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# ITU-EKIP Regional Regulatory Forum for Europe

## Session 1: Market and Technological Trends *5G Preparatory Studies in Türkiye*

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# AGENDA

**An Overview of Mobile Communication Market in Türkiye**

**Domestic Production Studies for Mobile Networks**

**5G Test Trial Permits**

**Preparation Studies on 5G Authorization**

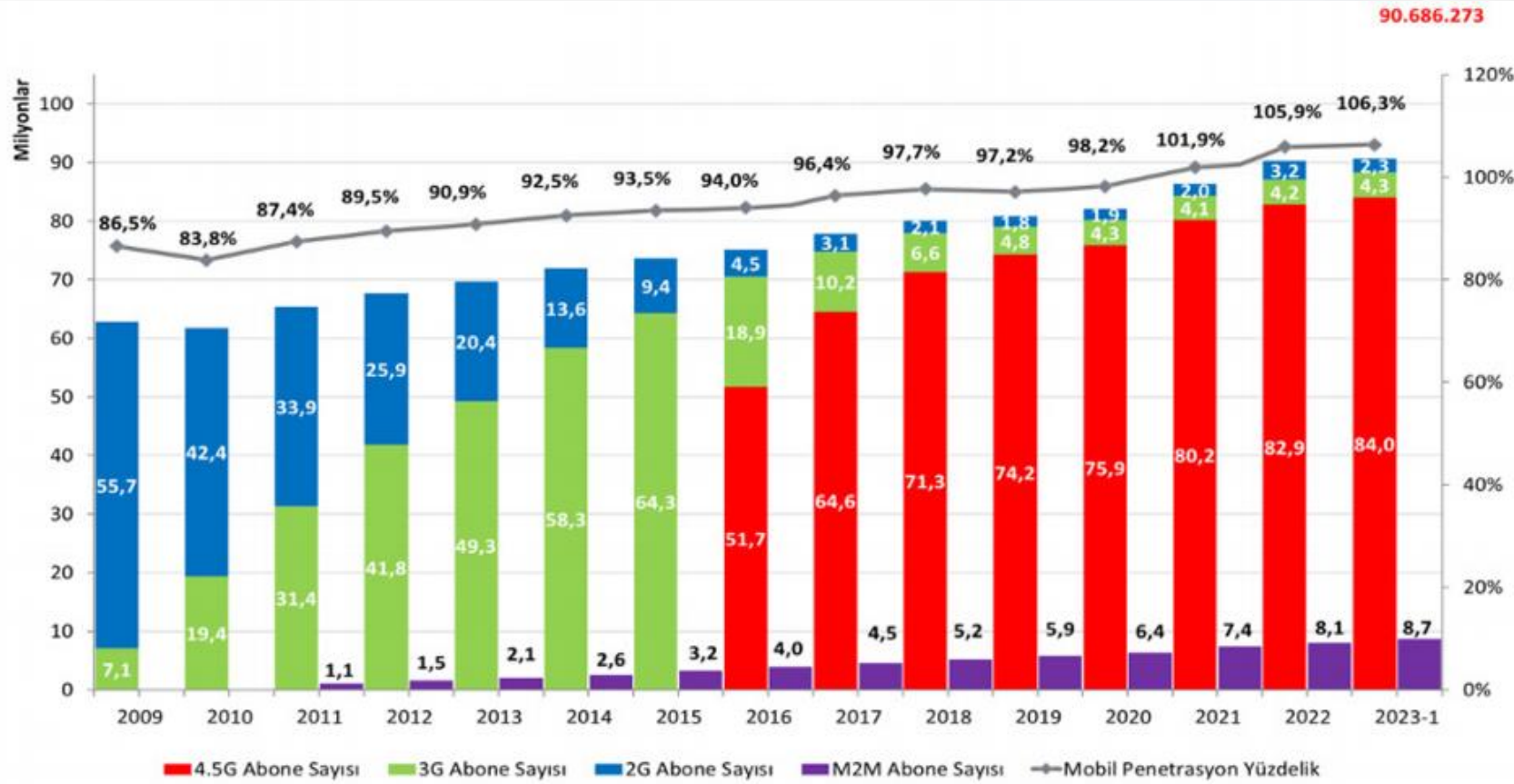
**Conclusion**

# Mobile Communication Market-I

- 3 mobile operators
- 9 mobile licenses

	<b>2G</b>	<b>3G</b>	<b>4.5G</b>
<b>TT Mobil</b>	2026	2029	2029
<b>Turkcell</b>	2029	2029	2029
<b>Vodafone</b>	2029	2029	2029

# Mobile Communication Market-II



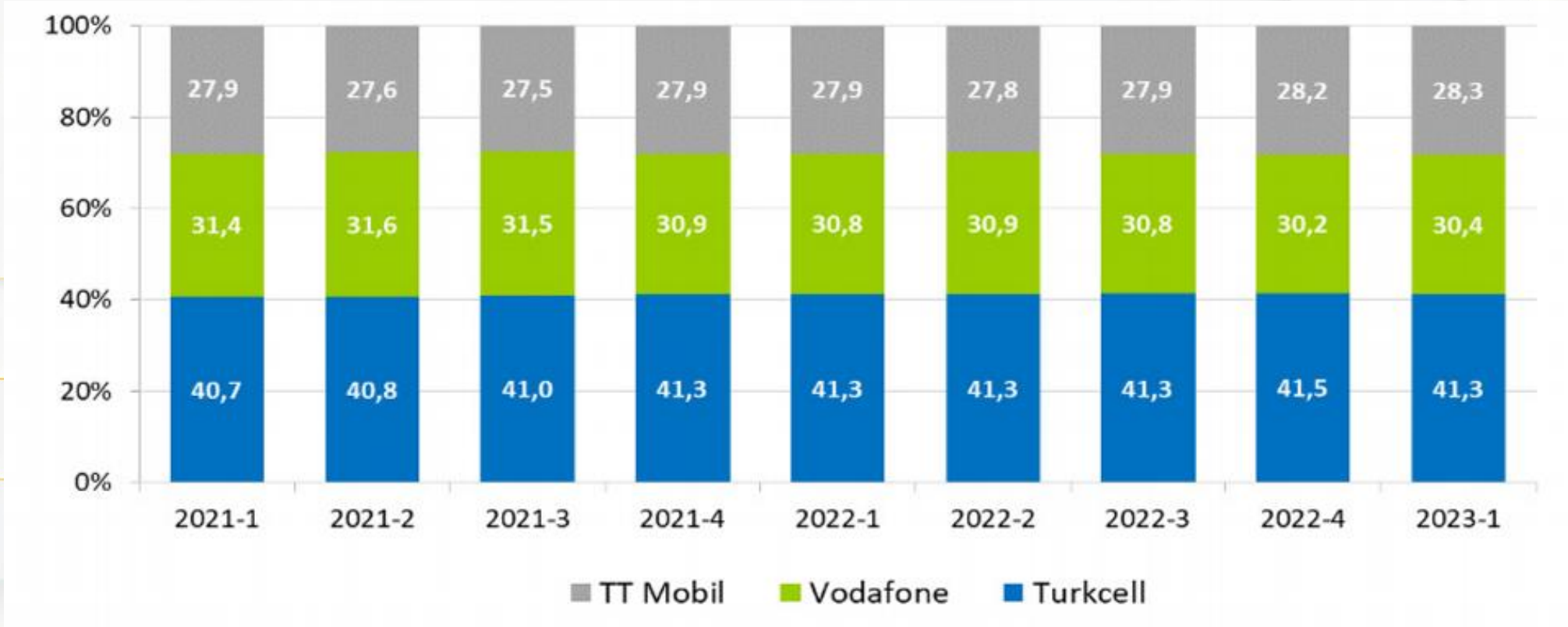
**Mobile Subscribers  
2023/Q1  
90.7 millions**

**8.7 millions M2M  
2.3 millions 2G  
4.3 millions 3G  
84 millions 4.5G**

**Peneration rate  
%106,3**

Source: BTK, Sector Report Quarterly

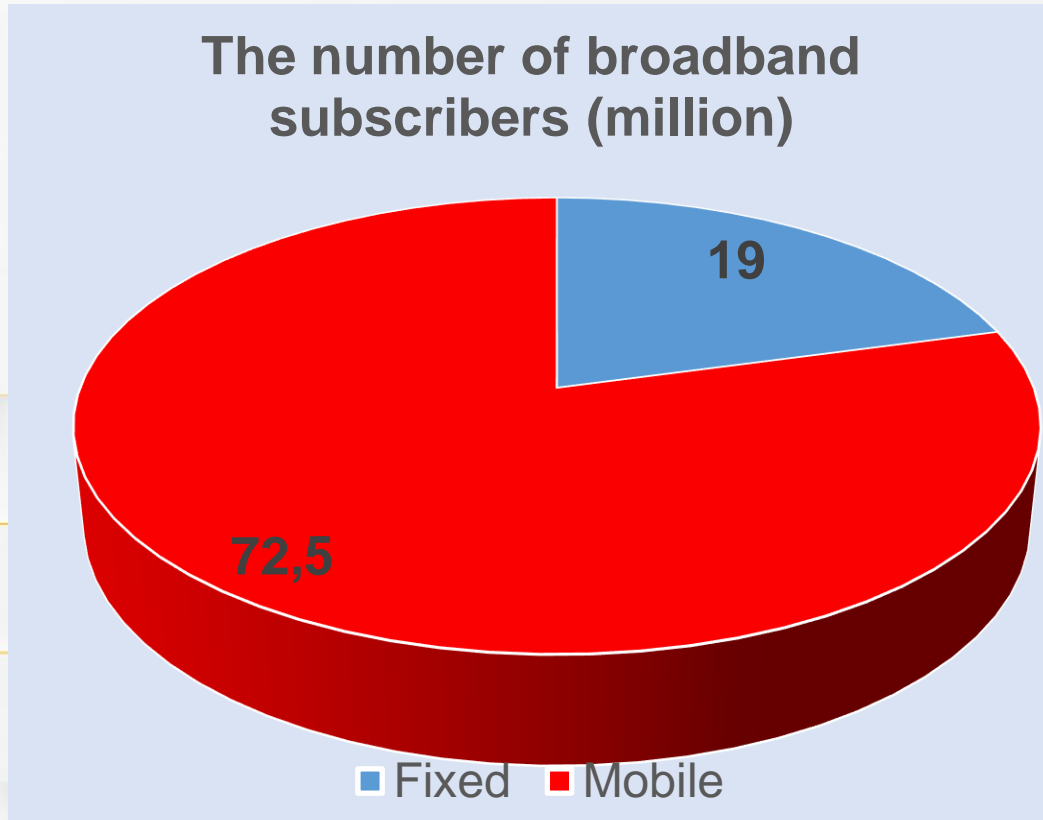
# Mobile Communication Market-III



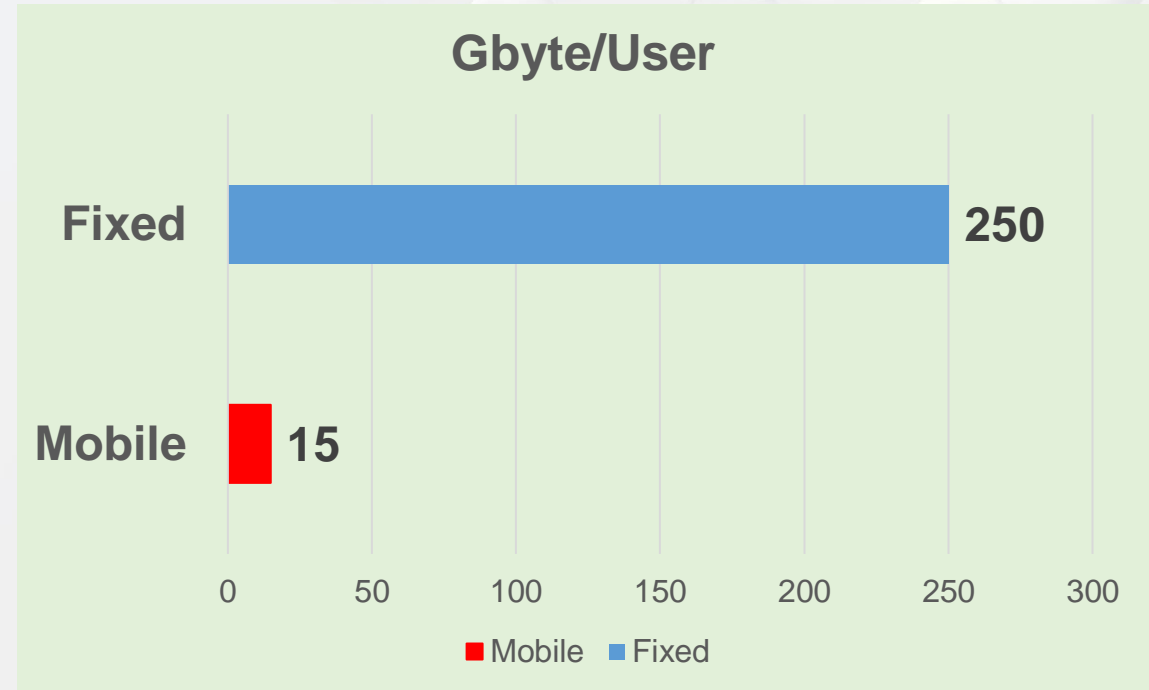
*Market share of mobile operators by number of subscribers*

# Mobile Communication Market-IV

The number of broadband subscribers (million)



Gbyte/User

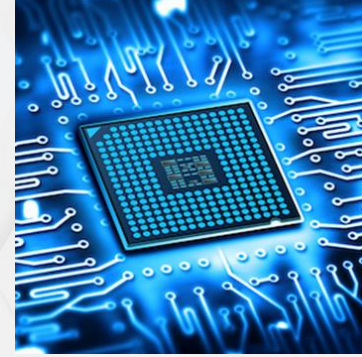


*Average monthly data usage per subscriber*



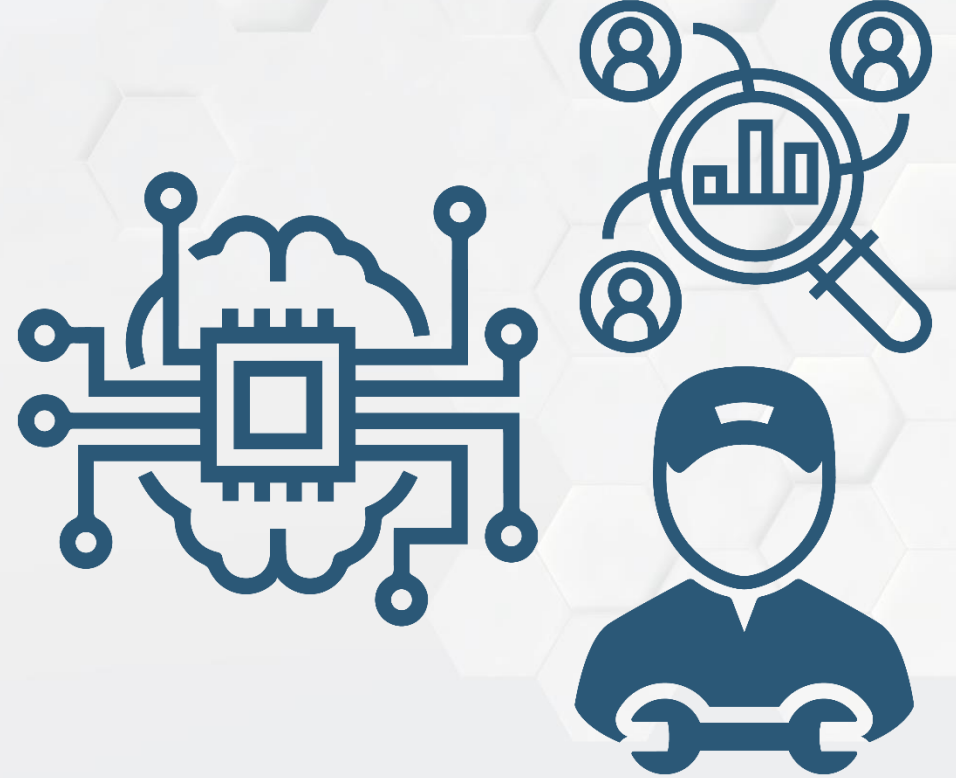
# Domestic Production Studies-I

- In order to develop R&D studies and support the domestic production ecosystem in the electronic communication sector is one of our main goals.
- In accordance with this purpose, we wanted operators to purchase certain amount of their network equipment from the domestic goods certified products.
- The domestic product usage rate, which was at the level of 1% in the first investment period, reached 37% in the end of 2022.



## Domestic Production Studies-II

- Every year, mobile operators have to cover at least 40% of their investments from vendors having R&D centers in Türkiye.
- Ericsson and Huawei have had R&D centers in Türkiye.
- Over 600 engineers who is Turkish Citizens are working at each of these R&D centers.
- National and international R&D projects.
- Software products developed in Türkiye.





# Domestic Production Studies-III

## ULAK

- One of the important domestic production works is the ULAK 4.5G Base Station project.
- With the ULAK 4.5G base station, Türkiye has become one of the countries that can produce base stations.
- ULAK 4.5G base station is currently in service at more than 2000 sites.

## HTK (Communication Technologies Cluster)

- HTK was established in 2017, under the leadership of BTK, in order to improve domestic and national product development activities in the sector.
- HTK represents more than 160 manufacturing companies.



*ULAK 4.5G Base Station*

## Domestic Production Studies-IV

- HTK companies and 3 mobile operators have carried out «End to End Domestic 5G Communication Network Project» initiated in 2018.
- Funded by TÜBİTAK.
- The first phase, which covers the prototype development of products such as 5G new radio (@3.5 GHz, NSA and SA, compatible with Rel.15) and 5G core network (SA) was completed in 2021.
- Developed 5G new radio prototype can work in existing 4.5G networks.
- The other phases are continuing on the development of higher capacity versions of the 5G products.



## 5G Test Trial Permits

- Within the scope of 5G, test and trial permits are given to domestic manufacturers, universities and mobile operators by BTK.
- The 700 MHz, 3.5 GHz and 26 GHz frequency bands are used for test-trial purposes.



- One of the important studies within the scope of the test trial permits is the pilot 5G service started to be offered at Istanbul Airport.
- With the launch held in July 2022, 5G services have started to be provided by three operators in certain areas of Istanbul Airport.



# Studies on 5G Authorization-I

## ➤ Defining 5G Strategy:

- Frequency bands and bandwidth,
- Starting date of the service,
- Authorization method,
- Duration of the authorization,
- The number of the operators to serve.

## Studies on 5G Authorization-II

- 800-900-1800-2100-2600 MHz bands are used by operators.
- 5G frequency bands:
  - 700 MHz (694-790 Mhz) As part of the preparation for 5G, 700 MHz frequency band has been vacated by the RTÜK (Radio and Television Supreme Council).
  - 3.5 GHz (3400-3800 MHz)
  - 26 GHz (24.25-3800 MHz)
- Operators want 700 MHz and 3.5 GHz to be auctioned primarily.
- All of the 3 Operators have trials in 700 MHz, 3.5 GHz and 26 GHz.
- Planning stage of 5G frequencies is ongoing.



## Studies on 5G Authorization-III

- Coverage obligations in Türkiye.
- 4.5G: In addition to population coverage obligation, highways, railways, tunnels more than 1 km length are in the scope of coverage obligation.
- It is discussed to include industrial areas and technology development zones in the 5G coverage obligations.



## Studies on 5G Authorization-IV

- Private 5G issue.
- In Türkiye, it is not decided whether private networks shall be assigned freq.
- Certain frequency bandwidth can be considered to assign the big factories depending on the demand OR new entrants can take this role for niche markets.
- 4.5G auctions held for 4 licences and 10 MHz FDD and 5 MHz TDD block reserved in 2.6GHz auctions for the new entrants.
- These blocks were not assigned due to the lack of interest.

## Studies on 5G Authorization-V

- Domestic product development efforts for 5G continue by Turkish companies.
- Transition to 5G technology by using domestic products as much as possible.
- Definition of critical network functions.
- Ensure the vendor diversity in mobile networks.





# CONCLUSION

- BTK's policy proposals for the 5G Authorization.
- Studies for 5G are continuing with the following sensitivities:
  - Considering the interests of all stakeholders
  - Prioritizing 5G network security
  - Ensuring the vendor diversity
  - Raising awareness in vertical sectors
  - Giving importance to national and international cooperation in the production of 5G equipment and the development of the ecosystem
  - Supporting the development of human resources in telecommunications area.



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**THANK YOU FOR YOUR ATTENTION**

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