WORLD 5G SUMMIT

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TURKCELL

Strategic Paving the Driveway to 5G

25-26 Oct. 2018
Barcelona

SNAPSHOT

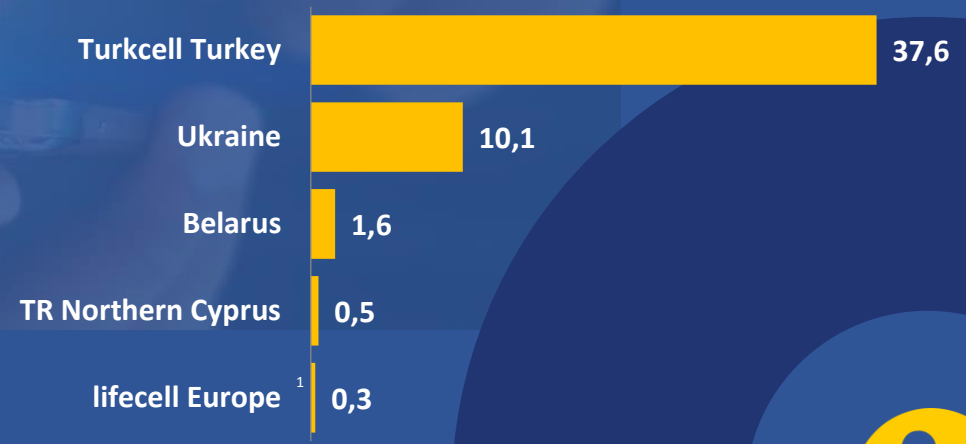
- **CONVERGED** COMMUNICATION AND DIGITAL SERVICES PLAYER
- **8** COUNTRIES
- **50.1 MILLION** TURKCELL GROUP SUBSCRIBERS
  - ***2.5 MILLION*** *FIXED SUBSCRIBERS*
- LISTED ON NYSE & BORSA ISTANBUL

BORSA İSTANBUL

NYSE
New York Stock Exchange

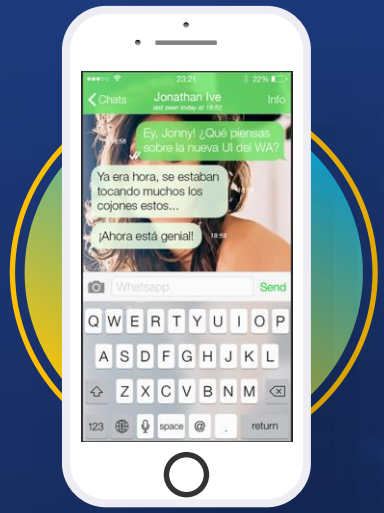
SUBSCRIBER BREAKDOWN

(mn, Q218)

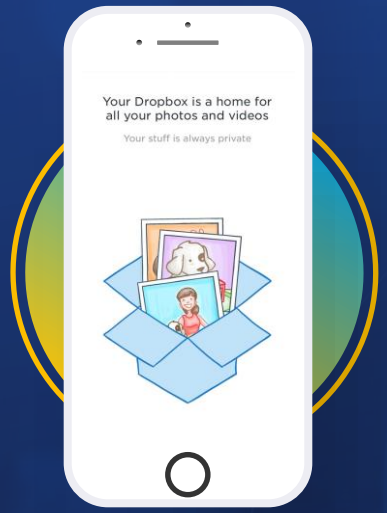


[1] *lifecell Europe GmbH operates in Germany under a "marketing partnership" agreement with Deutsche Telekom (DT). Its subscribers are owned by DT and are also included in the Turkcell Group subscriber figure*

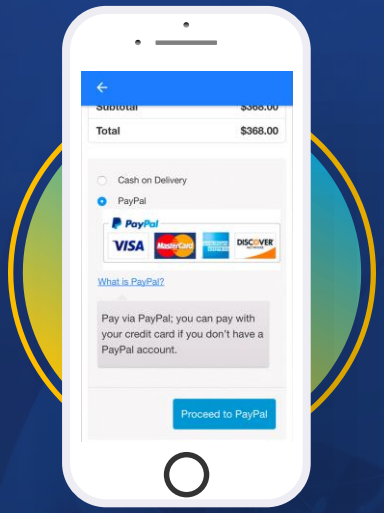
WHEN THE TELECOM WORLD LEFT THE STAGE...



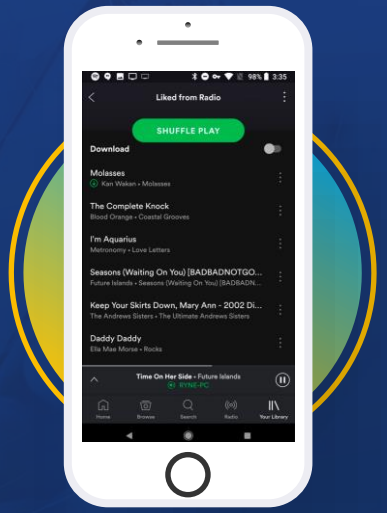
WhatsApp



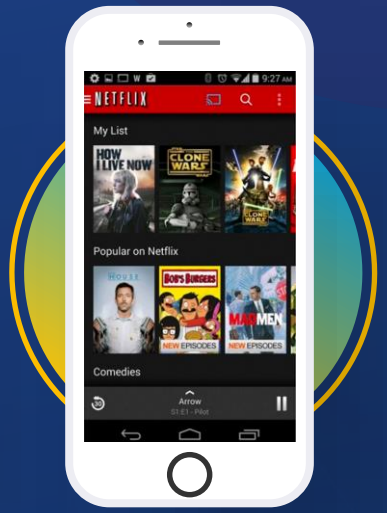
Dropbox



PayPal



Spotify



NETFLIX

THE DEFINITION OF COMPETITION HAS CHANGED

facebook	2.2	BILLION USERS
WhatsApp	65	BILLION MESSAGES
Dropbox	1.2	BILLION FILES
NETFLIX	350	MILLION HOURS VIDEO

©Statistica 2018

TRANSFORMING INTO THE DIGITAL OPERATOR

ORGANIZATIONAL TRANSFORMATION

STATE-OF-THE-ART 4.5G DEPLOYMENT

SALES CHANNEL TRANSFORMATION

SHAPING TECHFIN IN TURKEY

CONVERGENCE OF OTT SERVICES

AND WE HAVE AN ANSWER...

OUR 1440 VISION

INTERNET OF THINGS

MEDIA & ENTERTAINMENT

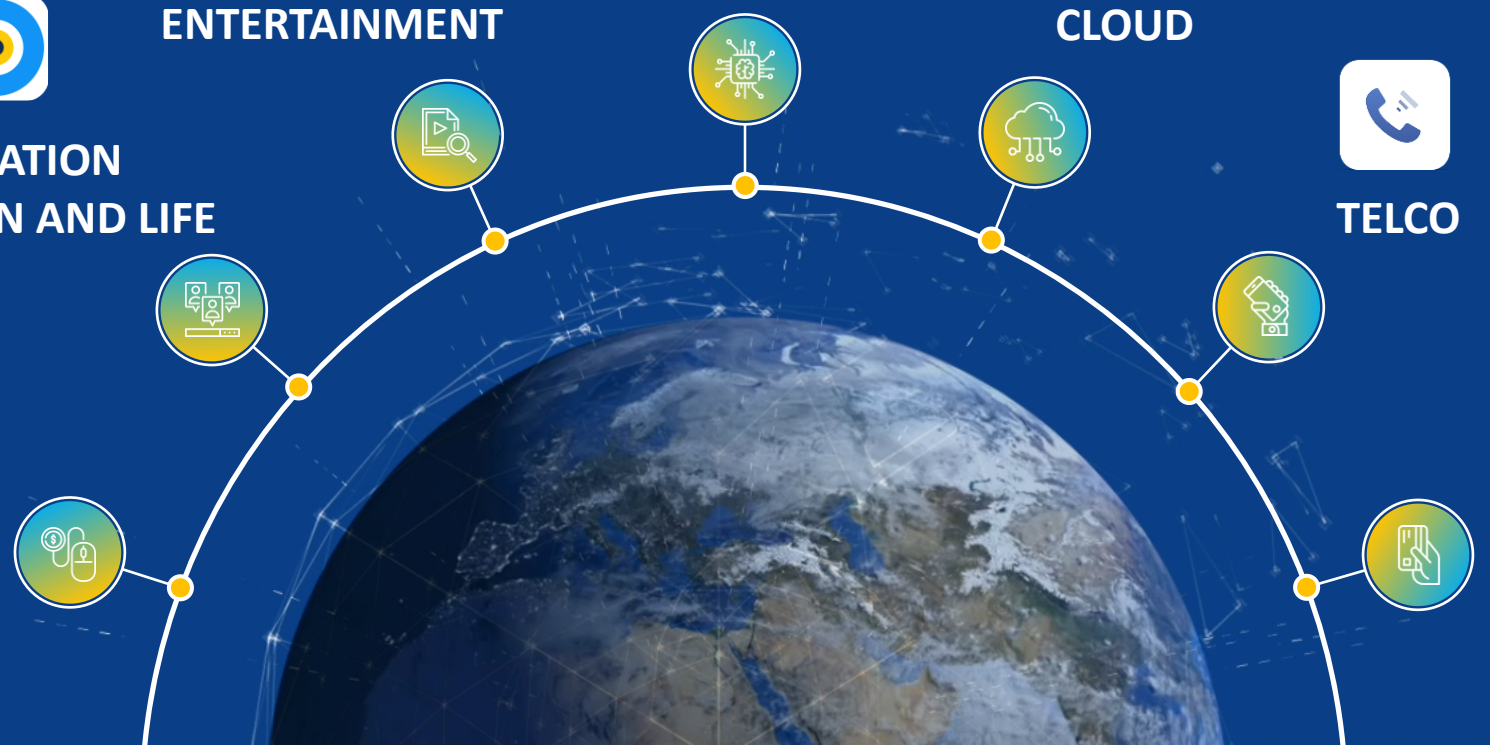
CLOUD

NEW GENERATION COMMUNICATION AND LIFE

TELCO

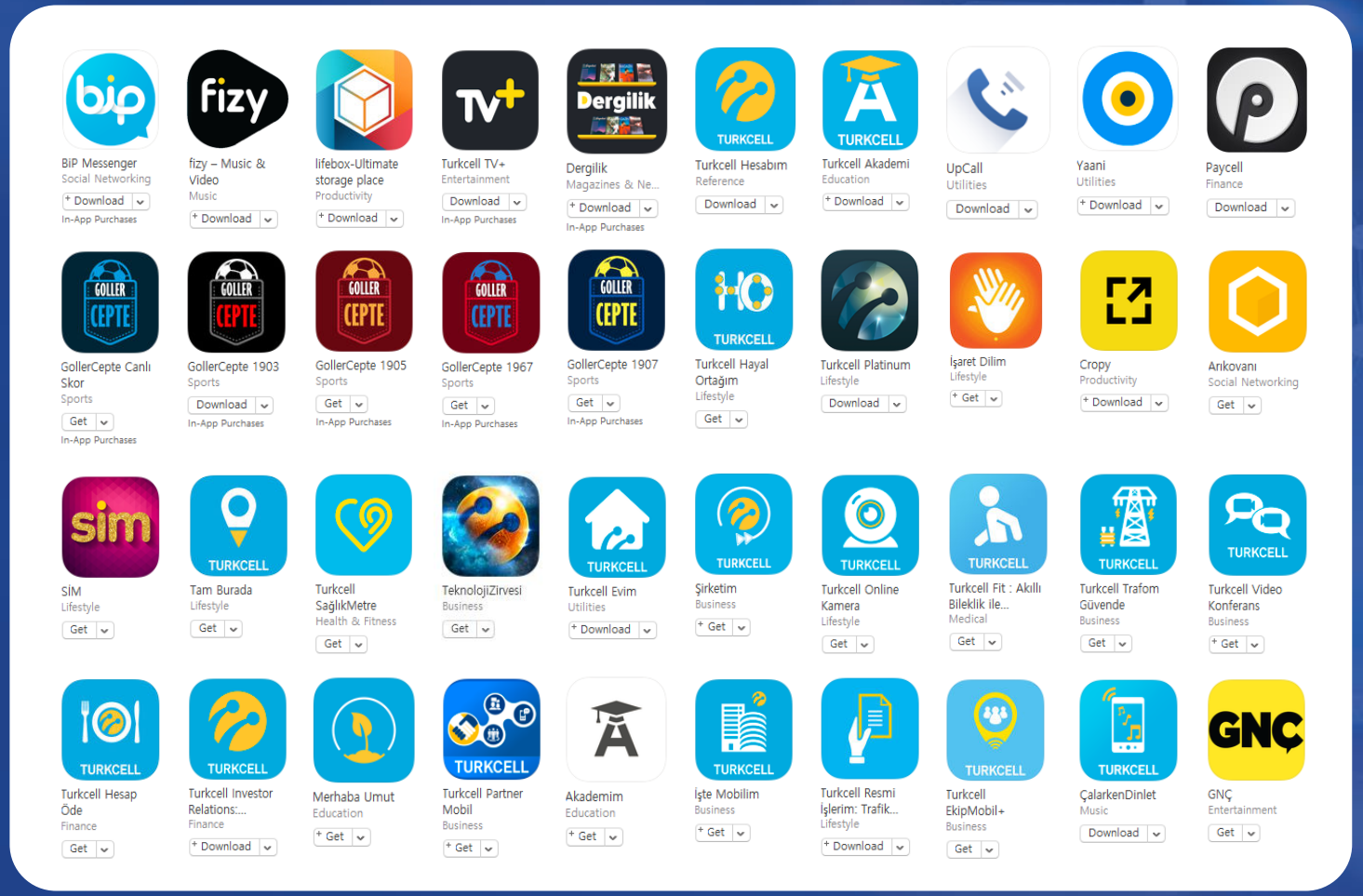
FAST ENTRY

PAYMENT



TURKCELL'S DIGITAL WORLD

TECHNOLOGY based NETWORK OPERATOR ▶ **SERVICES based EXPERIENCE PROVIDER**



2nd

Top Publisher in Google Play Store

Turkey (2017)

100+ Million

Total number of downloads of core digital services

1000+

R&D Engineers

DIGITAL COMPANION THROUGHOUT THE DAY

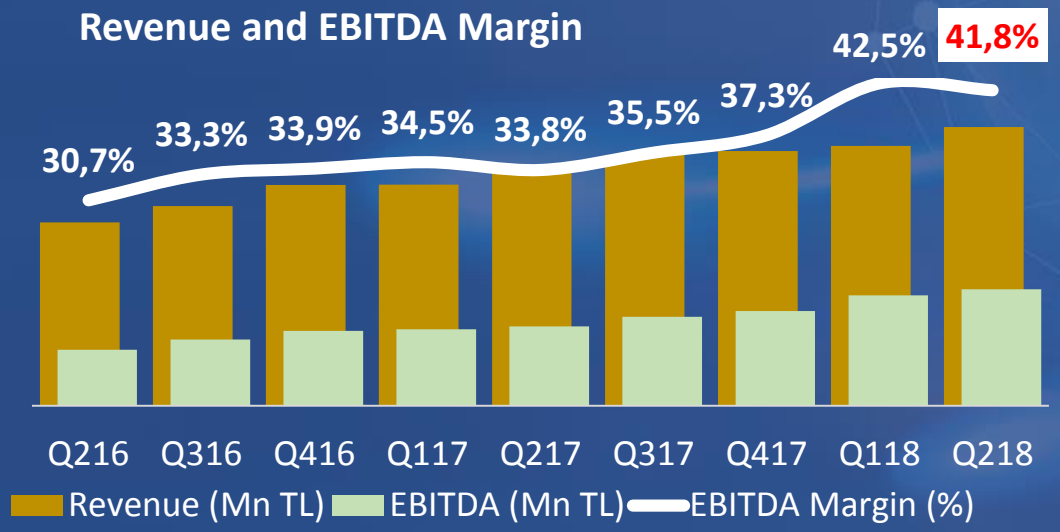
bip
Broadway
W 43 ST
ONE WAY
ONE WAY
ONE WAY
AT&T
CHASE
europa café

SUCCESS STORY OF TURKCELL WITH NUMBERS

FINANCIAL

- Record top line up 18.3% yoy, 52% 2yr growth
- EBITDA Margin at 41.8%
- Revenue guidance revised upwards to 16% - 18%
- Asset light strategy: infrastructure sharing protocol
- First installment of dividend distributed

Revenue and EBITDA Margin



OPERATIONAL

- Over 100Mn core digital services* downloaded
- Mobile triple play at 60.5%, up 13.8 pp yoy
- 4.5G user data usage reached 7GB in June 18
- 18Mn 4.5G compatible smartphones, ~1Mn QoQ

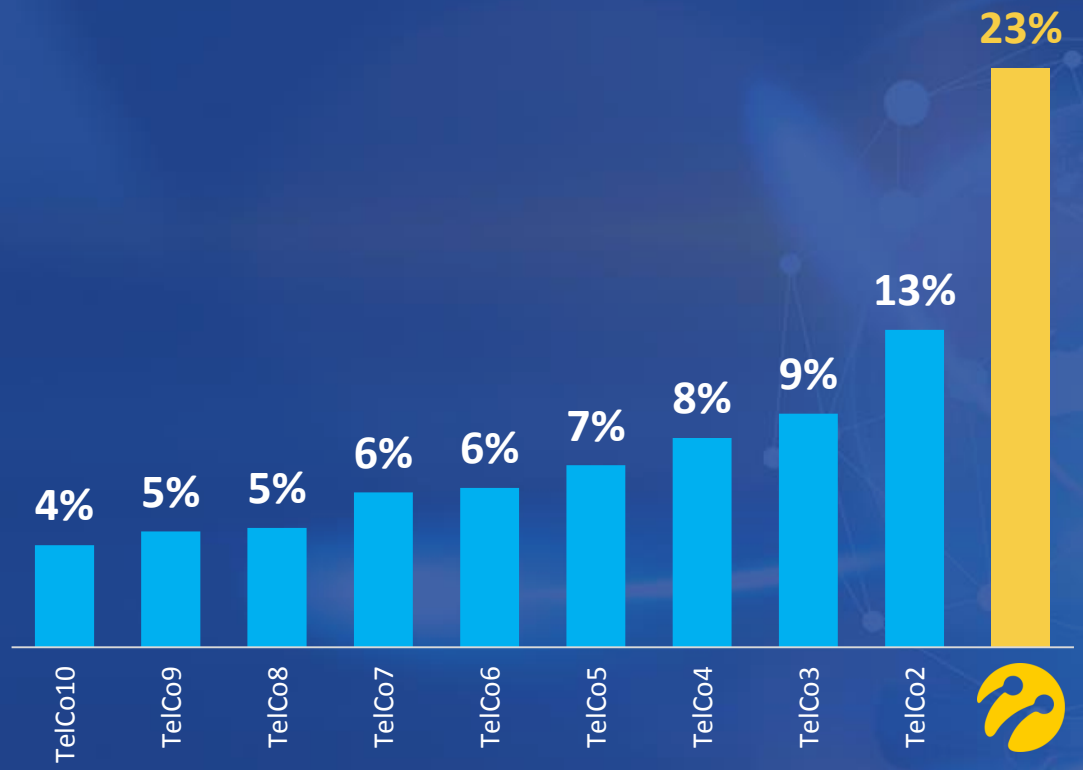
Mobile Triple Play

Multiplay with TV

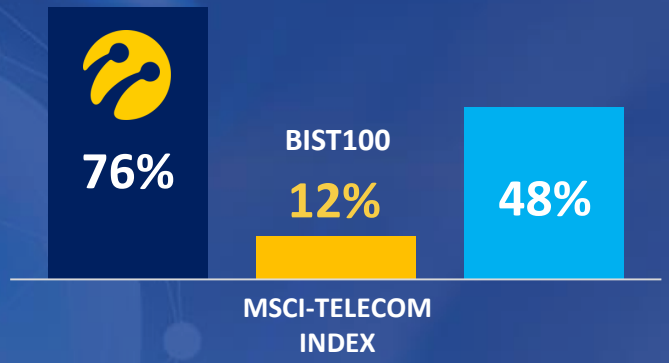
* *Core digital services include BiP, Dergilik, Fizy, My Account, Lifebox, Academy, Sports app, Upcall, TV+ and Yaani*

SUCCESS STORY OF TURKCELL WITH NUMBERS

REVENUE GROWTH RATE COMPARISON (2017)



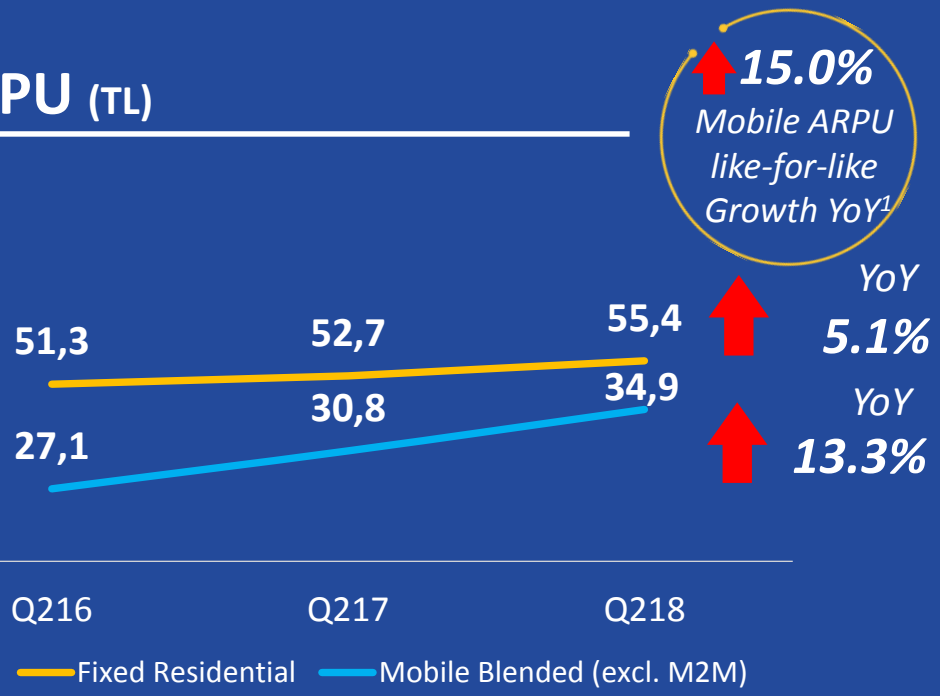
SHARE PRICE PERFORMANCE (2017)



Source: Bloomberg
Note: Top 100 telecom operators in terms of market capitalization is taken into consideration.
Turkcell 2017 revenue growth rate is compared to those which announced their financial results as of Feb 15, 2018.

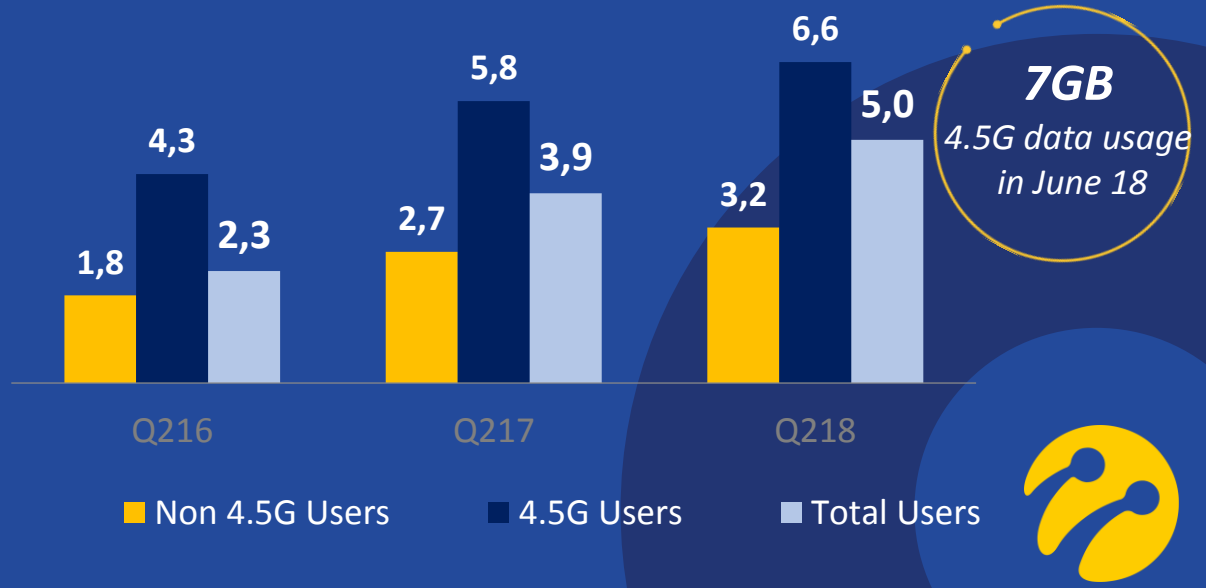
TRANSFORMING INTO THE DIGITAL OPERATOR

ARPU (TL)



MOBILE CHURN RATE

MOBILE DATA USAGE (Av. GB/User)



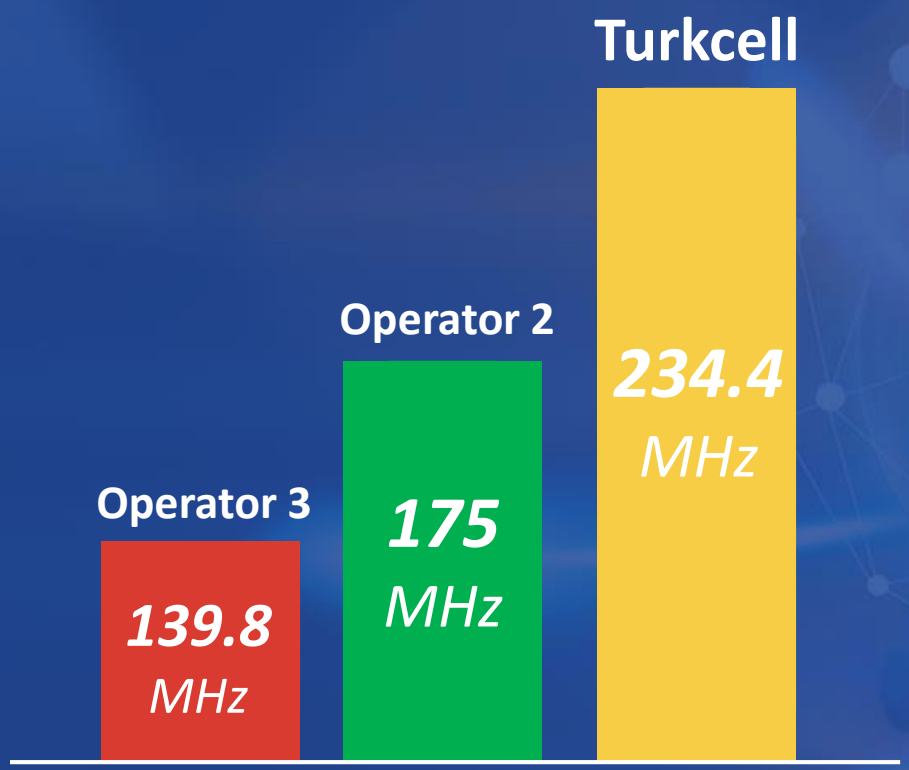
Note: In Q117, our churn policy was revised to extend from 9 months to 12 months (the period at the end of which we disconnect prepaid subscribers who have not topped up above TRY10). Additionally, under our revised policy, prepaid customers who last topped up before March will be disconnected at the latest by year-end. Please note that figures for prior periods have not been restated to reflect this change in churn policy. The net mobile subscriber addition figures and mobile churn rate for Q217 disclosed in this document have been positively impacted by this change.

[1] The ARPU of customers who have stayed with Turkcell for at least 14 months.

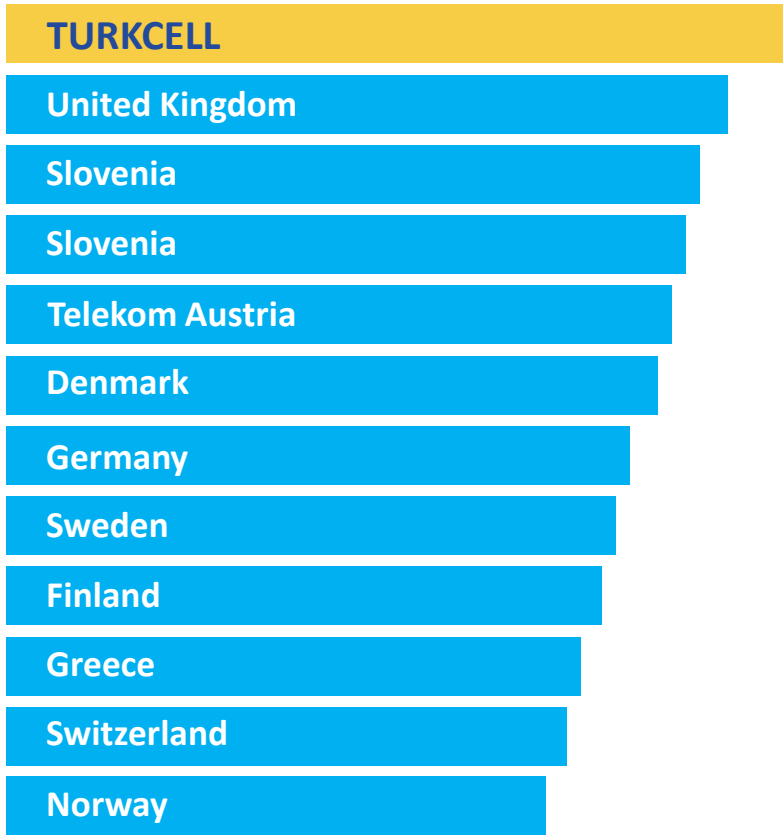
[2] Company calculation on the basis of monthly churn rates disclosed in ICTA sector reports.

THE WIDEST SPECTRUM

TURKEY

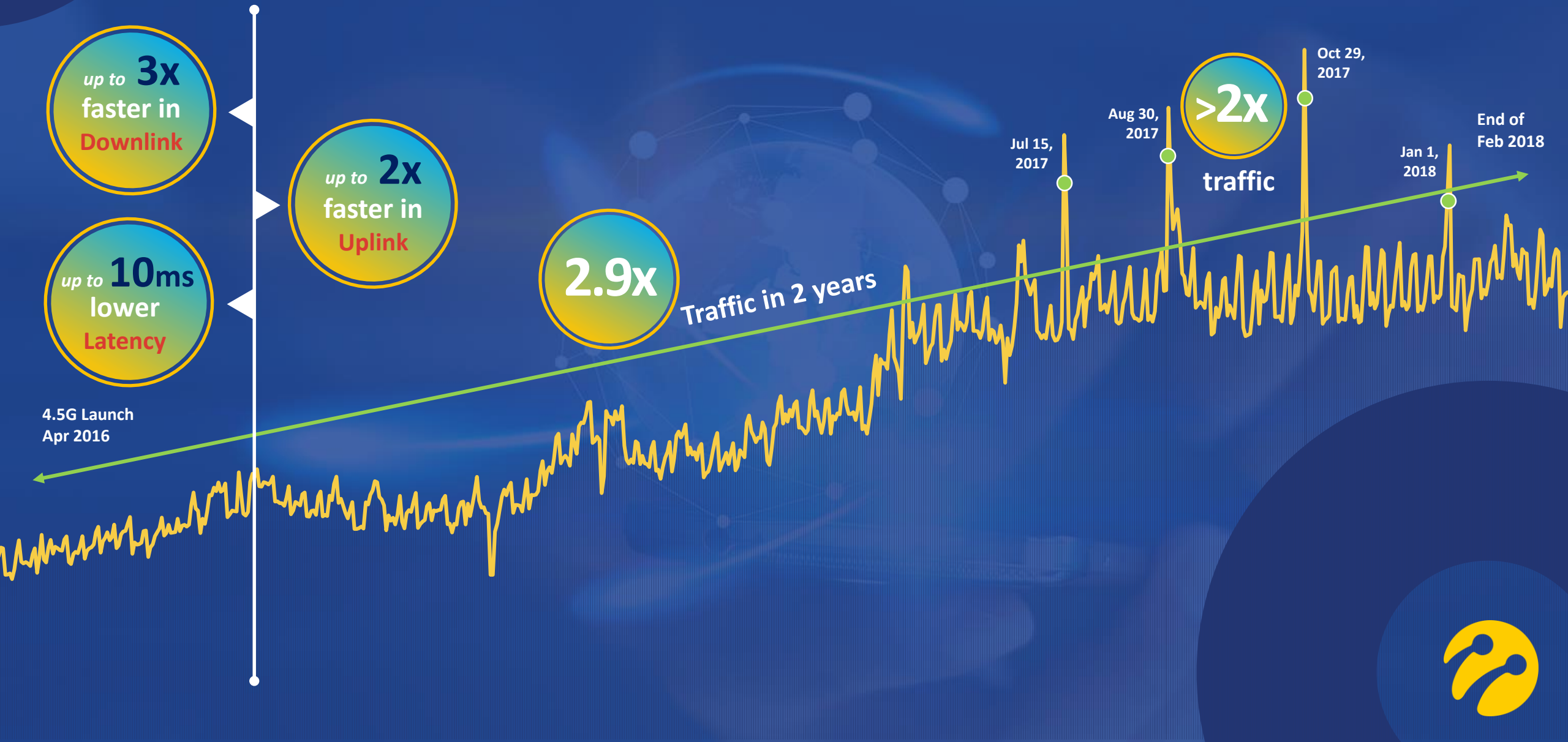


EUROPE



TTG: Turk Telekom Group, VDF: Vodafone TR

SMART NETWORK PLANNING



FASTEST + BEST + WIDEST

SPEED

1,6 Gbps

QUALITY

4x4 MIMO
all network

CARRIER AGGREGATION
all network

COVERAGE

2G **> 99.5%**

3G **> 97%**

4.5G **> 90%**

INTERNET OF THINGS @ TURKCELL

All network NB-IoT and Cat-M
Among 4 operators in the world

Not the pipe, but the analysis
(*Analytics, Machine Learning*)

Different use cases
(Metering, Car parking, Lightning)

2023
1.8 billion
IoT devices

LTE/5G

2017
0.5 billion
IoT devices

Source: Ericsson Mobility Report, November 2017

NEW BUSINESSES

ENERGY & AUTOMOTIVE

SMART HOME, CITY, CONNECTED CAR TRANSPORTATION & ENERGY SOLUTIONS,

Turkcell Energy

Technology provider role in «Turkey's Automobile Project»

EDUCATION

EDUCATION SERVICES TO A WIDE RANGE OF CUSTOMER GROUPS

Turkcell Academy
Hello Hope, Sign Language & Digital Intelligence Quotient

HEALTHCARE

END-TO-END «HOSPITAL INFORMATION MANAGEMENT SYSTEMS»

Leader in terms of # of beds

Strong pipeline

5G COLLABORATING WITH VENDORS DEVELOPING 5G TESTBEDS TO VALIDATE USE CASES

HUAWEI

ERICSSON

NOKIA

HTK HABERLEŞME TEKNOLOJİLERİ KÜMELENMESİ

Airspan

ULAK HABERLEŞME A.Ş.

aselsan

SAMSUNG

11 January 2017 — 24.7 Gbps

15 June 2017 — 70.97 Gbps

5G R&D ACTIVITIES

Network Intelligence	Network Slicing, MEC	Connected & AV
Health	PHY	5G Testbed

1 Horizon 2020

3 Celtic-Plus Smart Connected World

7 TÜBİTAK

- 5G testing (Co-leading)

3GPP A GLOBAL INITIATIVE

ITU

- SG 13, SG 16, SG17 and SG20
- Focus Group on "Machine Learning for Future Networks including 5G" (Vice-chairing)

5G TR FORUMU

5G PPP

ngmn the engine of broadband wireless innovation

İSTANBUL TEKNİK ÜNİVERSİTESİ 1773

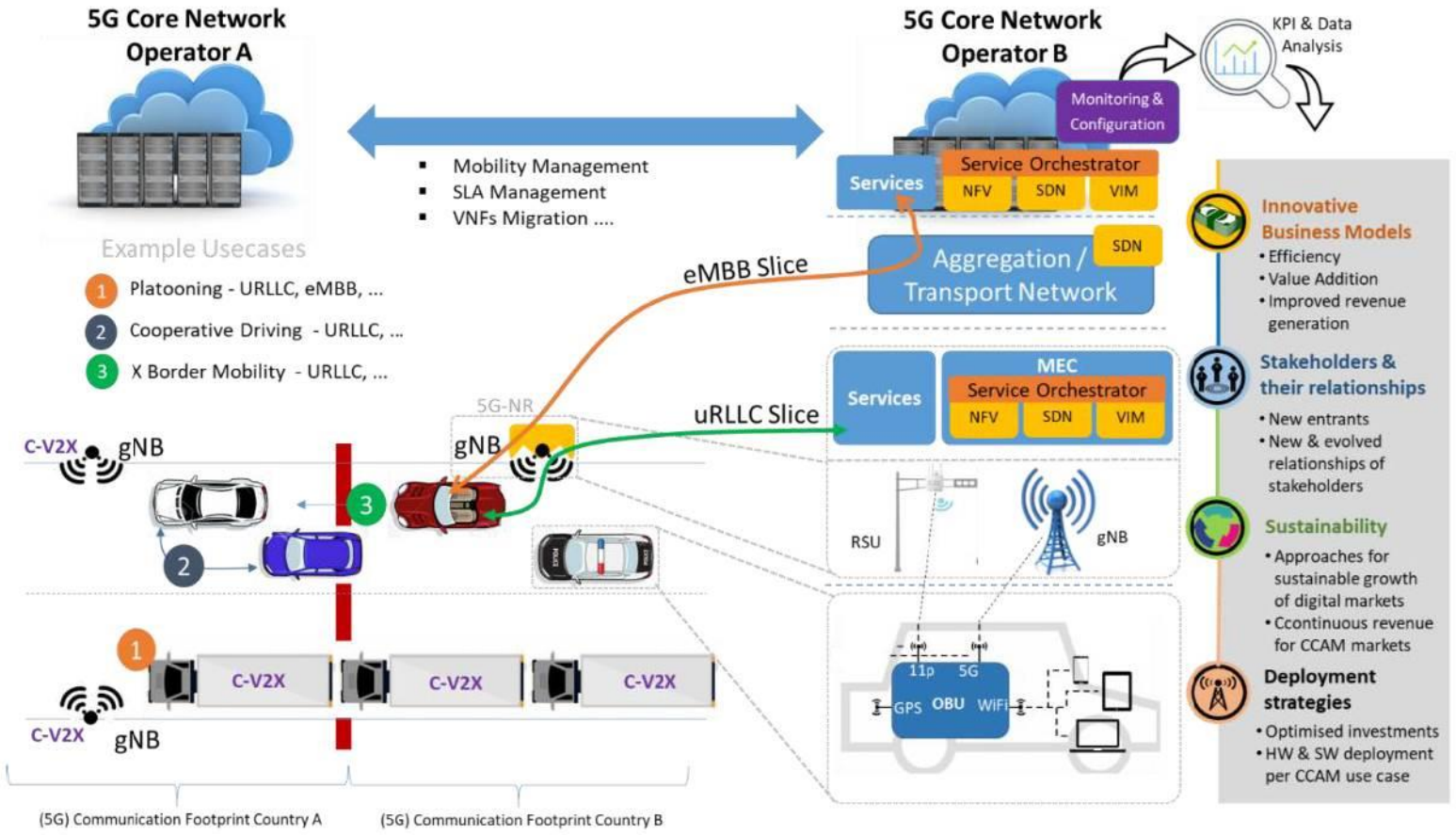
GSMA

ONF

TELECOM INFRA PROJECT

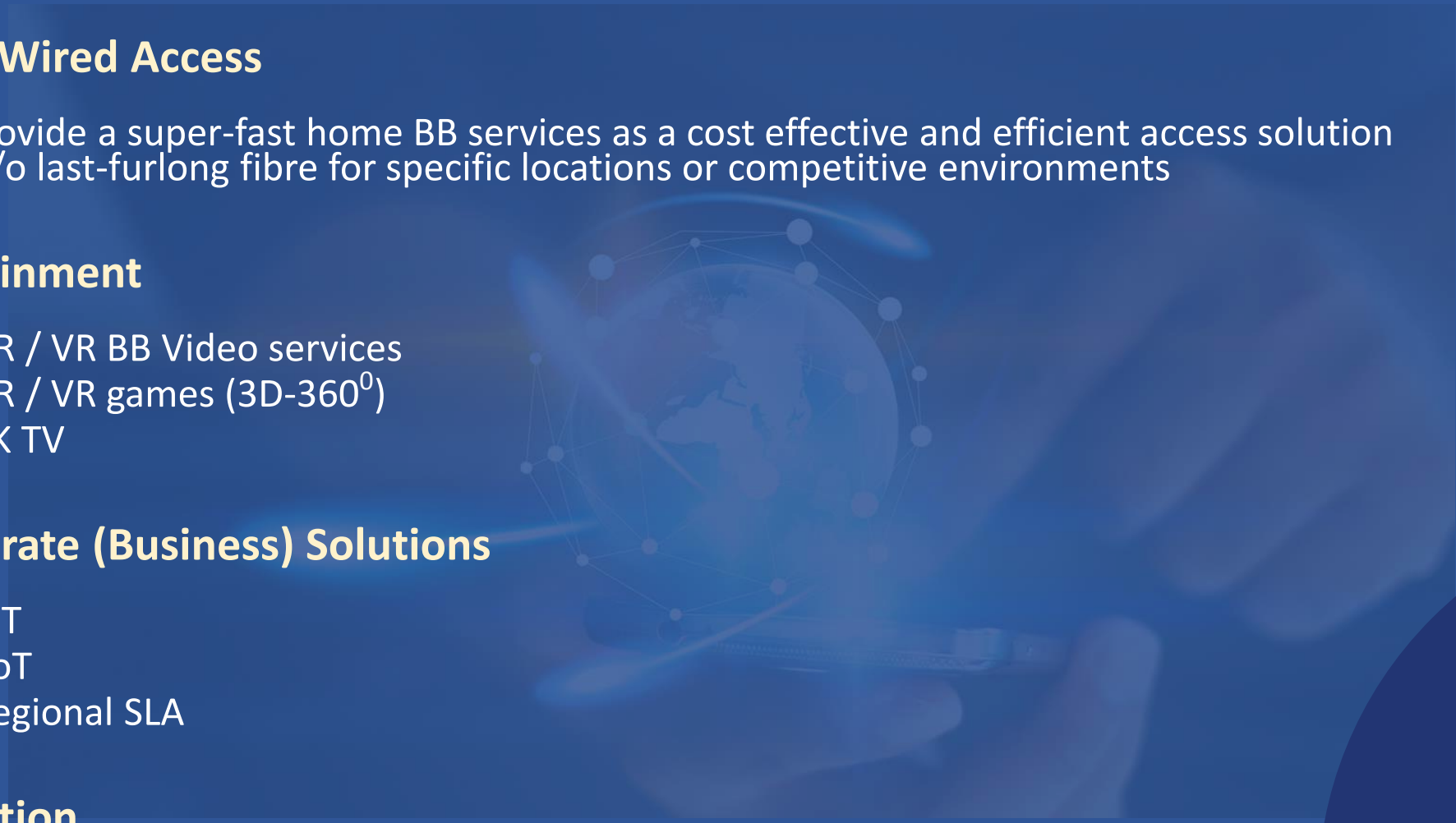
TURKCELL'S HORIZON 2020 5G PROJECT

5G for cooperative & connected automated MOBIility on X-border corridors



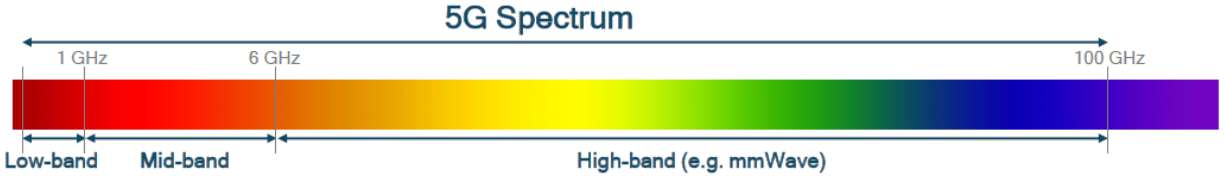
- The largest 5G based V2X Communications Project in Turkey
- Smart Platooning Services along the borders

5G QUICK-WIN USE CASES



- **Fixed Wired Access**
  - Provide a super-fast home BB services as a cost effective and efficient access solution w/o last-furlong fibre for specific locations or competitive environments
- **Infotainment**
  - AR / VR BB Video services
  - AR / VR games (3D-360^0)
  - 4K TV
- **Corporate (Business) Solutions**
  - IoT
  - IIoT
  - Regional SLA
- **Education**
  - BB (High Quality Contents) connectivity

5G SPECTRUM IN TURKEY



- 470-694/8 MHz (ITU)
- 600 MHz (US)
- 700 MHz (EU)

- 3.3-3.8 GHz (EU)
- 3.85 GHz (US)
- 3.8-4.2 GHz (UK)
- 4.8-4.99 GHz

- 24.25-27.5 GHz (EU)
- 28 GHz (Japan)
- 27.5-28.35 GHz (US)
- 26.5-29.5 GHz (Korea)

- 37-40 GHz (US)
- 64-71 GHz for licence excempt (US)

To be considered at ITU- WRC19

- 5-6 GHz (for ITS, AV, IoT, IIoT)
- 24.25-27.5 GHz
- 31.8-33.4 GHz
- 37-43.5 GHz
- 45.5-50.2 GHz
- 50.4-52.6 GHz
- 66-76 GHz
- 81-86 GHz

ULAK COMMUNICATIONS INC.

SOLUTIONS TOWARDS 5G and BEYOND

ULAK BASE
STATION (LTE/5G)

MILAT SDN/NFV
Based Network Technologies

LTE/5G Core Network

aselsan NETAS ARGELA TURKCELL Türk Telekom vodafone

DOMESTIC E2E 5G COMMUNICATIONS NETWORK

HTK HABERLEŞME TEKNOLOJİLERİ KÜMELENMESİ

120+ member companies,

8000+ experts,

8 universities within 6 technopolis areas

SUPPORTERS

TURKCELL Türk Telekom vodafone

MEMBERS

Main project:

- End to end 5G NW with 17 companies and 3 GSM operators
- $50 Mn budget (Government funding granted), 500+ engineers
- Radiolink equipments, 5G NR, Virtualized and centralized RAN (C-RAN) , Core Network, OSS, NFV, Cyber Security, Routers and Switches, SW, System Tests and Integration

TURKISH UNIVERSITIES RESEARCHING 5G & BEYOND

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

KOÇ
UNIVERSITY

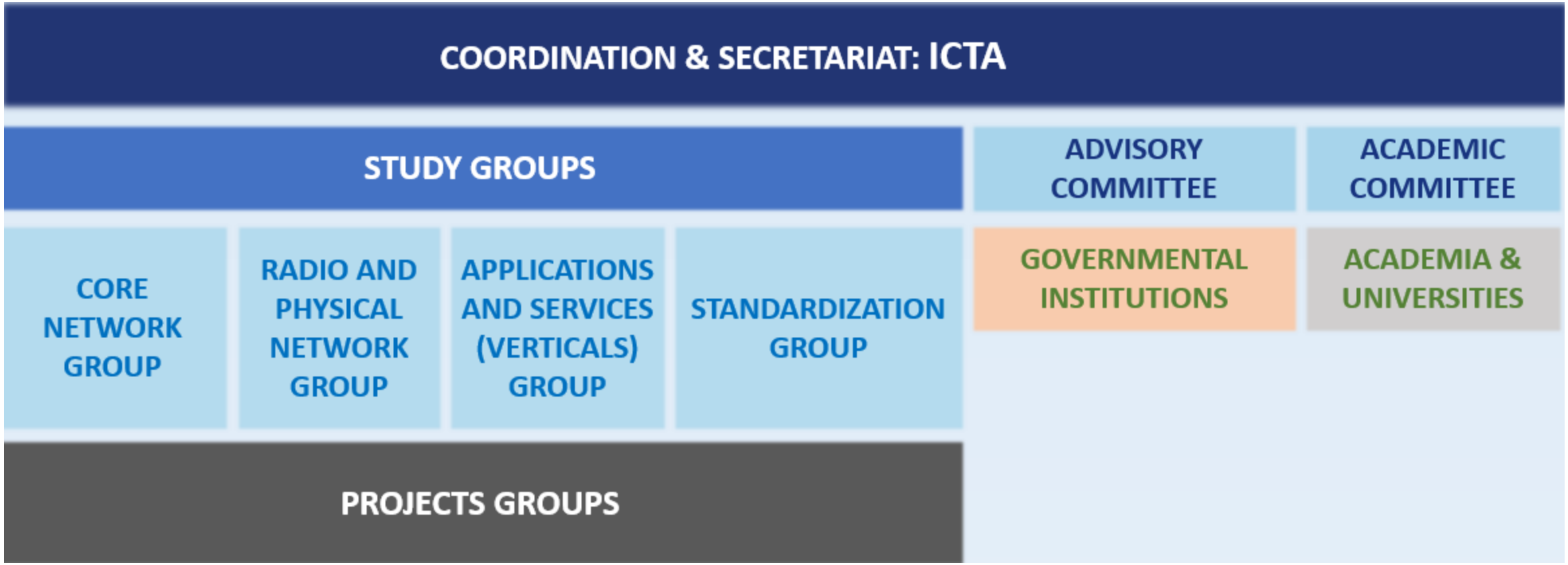
Sabancı
Üniversitesi

TOBB
EKONOMİ VE TEKNOLOJİ
ÜNİVERSİTESİ

5GTR FORUM

- **70 Members**
  - Operators, Institutions, Ministries, Manufacturers, Universities, NGOs, R&D Corps.
- **Objectives**
  - Conduct 5G R&D co-ordinating with related domestic and intl. stakeholders
  - Foster 5G ecosystem
  - Collect knowledge pertaining to standarts Framework for 5G Technology and Policy in Turkey
  - Promote education (5G and Beyond Joint Graduate Support Programme)
- **5th 5G Forum in the World**
  - Founded on April 29, 2016
  - MoUs with 5GMF and 5G Forum Korea
  - Plenty of domestic and intl. Workshops, SG Meetings, Summits, Conferences, Symposiums etc.

5GTR FORUM STRUCTURE



5G VALLEY OPEN TEST AREA CONSORTIUM

PARTNERS

TURKCELL supports 10 MSc & PhD students each year to work on 5G related topics for their thesis

JOINT POSTGRADUATE PROGRAM

THANK YOU

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