Technology & Innovation

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CAPITAL
MARKETS
DAY 2021

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Key messages

Review

We delivered our CMD 2018 promises including the DT 'Superior Production Model' (All IP Migration, Agile IT Transformation, Integrated Network Leadership).

Going forward, we evolve to an experience-obsessed tech player:

01
Automation, cloudification & disaggregation

We will move towards a high degree of automation. Hyperscaler-like, yet telco-grade

02
Digitalization & SW/data capabilities

We will continue digitalizing the full stack and continue to enhance the software/data capabilities of our employees

03
Continued network leadership

Our integrated network leadership will continue to deliver clear business benefits

04
Green – Energy efficiency

To support DT's ambitious climate targets, we will double energy efficiency in network production

05
Experience obsession

Experience-obsessed, focused innovation and new products will leverage our superior networks

Review 2017–2021

IP Migration with customer experience and cost benefits

Superior Production Model 1/3 – All IP Migration 100% at DT, with radically simplified BNG architecture in GER

Broadband availability

10 mn HH

≥ 250 Mbps

enabled by SuperVectoring & FTTH

Simplicity for customer

Plug & Play

for all customers

Relief of service organization

Activation incidents reduced by

40%

Cost savings

€100 mn

annual cost saving already realized in 2020

+

Stable & secure networks during Covid-19

+100%

fixed voice calls

+300%

video conferencing

All numbers YE 2020

IT Transformation with huge impact on speed, stability and cost

Superior Production Model 2/3 – Agile IT Transformation

2017

Example GER

- Time-to-market: **18 months**
- Share of flexible delivery: **0%**
- Share of agile working: **< 5%**
- Improvable IT stability
- IT spend above benchmark-level
- Tightly coupled **legacy** IT

YE 2020: Industry leading IT

Example GER

- Time-to-market: **3.5 months**
- Share of flexible delivery: **70.5%**
- Share of agile working: **80%**
- Operational stability almost doubled[1]
- Reduced IT spend[2]: **-€0.2 bn**
- IT **modernization**, decoupling and selective greenfields

+

Secure operations & Resilience during Covid-19

[1] Index for business impact from 252 (2017) to 132 (2020) [2] YE 2017 vs. plan for YE 2021e

Integrated Network Leadership with clear competitive advantage

Superior Production Model 3/3 – Integrated Network Leadership

Integrated network leadership

Best in mobile Connect Test (01/2021)

connect SEHR GUT MOBILFUNK-NETZTEST Deutsche Telekom

CHIP Bestes 5G-Netz

Best in 5G Chip Test (01/2021)

Network quality perception **+23pp** vs. best competitor[1]

T-Mobile Netherlands

Best in Test 20 20 umlaut

World's best mobile network Umlaut (10/2020)

#1 in **8/10** markets based on network TRI*M[2]

Mobile network leadership

OPENSIGNAL Winner 5G & LTE (01/2021)

TMUS delivering 5G leadership (02/2021)

OOKLA SPEEDTEST

Perception as "the 5G company" **+120%** since Q3/2019

Our clear competitive advantage

Brand worth

> $50 bn

#1 in DAX30 reputational ranking[3]

[1] Source of data: Kantar Image and Advertisement Monitor for German footprint (2020), % of participants that attribute statements to a brand [2] AT, CZ, GR, HR, HU, ME, MK, NL, PL, SK (2020)

[3] Dr. Doeblin Society for Economic Research 2021

CMD 2018 commitments: We delivered!

	Ambition level	Achievements 2020	2017–2021e
Technology leadership	▪ Gigabit rollout		
	▪ Ramping up to 2 mn HH p.a. in GER by 2021e	▪ approx. 1.2 mn HH in 2021e (0.5 mn in Q4)	
	▪ 0.75 mn HH p.a. in EU[1] by 2021e	▪ 1.4 mn HH in 2021e	
	▪ Mobile network leadership & leading in CX		
	▪ 99% outdoor LTE coverage in GER by 2020	▪ 99% in 2020	
	▪ 99% outdoor LTE coverage in EU by 2021e	▪ 98% in 2021e	
	▪ 5G innovation leadership	▪ First European 5G network in Austria (2019), DSS pioneer (2020), Connect 5G Innovation Award (2021)	
Value transformation	▪ IT spend reduction of €0.2 bn in 2021e	▪ €0.2 bn reduction achieved by 2021e	
	▪ IT delivery time down to 6 months in 2021e	▪ Down to 3.5 months already in 2020	
	▪ IP migration completed in 2020	▪ Completed across the entire footprint in 2020	

[1] FTTH/B & Docsis 3.1; AT, CZ, GR, HR, HU, ME, MK, PL, SK (excl. RO & PL)

Strategy 2021–2024

We evolve towards an experience-obsessed tech player

FROM a reliable network builder & operator

Superior Production Model

- All IP Migration
- Agile IT Transformation
- Integrated Network Leadership

+

Capabilities built so far

- Global skill-based organization implemented
- DevOps in place in NT & IT
- First successes in radical automation, disaggregation & software integration

TO an experience-obsessed tech player

Tech player

01 Network automation, cloudification & disaggregation + **02** All value-chain digitalization & SW/ data capabilities + **03** Continued integrated network leadership

04 Green

Path to carbon neutrality[1] – Energy efficient

05 Experience-obsessed

- Best connectivity experience
- Seamless interplay at home
- Beyond the core

[1] CO_2 neutral scope 1&2 in 2025, scope 3 in 2040, addressed in RfPs with high priority

Network automation proven and ready to scale

PROVEN

Hyperscaler like & telco grade voice operations

18	》	3 months from idea to product
90		2 days from SW to rollout
14		1 day bug fix
Many		0 nightshifts required

in GER (2021)

We are live with 1 mn customers

Voice production platform

- Fully automated
- Open
- Multi-vendor
- Cloudified

SCALING

All voice customers
on one automation platform by 2024e

At least
50% of data customers
on one platform by 2024e

Automated network planning proven and ready to scale

PROVEN

AI driven FTTH rollout planning

25
- Manual processes
- Complex hand-overs with municipalities

5 days average planning time
- Fully automated, AI based planning processes
- Digitized municipal applications

in GER (2021)

Deployed for 75% of new areas

Reduction of working hours by up to 75% in structural planning

SCALING

Contributes to
-25% unit cost
vs. 2020 by 2024e[1]

Enables ramping **> 2.5 mn** HH p.a. to achieve **10 mn** FTTH HH passed until 2024e

[1] Planning effort is one out of many factors reducing unit costs

Network disaggregation will increase choice and efficiency

PROVEN

Mobile access – "ORAN"

Cornerstones laid down by
- **OTIC** test and integration **lab** (Europe's 1st)
- **Open fronthaul** requirements binding in RfPs

Implementation with **ORAN town** in real network

Fixed access – "Access 4.0"

- Evolving BNG
- Edge-cloud based fixed broadband access live and in production (World's 1st)

Capabilities built so far

350 experts for NW integration, NW operations & NW management

20 agile squads

New way of working

SCALING

Diverse ecosystem with increasing competition leading to more choice and efficiency

e.g. 10–20%
efficiency in RAN as planned by 2024e

Example GER

Digitalization capabilities proven and ready to scale

Two examples…

PROVEN

Easy Fiber ordering (Gigabit Geschäftssystem)

Cloud-based, fully digital platform to order, provision and configure Fiber products instantly and in any channel

7 cumbersome 〉 **2** Delightful customer interactions

Award-winning bot (Frag Magenta)

Digital assistant for personalized 24/7 service automation

Few bot interactions 〉 **> 2mn** Issues already solved

37% Solution quota

SCALING

Complete Fiber rollout channeled and processed via the platform by 2022

Leveraging **AI in all customer service interactions** by 2025

We accelerate digitalization with future-proof IT

YE 2020: Industry leading IT

Example GER

- Time-to-market: **3.5 months**
- Share of flexible delivery: **70.5%**
- Share of agile working: **80%**
- Operational stability almost doubled
- IT modernization, decoupling and selective greenfields
- IT spend reduced[2] by **€0.2 bn**
- Share of cloudified production: **8% in IT**

2024e: World class IT

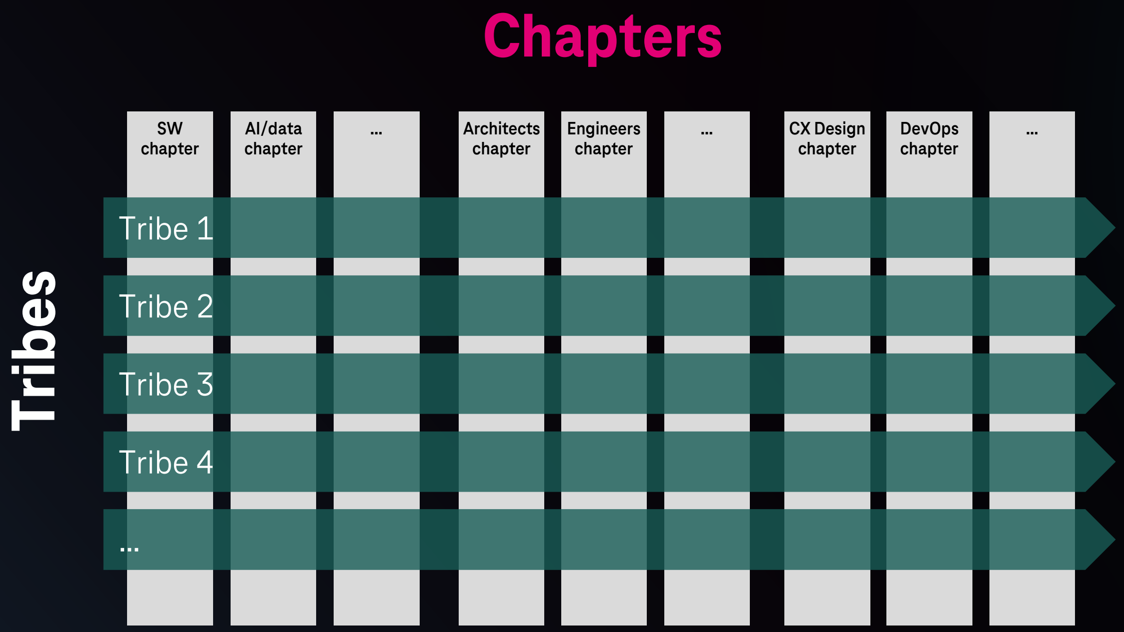
Example GER

- Time-to-market: **2 months**
- Share of flexible delivery: **80%**
- Share of agile working: **100%**
- Further improved IT stability[1]
- Massive increase of microservices & APIs
- IT spend further reduced[3] by **> €0.2 bn**
- Share of cloudified production: **80% in IT** **≈55% in NT[4]** NEW

[1] Index for Business impact should be < 100 by 2024e [2] YE 2017 vs. YE 2021e [3] YE 2020 vs. YE 2024e [4] In core network; GER: 67% & EU: 42% in 2024e

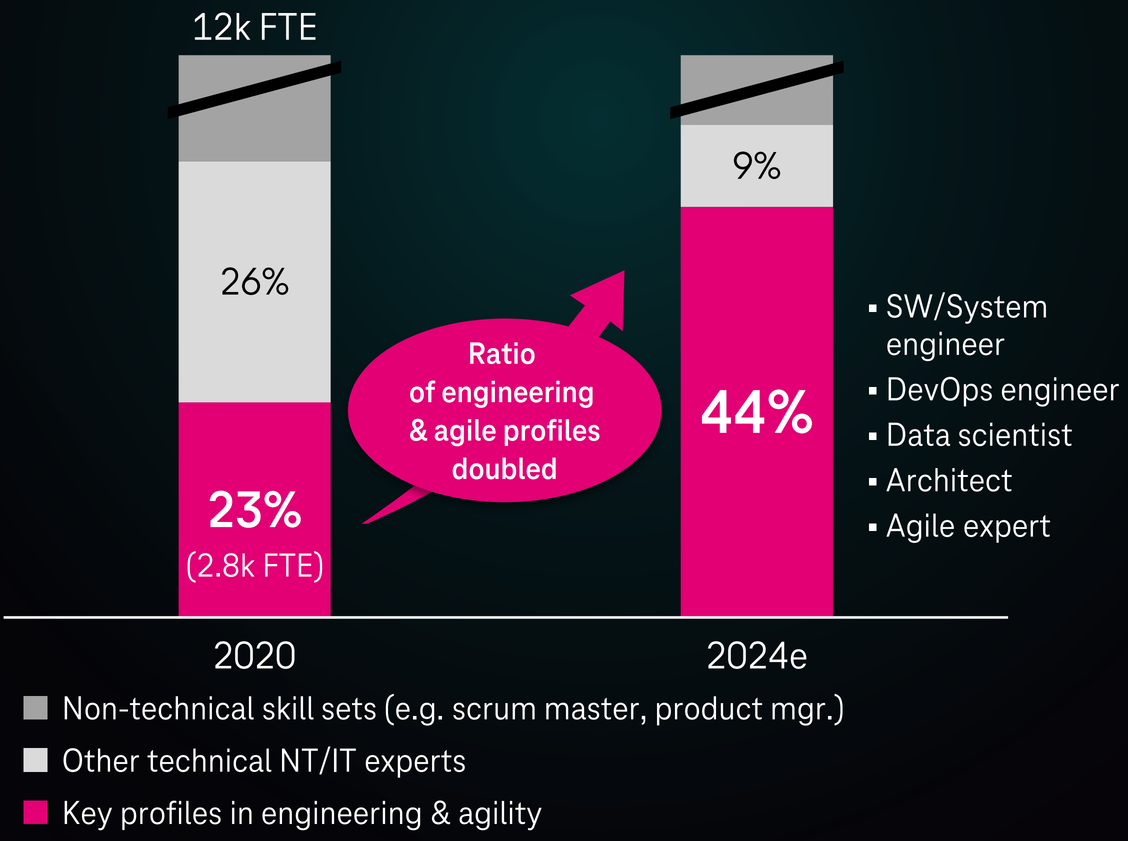
We are driving skill and cultural transformation

Modern chapter tribe setup in board area Technology & Innovation



Scale proven skill transformation in tech & innovation area

Quota of relevant skills, %



We will remain the network experience leader

		5G Leadership in GER, EU[1] & US	Commitment to Fiber in GER[2] & EU[3]	Toolbox of best combinations (own & orchestrated)
		based on superior (PoP) coverage		
Q1 2021	GER	80% PoP coverage	2.3 mn HH	≈**500k** customers on 4G hybrid solution + customer trial for 4G/5G indoor repeater[4]
	EU	18% PoP coverage	6.1 mn HH	≈**200k** customers on 4G hybrid solution
	US	90% PoP coverage		
2024e	GER	**≈97% PoP coverage**	**10 mn HH**	▪ **Leverage 5G for superior seamless performance in- and outdoors** **Hybrid routers & indoor repeater** ▪ **Orchestrate best customer experience across own- and third-party networks where required[5]**
	EU	**> 75% PoP coverage**	**≈10 mn HH**	
	US	**97% PoP coverage (2022e)**		

[1] AT, CZ, GR, HR, HU, ME, MK, NL, PL, SK (excl. RO) [2] Incl. cooperation [3] AT, CZ, GR, HR, HU, ME, MK, NL, SK (excl. RO & PL); FTTH/B & Docsis 3.1 [4] Tech-JV with SKT from South Korea
[5] E.g. broadband satellite for IoT and rural coverage & mmWave FWA for selected broadband use cases

We are convinced by the comprehensive benefits of 5G

Higher Capex efficiency

-40% Capex per Mbps for top speeds by 2024e

3G Shutdown

in combination with 5G increasing energy efficiency

Fixed wireless access

mainly in US and partially in EU

5G Leadership in GER, EU & US

Up & cross selling in B2C

e.g. grow number of German customers on L/XL tariffs by factor 1.5–2.0x by 2024e

B2B differentiation

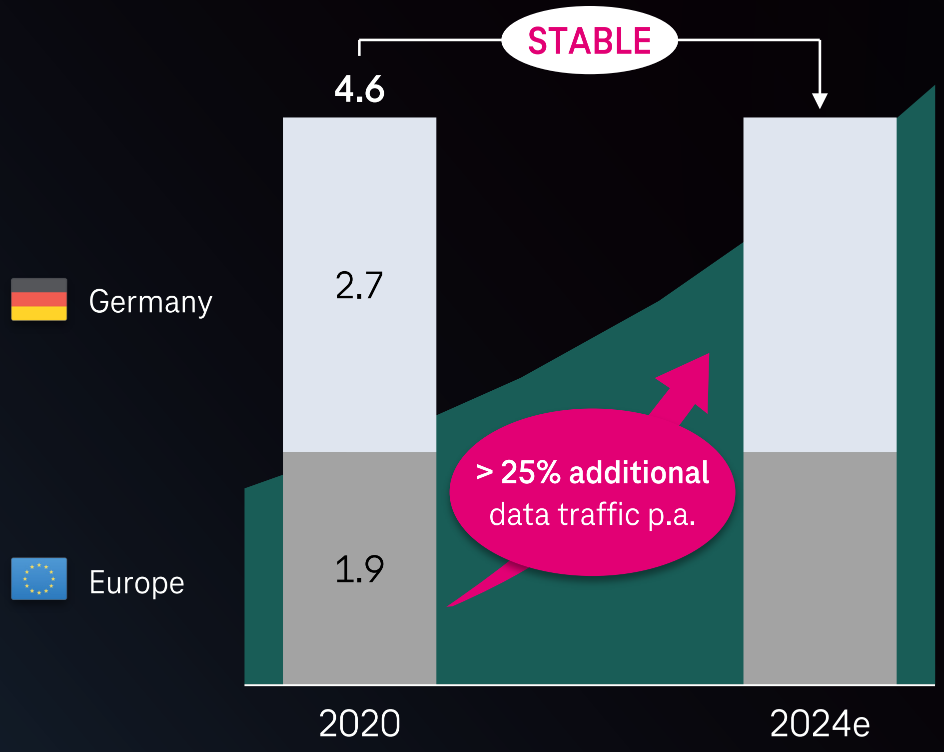
Industrial connectivity, edge cloud, IoT & new 5G SA core with QoS and slicing

Cumulating in **campus networks:** > €100 mn revenue until 2024e

We will double energy efficiency to offset volume explosion

Long-term stable energy consumption...

Energy consumption per region, mn MWh



... with efficiency levers offsetting volume increases

- We will retire legacy platforms[1] to counterbalance other trends such as rise in data traffic, network densification & rollout of more active network components
- In addition, efficiency from...
  - Network measures, including site sharing & AI steering
  - Copper to Fiber migration
  - Energy efficient data centers, on- and nearshore
  - In addition, innovation in packaging, materials, and decentral energy production

Double overall energy efficiency
by 2024e

[1] Like PSTN or SDH

Delightful home experiences built on best networks

Products & Innovation

3 Experiences

BEST CONNECTIVITY EXPERIENCE

SEAMLESS INTERPLAY

BEYOND THE CORE

3 Enablers

VOICIFICATION

BIG DATA & AI

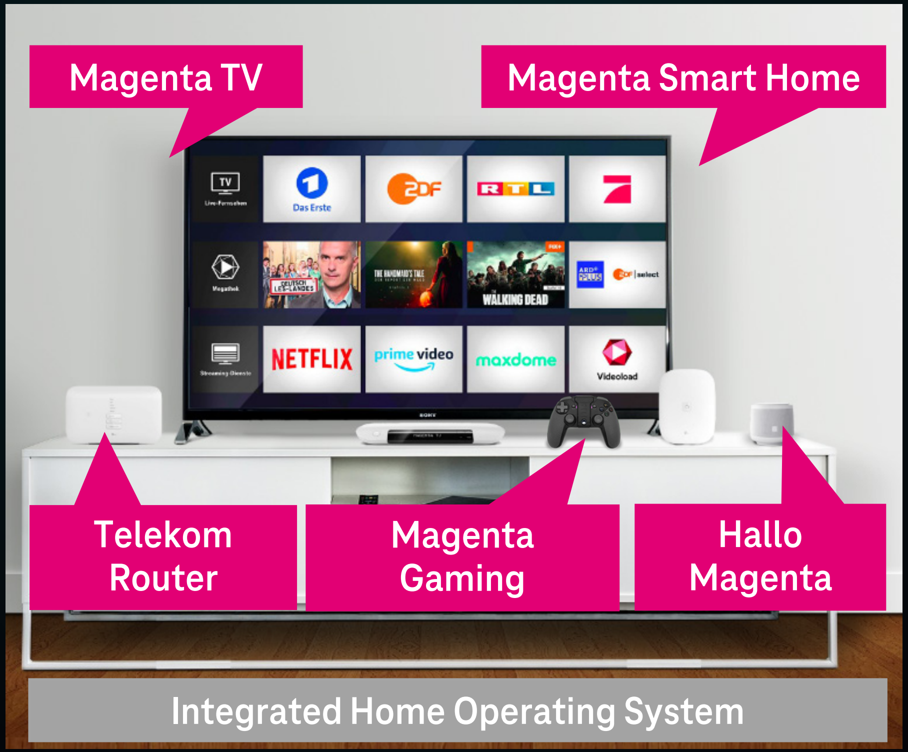
SERVICE ORCHESTRATION

Commitment to Fiber

Superior Mobile networks

Toolbox of best combinations

Unprecedented "Magenta Moments"



We scale experience innovation across our footprint

Customer expectations		PROVEN	SCALING
BEST CONNECTIVITY EXPERIENCE	Stable & fast connection **everywhere at home** – like at the curb	**> 1 mn routers with automated self-installation** based on a new RouterOS logic with decoupled HW & SW, and massive leverage of data for CX optimization, and predictive maintenance	**75% of DT router base** by 2024e
SEAMLESS INTERPLAY	**Simple & seamless** onboarding, upgrading and operating of new devices – OTT like	New HomeOS (API-first orchestration layer) launched e.g. with **200k engaged customers on Smart Home in 2021e**	**90% of DT customer base** enabled by 2024e
BEYOND THE CORE	**Home experiences** with friends and family – all voice enabled	**> 100k smart speakers sold,** plus nearly 100k users via TV app/remote control in 2021e	**All DT services voice enabled** by 2024e

Midterm ambition level

Midterm ambition level

	Midterm ambition level	Year
Technology leadership	▪ Commitment to Fiber rollout	
	▪ GER: 10 mn HH passed	▪ 2024e
	▪ EU: ≈10 mn HH passed	▪ 2024e[1]
	▪ 5G PoP coverage & network leadership	
	▪ GER: ≈97%	▪ 2024e
	▪ EU: > 75%	▪ 2024e
	▪ Further enhancing 5G innovation leadership & consumer experience	▪ 2024e[2]
Value transformation	▪ IT spend reduction: > €0.2 bn	▪ 2020–2024e
	▪ Time-to-market: 2.0 months	▪ 2024e
	▪ Agile share of development: 100%	▪ 2024e
	▪ Increase degree of cloudified production	
	▪ NT: GER 67%; EU 42%	▪ 2024e
	▪ IT: 80%	▪ 2024e
	▪ Adj. indirect cost AL reduction (GER/GHS): €0.7 bn	▪ 2020–2024e
	▪ Technology energy consumption (GER & EU): stable	▪ 2020–2024e

[1] AT, CZ, GR, HR, HU, ME, MK, SK (excl. RO & PL; FTTH/B & Docsis 3.1) [2] AT, CZ, GR, HR, HU, ME, MK, PL, SK (excl. RO)