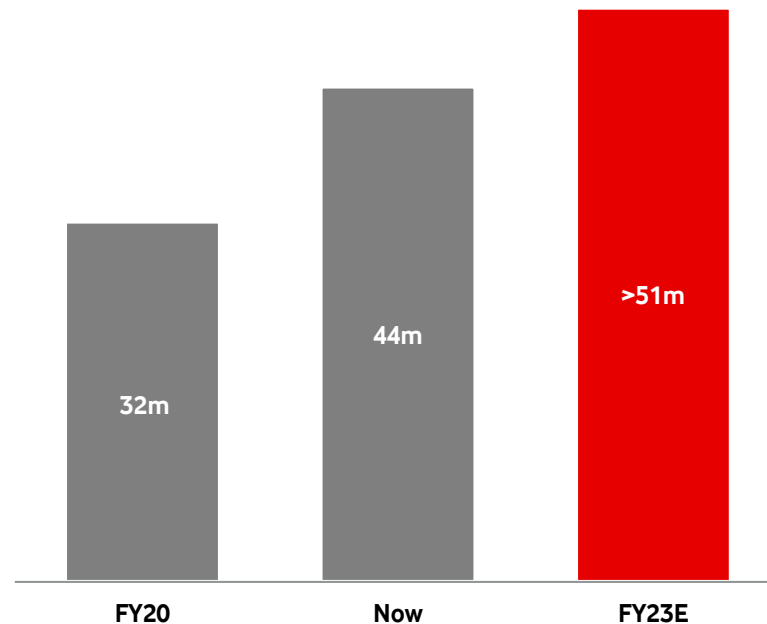
B : Delivering gigabit fixed connectivity

Over 140m NGN homes passed¹



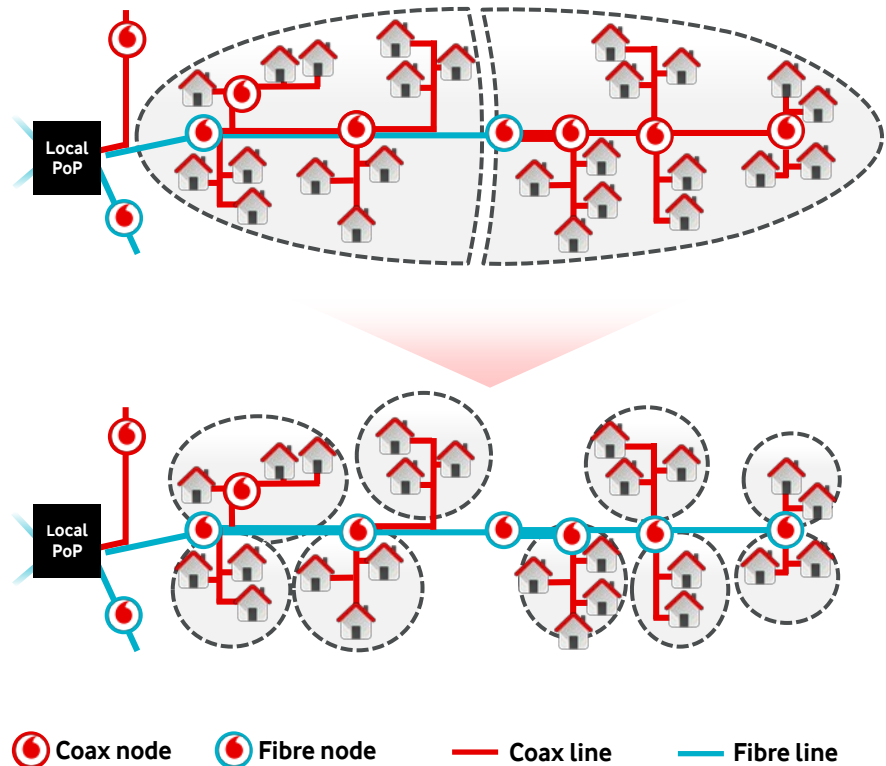
Rapid upgrade to gigabit speeds

Self-built homes passed with gigabit speeds¹



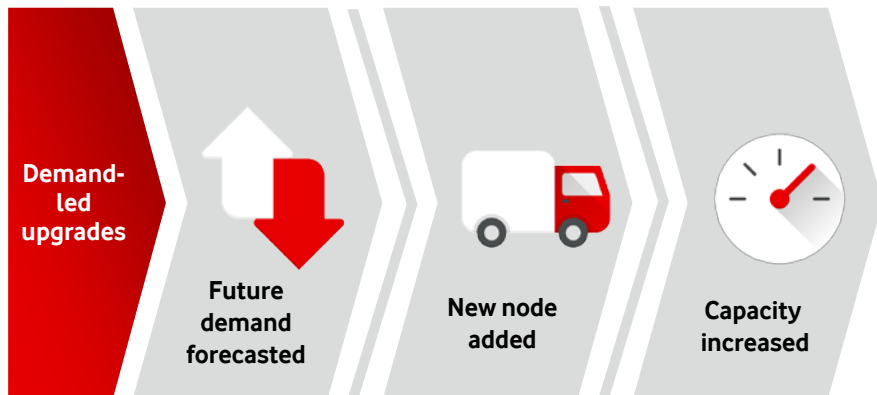
B : Delivering gigabit fixed connectivity

Building fibre deeper into our hybrid fibre cable network



A demand driven fibre upgrade path




- Fibre nodes deployed close to the customer
- High bandwidth coaxial cable used to connect the building to the node



Avoids rewiring customer homes, saving cost and customer disruption

B : Delivering gigabit fixed connectivity

A clear roadmap beyond 1 Gbps peak speeds

	Completion	Downstream speed	Upstream speed	
DOCSIS 3.0	 100%	500Mbps	50 Mbps	Product speed
DOCSIS 3.1	 >80%	1.8Gbps	100Mbps	
'High-split' 3.1	 <5%	>3Gbps	Up to 1Gbps	Network speed
DOCSIS 4.0	Test & validate	Up to 10Gbps	2 to 4 Gbps	

A strong upgrade path for our hybrid fibre cable network



DOCSIS 3.1 enables 1.8Gbps downstream speeds today



'High-split' DOCSIS 3.1 allows upstream network speeds up to 1Gbps by reallocating cable spectrum



Distributed cable architecture allows digital transmission, improving signal quality

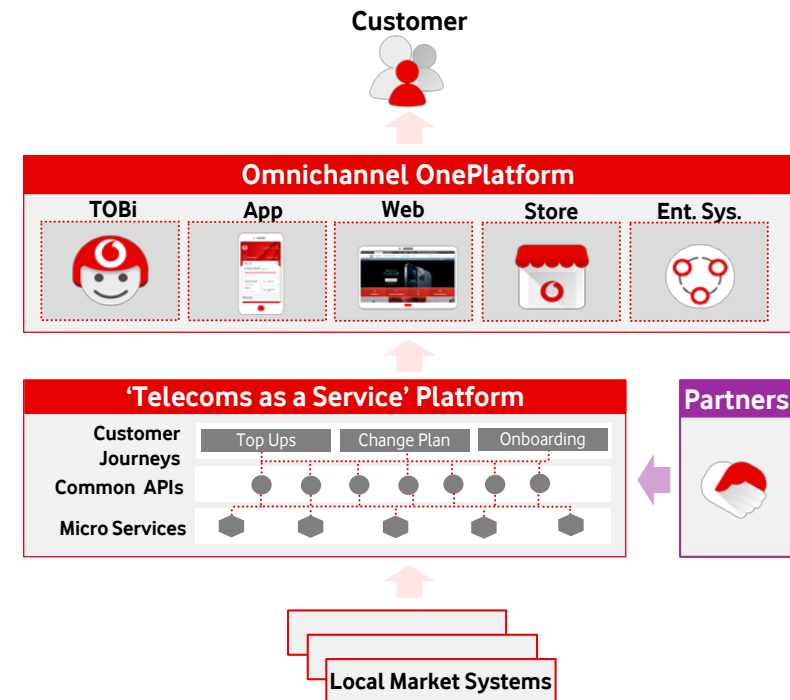
- DOCSIS 4.0 standard released in 2020
- Speeds up to 10Gbps
- Testing expected to begin from next year

C :: Cloud native digital architecture for radical change

Legacy approach to architecture



Tech2025 approach to architecture



Develop once, redeploy everywhere – Enabling efficiency and speed

C : Cloud native digital architecture for radical change



Scalability

- Moved from single-market servers to shared systems on the cloud

Ability to rapidly scale up to meet Consumer and Business demand

TOBi standardised across 11 markets



Open-source interfaces

- IT and Networks turned into platforms via open-source interfaces

Easier access for third parties, enabling new revenue generating opportunities

57% of IT applications virtualised



Single Data Ocean

- All Vodafone data moved to one central repository on the cloud

Larger datasets enable improved AI-based decisions

17 Petabytes of shared data, enabling >150 AI projects



Agile development

- Development moving from project to product based
- Developers embedded within commercial teams

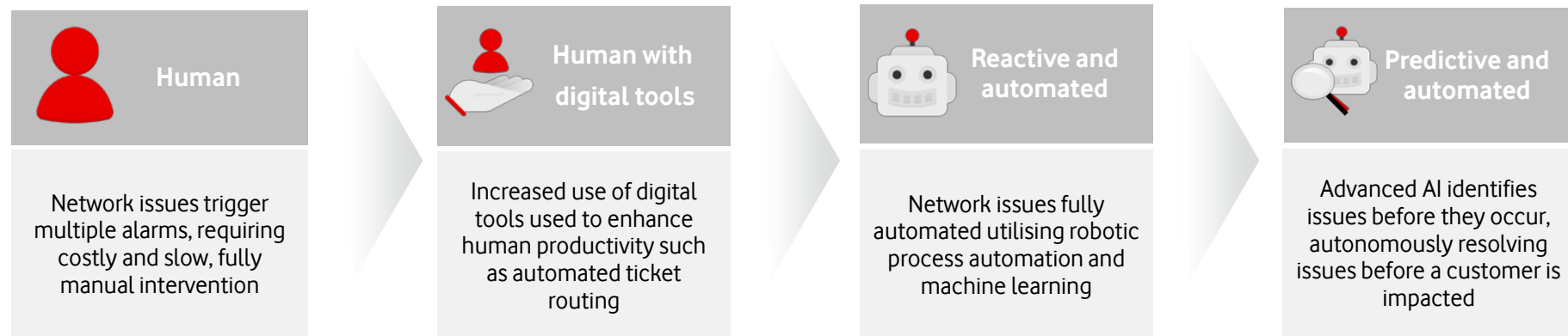
Products continuously improved whilst in use

Legacy IT systems upgraded to digital experience layers in 17 markets

Enabling efficiency and speed

D : Advanced analytics allow zero-touch intelligent networks

Automate manual human processes



Driving efficiency, speed & reliability

35% of network tickets automated in 7 markets

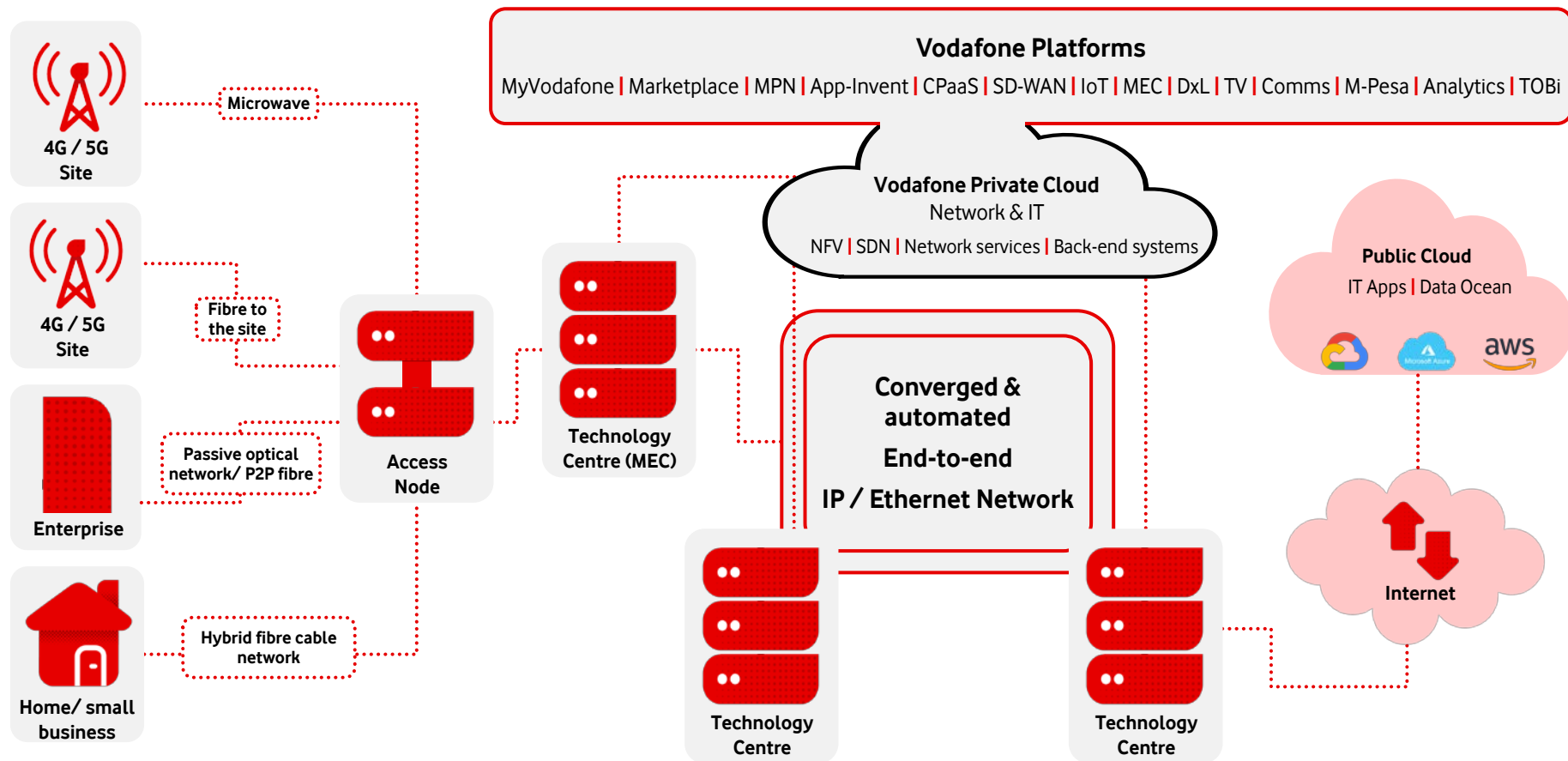
90% improvement in speed to dispatch over the last year in 4 markets

12m operational activities automated a year

80% of Monitoring and Diagnostics automated across 7 markets

99.8% Mobile Availability in Europe

Summary : We have a strong technology roadmap



3 : We allocate capital to drive returns

John Otty

Group Financial Controller



Key messages : We allocate capital to drive returns

A

Investing efficiently in connectivity infrastructure

B

Allocating capital to drive returns and growth

C

Relentless focus on efficiency and simplification

D

Investing in digital opportunities with attractive returns

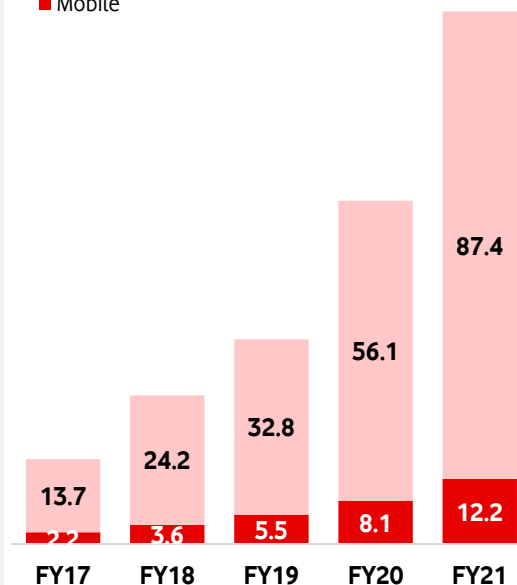
A :: Investing efficiently in connectivity infrastructure

Usage has grown rapidly

Network traffic

(Exabytes per year)¹

Fixed
Mobile



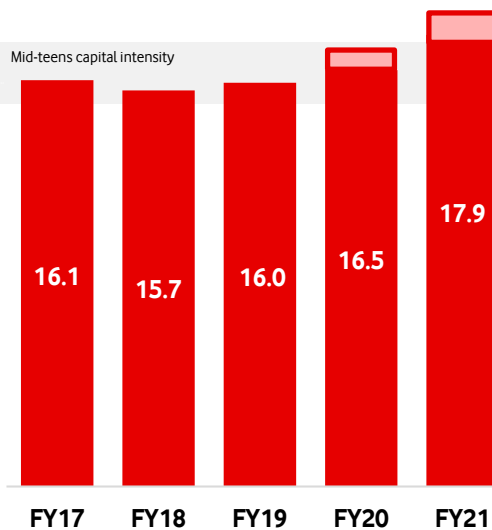
Capital intensity has absorbed this

Capital intensity

(%)

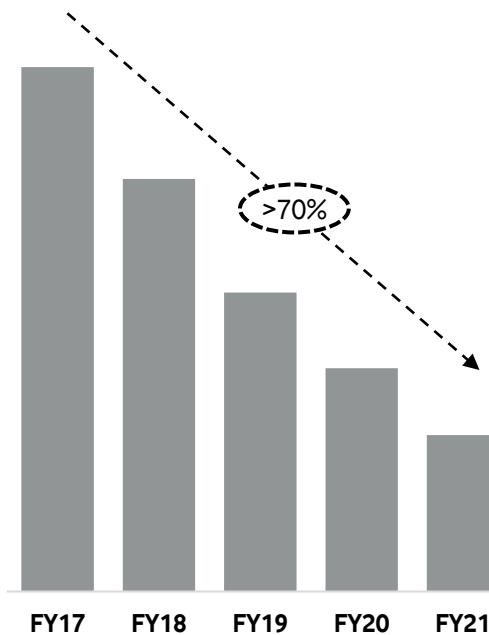
Includes impact from acquired Liberty
Global assets and IFRS15

Mid-teens capital intensity



As Cost per GB has fallen faster

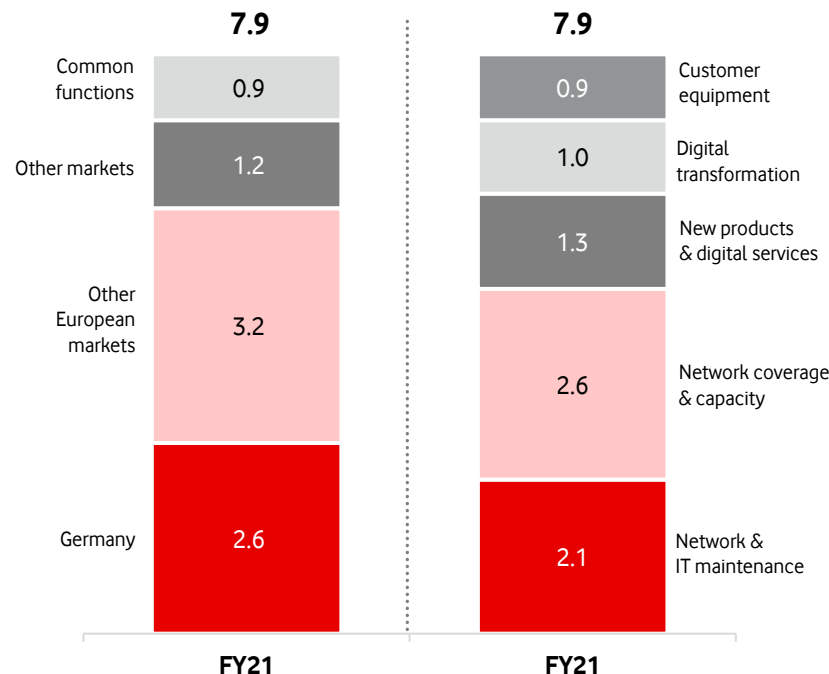
Cost per GB



A : Investing efficiently in connectivity infrastructure

Capital allocation breakdown

Capital additions (€ billions)



Customer equipment

- Investments into owned equipment that is used to service customers

Digital transformation

- Large IT projects that will reduce costs and improve organisational agility

New products and digital services

- Investments into new revenue generating products and services across Consumer and Business

Network coverage and capacity

- Investment to build new coverage, typically in rural areas, or to add new technology coverage, e.g. 5G

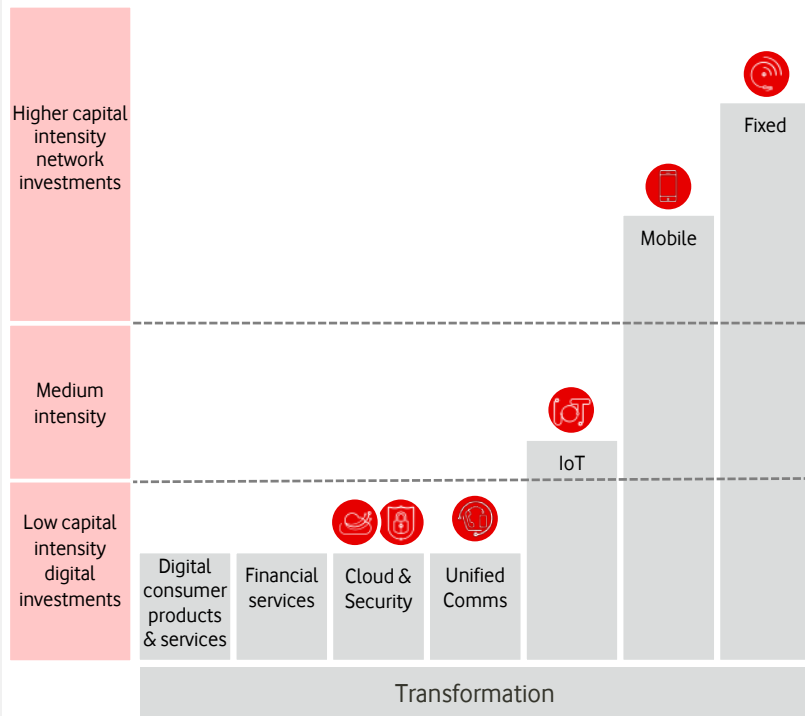
Network & IT maintenance

- General maintenance costs incurred to ensure the running of our Network & IT assets

A : Investing efficiently in connectivity infrastructure

Capital intensity varies across our segments

Illustrative capital intensity



Investing and partnering



Hybrid fibre cable markets typically have higher capital intensity due to node-splits and customer equipment



Mobile investment typical investment around 'low-teens' capital intensity



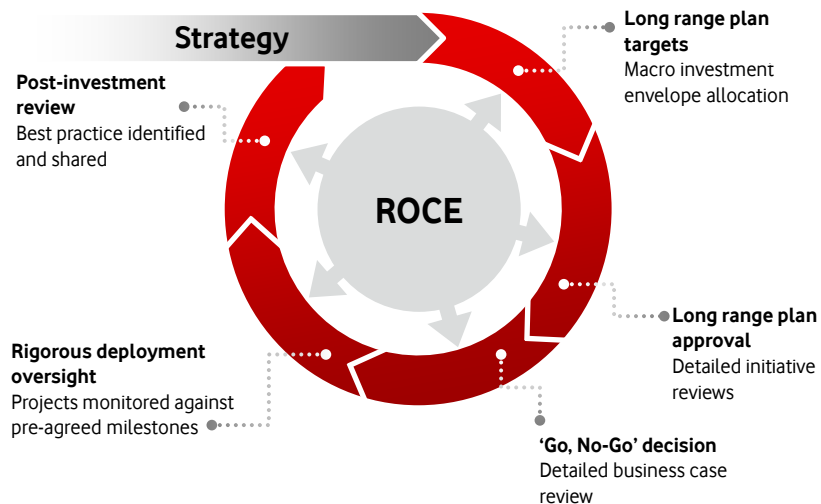
IoT and private networks developed by Vodafone



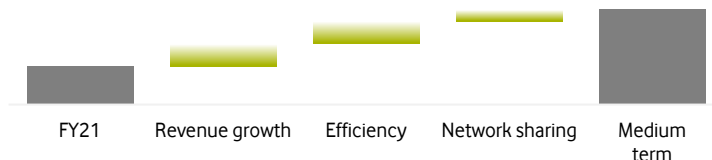
Partnership model with global technology leaders in Cloud & Security, UC, Financial Services and Digital Consumer Products

B : Allocating capital to drive returns and growth

Capital allocation review process built around ROCE



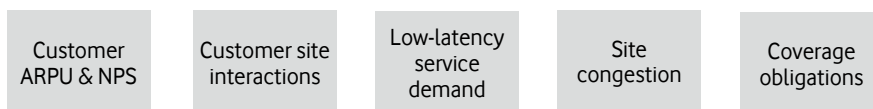
Illustrative ROCE growth bridge



Capital allocation framework

	Capex (£bn)	Allocation criteria	Decision metrics
Customer equipment	0.9	Unitary cost optimisation Revenue	Customer lifetime value
Digital transformation	1.0	CRM tech cycle Network lifecycle	< 8 years payback / Double digit IRR
New products & digital services	1.3	Business case driven	2-4 years payback / 20%+ IRR
Network coverage & capacity	2.6	Business case, competitive positioning & obligations	EM: <3 year payback EU: Smart Capex
Network & IT maintenance	2.1	Efficiency benchmarks Lifecycle management	Supply chain optimisation

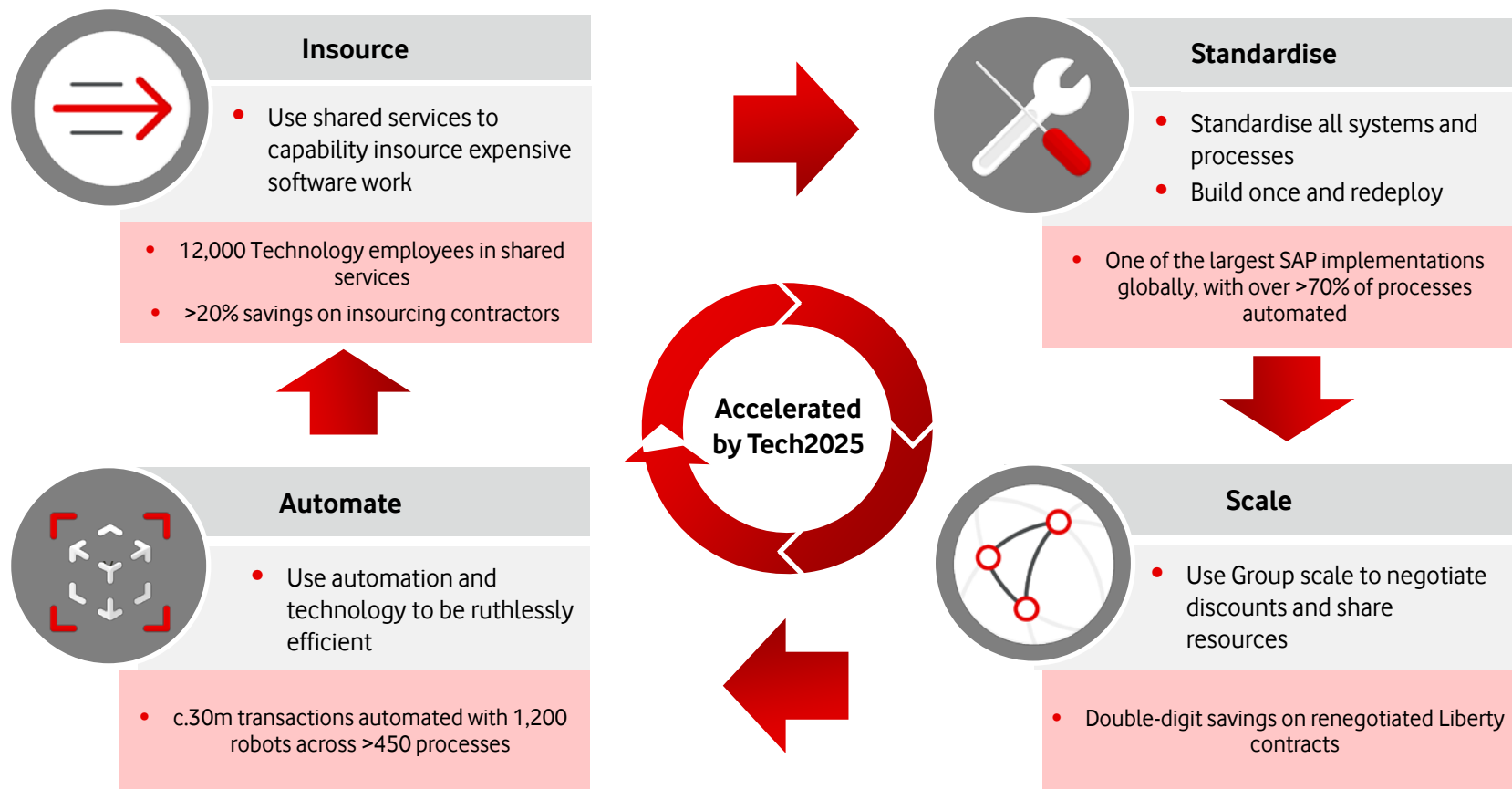
Network site investment - smart capex model



Forecast demand leveraging big data model

Site selected for upgrade

C : Relentless focus on efficiency and simplification

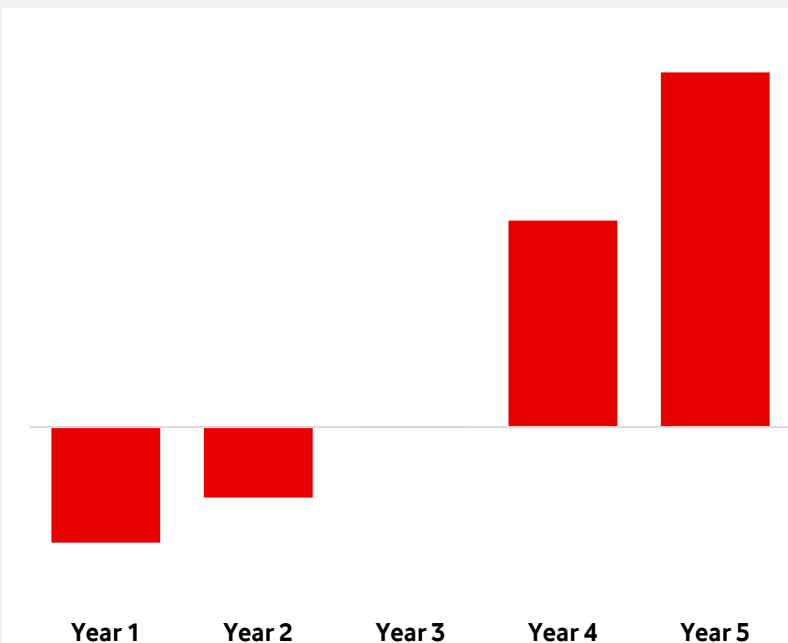


C :: Relentless focus on efficiency and simplification

Agreed network sharing across Europe

Country	Partner	Latest update	Sharing status
Germany	Deutsche Telekom & Telefonica DE	Nov'2019	Passive sharing with DT & TEF in 5k 'white spots' + active sharing in 3k 'grey spots'
Italy	Telecom Italia	Feb'2019	4G & 5G active + passive sharing + backhaul
UK	O2	Jul'2019	4G & 5G active + JV for passive infrastructure
UK	EE, O2, 3	Mar'2020	Shared rural network for 4G active sharing
Spain	Orange	Apr'2019	4G & 5G active + passive sharing
Greece	Wind	Jul'2019	Active sharing + JV for passive infrastructure
Romania	Orange	Dec'2018	4G active + passive sharing
Portugal	NOS	Oct'2020	Active + passive sharing

Illustrative phasing of FCF benefits from network sharing



Reduces future network investment burden by c.€2.5 billion*

C: Relentless focus on efficiency and simplification

Key examples



IBM Cloud partnership
2019

Co-develop new digital solutions,
access to IBM multicloud and reduced
capital requirements



Vantage Towers
2021

Increased focus on operational
efficiency whilst generating revenues



Shutdown 3G in Europe
2020 - 2023

Italy, NL and CZ already shutdown.
Total European shutdown will free up
c.20 MHz of spectrum per market



OpenRAN ready to be
deployed at scale
2023

Increased supplier diversity

**Tech
2025**

Increased operational efficiency
and organisational agility

Vodafone global data ocean partnership with Google



Common data
sourcing



Common data
platform



Common data
model



Common data
products

Data at the Core



Unified data
ownership and
governance

50% cost reduction in data
storage



Single view of
business
performance

Over 90% reduction in
manual efforts for
business performance
reviews



Meet all future
regulations

30% reduction in cost for
meeting regulatory
requirements



In-house skill
development

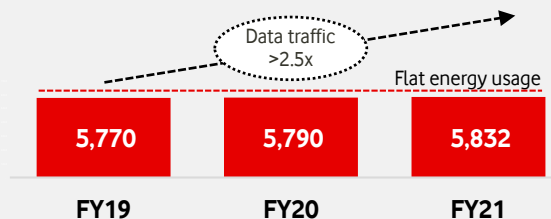
75% reduction in cost of
data engineering

C :: Relentless focus on efficiency and simplification



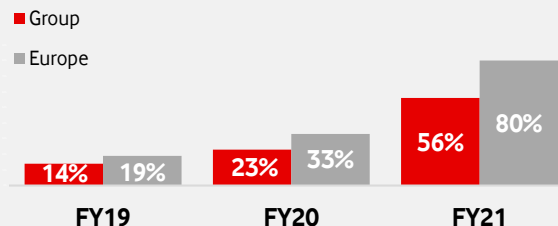
Flat energy consumption despite increasing demand

*Energy use vs. network traffic
(GWh vs Exabytes)*



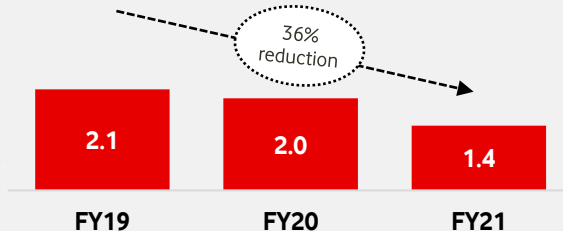
Accelerating our use of renewable electricity

*Renewable electricity as share of purchased electricity
(%)*



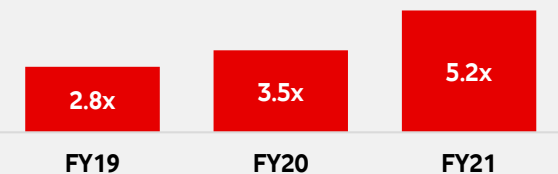
Reducing our
environmental
impact

*Scope 1 & 2 greenhouse gas emissions
(million tonnes CO2e)*



Reducing our impact on the planet

Customers' avoided tonnes CO2e vs. our own operations



Helping our customers reduce their own emissions



D: Investing in digital opportunities with attractive returns

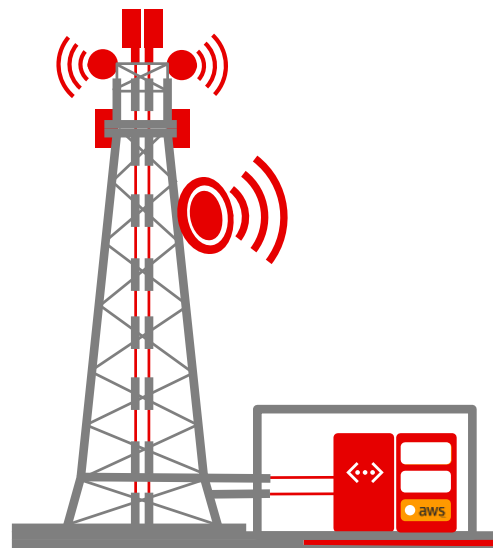


Distributed Multi-access Edge Computing

Overview



- Integrating AWS computing servers at the edge of the network, enabling real-time latency
- First to market with AWS in Europe
- Attractive partner given pan-European scale and increasingly standardised IT and Network stacks
- Capital investment of around €10-30m per year over the medium-term
- High return as it leverages existing assets and customer relationships



Customers



>180 companies in the pipeline



10 pilots completed, 10 in progress



6 sectors expressed interest: Automotive, Manufacturing, Entertainment, Technology, Retail and Public services



Customer use case



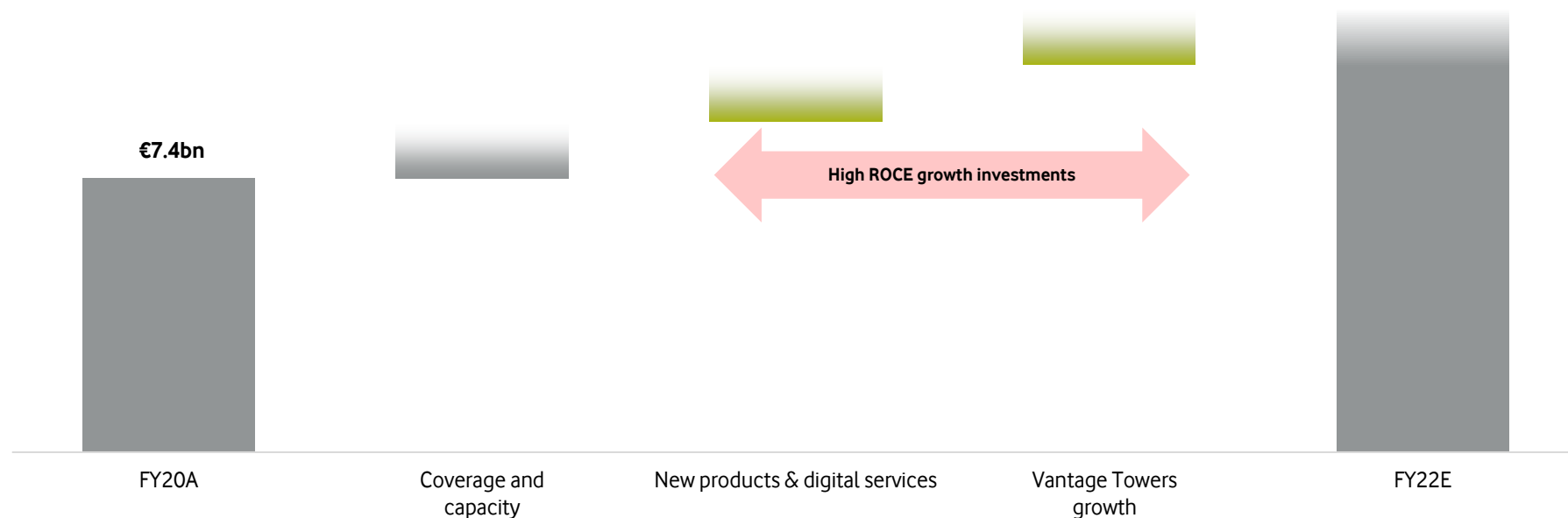
Dedrone®

- Dedrone protects key sites such as ports, factories and powerplants against unwanted drone activity, requiring rapid response times
- Dedrone's counter-drone platform has, therefore, been integrated into Vodafone's Multi-access Edge Computing solution



D : Investing in digital opportunities with attractive returns

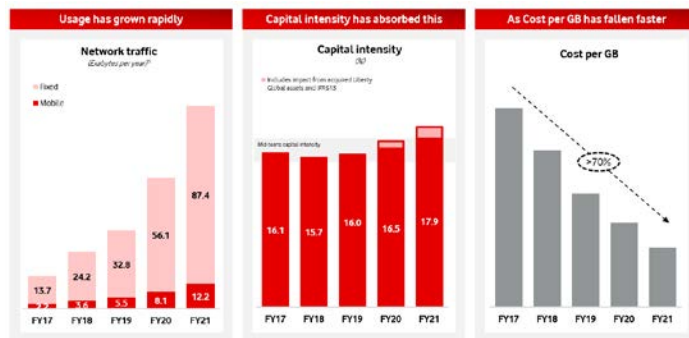
Pre-pandemic to post-pandemic capex elements



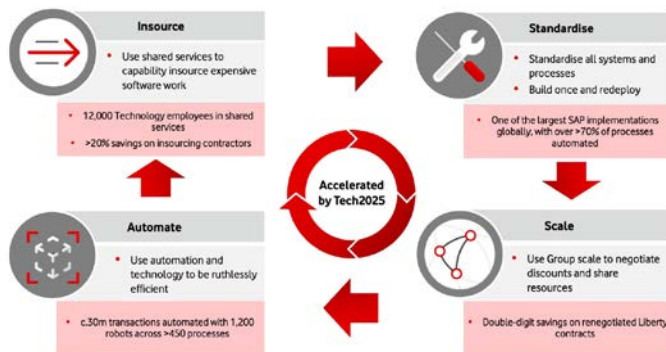
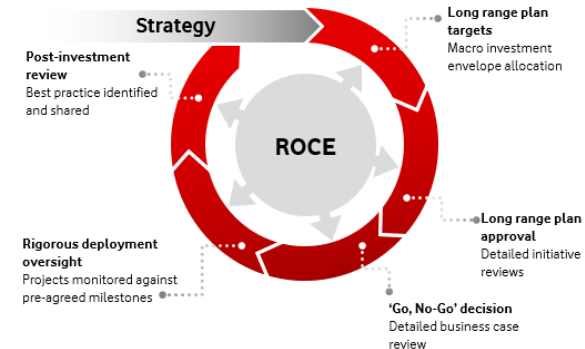
Investing in new Vodafone products and services & Vantage Towers growth at good incremental ROCE

Summary : We allocate capital to drive returns

1 Investing efficiently in connectivity infrastructure

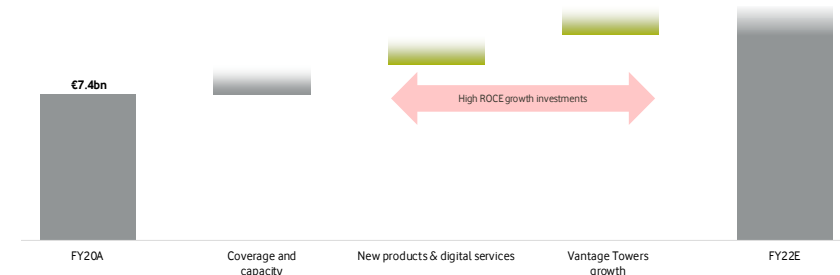


2 Allocating capital to drive returns and growth



3 Relentless focus on efficiency and simplification

4 Investing in digital with attractive returns



4 : We are transforming to deliver growth

Johan Wibergh

Chief Technology Officer

Key messages : We are transforming to deliver growth

A

We have transformed our operating model

B

We have the right team and capabilities to deliver

C

We have a clear vision to drive growth

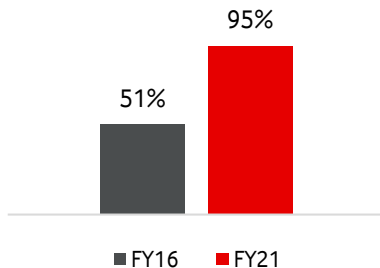
D

We are enabling new digital products and services

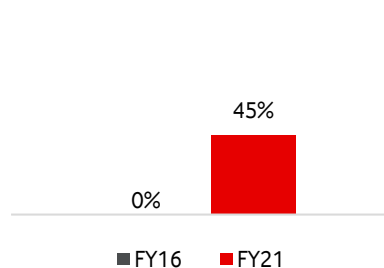
A : We have transformed our operating model

Network efficiency

EU 4G/5G data traffic (%)

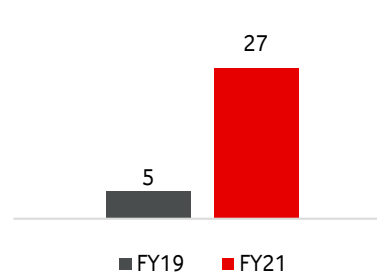


EU VoLTE voice traffic (%)

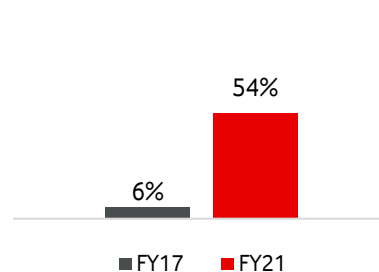


Digitalisation

TOBi monthly conversations (m)

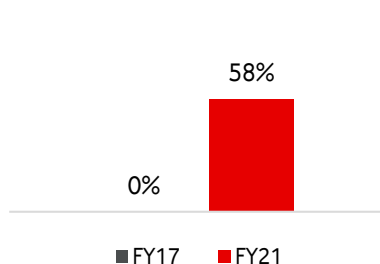


Agile IT delivery spend (%)

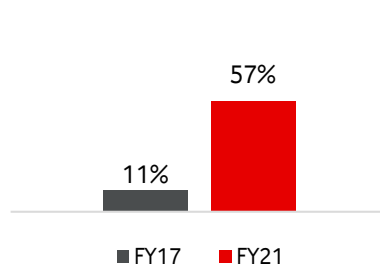


Cloudification

Network functions (%)

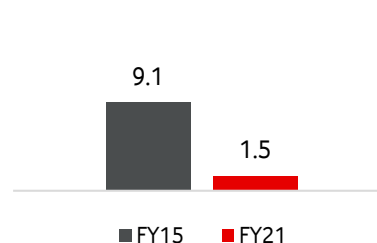


IT applications (%)

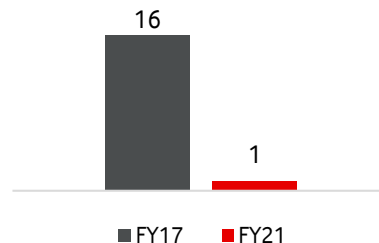


Network resiliency

EU networks major incidents (#/month)



Int'l network major incidents (#/year)



A : We have transformed our operating model

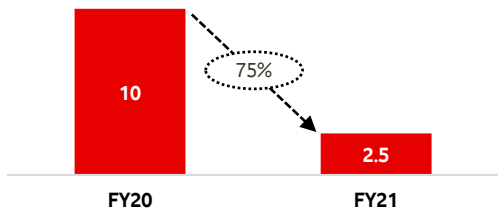
Significant improvements in digital channel delivery in the UK

Planning

- We continue to drive and embed Agile methodology throughout the organisation
- The average time spent planning an agile project phase, known as a sprint, has reduced by 75% over the last year

Massive improvement in planning speed

Number of days to plan an Agile sprint in the UK

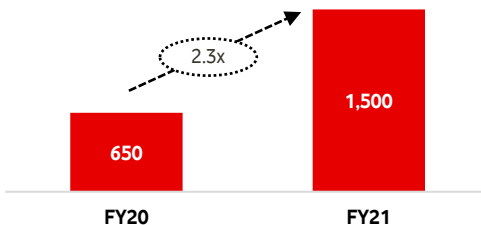


Efficiency

- Agile has enabled improved efficiency, driving faster product launches across Consumer and Business
- The average speed to deliver one unit of work in the UK has improved by >35% YoY to 8.5 days

Massive increase in the number of software releases

Annual Digital software releases in the UK

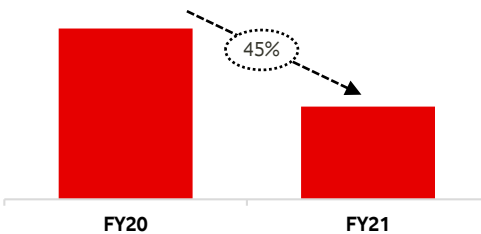


Effectiveness

- Despite the increasing amount of software releases we are continuing to reduce errors and drive higher quality
- Our internal software tests show a 30% improvement in quality YoY

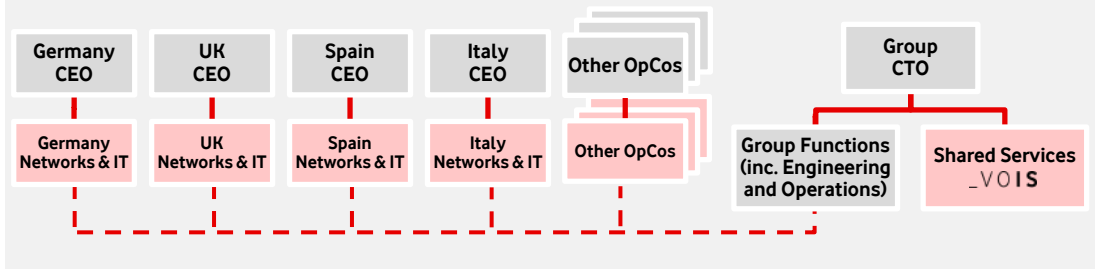
Release defects continue to decrease

Release defect rate in the UK



A : We have transformed our operating model

Legacy operating model

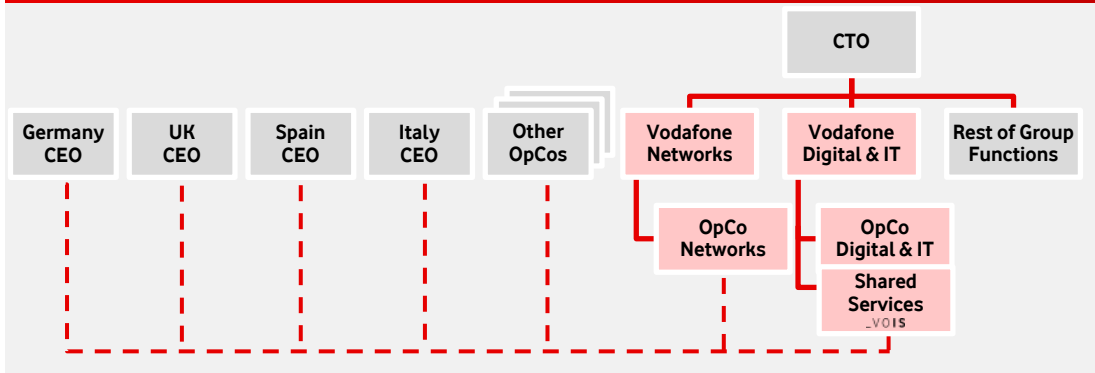


Unlocking efficiency

Under our legacy operating model, technology decisions had to be aligned across 11 European markets

As of April , Networks and Digital & IT functions in Europe now report directly to the CTO, enabling a better, faster and more efficient organisation

Our new operating model – Implemented in April



Scale enables deep expertise to be shared and work to be insourced



Standardised processes and tools enable rapid development



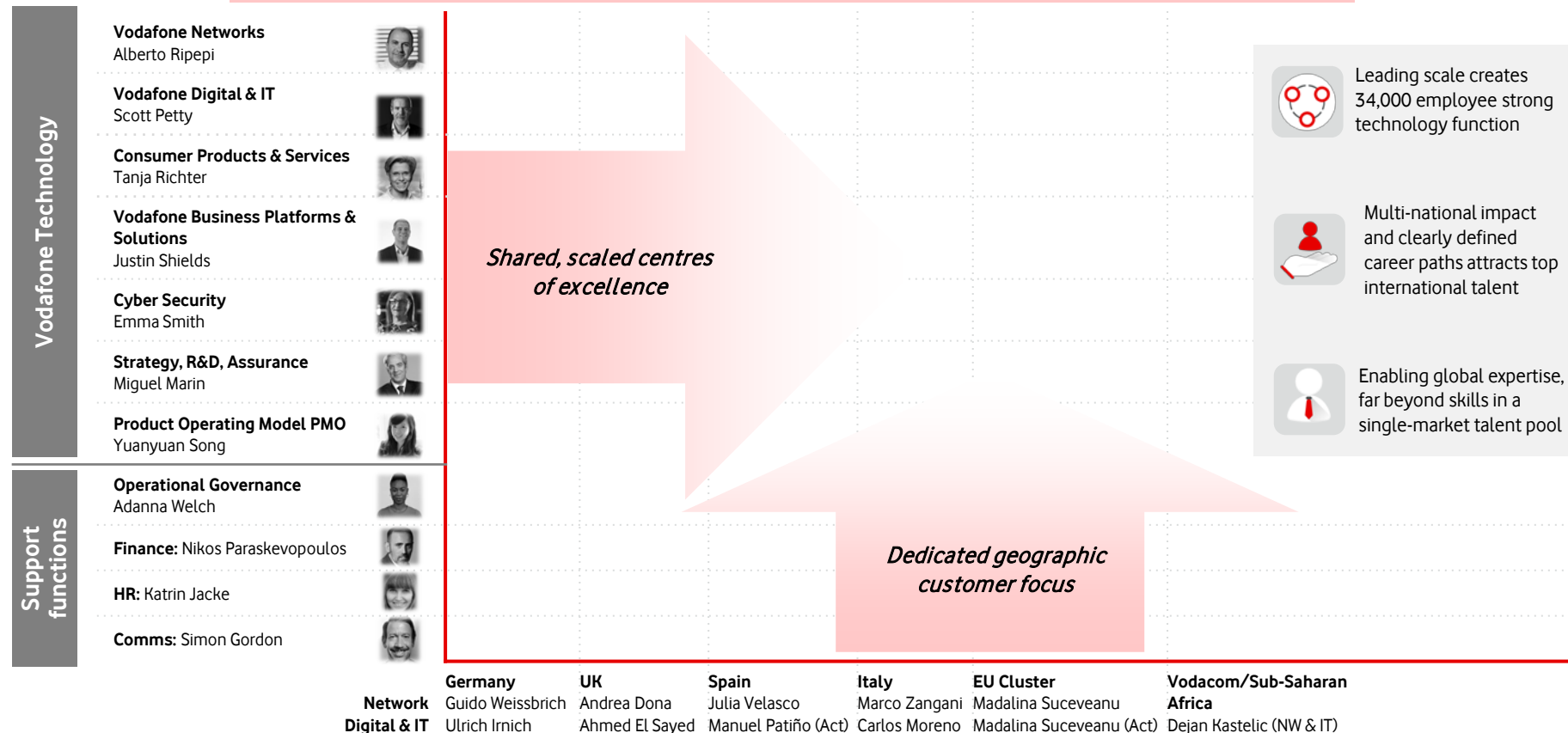
Software and code can be built once and reused



Enabling operational excellence and efficiency

B : We have the right team and capabilities to deliver

Matrix organisation to optimise blend of technical & functional expertise with deep local knowledge



B : We have the right team and capabilities to deliver

One global team – 34,000 employees

IT & Digital

- 17,000 employees working across project management, application development, maintenance, testing and operations and office IT

Networks

- 14,000 employees across design and engineering, operations, architecture and service enablement

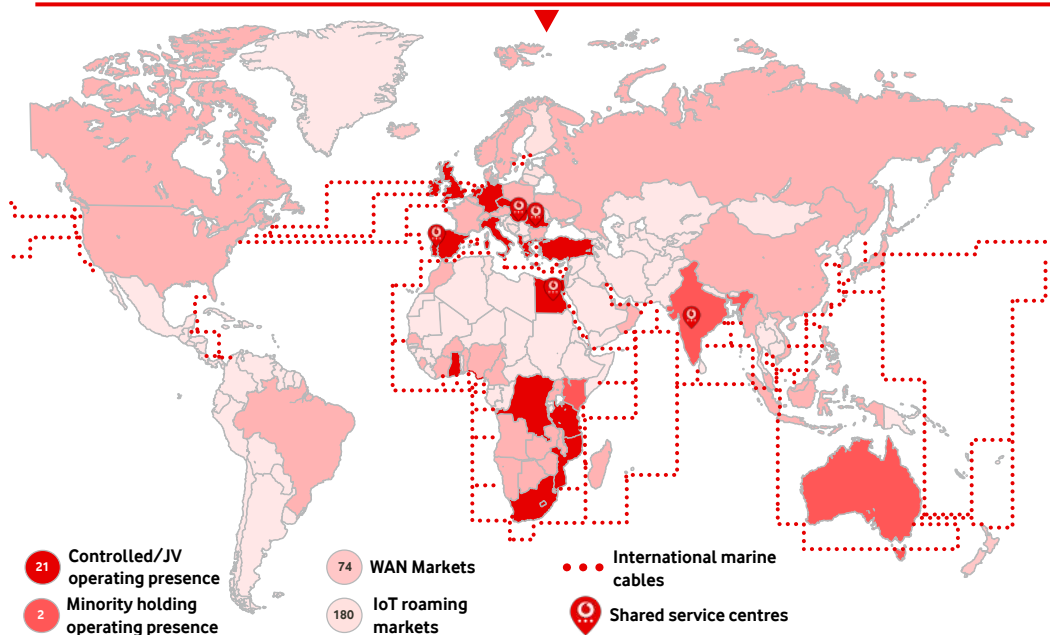
Other

- 3,000 employees across cybersecurity, R&D, product and service development, strategy



Of which, 12,000 employees in shared service centres in India, Egypt, Romania, Hungary and Portugal

Global capabilities



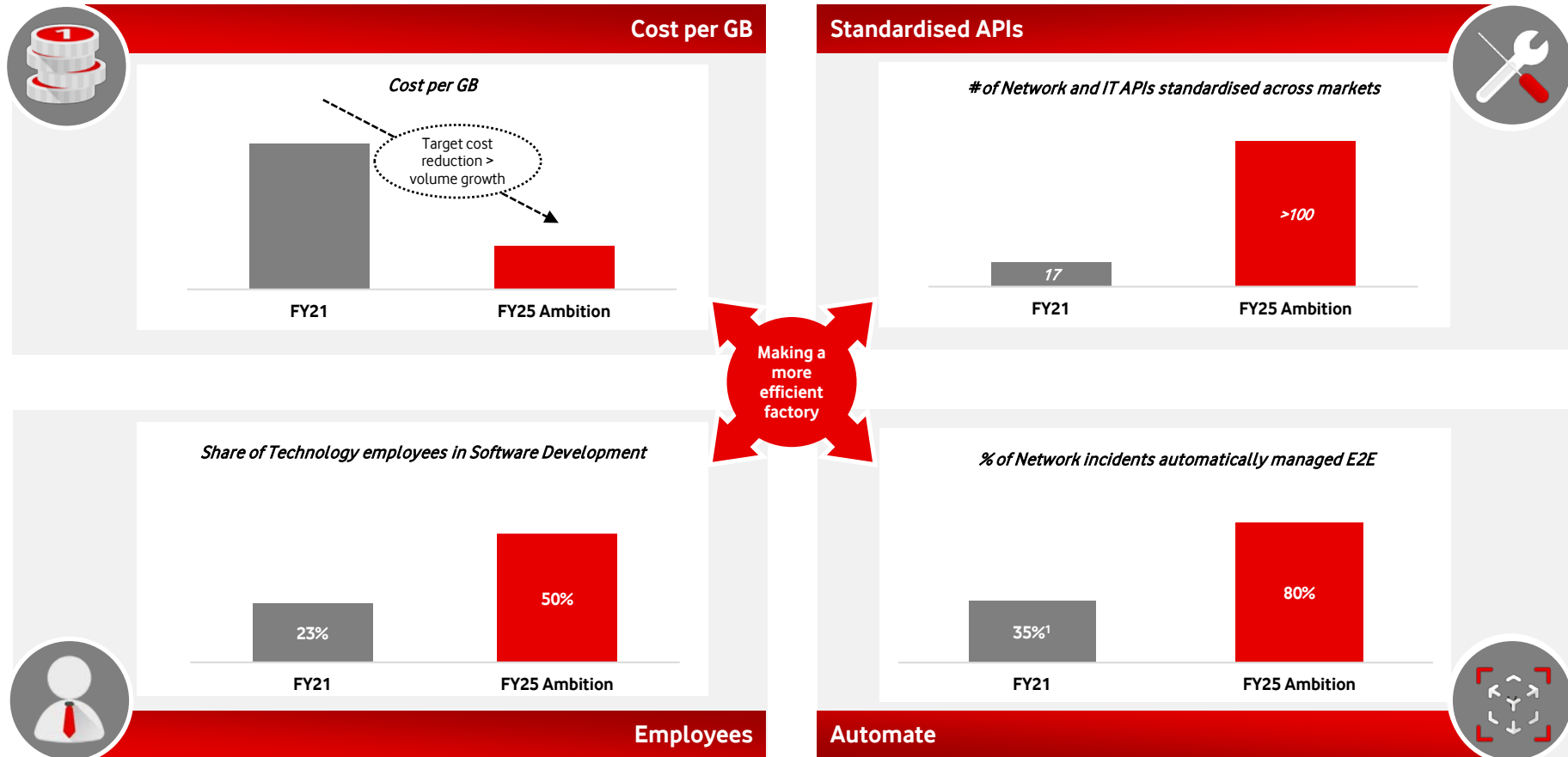
2,900 patents granted, c.600 patents pending

Leadership team part of >40 industry boards

7,000 software engineers

Data centres host c.100,000 servers




C: We have a clear vision to drive growth



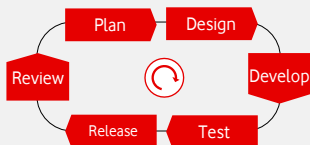
C : We have a clear vision to drive growth

New product operating model

New product framework

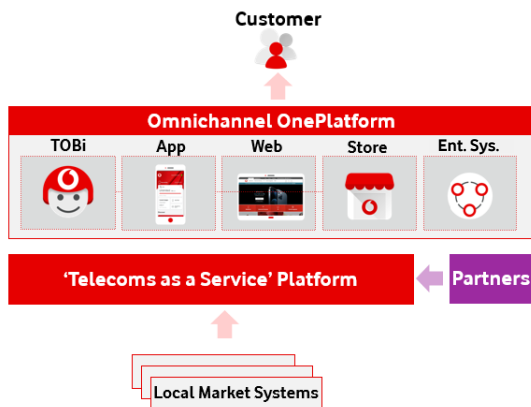
-  Dedicated, global product managers
-  Business cases assessed globally
-  Global product board to provide oversight

Supported by Agile development



Drives **cross-functional ownership** and **continuous improvement**

Platform approach



Build products once and redeploy everywhere, whilst attracting partners

New Generation culture

- Globally **standardised** development practices, improving efficiency
- Experiment** and make calculated bets
- Increase **in-house software** development as we become more efficient
- Develop own Intellectual Property** where there is a clear right-to-win

From a Telco to a **New Generation Connectivity** and **Digital Services culture**

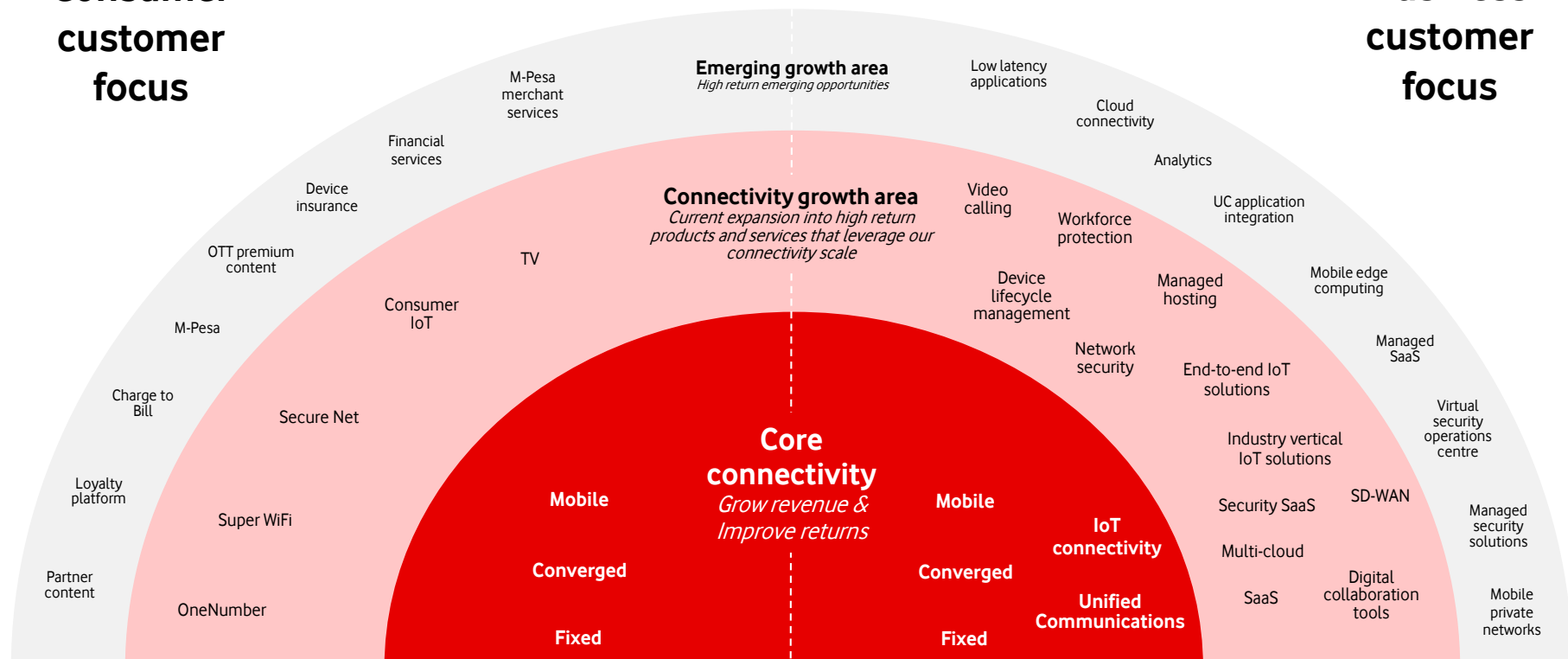
Industrialising high ROCE product creation for Business and Consumer

FY25 Ambition to reduce product lead times by 50%

C: We have a clear vision to drive growth

Consumer customer focus

Business customer focus



D : We are enabling new digital products and services

Platform capabilities

Global

- Supports connections in >180 markets and 570 networks, used by 16 partner markets
- SIMs can easily convert from global to local and back to comply with local regulations

Scalable

- Cloud-native, can be easily scaled to meet demand from up to one billion devices
- 60% increase in data growth YoY
- >72bn km of driving data analysed

Flexibility & Innovation

- Platform can meet both Consumer and Business demand, across sectors
- >500 IoT experts

Speed

- New products and services can be onboarded rapidly as standardised code can be redeployed

Security

- Security embedded into the platform at the network-level

Integrated

- Easily integrated with other systems, handles 1.7bn API calls a month
- Toolkit for third-party developers to create their own software on top of the platform

Built and continuously improved over 10 years

One global, self-built IoT platform

7-time Gartner Magic Quadrant leader¹

Business



>123m connected devices, >100E2E use cases

Consumer



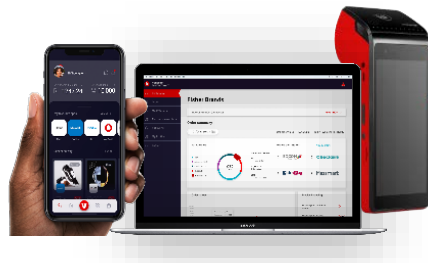
1.4m connected devices , >20 products

D : We are enabling new digital products and services

13m Financial Services users in South Africa



In SA, we offer financial services ranging from peer-to-peer payments and merchant services to loans and e-commerce. We will launch our super-app proposition, VodaPay, in the coming months



AI

- AI-based risk model instantly processes 4.3m Airtime Advance transactions per day
- AI-based credit modelling enables low bad debt rate of only 0.5%

Scalable

- >2000 merchants with in-store sales terminals
- Data lake processes ZAR200bn of transactions per annum

Flexible

- Platform offers insurance, lending, payment, saving, trading, e-commerce, content and third-party services
- Serves both Consumer and Business customers

Integrated

- New VodaPay smartphone app launching in the coming months, designed for deep partner integration – South Africa's app store

48m M-Pesa users



M-Pesa is our financial services platform in sub-Saharan Africa and Egypt, which is expanding into digital and business services



International

- One platform across 7 African markets

Scalable

- Cloud-enabled, supporting 15.2bn transactions per annum, growing >20% per annum
- 48m users, c.1 million agents, >350k merchants

Flexible

- One platform for both Consumer and Business
- Handles peer-to-peer, merchant services, loans and is increasingly expanding into more services

Integrated

- >20 APIs enabling plug and play capabilities
- 6 mini-applications live, 40 more apps in the pipeline across Consumer and Business

Leading Financial Services platform in Africa with 61m customers

D : We are enabling new digital products and services

>10 Mobile private networks live across 6 verticals

MPN offers guaranteed bandwidth, low latency, high availability and reliability in order to enable business-critical services



Scalable

- Leverages our leading spectrum positions and IoT customer channels and applications

Insight

- Utilises our leading expertise at building and managing networks at scale

Integration

- Partner integration to offer over the top solutions, alongside integration with our wider network for seamless customer device transitioning

Flexible

- Solutions across six different sectors

Speed

- Over 10 MPNs already live, including Ford's factory of the future

Distributed Multi-access Edge Computing

- MEC leverages our leading networks and IoT capability
- Integrating AWS into strategic locations in the network
- This reduces latency, creating multiple new use cases which we are seeing demand from today

Video case study with AWS here:
investors.vodafone.com



Security

- Strategic partnership with Accenture to create enterprise-grade end-to-end cybersecurity services
- 24/7 Security Operations Centre running 365 days a year to ensure rapid incident response
- 750k security licences across 17 solutions



Summary : We are transforming to deliver growth

Tech:2025

What we'll look like



Reliable, high-speed & efficient convergent networks



Always-on & zero-touch operational excellence



Most efficient and simplified operator



Product operating model & scaled platform architecture with standard APIs



Culture of innovation & collaboration, embedding leading practice

Our ambition



60% 5G built-right population coverage, >51m on-net gigabit homes in Europe



80% of network incidents automated end-to-end



Data volume growth met or exceeded by cost per GB reduction



50% reduction in product lead times



Enabling consistent revenue and ROCE growth

1 We have transformed our operating model



2 We have the right team and capabilities to deliver



3 We have a clear vision to drive growth



4 We are enabling new digital products and services



Appendices

I	Definitions	<i>P65</i>
---	-------------	------------

II	Importance notice	<i>p66</i>
----	-------------------	------------

Appendix I : Definitions

Term	Definition
2G/3G/4G/5G	Cellular technologies that enable voice and data services. 2G stands for 2nd generation etc.
AI/ML	Artificial intelligence / machine learning
API	Application programming interface, a software intermediary that allows two applications to talk to each other
AR/VR	Augmented reality/virtual reality
AWS	Amazon Web Services
Connections	The number of devices or products that we connect
CPaaS	Communications Platform as a Service
CRM	Customer relationship management systems
DXL	Digital experience layer: an intermediary software layer that decouples customer facing systems from legacy systems improving time to market
E2E	End-to-end
EM	Emerging markets
FCF	Free cash flow
Exabyte/Petabyte	A petabyte is equal to 1,000,000 gigabytes. A exabyte is 1,000 petabytes
Gbps / Mbps	Gigabits (billions) / megabits (millions) of bits per second
IoT	Network of physical objects embedded with electronics, software, sensors & network connectivity, including built-in mobile SIM cards, that enables collection of data & exchange communications with one another or a database

Term	Definition
IRR	Internal rate of return
MEC	Multi-access edge computing: embedding compute servers closer to the edge of the network in order to reduce latency
Massive MIMO	Multiple-in multiple-out antennas, 'massive' as they can have a large number of antennas per array
MPN	Mobile Private Networks
NFV	Network function virtualisation
NOC	Networks operation centre
NPS	Net promoter score, a measure of customer sentiment
RAN	Radio access network
ROCE	Return on capital employed
SaaS	Software as a service
SDN	Software defined networks
SD-WAN	Software defined wide area networks
Self-built	Fixed networks that are fully owned by Vodafone
SOC	Security operations centre
UC	Unified communications & collaborations products and software
VOLTE	Voice over LTE (data)

Appendix II : Important notice

By accessing these slides, you agree to be bound by the following conditions. You may not disseminate these slides or any related recording, in whole or in part, without the prior consent of Vodafone. Information in this presentation relating to the price at which relevant investments have been bought or sold in the past or the yield on such investments cannot be relied upon as a guide to the future performance of such investments.

This presentation does not constitute an offering of securities or otherwise constitute an invitation or inducement to any person to underwrite, subscribe for or otherwise acquire or dispose of securities in any company within the Vodafone Group.

This presentation also contains non-GAAP financial information which Vodafone's management believes is valuable in understanding the performance of the Vodafone Group. However, non-GAAP information is not uniformly defined by all companies and therefore it may not be comparable with similarly titled measures disclosed by other companies, including those in the Vodafone Group's industry. Although these measures are important in the assessment and management of the Vodafone Group's business, they should not be viewed in isolation or as replacements for, but rather as complementary to, the comparable GAAP measures.

References to Vodafone are to Vodafone Group Plc and references to Vodafone Group are to Vodafone Group Plc and its subsidiaries unless otherwise stated. Vodafone, the Vodafone Speech Mark Devices, Vodacom and Together We Can are trade marks owned by Vodafone. The Vantage Towers Logo and the VT Monogram Logo are trade marks owned by Vantage Towers AG. Other product and company names mentioned herein may be the trade marks of their respective owners.

This presentation, along with any oral statements made in connection therewith, contains "forward- looking statements" including within the meaning of the US Private Securities Litigation Reform Act of 1995 with respect to Vodafone's Tech:2025 strategy, including PoP coverage, on-net Gigabit homes, automated network incidents, data volume, product lead times and revenue and ROCE growth; IoT coverage; device, data, product and service growth; efficiency and simplification benefits; capex investment; Vodafone's vision to drive growth in, amongst other areas, cost per GB, employees and APIs; and certain of the Vodafone Group's other plans and objectives.

Forward-looking statements are sometimes, but not always, identified by their use of a date in the future or such words as "plans", "targets" "gain", "grow", or "accelerate" (including in their negative form). By their nature, forward-looking statements are inherently predictive, speculative and involve risk and uncertainty because they relate to events and depend on circumstances that may or may not occur in the future. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied by these forward-looking statements.

A review of the reasons why actual results and developments may differ materially from the expectations disclosed or implied within forward-looking statements can be found under "Forward-looking statements" and "Risk management" in the Vodafone Group Plc Annual Report for the year ended 31 March 2021. The Annual Report can be found at investors.vodafone.com.

All subsequent written or oral forward-looking statements attributable to Vodafone, to any member of the Vodafone Group or to any persons acting on their behalf are expressly qualified in their entirety by the factors referred to above. No assurances can be given that the forward-looking statements in or made in connection with this presentation will be realised. Any forward-looking statements are made as of the date of this presentation. Subject to compliance with applicable law and regulations, Vodafone does not intend to update these forward-looking statements and does not undertake any obligation to do so.

Group
Investor Relations



investors.vodafone.com



ir@vodafone.co.uk



1 Kingdom Street, London, W2 6BY

Matthew Johnson

Director
Group IR



matthew.johnson@vodafone.com

Daniel Morris

Deputy Director
Group IR



daniel.morris@vodafone.com

Roy Teal

Deputy Director
Group IR



roy.teal@vodafone.com

Victoria Garnham

Access Manager
Group IR



victoria.garnham@vodafone.com

Upcoming events

**23
July**

Q1 FY22 trading update

**27
July**

Annual General Meeting

**29
Sep'**

Digital services & experiences
investor briefing