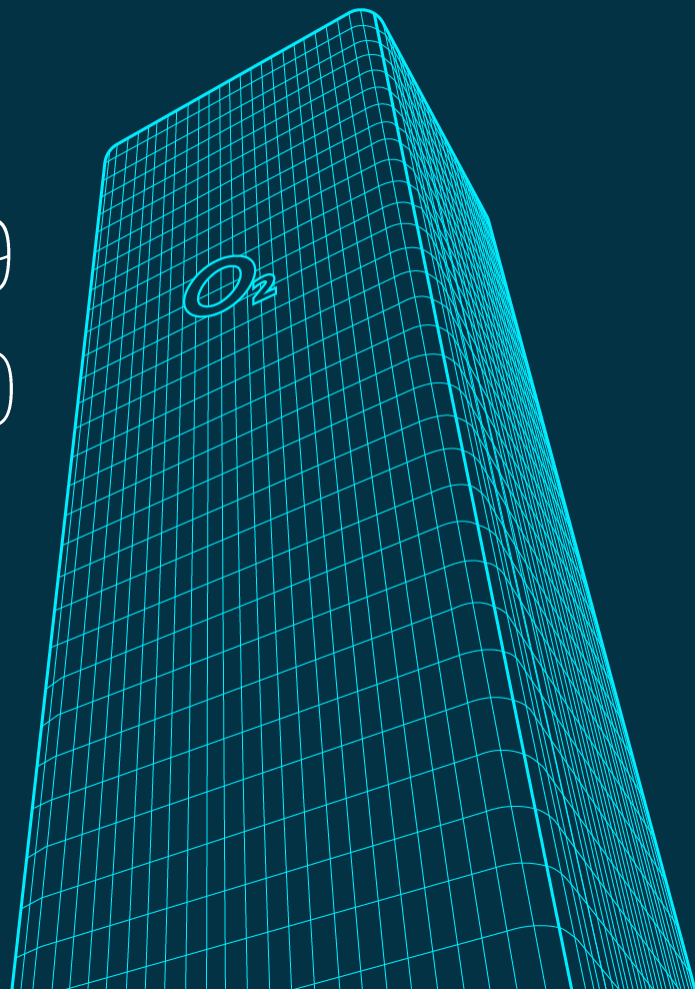


5G Learnings out of 2019 Expectations for 2020

Nokia Innovation Days 2019, 27. November 2019
Gerald Huber Telefonica Germany GmbH & Co. OHG



Telefónica weltweit



49

49 Mrd. Euro Umsatz in 2018



336

336 Mio. Kunden weltweit
in 2018



10

Eines der 10 größten
Telekommunikations-
unternehmen der Welt



120.000

Über 120.000 Mitarbeiter in 2018



14

Geschäftsaktivitäten
in 14 Ländern

Telefónica in Deutschland



50,1

Mio. Kundenanschlüsse*



8.800

Mitarbeiter 2018



45,7

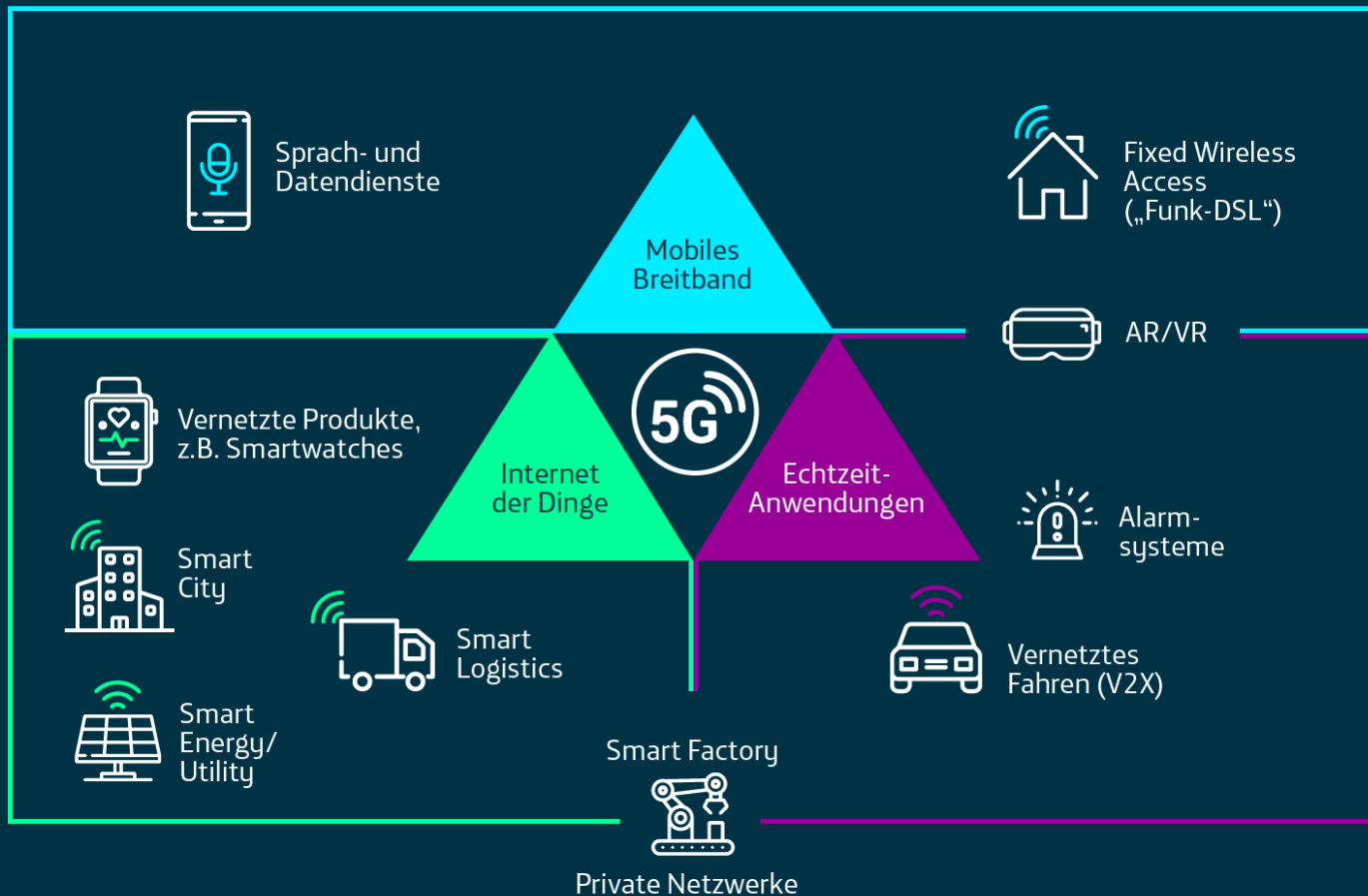
Mio. Mobilfunkanschlüsse*



7,3

Mrd. Euro Umsatz 2018

5G – Capabilities & Use Cases



5G - 2019 what happened...

12.06.2019
„The auction has ended“

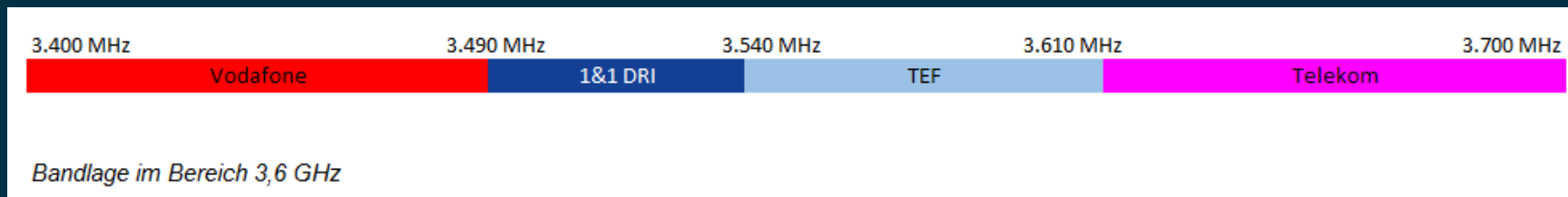


6,55 billion €

Source: Bild (<https://www.bild.de/geld/wirtschaft/wirtschaft/5g-mobilfunk-auktion-startet-60731190.bild.html>)

5G - 2019 what happened

02.08.2019 Agreement of the absolute frequency position of all four participants within the 3.6GHz frequency spectrum

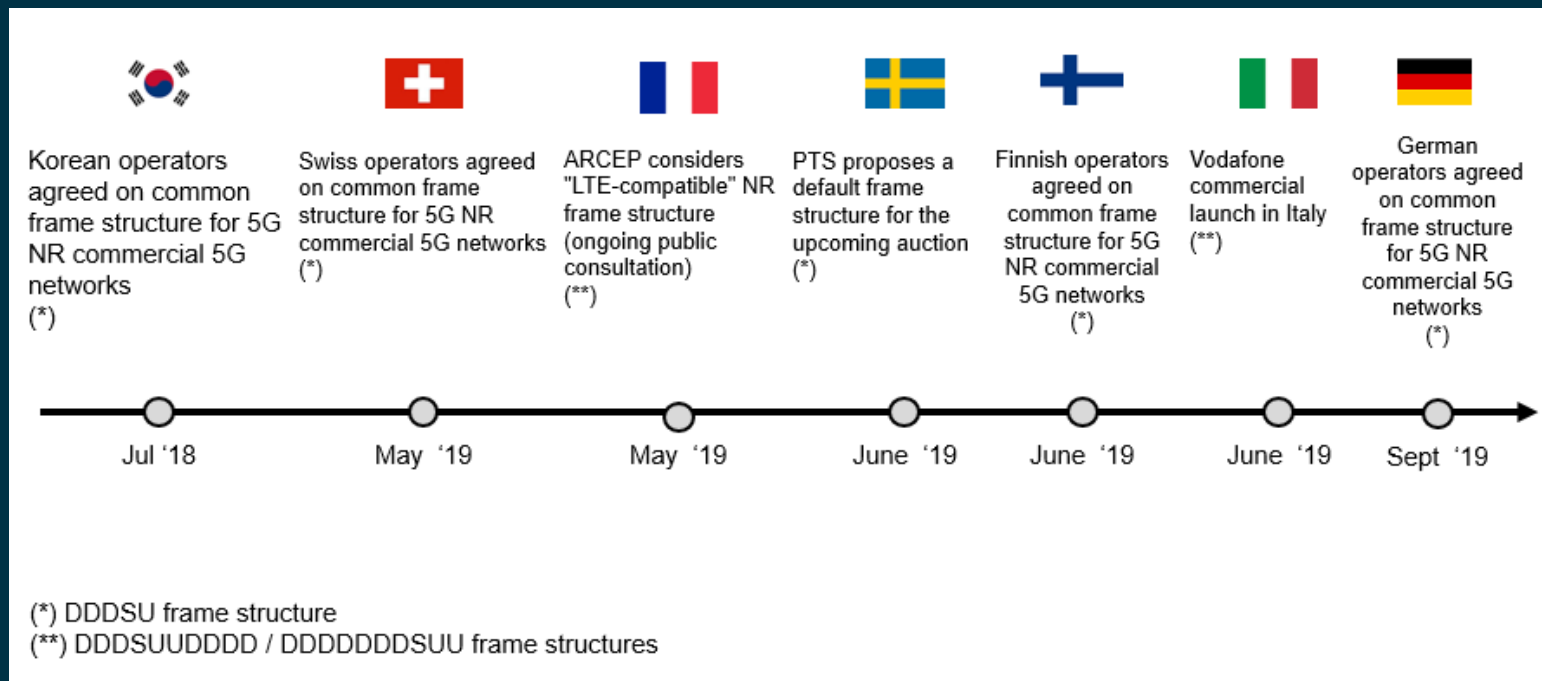


Source: Bundesnetzagentur

Agreement within Germany over the FDD configuration

DL	DL	DL	S	UL
DL	DL	DL	S	UL
DL	DL	DL	S	UL
DL	DL	DL	S	UL

5G frame structure in 5G Countries



Source: HUAWEI

August 2019



Telefonica

August 2019



Telefonica

August 2019



5G - 2019 what happened

The image is a screenshot of a press release from the Bundesnetzagentur (Federal Network Agency) website. The header includes the agency's logo and navigation links: Themen, Verbraucherservice, Bundesnetzagentur, and Presse. The main headline is 'Antragsverfahren für lokale 5G-Campus-Netze gestartet'. Below the headline, it states 'Präsident Homann: "Fördern innovative Lösungen für Wirtschaft und Industrie"'. The release date is given as 'Ausgabejahr 2019' and 'Erscheinungsdatum 21.11.2019'. The first paragraph mentions that the application process for local 5G applications has started. The second paragraph is a quote from Jochen Homann, President of the Bundesnetzagentur, stating that the agency aims to promote digitalization and create opportunities for diverse campus networks in the Industry 4.0 sector.

 Bundesnetzagentur

Themen Verbraucherservice Bundesnetzagentur Presse 

Antragsverfahren für lokale 5G-Campus-Netze gestartet

Präsident Homann: *"Fördern innovative Lösungen für Wirtschaft und Industrie"*

Ausgabejahr 2019
Erscheinungsdatum 21.11.2019

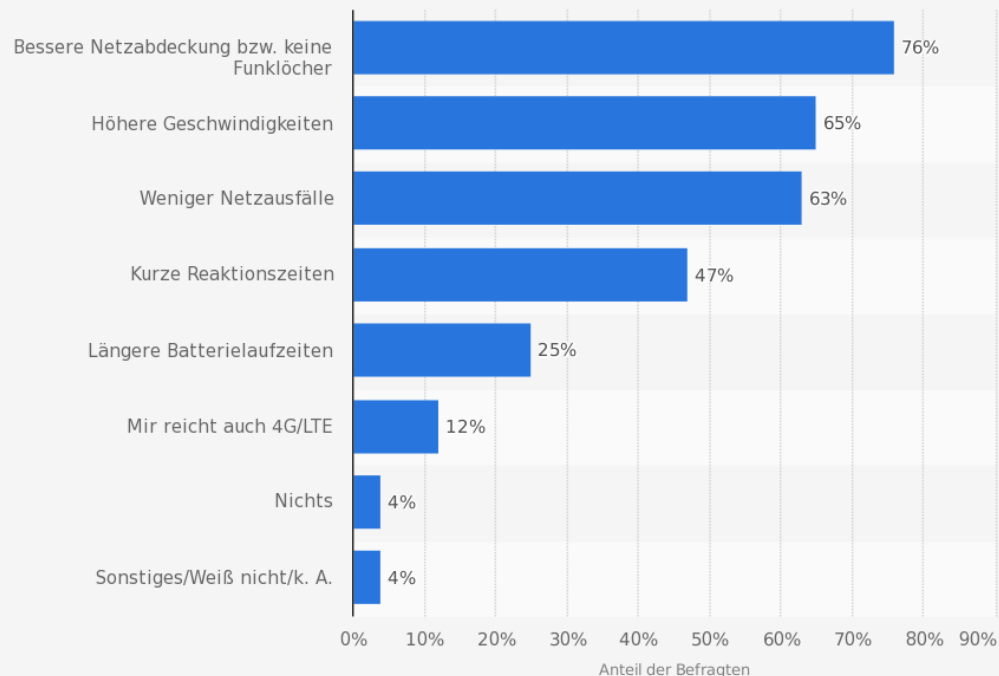
Die Bundesnetzagentur hat heute das Antragsverfahren für lokale 5G-Funkanwendungen gestartet.

"Mit den Frequenzen für lokale Anwendungen fördern wir die Digitalisierung von Wirtschaft und Gesellschaft. Wir setzen auf innovative Lösungen und schaffen Möglichkeiten für vielfältige Campus-Netze. Wir wollen, dass Deutschland eine Vorreiterrolle im Bereich Industrie 4.0 einnehmen kann", sagt Jochen Homann, Präsident der Bundesnetzagentur.

5G - Expectations

Mobilfunktechnologie
Hohe Erwartungen
Versteigerung von
Das Internet der Dinge, vernetzte Pro
Übertragung von Dokumenten und
Mobilfunk-Frequenzen im 5G-Netz
der Frequenzen begonnen. Vier U
Von Andreas Reinhardt

Was erwarten Sie von 5G?



Quelle
Bitkom Research
© Statista 2019

Weitere Informationen:
Deutschland; Februar 2019; 782 Smartphone-Nutzer; ab 16 Jahre

5G - Expectations

Expectation

1 Gbit @ 1ms
everywhere, for
everybody at any
time

Technology

Reality depends on the
spectrum...

Estimation for the FDD (700,
800, 1800, 2100, 2600 MHz)
spectrum:

10MHz ~ 75MBit

Estimation for the TDD
(3,6GHz & 26GHz) spectrum:

70MHz ~ 1 Gbit

Reality

Demand driven roll out

**70 MHz in Cities
+ 4G**

**10 MHz in the Countryside
+ 4G**

5G – 2019 not in mass rollout today

Actual acquired spectrum in TDD is not available to all operators now.

Telefonica

No numbers about volume and network start.

Operator A

Plans to build 100 sites in 20 cities until EoY 2019

Operator B

Start with 20 sites and plan for extension until EoY

Operator C

No info about network start and plans

Option 3x vs. Option 2

Option 3x

PRO:

- Works on existing (upgraded) core
- Radio & Core available
- Dual Carrier and Carrier Aggregation gives benefits to the customers

CON:

- Radio Coverage depends on the anchor network (e.g. 1800MHz grid)
- Only eMBB case possible

Option 2

PRO:

- Full blown 5G in case of the “triangle” (eMBB, URLLC, mMTC)
- Basis for edge computing
- Basis for slicing

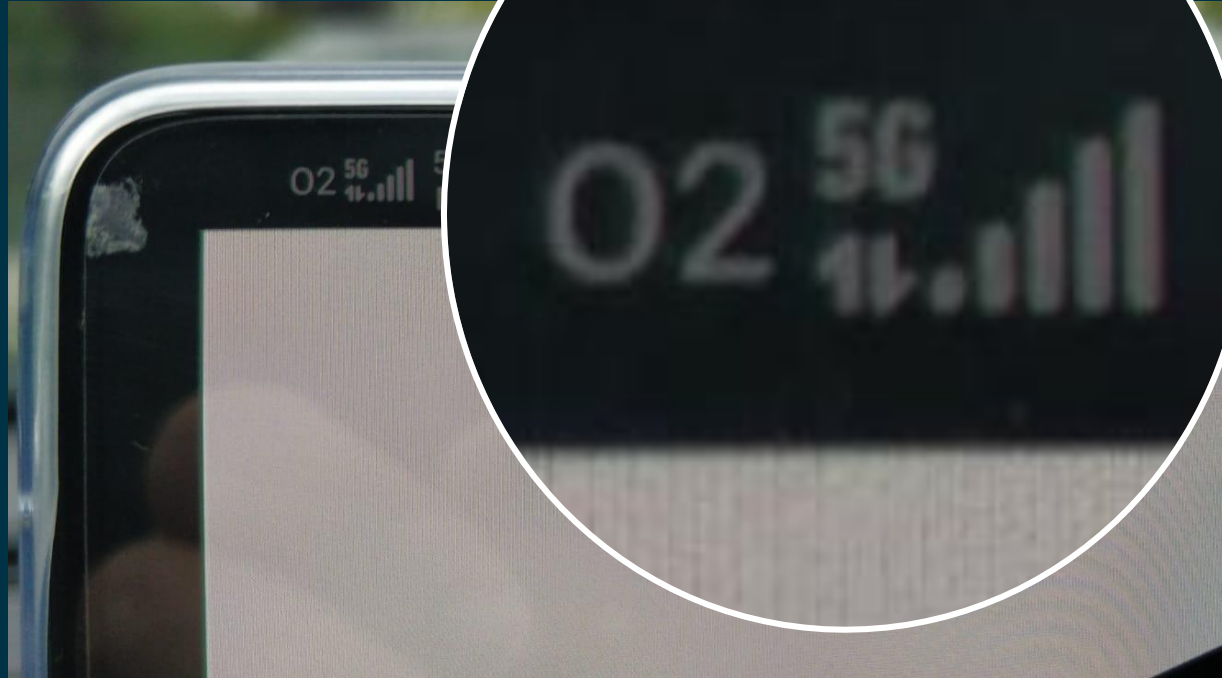
CON:

- Not available
- Early start = vendor lock with VNF's

5G in 2020

- Even if there „thousands“ of sites built in the world 5G is still at the beginning.
- 4G will be there for a long time
- Business customers will be first ones who will benefit from 5G
- Indoor & Campus Networks becoming more important
- FWA will become more common
- Today there are tariffs on the market but we will see more specific products based on customer needs and ultimate goal (for operators) monetarization of 5G.
- 5G mobiles will become more common and customers will buy them even w/o a 5G network to be 5G ready.
- Campus networks will become present (w/ and w/o classical operators)

We are ready! 5G ready!



EINE *Telefonica* MARKE

O₂



Telefónica

First 5G “call” in Hamburg October 5th 2018

