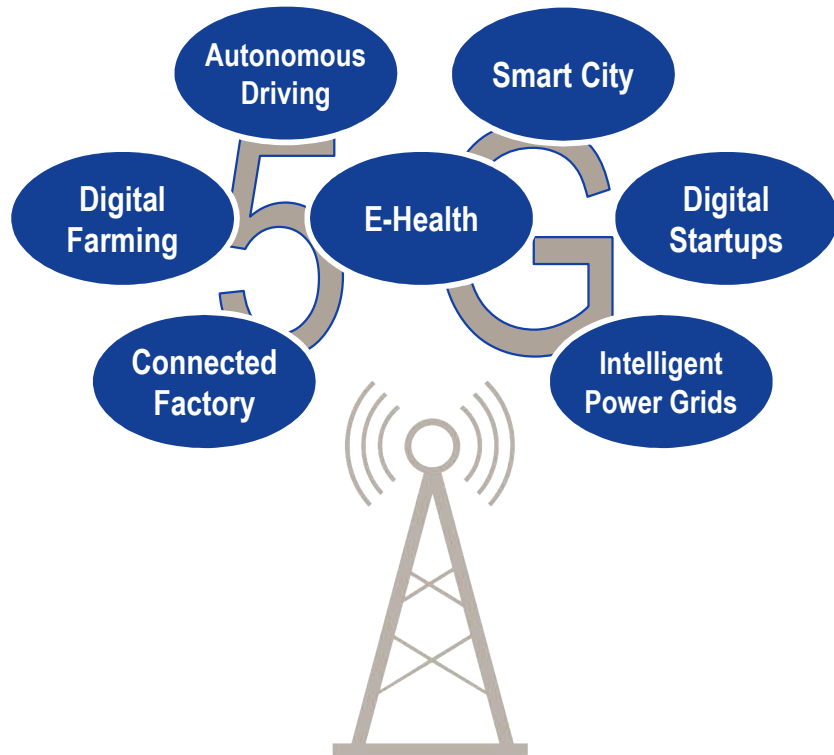




5G Rationale










- 5G is the basis for a new eco-system
- Networks, applications and billions of devices that are not yet internet-enabled today are growing together
- In addition to telecommunications know-how, network operators increasingly require online and application know-how with 5G
- As part of the United Internet Group, 1&1 Drillisch has these skills at its disposal

Higher speed: 10 GBit/s

Bigger capacity: 1 million devices/km²

Shorter latency: 1 ms

5G connects people, machines and applications (II)

Massive increase in traffic and speed requirements	 <p>Increase in data consumption per subscriber From 6.1 GB/month (2018) to 32 GB/month (2024)¹</p>  <p>Increase in mobile data traffic through video streaming From 3.4 GB/month (2018) to 16.3 GB/month (2024)²</p>  <p>Increase in on-the-go consumption Consumption of more videos/music (e.g. in-car-entertainment)</p>
Complementary technology to the fixed network	 <p>Ultra-fast Fixed Wireless Access</p>
Transfer huge amounts of data in real time	 <p>Communication between machines and applications M2M, IoT, Smart Home</p>  <p>Networking between people: Telemedicine Networking between things: Autonomous driving Networking cities: Smart Cities Networking of factories, industry and production: Industry 4.0, Virtual / Augmented Reality</p>
Increasing number of devices	 <p>Networking of millions of devices: By 2020, more than 50 billion devices worldwide will be connected³</p>

(1) Ericsson Mobility Report November 2018, Mobile Data Traffic per active smartphone, GB per month, Western Europe

(2) Ericsson Mobility Report November 2018, World Average data consumption, GB per month

(3) Cisco IBSG, 2011

Independence from MNO and margin uplift

- Business model becomes independent from wholesale access on MNO network.
- Substitution of variable cost with own fixed-cost will allow better fixed cost leveraging and drive margin upside.

Better product differentiation

- We will offer a superior 5G technology right from the start - innovation premium drives ARPU uplift.

Multiple upsides from additional revenues streams

- Access to new customer groups (business/premium), fixed wireless access, own wholesale product, IoT (Internet of Things) etc.
- Cooperation with 1&1 Versatel for B2B customers.

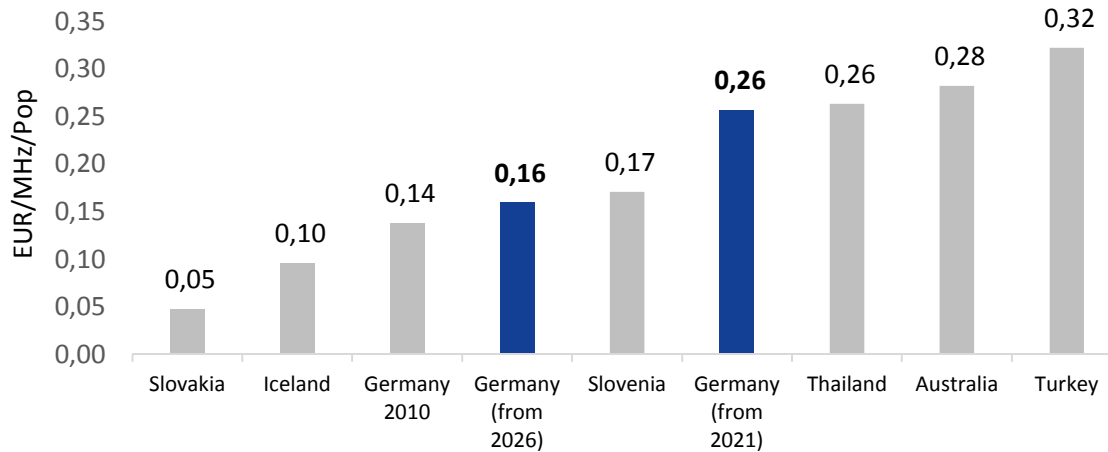
Improved network quality

- Currently, customer perception dependent on network quality of counter party under MBA MVNO.
- Own tailor-made network design with superior quality – supporting and matching 1&1 Drillisch brand proposition.
- Less complexity, as there is no legacy network which needs to be serviced.

Supporting terminal value upside

- Underpinned by higher profits mid- to long-term.

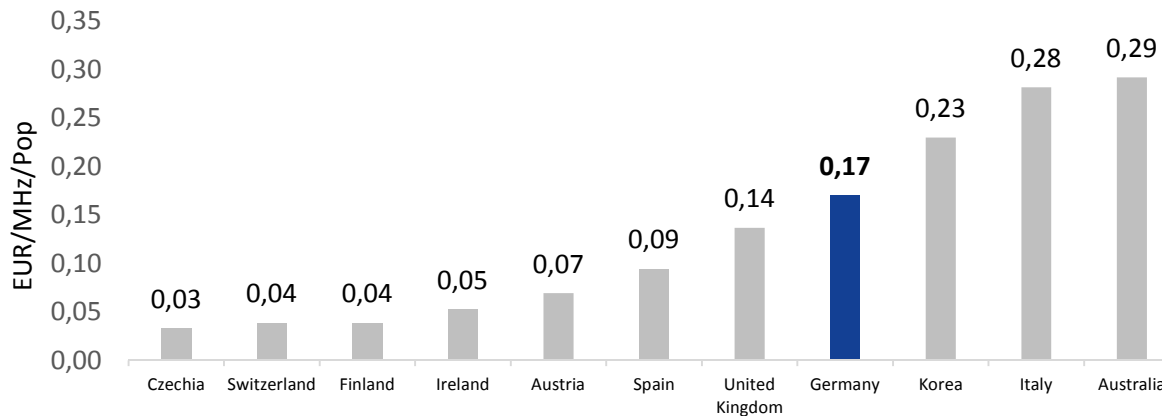
Benchmark 2 GHz¹



Spectrum auction in Germany:

- Frequencies auctioned:
 - 120 MHz of 2.1 GHz
 - 300 MHz of 3.6 GHz
- Total auction costs: € 6.55 billion
 - Of which € 2.37 billion in 2 GHz band
 - Of which € 4.18 billion in 3.6 GHz band
- Average MHz/Pop price: € 0.19
 - Of which € 0.24 in 2 GHz band
 - Of which € 0.17 in 3.6 GHz band

Benchmark 3.6 GHz¹



(1) 1&1 Drillisch internal benchmark; all prices translated into 2019 equivalents and 20y licenses; German 2 GHz spectrum (available from 2026) adjusted for payment in 2024

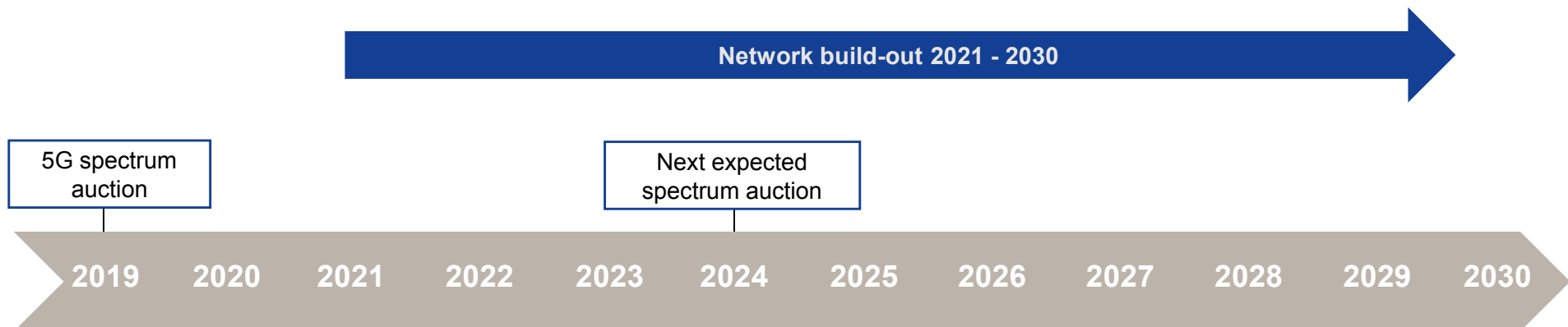
- **Acquisition of frequencies (5x10 MHz in 3.6 GHz) in the auction, available from 1 January 2021**
 - € 735 million (payable 12 September 2019)
- **Acquisition of frequencies (2x10 MHz¹ in 2 GHz) in the auction, available from 1 January 2026**
 - € 335 million (payable 30 June 2024)

=> Payment through temporary credit lines (with banks)

- **Further: Possibility to lease of 2x10 MHz in 2.6 GHz until 31 December 2025**
 - On the basis of a voluntary commitment of Telefónica Deutschland, which comes along as part of the EU merger release with E-Plus

Roadmap for network build

- 1st step:** Acquisition of spectrum ✓
- 2nd step:** Negotiate National Roaming
- 3rd step:** Cooperation Agreement with one or more technology partner(s) and their respective services
- 4th step:** Network build-out based on the 1&1 Versatel network
- 5th step:** Further participation in the next spectrum bid (800MHz), expected for 2024



- We have acquired 3.6 GHz and 2 GHz frequencies
- The construction of a nationwide 5G network in Germany is only possible with additional frequencies from the next auction (800 MHz, available from 2026). For this reason alone, national roaming on existing networks is essential for a new entrant
- Federal Network Agency (BNetzA) has taken this into account in the auction conditions and imposed an obligation to negotiate on existing network operators. The agency acts as arbitrator
- 1&1 Drillisch relies on the award conditions as well as on the decisions made by BNetzA

- In addition to the BNetzA's general obligation to negotiate for all network operators, the MBA MVNO contract with Telefónica explicitly guarantees national roaming.
- As part of the merger with E-Plus, Telefónica has committed itself to offer national roaming to a new entrant in Germany.
- Details are defined in the MBA MVNO contract and the "COMMITMENTS TO THE EUROPEAN COMMISSION" of 29 May 2014.
- The MBA MVNO contract is valid until 30 June 2020. It can be extended twice by five years by 1&1 Drillisch until 30 June 2030.

Extract from the commitments

... If the New MNO Entrant is an Upfront MBA MVNO, the MBA Agreement will continue as the national roaming agreement which means that national roaming traffic will be handled and invoiced under the Bitstream Component 1, the Bitstream Component 2 and the Bitstream Component 3 of the MBA Model and not under any national roaming agreement ...

until end of 2022

- 1,000 active 5G base stations (allocation per German federal state according to area segmentation)

until end of 2025

- 25 % household coverage (10.9m households)¹ or up to 20.7 million potential customers, corresponding to up to 40 Germany's biggest cities (approx. 1 % of country coverage)

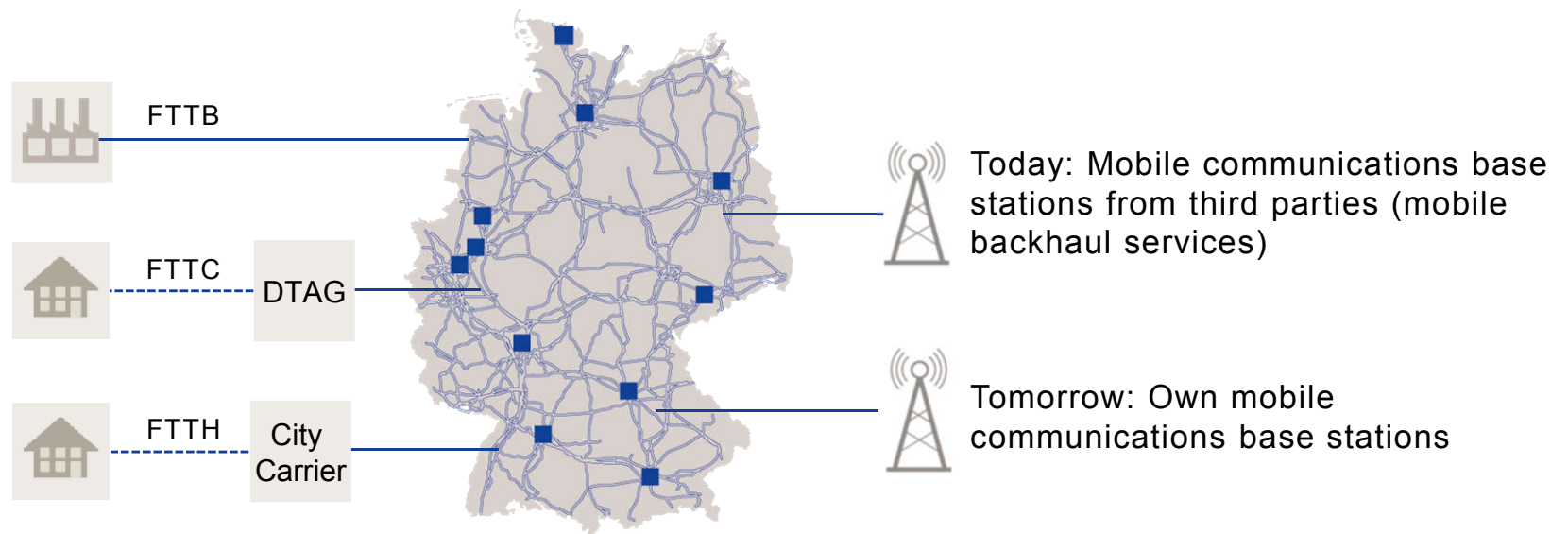
until end of 2030

- 50 % household coverage (21.8m households)¹ or up to 41.4 million potential customers, corresponding to up to 390 Germany's biggest cities (approx. 3 % of country coverage)

(1) Federal Statistical Office (Statistisches Bundesamt); the corresponding population might be lower due to a concentration of 1-person households in urban areas

Using 1&1 Versatel's fiber network

- 1&1 Versatel runs one of the largest fiber networks in Germany, which can be used as 5G backhaul
- Fiber-optic network with 47,013 km
- In 250 German cities, including 19 of the 25 largest cities



- The commercial potential for infrastructure sharing is even stronger with 5G
 - For example, the cost of small-cell deployment can be reduced by up to 50 percent if three players share the same antenna pole.
 - Practical roadblocks of 5G deployment can be solved, such as fear of radio waves from the installation of excessive radio equipment
- Given these arguments, operators will need to have strong commercial rationale to justify stand-alone deployment of 5G

After the successful frequency auction

We will ...

- agree a national roaming contract with one of the MNOs
- start a partnership with one or more experienced equipment providers to build our own 5G network
- build a tailored state of the art 4G & 5G network without any legacy

→ Rolling out 5G and opening a new chapter

Our Success Story
Continues!
