

DEUTSCHE TELEKOM CAPITAL MARKETS DAY 2018



LIFE IS FOR SHARING.

GROUP STRATEGY

TIMOTHEUS HÖTTGES

WHAT DRIVES US...



DEDICATED NETWORK INVESTMENT



FOCUSED PORTFOLIO APPROACH & CAPITAL ALLOCATION



PASSION FOR CUSTOMER EXPERIENCE



BEST-OF-BREED TEAM WITH ENTREPRENEURIAL SPIRIT



LEADERSHIP & WINNING MENTALITY



WALK THE TALK

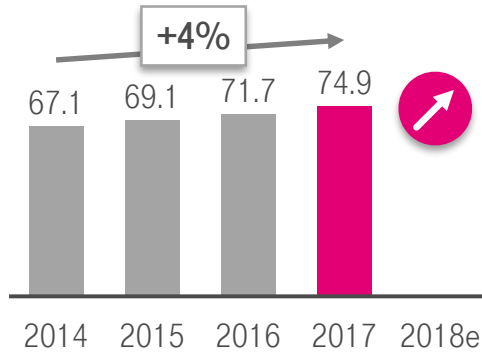
...TURNED DT INTO A GROWTH COMPANY

REVIEW 2014 – 2018

GROWTH ABOVE COMMITMENTS

Revenue (organic)¹

€ bn



CMD AMBITION 2014–2018:

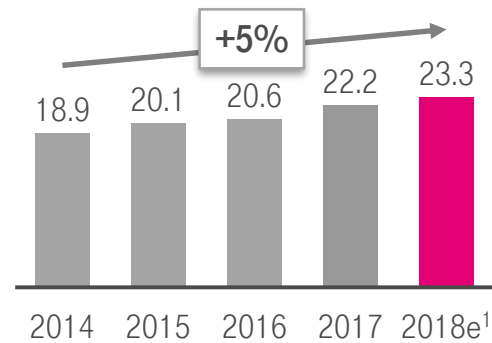
CAGR +1–2%



CAGR

Adj. EBITDA (organic)¹

€ bn



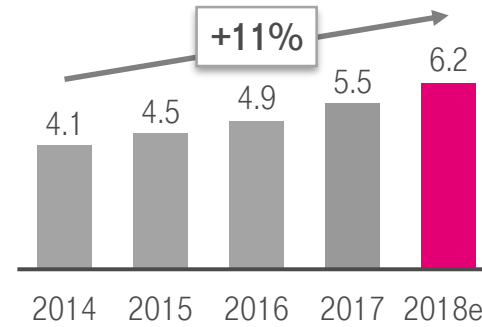
CMD AMBITION 2014–2018:

CAGR +2–4%



FCF²

€ bn



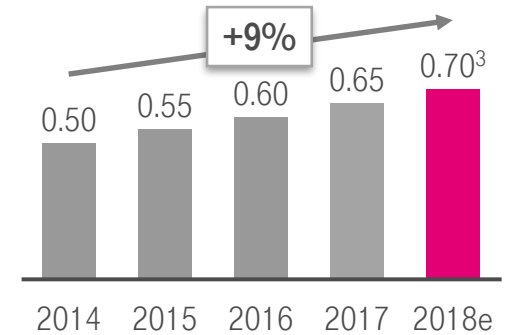
CMD AMBITION 2014–2018:

CAGR +10%



Dividend per share

€



CMD AMBITION 2014–2018:

FOLLOW FCF



¹ Based on constant exchange rates (Average exchange rate 2017 of €1 = US\$1.13); revenue and adj. EBITDA corrected for handset lease

² Before dividend payments & spectrum invest

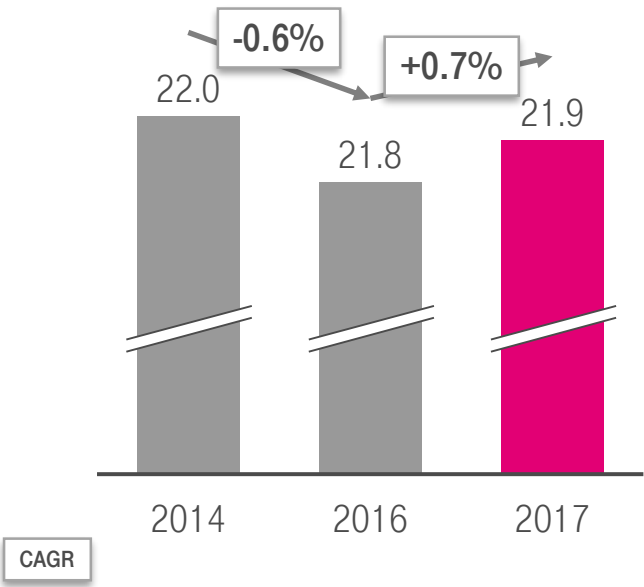
³ Subject to necessary AGM approval and board resolution

GROWTH PROFILE ACROSS OUR FOOTPRINT...

Germany revenue



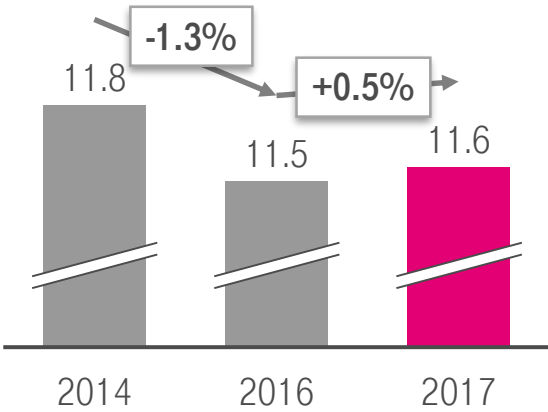
Excl. DFMG,
€ bn



Europe revenue



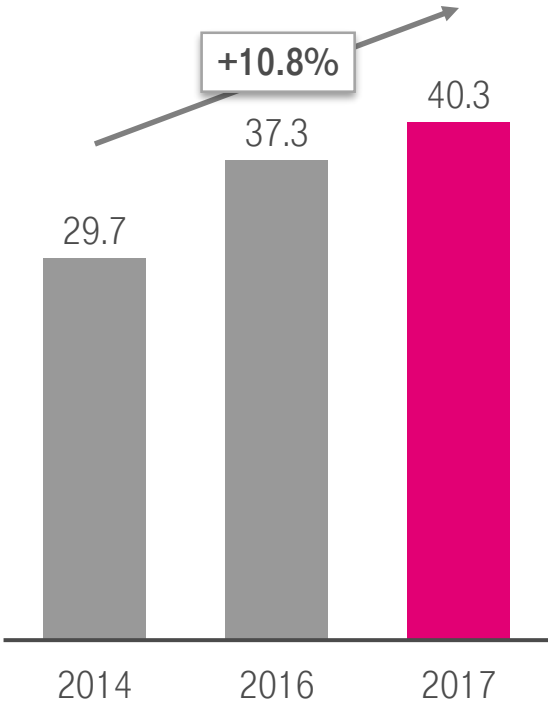
Organic,
€ bn



TMUS revenue



\$ bn

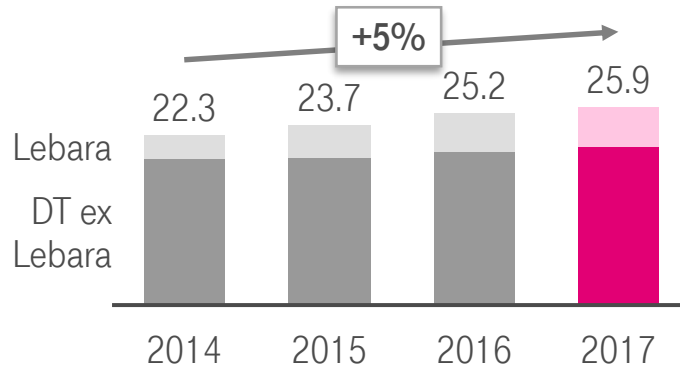


...SUPPORTED BY CONTRACT CUSTOMER GROWTH

Germany



Mobile postpaid customers,
mn

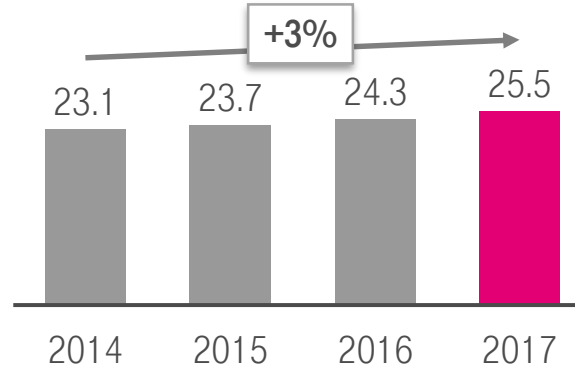


Customer growth in line
w/fair share

Europe



Mobile postpaid customers (excl TMNL),
mn

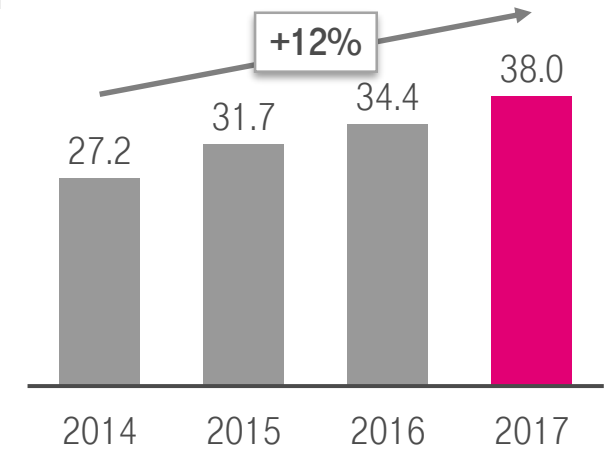


Customer growth in line
w/fair share since 2017

TMUS



Mobile postpaid customers,
mn



Customer growth well
above fair share



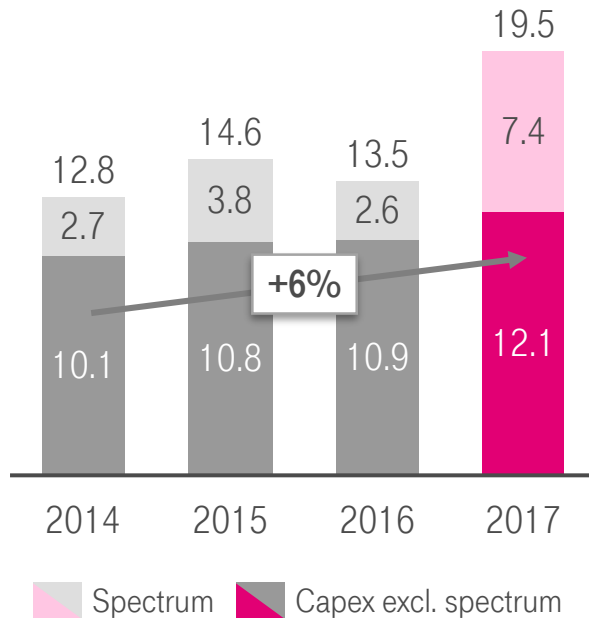
'FRONT BOOK ≈ BACK BOOK' REDUCING RISK

CAGR

INVEST FOR SUSTAINED GROWTH MOMENTUM

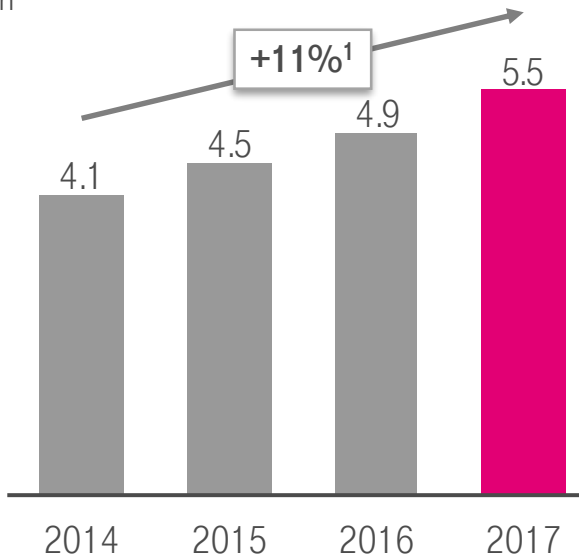
We heavily invested in the past...

Group Cash Capex¹,
€ bn



...while delivering strongly on FCF...

Group FCF²,
€ bn



...and creating the basis for future growth



Germany

- 94% LTE Pop coverage (2017)
- ≈ 80% HH vectoring coverage (2019e)³



Europe

- 94% LTE Pop coverage (2017)
- 8/11 NatCos with “Best in Test” network



TMUS

- Leading low band spectrum position
- LTE rollout to > 320 mn Pop

Others

- Innovation (e.g. Edge Computing, 5G)
- TSI: IoT & Security scale-up

CAGR

¹ Based on constant exchange rates (Average exchange rate 2017 of €1 = US\$1.13)

² Before dividend payments & spectrum invest

³ Delayed due to long regulatory process

WINNING MENTALITY: “BRING ME AWARDS”

Network



Customer Service & Satisfaction



Brand



Products & Company



PORTFOLIO: DISCIPLINED CAPITAL ALLOCATION

Invest in footprint



Consolidate towards FMC



Invest in innovation



Buy out minorities



Divest non-core activities



Risk situation stabilized



WE HAVE KEPT OUR PROMISES...

KEY FINANCIALS

Ambition level 2018

- Group Revenue CAGR +1–2% (2014–2018)
- Group Adj. EBITDA CAGR +2–4% (2014–2018)
- Group FCF CAGR \approx +10% (2014–2018)
- Group ROCE > WACC in 2018
- Group Cash CAPEX CAGR +1–2% (2014–2018)
- Group Adj. OPEX decrease (2014–2018)

SHAREHOLDER REMUNERATION (2015–2018)

- Following FCF growth; min. DPS of €0.50 p.a.

Achievements 2017

- +4% CAGR (2014–2017)
- +6% CAGR (2014–2017)
- +11% CAGR (2014–2017)
- ROCE > WACC in 2017
- +6% CAGR (2014–2017)
- €0.7 bn indirect cost decrease vs. 2014

- €0.65

Delivered/on track



¹ Compared to target of €1.8 bn

...AND HAVE LEARNED ALONG THE JOURNEY



Key learnings

- ✓ Convergence works, our customers love it
- ✓ Dialogue marketing is a must
- ✓ Network leadership pays off
- ✓ M&A is a valid lever for growth
- ✓ The last 1% is the toughest (e.g. All-IP)
- ✓ People make the difference

STRATEGY 2018 – 2021

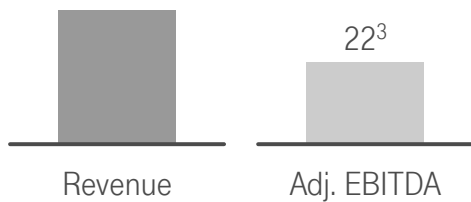
LEADING TELCO ON BOTH SIDES OF THE ATLANTIC...

Strong presence in US and Europe...

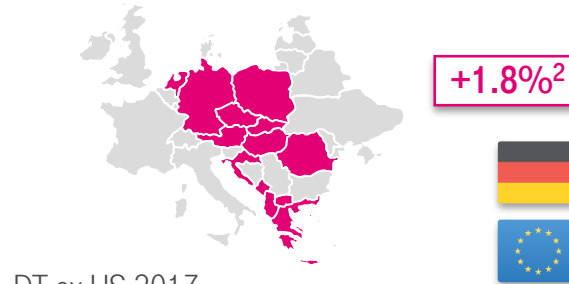
Market growth 2017 vs 2016



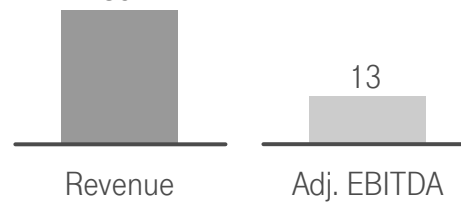
TMUS & Sprint pro forma 2017,
\$ bn



127 mn mobile customers **+6.9 mn⁴**



DT ex US 2017,
€ bn



96 mn mobile customers **+2.3 mn⁴**

19 mn broadband lines **+0.5 mn**

7 mn TV customers **+0.5 mn**

...with significant value creation

- ✓ Presence in two strongest economies in Western Hemisphere
- ✓ 90% of revenues in AAA economies
- ✓ Well-balanced growth & yield profile
- ✓ Local entrepreneurship & global scale
- ✓ High relevance for local economies

XX = 2017 vs. 2016

¹ Total mobile revenue ² Total integrated revenue ³ Pro forma revenue and adjusted EBITDA as of FY 2017; Calculated as the sum of T-Mobile US and Sprint revenue/adjusted EBITDA (as per respective company reporting)

⁴ FY 2017 total net adds (incl. wholesale); U.S. includes 5.7 mn and 1.2 mn net adds for T-Mobile US and Sprint, respectively; T-Mobile US net adds adjusted for wholesale customers restatement

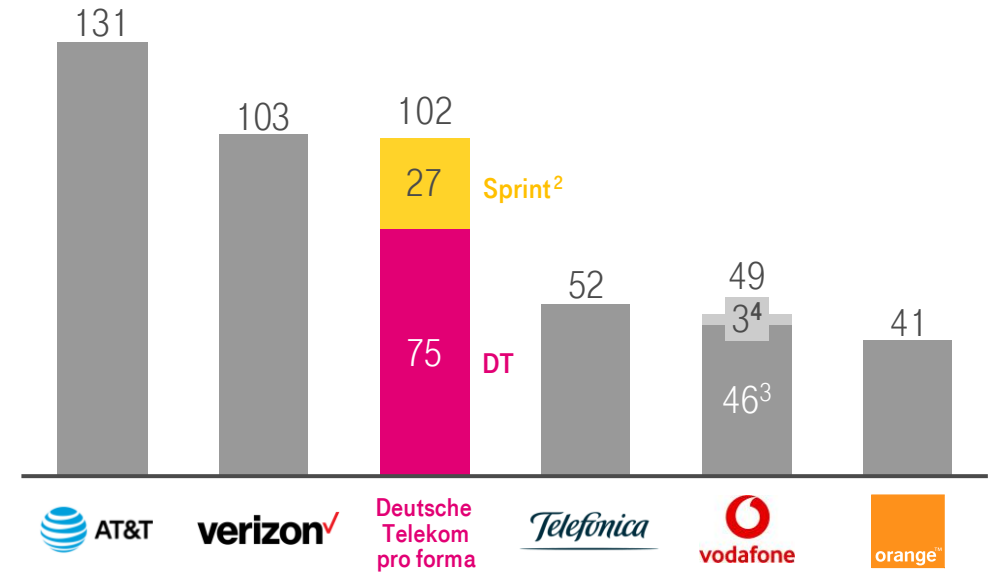
...WITH AN EVEN STRONGER POSITION POST US DEAL

Attractive TMUS/Sprint deal terms

- ✓ Unique value creation opportunity for DT shareholders
- ✓ Attractive transaction terms
- ✓ Benefitting US consumers, investments & job creation
- ✓ Governance designed for efficient integration
- ✓ Robust capital structure

DT's global position strengthened

Reported Revenue 2017¹,
€ bn



Source: Company information

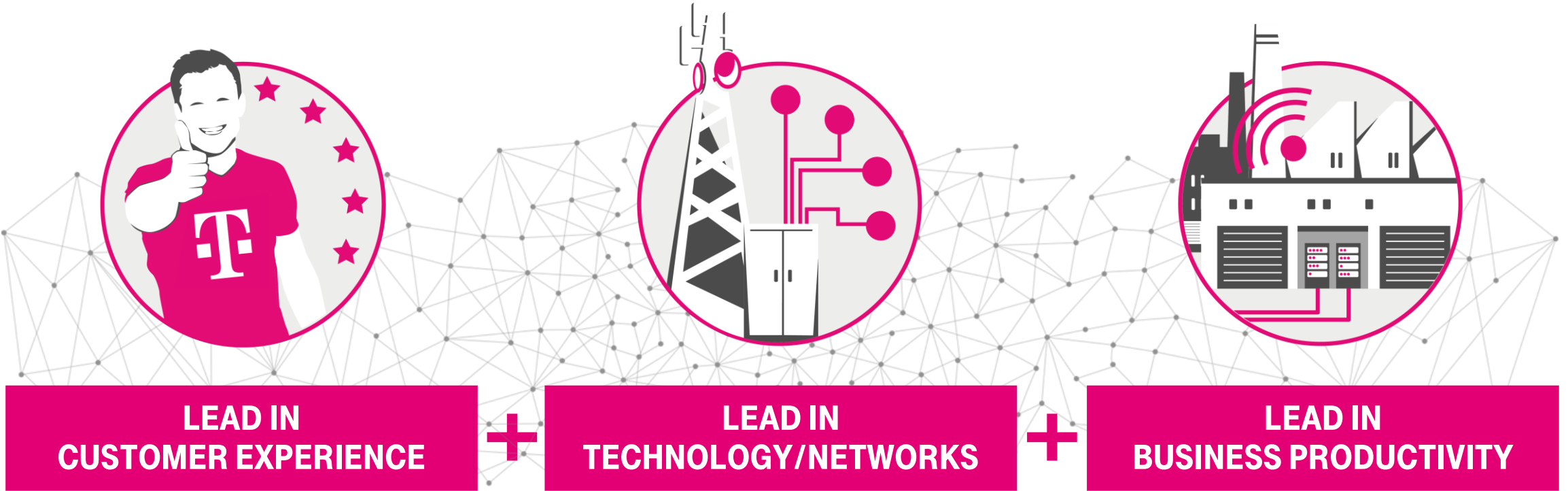
¹ \$-denominated figures converted in € based on exchange rate as of April 20th, 2018 (€1 = US\$1.22745)

⁴ Additional revenue from newly acquired Liberty assets in Germany, Czech Republic, Hungary & Romania

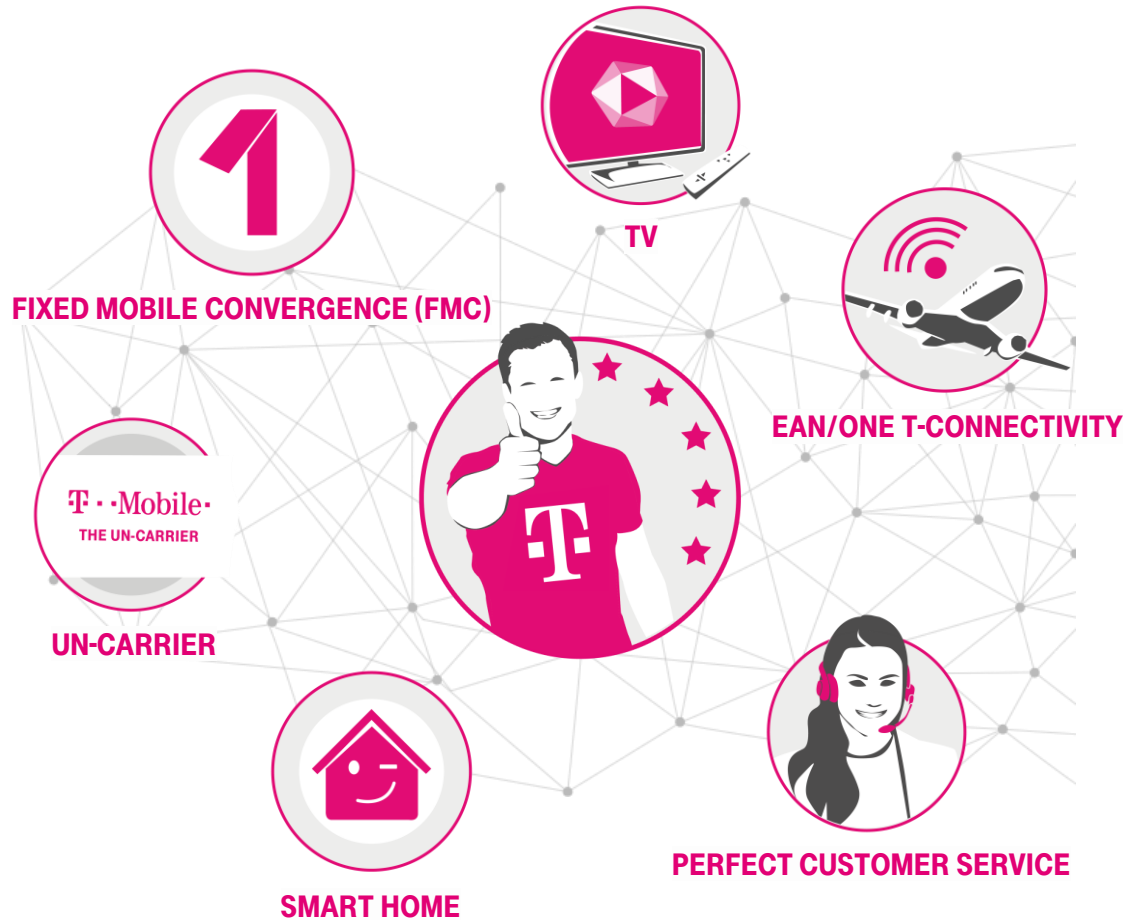
² Based on Sprint FY 2017 reported revenue, converted in €

³ LTM as of Sep. 2017 and excluding Netherlands operations in H2 FY 2016/17

FUTURE GROWTH IS FUELED BY THREE MAIN PILLARS



WE LEAD IN CUSTOMER EXPERIENCE AND IMPROVE CONTINUOUSLY

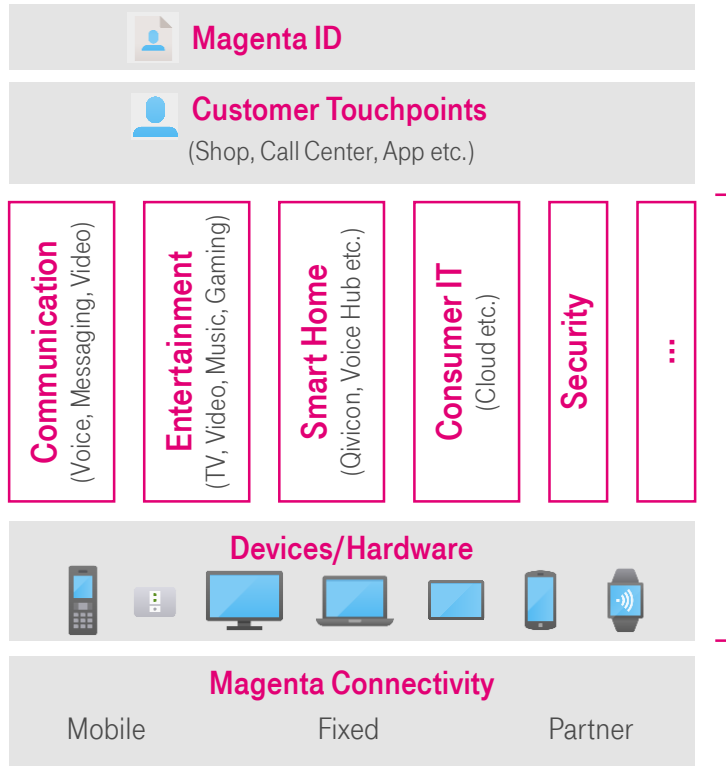


Our proof points

- ✓ We provide **one seamless T-connectivity**:
Connect App, European Aviation Network
- ✓ We offer the leading **FMC** proposition:
+1.5 mn FMC customers in our integrated footprint (FY 2017)
- ✓ We are **“The Un-Carrier”** in the US:
+11% post-paid customers in 2017
- ✓ We have made it to the living rooms with simple, modular products:
TV, Smart Home, Smart Speaker
- ✓ Our **customer service** is continuously improving:
Decreased no-shows in Germany by 33% (FY 2017)

MAGENTA 1: OUR UNIQUE CONVERGENCE OFFER

More than a tariff...



Seamless customer experience

- Magenta ID as single identifier
- Omni-channel customer journey

Seamless products & services

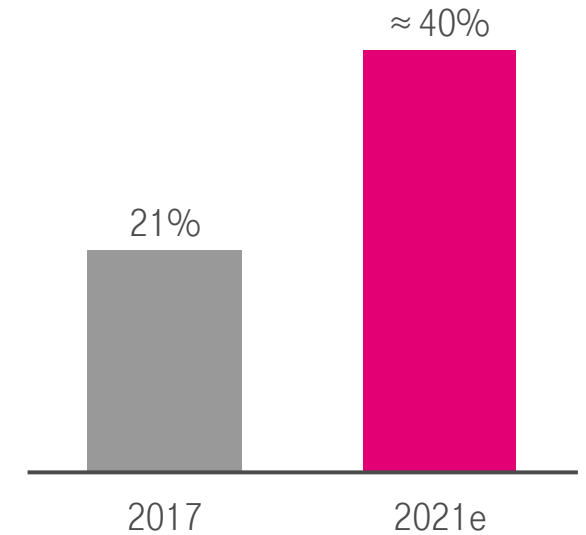
- Comprehensive portfolio positioned in the living room
- Integration across devices

Seamless connectivity

- Access agnostic
- Make, buy and partner

...and resonating with customers

FMC HH penetration in Germany and Europe (blended)
(FMC HHs/fixed broadband base)



WE STRIVE FOR PERFECT CUSTOMER SERVICE

We treat service as a key differentiator...



DER SERVICE

- ✓ Dedicated organization with > 30,000 employees for E2E responsibility of customer service
- ✓ One touch self service ability and personalized customer care with "Mein Magenta App"¹
- ✓ Predictive maintenance to fix problems before they arise



TEAM OF EXPERTS (TEX)

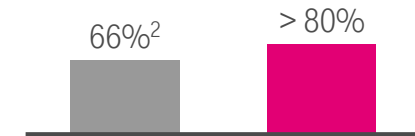
- ✓ Own P&L responsibility for dedicated teams
- ✓ Very high "Care NPS" (+9 pts. yoy 2017) at very low costs per account (-13% yoy 2017)
- ✓ Focus for 2018: global care to ensure 24/7 best customer experience

¹ Formerly MagentaSERVICE App ² Q1 2018

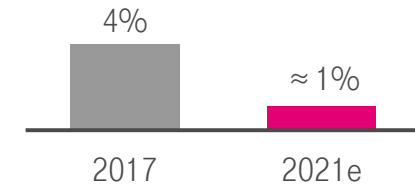
...reflected in our high ambitions



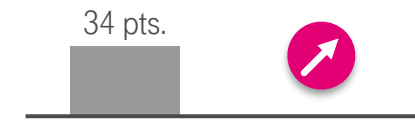
Contact resolution within 24h



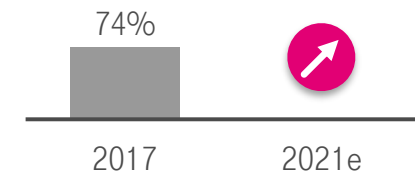
Rate of complaints



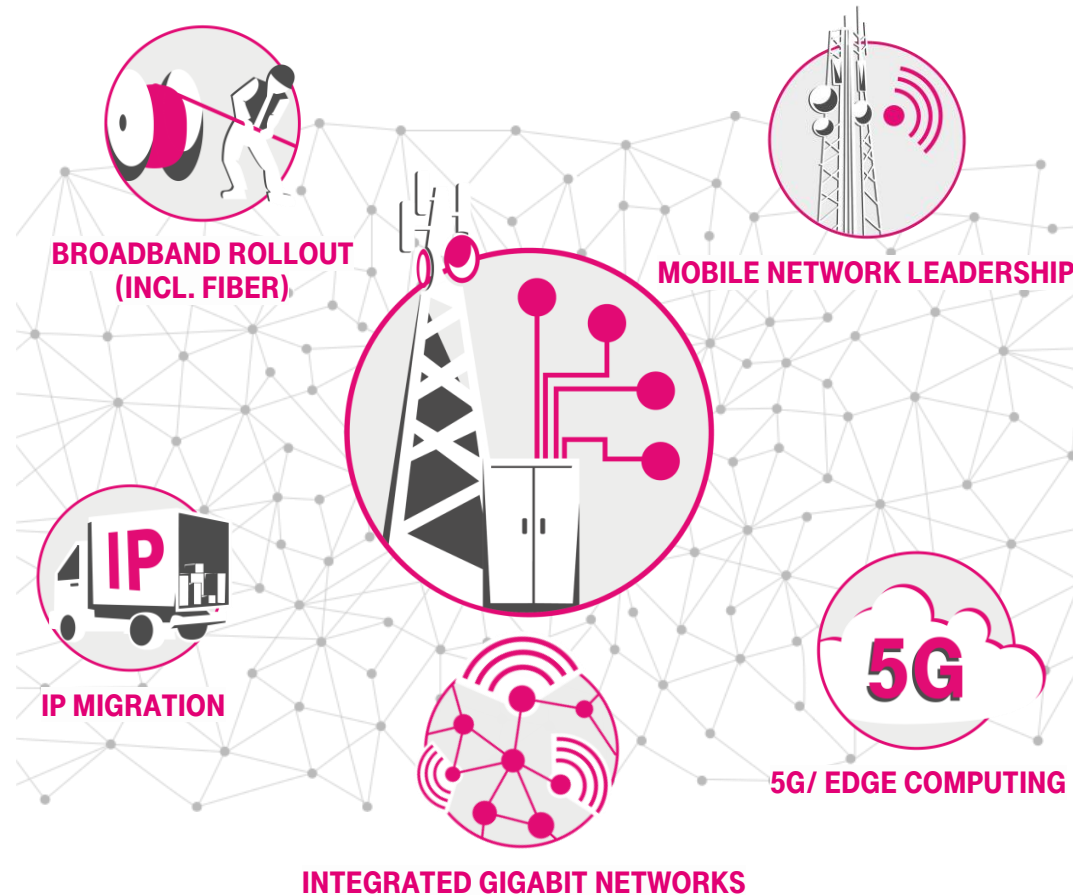
Net promoter score



Customer service satisfaction



WE ARE “DEDICATED NETWORK INVESTORS”



¹ Bandwidth ≥ 50 Mbps, delayed due to regulatory decisions

Our proof points

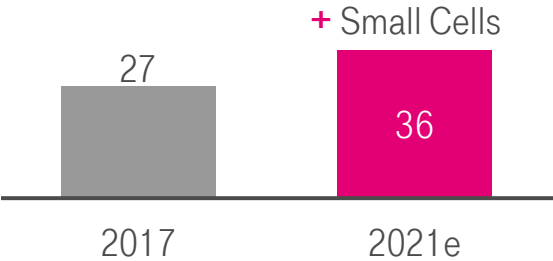
- ✓ **We own extended fiber backbone in our european footprint:**
Key asset for **integrated Gigabit networks**
- ✓ **We roll out broadband for the masses:** ≈ 80% HH coverage with vectoring in 2019 (≈ 62% in 2018)¹
- ✓ **We push the fiber rollout:** Already more than 455,000 km fiber deployed in Germany, 240,000 km in our EU footprint
- ✓ **We enable real-time networks: IP migration** completed in 5 EU NatCos, 75 k BNG access nodes migrated in Germany in 2017
- ✓ **We provide leading mobile network quality:** Winner of all relevant network tests (e.g. Connect, P3, Opensignal)
- ✓ **We drive network innovation with 5G and Edge Computing:** 600 MHz rollout started in US, MobileEdgeX launched

MOBILE NETWORK LEADERSHIP EVERYWHERE

Germany



Macro cell sites,
k



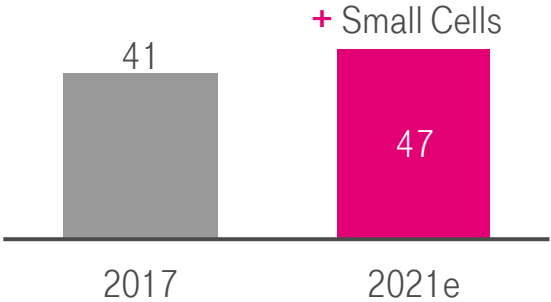
Strengthen leadership position (incl. 5G) & enable new use cases (e.g. IoT, FWA)



Europe



Macro cell sites,
k



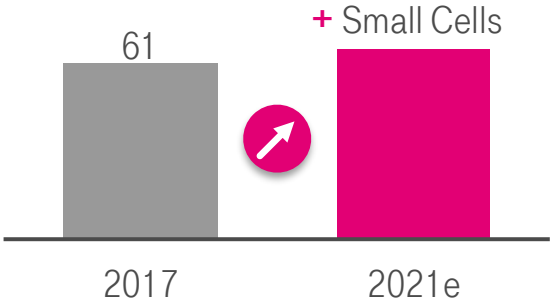
Build on strong fiber footprint to lead in 5G & maintain growth momentum



TMUS



Macro cell sites,
k

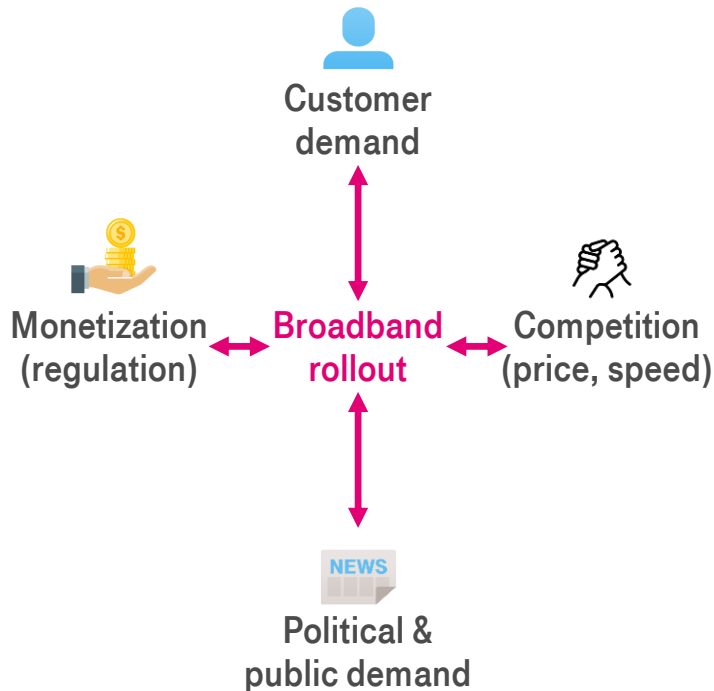


Extend network capacity & density to pave way for 5G



PUSHING FIBER ROLLOUT IN GERMANY...

In a very complex environment...



...we developed a sustainable & economically viable fiber rollout plan



High-speed networks
(50–250 Mbps)



Finalize and monetize (Super) vectoring rollout for max. high-speed coverage until end 2019e

- 80% DT infrastructure
- 95% incl. wholebuy



Gigabit networks (≥ 1 Gbps)

Start FTTH rollout from 2018

- New residential areas
- Business parks
- Telekom@School

Ramp up to 2 mn HH p.a. by 2021e

- White spots (subsidized)
- B2C winback areas

... complemented by cooperation & co-invest models and supported by a sensible wholesale access model

Benefits for DT:



Defend/grow market share



Maintain high & stable investment budget



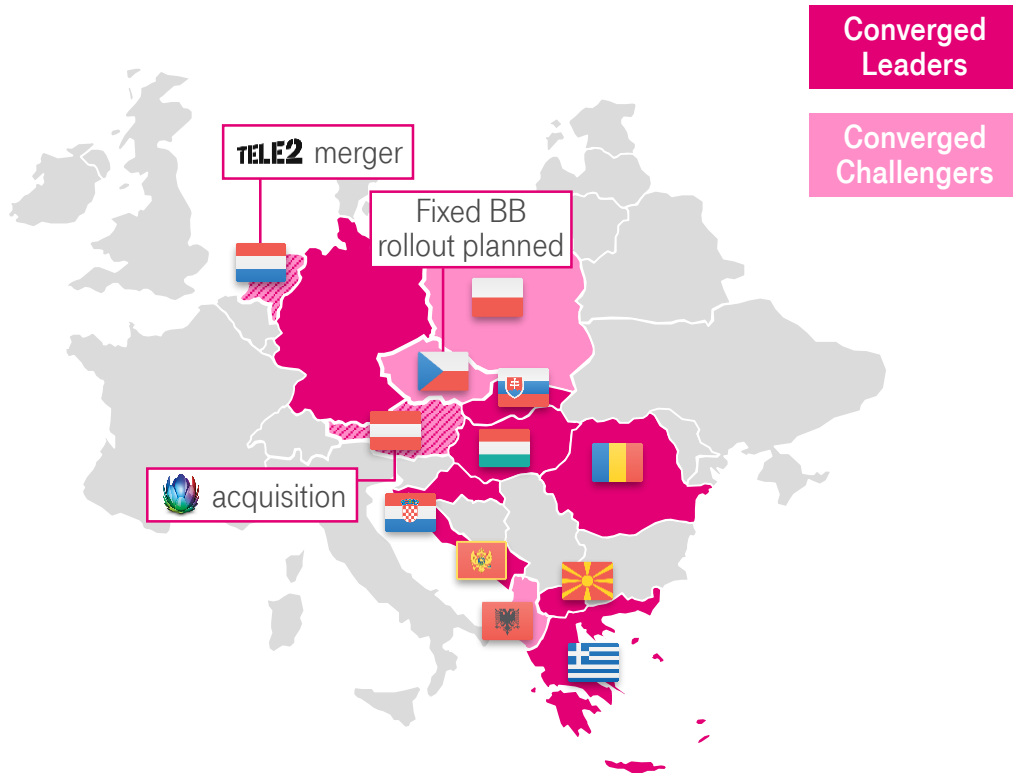
Adhere to strict FTTH/B return criteria: 7.5% IRR



Enable the Gigabit society

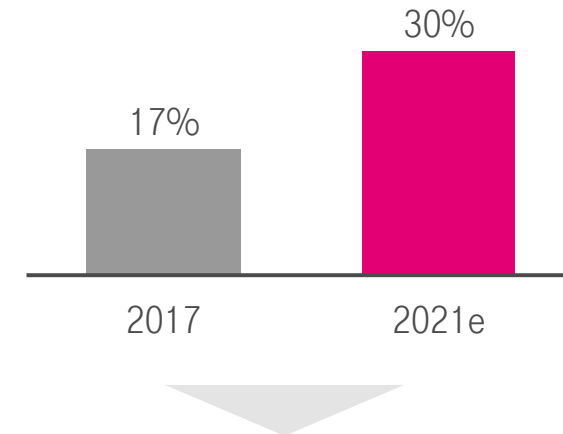
...AND INTEGRATING GIGABIT NETWORKS IN EUROPE

Uniquely positioned to drive FMC...



...and further drive broadband rollout

FTTH/B household coverage¹,
% of HH in GR, HU, SK, HR



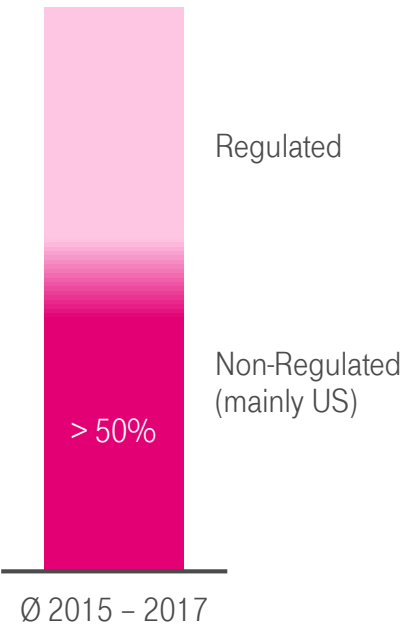
- **Triple organic FTTH/B investment** (run-rate p.a.) within stable total capex envelope in EU NatCos until 2021e¹
- **FMC proposition** to drive **penetration** & **mitigate back book risks** (front book ≈ back book)

¹ FTTH/B and Cable ED3.1, excluding Romania

MANAGE REGULATION



In a regulated environment...

DT Group revenue split



...German telecommunications policy sets the right tone

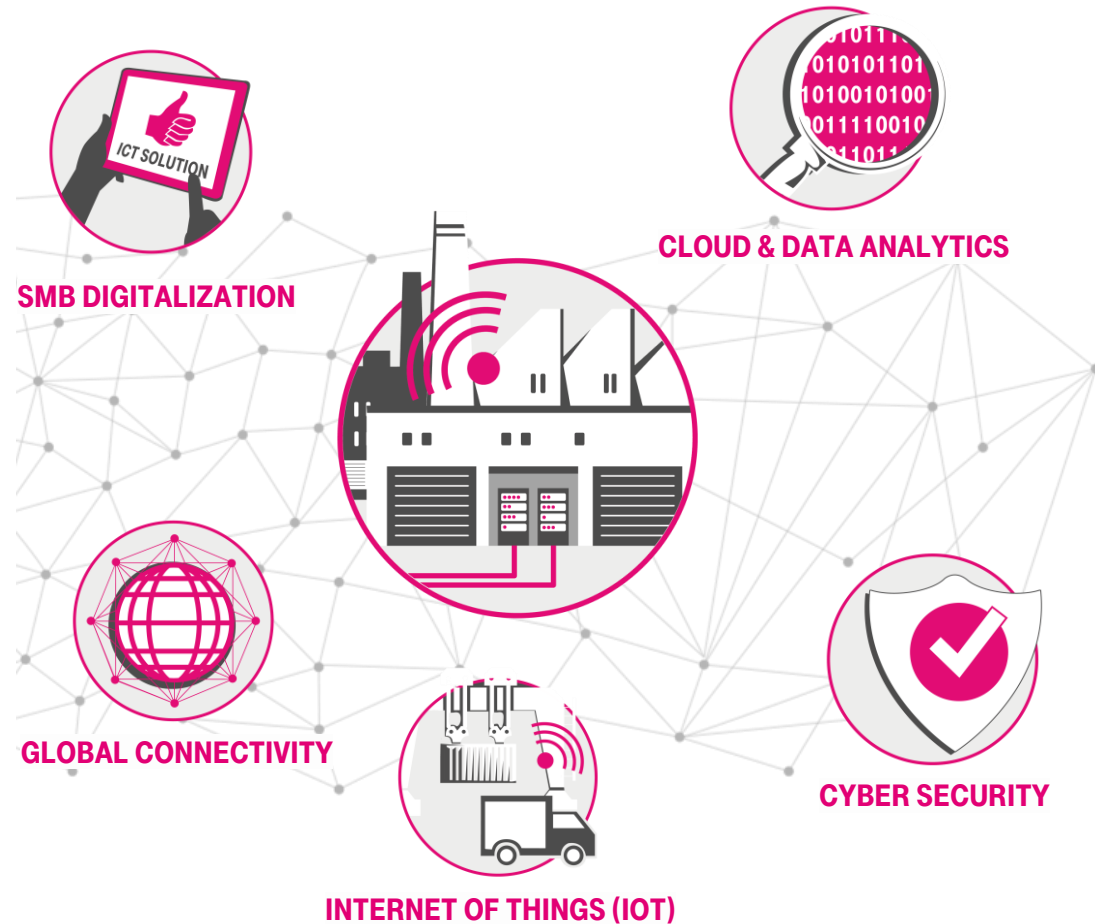
Recent developments

 German coalition agreement 2018	Fiber	<ul style="list-style-type: none">▪ “We create incentives via change to ex-post Open Access regulation instead of detailed ex-ante Regulation like copper”
	Subsidies	<ul style="list-style-type: none">▪ “We want nationwide Gigabit networks until 2025, preferably with fiber into the building”▪ “We expect €10-12 bn funding needs in this legislative period”
	5G	<ul style="list-style-type: none">▪ “We speed up densification of mobile networks and develop Germany to a leading market for 5G”
 EU regulation	Consolidation	<ul style="list-style-type: none">▪ Foster market environment for further infrastructure investment

DT position

- Create conditions for collaborations
- Provide fair framework for fiber investments
- Make sensible use of public funding
- Release spectrum for 5G, securing investment incentives
- Push approval of merger in NL and AT

WE INCREASE BUSINESS PRODUCTIVITY...



Our proof points

- ✓ We build horizontal platforms & vertical solutions for the **Internet of Things**: NB-IoT network in 8 EU markets & US, IoT unit established
- ✓ We enable **E2E SMB digitalization** with **secure & reliable ICT solutions**: Existing trusted customer relationships, 20% IT/Cloud revenue growth in SMB in 2017 in Germany
- ✓ We provide leading **cyber security** solutions: German market leader with > 1,400 experts
- ✓ We enhance our **global connectivity** proposition: Germany-outbound focus, smart SD-WAN powered by ngena
- ✓ We provide platforms for secure data exchange and **analytics**: Telekom Data Intelligence Hub (DTH) launched

...WITH SECURE ICT SOLUTIONS FOR SMB DIGITALIZATION

We leverage our strengths...



Trusted partner with strong B2B brand & customer base



Large & efficient sales force



Reputation as ICT provider (8x isg/Experton leader)

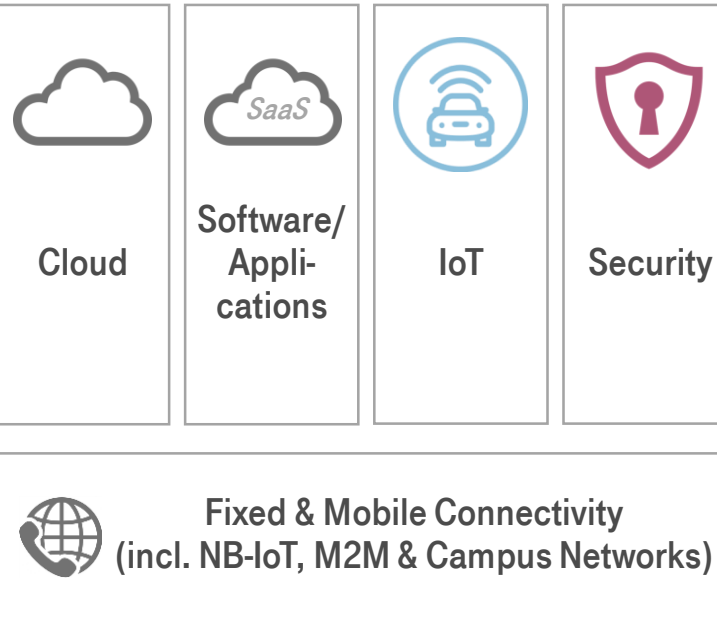


Local partner network

CAGR

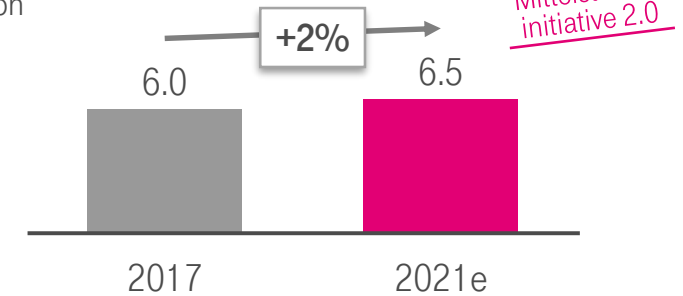
...with a strong portfolio...

Connectivity-Based Converged ICT Portfolio

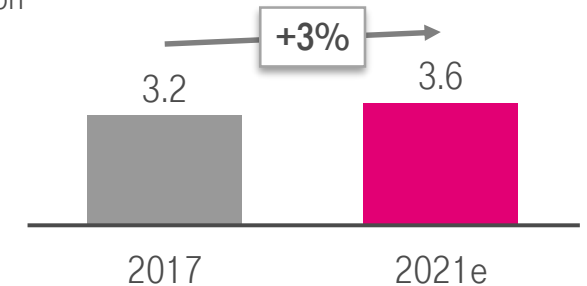


...to grow in SMB digitalization

B2B revenue Germany, € bn

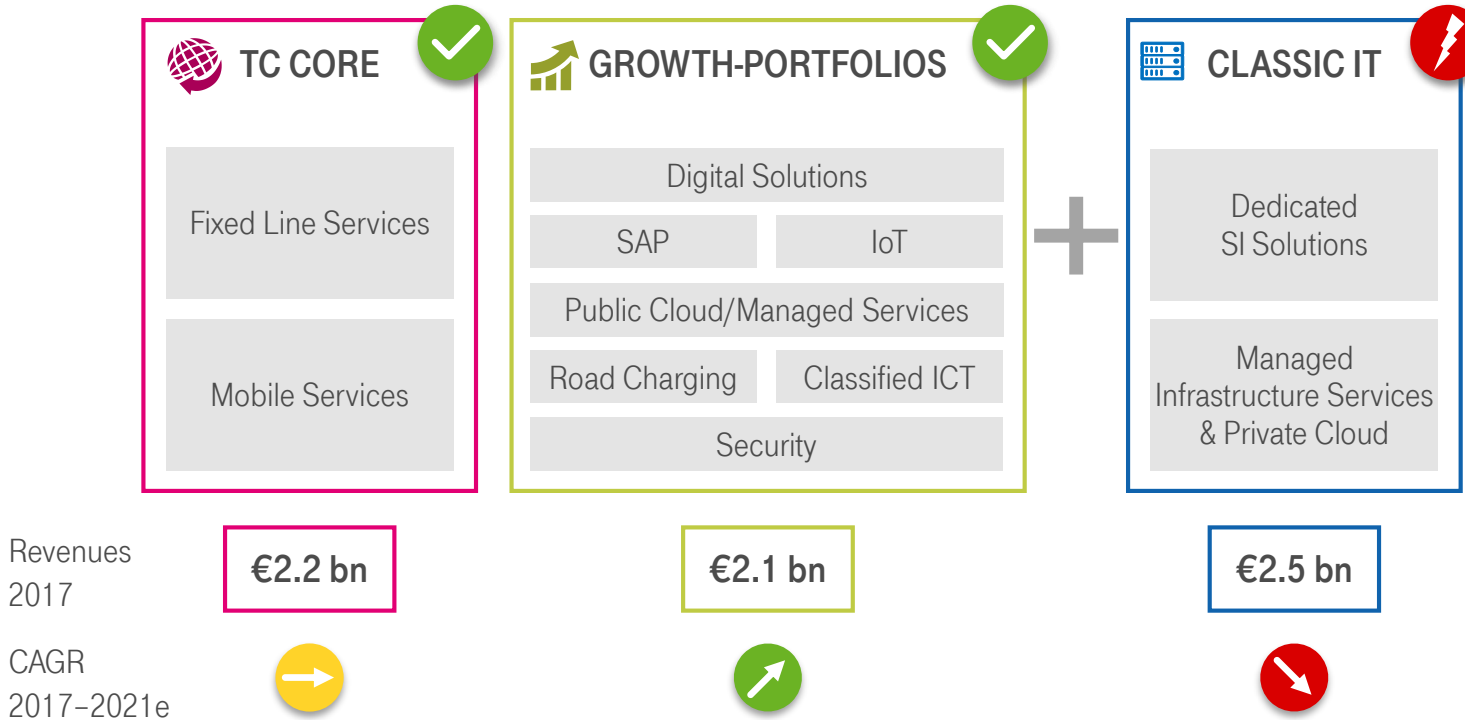


B2B revenue Europe, € bn



CLEAR TURNAROUND PLAN FOR T-SYSTEMS

Preserving optionality with portfolio-based steering...

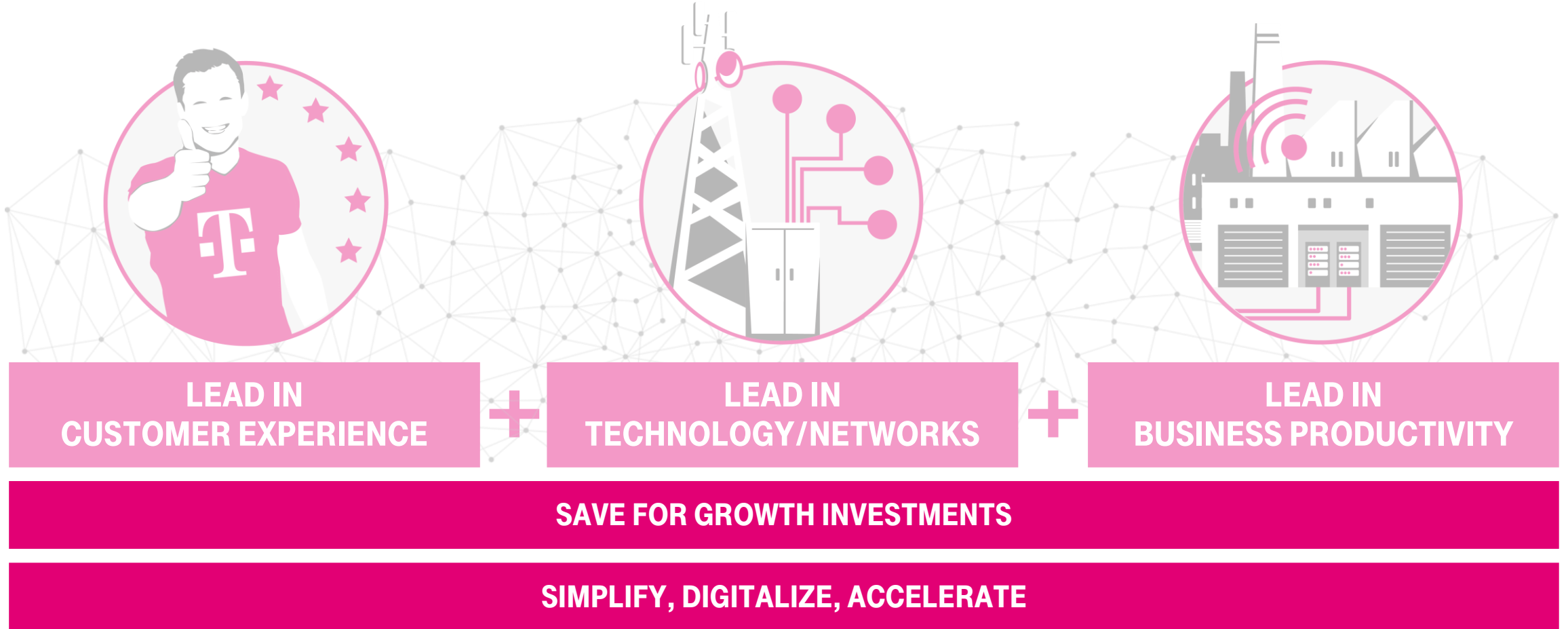


...and turnaround initiatives

- Sales revitalization
- Portfolio focus
- Delivery integration
- Overhead reduction

- ✓ Transform revenue mix towards growth portfolio
- ✓ Increase profitability (Cash contribution breaking even in 2020e)
- ✓ Maintain strategic optionality

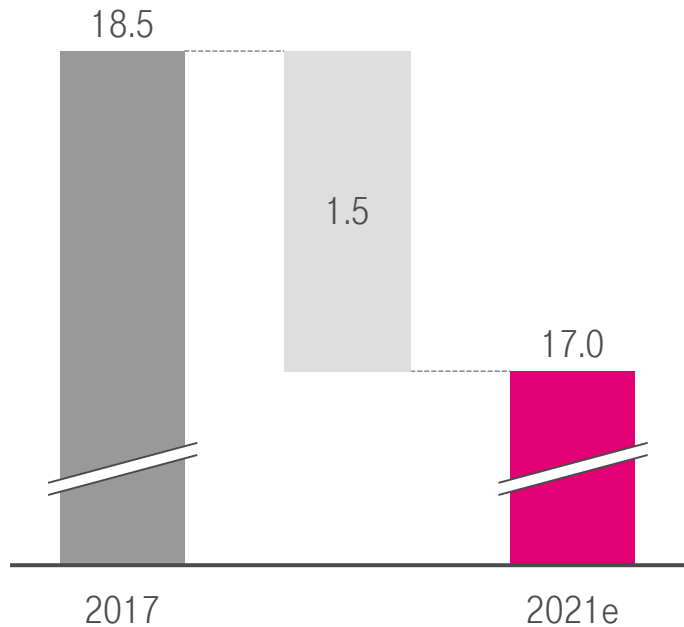
GROWTH UNDERPINNED BY VALUE TRANSFORMATION



EFFICIENCY TO FUND INVESTMENTS INTO GROWTH

Accelerated cost reduction...

Indirect Costs DT Group ex US, €bn



- Address cost savings potential **more effectively** than in the past
- Focus on **operational excellence** and **lean organizational structure** (e.g. enabled by digitalization)

...across all segments

T DEUTSCHLAND



-€0.8 bn



EUROPE



-€0.4 bn

T Systems

-€0.1 bn

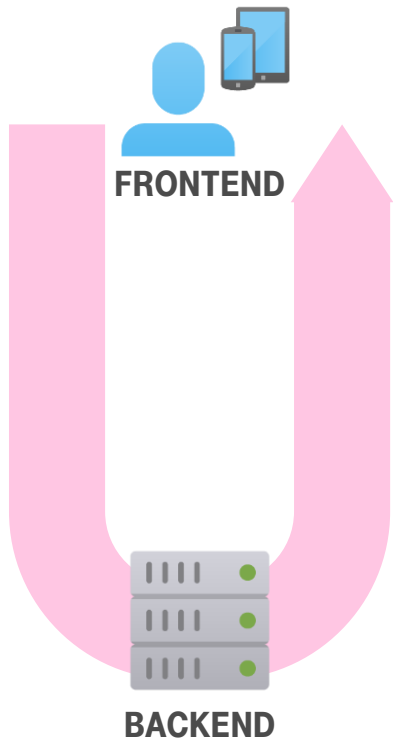
T GHS

(incl. GROUP DEVELOPMENT)

-€0.2 bn

DIGITAL TRANSFORMATION TO ADDRESS UNTAPPED POTENTIAL

We have started our E2E digitalization...



We digitalize our touchpoints:

“Mein Magenta App” in Germany¹, One App for EU

We simplify our products and services:

e.g. EU tariff reduction

We automate our core business processes:

1,500 bots handling 20 mn transactions in Germany

We exploit our data:

> 300 analytics use cases, > 50 ongoing AI projects,
> 100 experts working on AI

We transform our IT systems:

Portfolio approach in Germany, harmonized API Layer in EU

We digitalize our network for real-time operations:

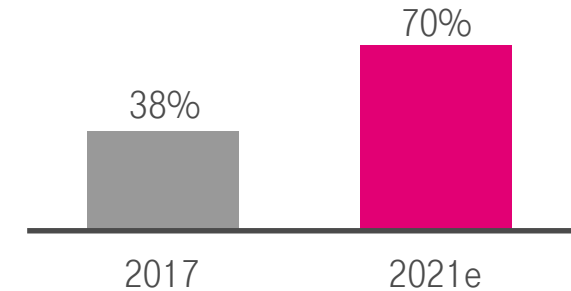
IP/BNG migration, Access 4.0

¹ Formerly MagentaSERVICE App ² E-Service Share Interaction, year end 2017

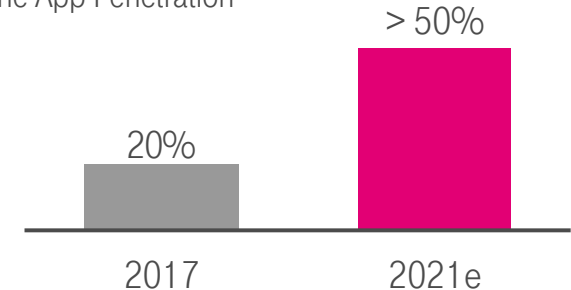
...and aim for more



Share of resolved requests in digital channels²



One App Penetration



BOLD CULTURAL TRANSFORMATION...

Strengthened the team on all levels...

New board members ...



Adel Al-Saleh
T-Systems



Srini Gopalan
Europe



Dirk Wössner
Germany

...supported by a strong international management team



Omair Khan
Data Governance



Omar Tazi
Product Innovation &
Customer Experience



Alex Choi
Research & Technology
Innovation



Campbell McClean
IT Architecture



Surya Manepalli
Operational
Excellence TSI



Eva Somorjai
Human Resource
Europe



Debanjan Banerjee
Investment Monetization
Europe

...

...to drive cultural transformation



- **Transform culture & organization** towards agile mindset
(220 T³ transformation leaders participated in classes in 2017)
- **Support cross-functional collaboration**
(90% of business leader placements in 2017 were cross-functional)
- **Establish new ways of working**
(T&I established with new pool organization; > 10k employees enabled in “Design Thinking” in 2017)
- **Drive empowerment and entrepreneurship**

...INNOVATIVE BUSINESS & STEERING MODELS...

New asset management & investment models

New Segment
Group
Development

T-Mobile 

Deutsche Funkturm

T-Mobile 

Innovative
Spin-Outs

Comfort Charge

ngena

MOBILEEDGE X

Growth &
Financial
Investments

T-CAPITAL PARTNERS

1NCE
The IoT Natives

axonize

relayr.

ENTREPRENEURIAL VALUE CREATION

Innovative ways of working

Flexible Incentive
Models



Entrepreneurial headroom
Collective targets

Agile
Development



Iterative & incremental
Cross-functional teams

Pool
Organizations



Competence Chapters
Project-based staffing

AGILITY & ACCELERATION

...TAKING CORPORATE RESPONSIBILITY

“Lighthouse” examples...

Climate Change & Enabling Potential



Sustainable Supply Chain



Human Rights & Employee Relations



Social Engagement



Digital Ethics



...of contribution to the sustainable development goals

- **Climate:** 20% CO₂ footprint reduction by 2020e¹
- **Renewable energy share:** Group at 41% (2017), TMUS aims at 100% by 2021e
- **Impact:** Positive CO₂ effect enabled on customer side at 71% above DT emissions
- **ESG² risk assessment** integral part in purchasing process
- 81% of **procurement volume reviewed** according to ESG² criteria (i.e. audits)
- **Joint audit** corporation and **supplier development program**
- **“Code of Human Rights & Social Principles”** & **“Employee Relations Policy”**
- Continuous human rights **due diligence** covering > 100 business units³
- **41%** of social engagement activities **focus on media skills & digital literacy**
- **Telekom Foundation** with focus on STEM⁴, digital teaching and learning
- Integration into the German labor market: **DT employs ≈ 340 refugees**
- **Ethics codex for responsible use of Artificial Intelligence implemented**
- Codex defines how DT will use AI for product and service development

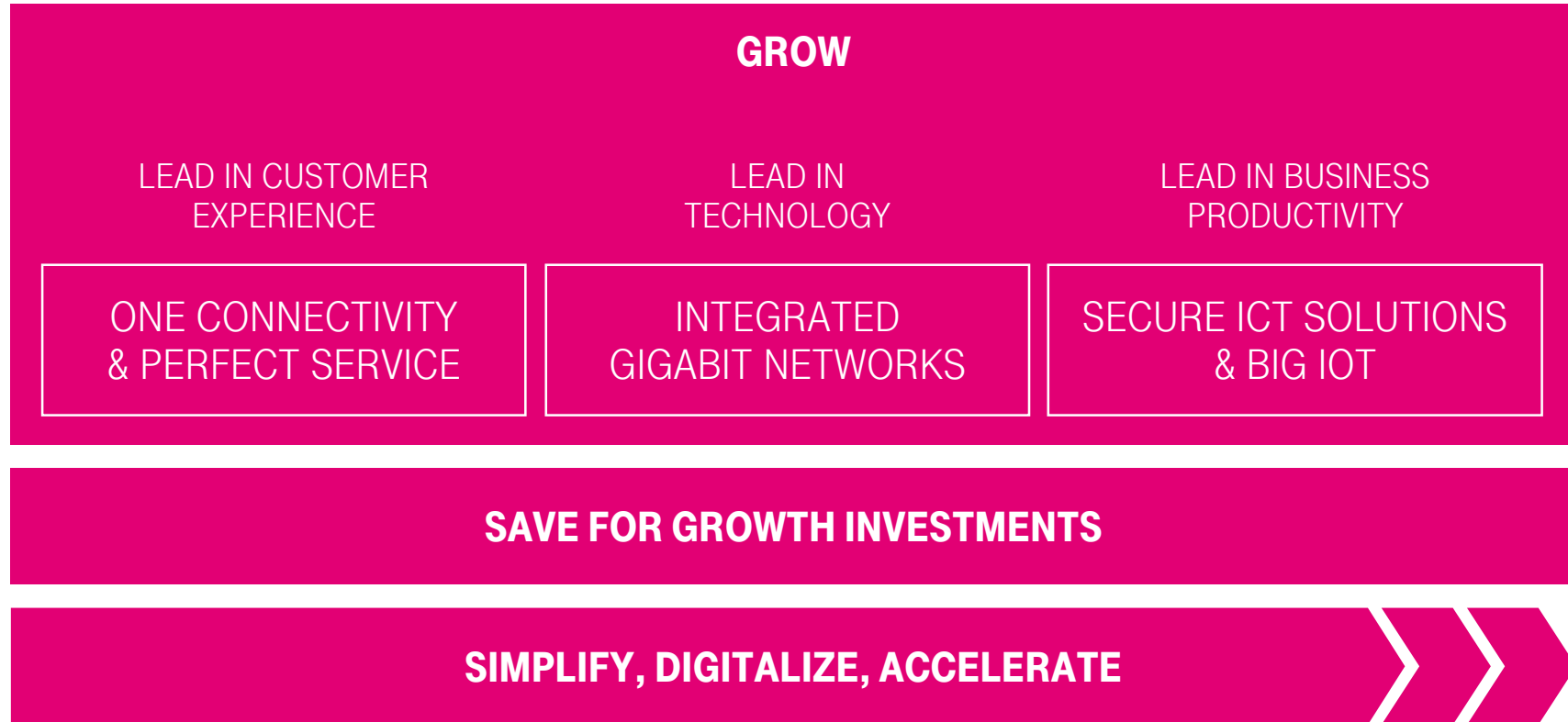
¹ Compared to base year 2008, without T-Mobile US, in t CO₂

² ESG: Environmental, Social & Governance

³ Incl. assessments of basic minimum requirements

⁴ Science, technology, engineering and mathematics

OUR AMBITION: LEADING EUROPEAN TELCO



MID TERM AMBITION LEVEL

MID TERM AMBITION LEVEL

	Mid term ambition level ¹	Year	Implications of US deal ²
GROUP REVENUES	CAGR +1–2%	2017–2021e	Confirmed
GROUP ADJ. EBITDA	CAGR +2–4%	2017–2021e	Confirmed
GROUP FCF	CAGR ≈ +10%	2017–2021e	Slightly dilutive in 2021e & accretive in 2022e
GROUP ADJ. EPS	≈ €1.20	2021e	Slightly dilutive in 2021e & accretive in 2022e
GROUP ROCE	ROCE > WACC	2021e	Confirmed
GROUP CASH CAPEX	Ex US stable	2017–2021e	Confirmed
GROUP INDIRECT OPEX	Ex US –€1.5 bn	2017–2021e	Confirmed
SHAREHOLDER REMUNERATION POLICY (2018–2021)³	Dividend will reflect growth in adjusted EPS. Floor remains at €0.50 per share	2017–2021e	Confirmed

¹ Based on constant exchange rates (Average exchange rate 2017 of € 1 = US\$1.13) and no further changes in the scope of consolidation ² Assumption: closure date Jan. 1st, 2019

³ Subject to necessary AGM approval and board resolution. 2018 dividend target of €0.70 per share. Share buy backs to be considered, but not relevant for first 3 years in US deal scenario.

WHY DT: BEST POSITIONED FOR FUTURE GROWTH



Unique **FOOTPRINT & ASSET BASE**

- ✓ **Transatlantic presence** in worlds' leading economies
- ✓ **Converged leader** in Europe with **superior network position**



GROWTH Profile

- ✓ **95% of footprint growing** with further FMC growth potential
- ✓ Supercharging the Un-Carrier **boosts DT's financial profile** (EPS accretive from year 3)



Untapped **VALUE POTENTIAL**

- ✓ Still untapped potential from **cost transformation**
- ✓ **Accelerated digitalization** to improve CX and reduce costs



Clear **STRATEGY**

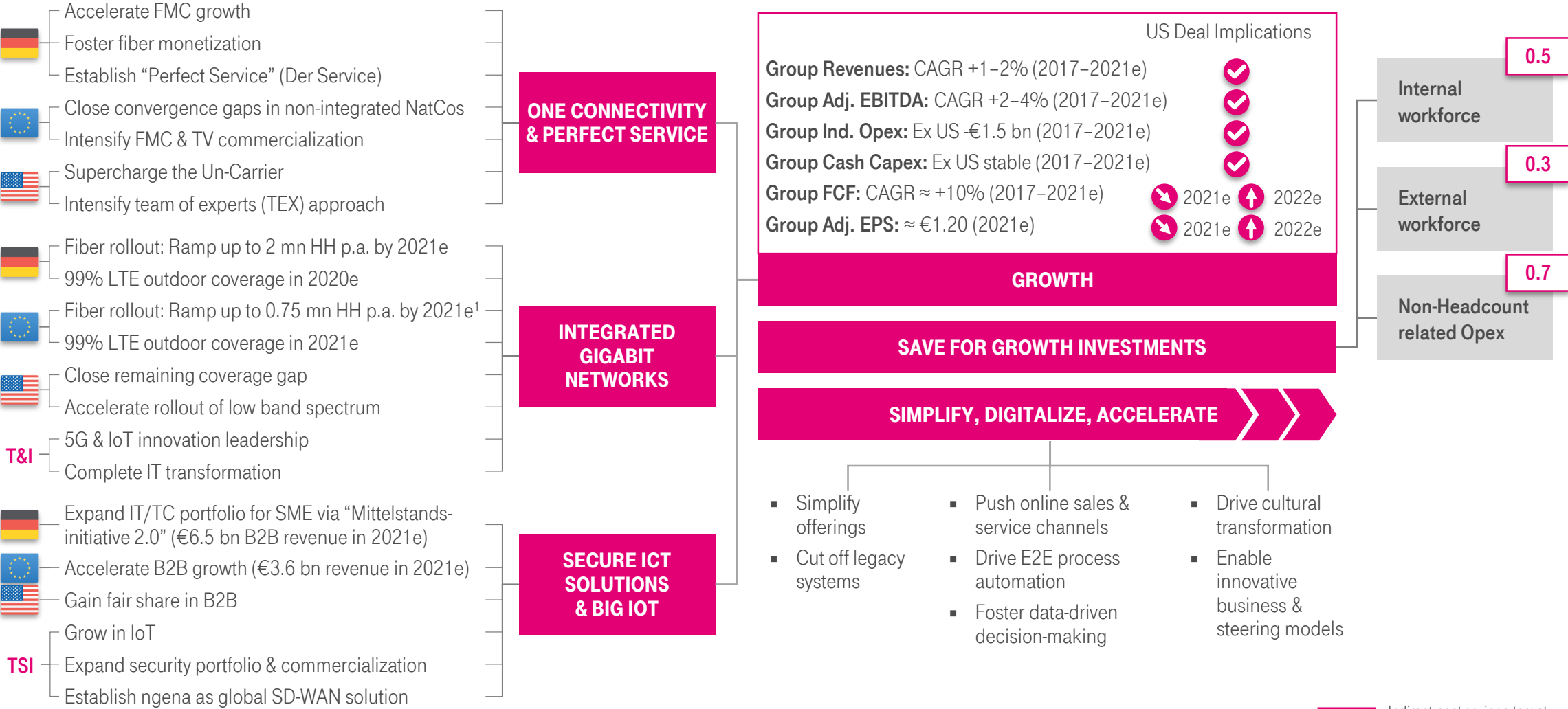
- ✓ Focus on **connectivity core & adjacent business**
- ✓ Focused **portfolio approach & capital allocation**



Best **TEAM**

- ✓ **New international leaders** with excellent track record
- ✓ **Walk the talk & winning mentality**

BOTTOM LINE: WE HAVE A PLAN



¹ FTTH/B and Cable ED3.1, excluding Romania

XX Indirect cost savings target
DT ex US 2017–2021e, € bn

DEUTSCHE TELEKOM CAPITAL MARKETS DAY 2018



LIFE IS FOR SHARING.

GERMANY

DR. DIRK WÖSSNER

KEY MESSAGES

01

MARKET WITH STABLE GROWTH

The German telecommunications market has returned to stable growth and Telekom is uniquely positioned within this market

02

LEAD IN CUSTOMER EXPERIENCE

Our stable top-line growth focuses on four key drivers: Expanding our converged household penetration, continuing more for more and multi-brand approach in mobile, leveraging our improved broadband networks and TV proposition, and continued low churn through best-in-class service

03

LEAD IN BUSINESS PRODUCTIVITY

“Mittelstandsinitiative 2.0” will further contribute to our strong growth momentum in the B2B market with secure ICT solutions

04

LEAD IN TECHNOLOGY – FIXED

Finalizing our super-vectoring rollout and then reallocating our high budget towards fiber will yield strong broadband growth while addressing political concerns. Our proposed co-investment will ensure a fair risk reward

05

LEAD IN TECHNOLOGY – MOBILE

Leveraging our backhaul capacity and unprecedented site expansion while increasing speed and capacity with massive MIMO, SDRAN technology and enable innovative 5G services

06

VALUE TRANSFORMATION

Indirect cost reduction of €750 mn by 2021 through automation, operational excellence, and retirement. Improvements supported by consolidating management functions, flexible IT-architecture and investing into agile development skills

07

FINANCIAL OUTLOOK

Continue our growth path of > 1% in revenue, +2–2.5% in adj. EBITDA and +4–5% in cash contribution with stable Cash Capex and Special factors (Cash)

REVIEW 2014 – 2018

SOLID DELIVERY ON KEY PROMISES

MARKET

Ambition level 2018

- #1 in FMC with **MagentaEINS**: 3 mn customers
- #1 in **Mobile** service revenue: $\approx 1\%$ ¹ CAGR
>36% market share
- #1 **Broadband**: $\approx +2\%$ CAGR
> 40%² market share
- Stable **Wholesale** revenue

Achievements 2017

- 3.6 mn customers
- #1 Mobile: $+1.0\%$ ¹ CAGR
> 36% market share
- #1 Broadband: $+1.1\%$ ³ CAGR
 $\approx 40\%$ ² market share
- $+1.2\%$ ⁴ CAGR 2014–2017

Delivered/on track



QUALITY

- **Customer loyalty** (TRI*M): ≈ 64 points

- 59 points



FINANCIALS

- Adj. **EBITDA** margin: $\approx 42\%$
(Pro Forma: $\approx 40\%$)⁵
- Growing adj. **EBITDA**: $+1-2\%$ CAGR
- Growing adj. **Cash Contribution**: $\approx +2\%$ CAGR
- **Revenue stabilization**: $+0.3\%$ ¹ CAGR

- 38.4%
- $+0.8\%$ CAGR 2014–2017
- -2.7% CAGR 2014–2017
- $+0.1\%$ ¹ CAGR 2014–2017



¹ Without EU roaming impact

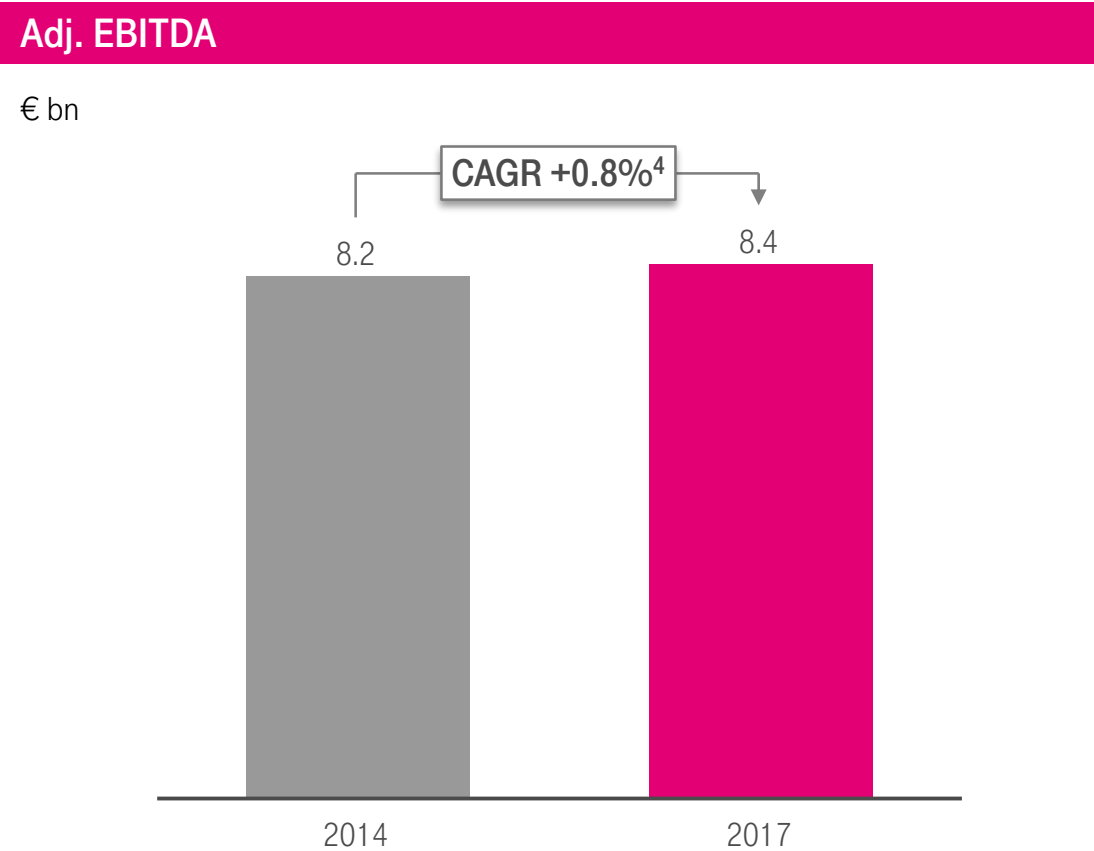
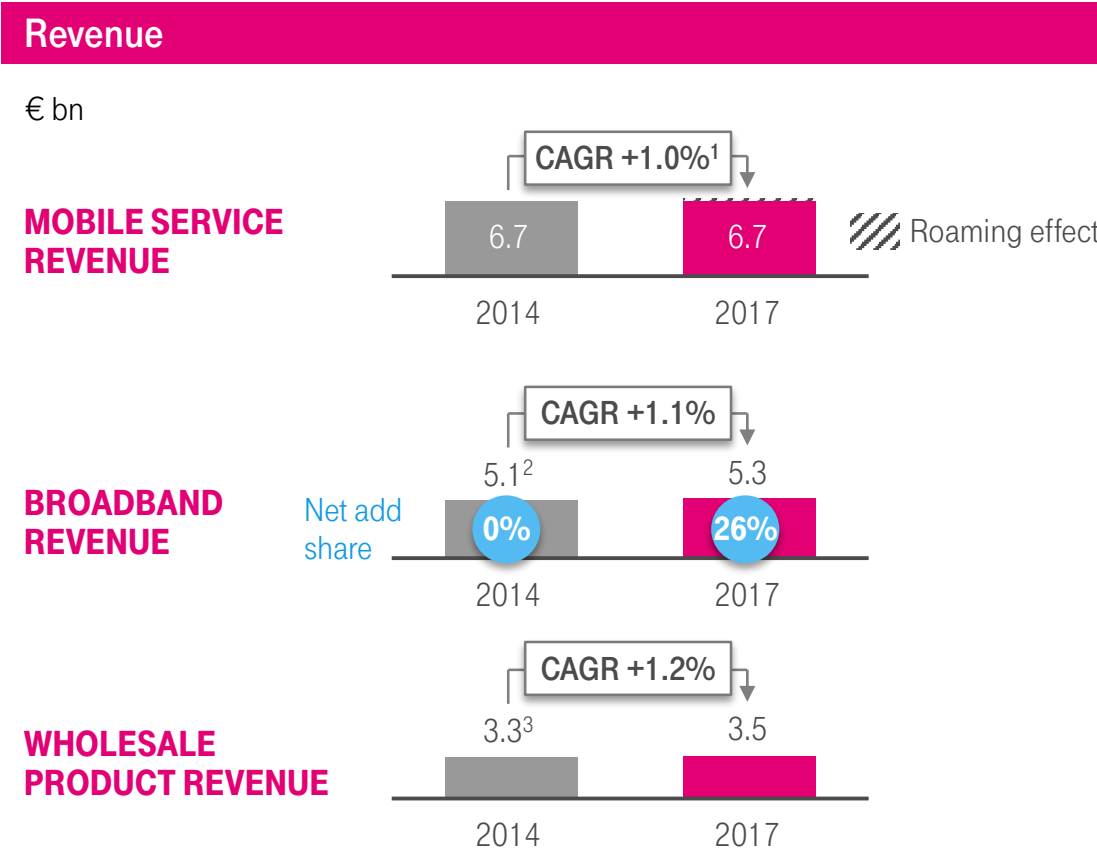
² Access market share in 2018e

³ FY 2014 restated (supplement accesses allocated to voice only revenues) during 2015

⁴ FY 2014 restated (€70 mn shifted from "Wholesale" to "Others") during 2015

⁵ Excl. DFMG and VCS

GERMANY RETURNED TO GROWTH IN REVENUE & EBITDA



¹ Without EU roaming impact

² FY 2014 restated (supplement accesses allocated to voice only revenues) during 2015

³ FY 2014 restated (€70 mn shifted from "Wholesale" to "Others") during 2015

⁴ Excl. DFMG and VCS

HEALTHY AND STABLE MARKET ENVIRONMENT ENABLES GROWTH

Market insights and trends



Stable economy with positive outlook

GDP +2.3% in 2018¹



Well segmented market.
Willingness to pay for quality & service



Stable & long-term capacity models for
fixed & mobile in place

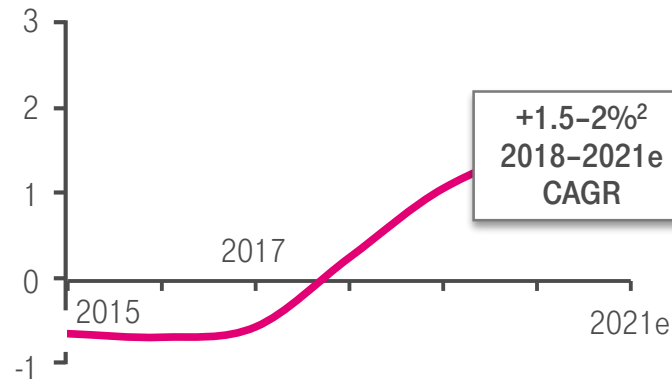


Expected improving regulatory environment

Stable IP BSA pricing until 2022,
MTR-glidepath defined until 2020

Mobile market back to growth...

Service revenue (market),
growth rate yoy, %

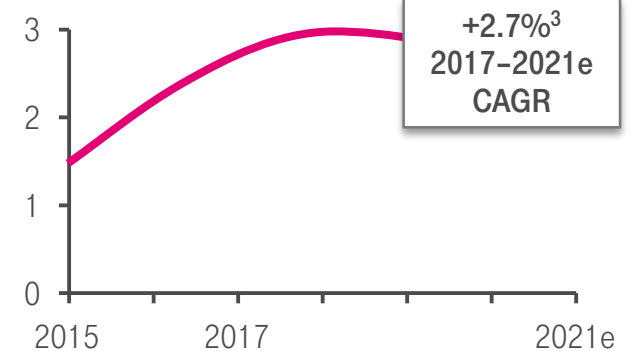


After 3 years of decline, positive
development expected

- 3-player market with capacity models for MVNOs
- Catch up in mobile usage (still low average consumption in Germany)

...and still positive broadband momentum

Broadband revenue (market),
growth rate yoy, %



Broadband- & high-speed penetration
supporting growth

- High-speed demand increases by ≈ 40% yoy on telco infrastructure
- Broadband growth due to low penetration (78% HH-penetration⁴)

Source: ¹ BMWi estimate ² AnalysysMason/IDC ³ AnalysysMason Telco Market Aug. 2017 ⁴ Credit Suisse Research Mar. 2018

WE ARE UNIQUELY POSITIONED IN THE GERMAN TELCO MARKET

#1

TELEKOM

MARKET LEADER IN
GERMANY

\$40 BN

Most valuable
telco brand in
Germany

3.6 MN

Lead in converged
customers

#1

B2B market leader
in Germany

+20 %¹

IT/cloud growth
leader in SMB

#1

Winner of most
telco service tests

18 MN

Most customers on
IP-platform

≈ 80 %

Most mobile sites
connected via fiber

95 %

Outstanding
winner of 95% of
all network tests

**UNLIMITED &
STREAMON**

#1 telco innovator
in Germany

¹ Growth 2016–2017

STRATEGY 2018 – 2021

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT

FINANCE

GERMANY CONTRIBUTING TO GROUP STRATEGY

Our strategy

GROW

LEAD IN CUSTOMER
EXPERIENCE

ONE CONNECTIVITY
& PERFECT SERVICE

LEAD IN
TECHNOLOGY

INTEGRATED
GIGABIT NETWORKS

LEAD IN BUSINESS
PRODUCTIVITY

SECURE ICT SOLUTIONS
& BIG IOT

SAVE FOR GROWTH INVESTMENTS

SIMPLIFY, DIGITALIZE, ACCELERATE

Ambition Germany



- 1 LEAD IN CUSTOMER EXPERIENCE**
Strengthen market leadership with stable top line growth in consumer market
- 2 LEAD IN BUSINESS PRODUCTIVITY**
Continue strong growth momentum in B2B with secure ICT solutions ("Mittelstandsinitiative 2.0")
- 3 LEAD IN TECHNOLOGY**
Maintain network leadership based on demand driven network rollout within stable Capex budget
- 4 VALUE TRANSFORMATION**
Clear commitment to efficiency improvements driven by digitalization

1 LEAD IN CUSTOMER EXPERIENCE



**FOR OUR
CUSTOMERS**

**LEADING
CUSTOMER EXPERIENCE**

Key growth drivers



CONVERGENCE

Expanding our converged household penetration with MagentaEINS



MOBILE

Continuing our successful more for more multi-brand approach



BROADBAND/TV/WHOLESALE

Leveraging our improved fiber network & TV proposition



SERVICE

Continuing low churn through best-in-class service

1 CONVERGENCE: CONTINUE MAGENTA EINS SUCCESS STORY

More for more strategy pays off



HIGHER REVENUE PER HOUSEHOLD

+€9.00

Additional revenue
per household



HIGHER CUSTOMER LOYALTY

-50%

Churn rate
(mobile/fixed)



HIGHER CUSTOMER SATISFACTION

+19pts

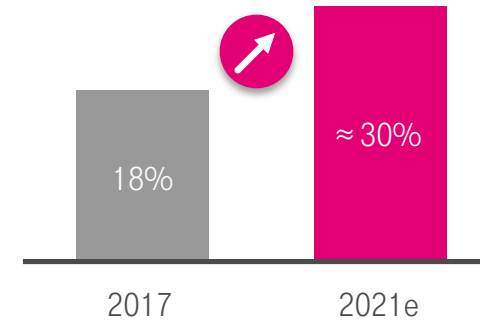
Net Promoter Score vs.
consumer base¹

¹ Average of last four data points of Consumer segment NPS vs. MagentaEINS

Growing converged base with focus on value

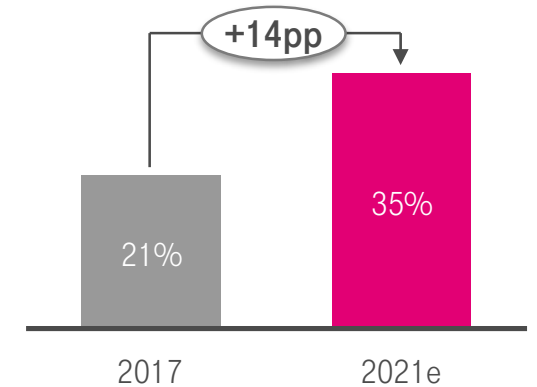
Cross-sell into base and add
additional SIM cards/family
offers

Share MagentaEINS households/
broadband households,
%



Secure high share of revenue in
converged offer

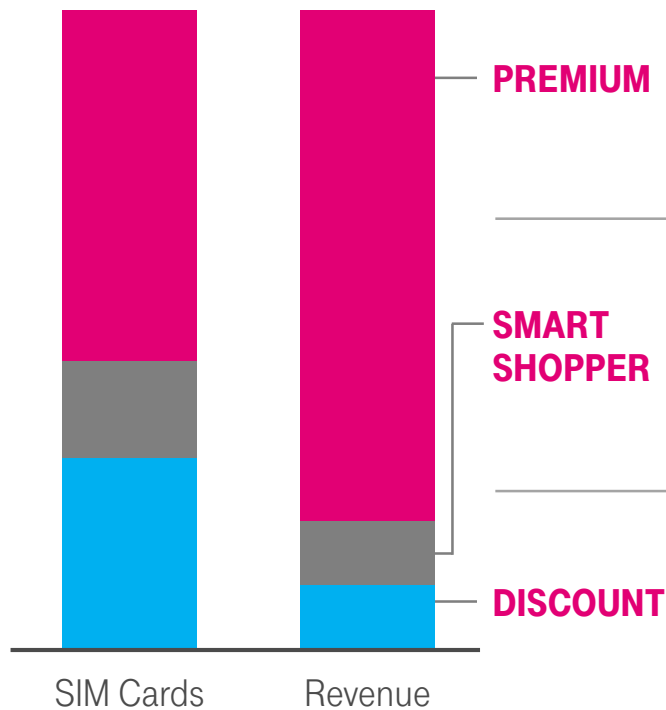
MagentaEINS revenue share,
%



1 MOBILE: RELEVANT MARKET SEGMENTS ADDRESSED

Multi-brand strategy with clear focus on premium segment

Market value distribution¹



- Focus on defending leading position with innovative services (e.g. StreamOn, Unlimited)
- Differentiate through handset portfolio and pricing



- Aim for fair-share through fast-follower strategy with flexible “build-yourself” tariffs
- Strong digital heritage & reactive pricing strategy



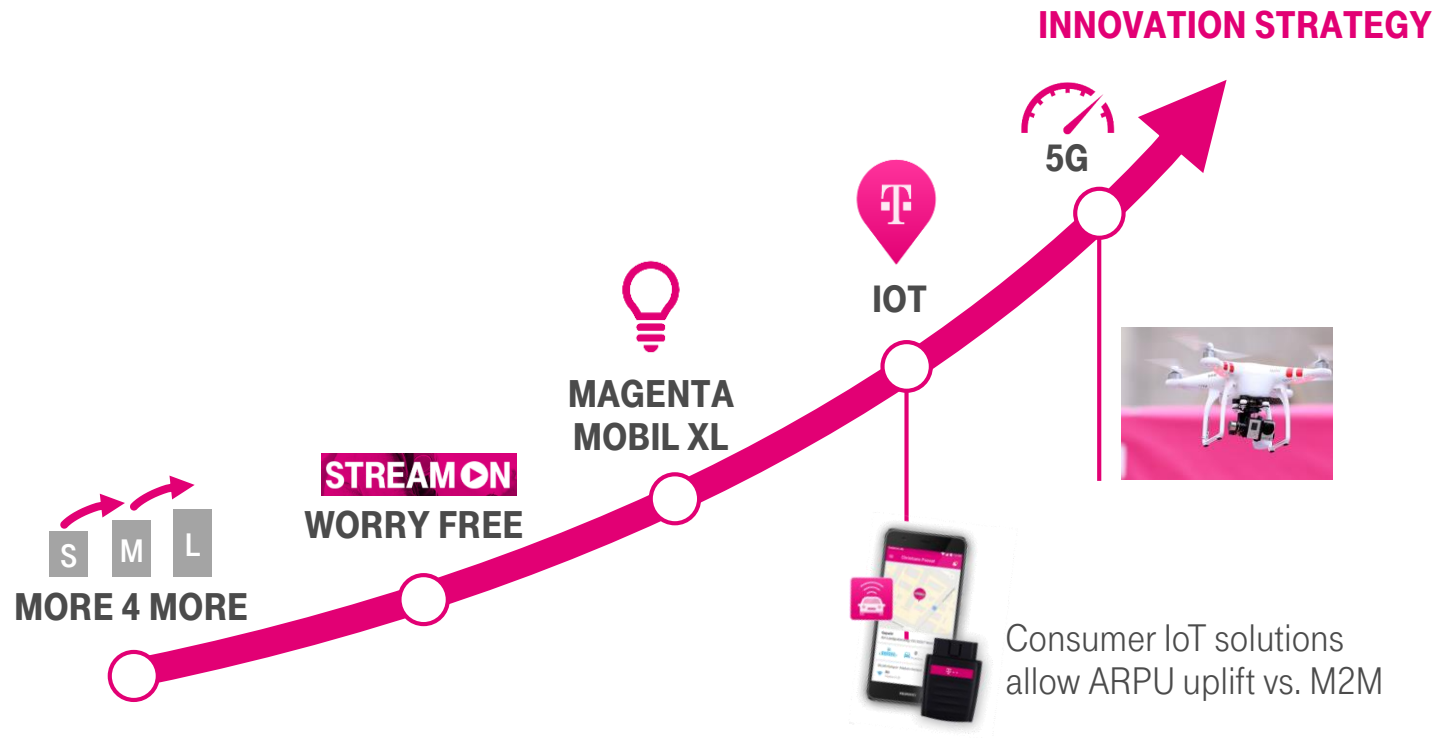
- Underindexed and focus on revenue stabilization
- Balanced channel presence through wholesale brands & retail partnerships



¹ Rough estimation based on internal market survey

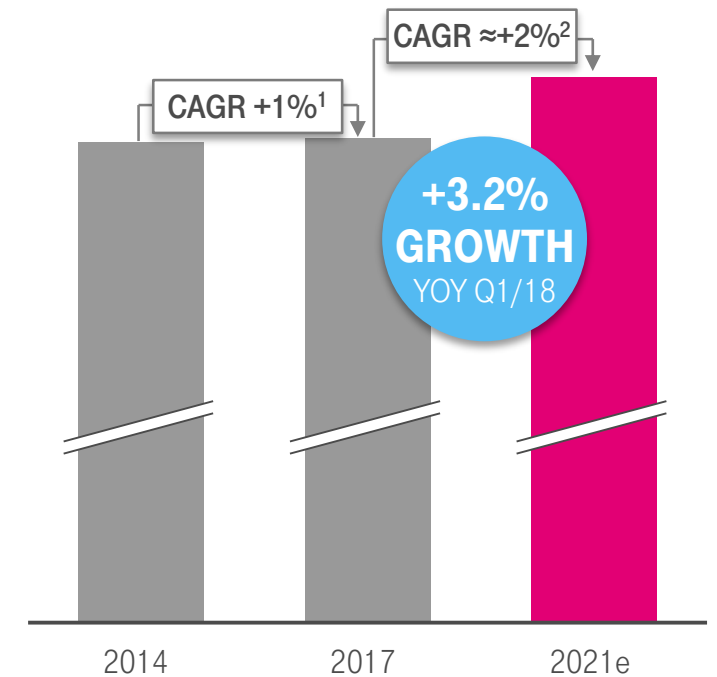
1 MOBILE: DIFFERENTIATION WITH INNOVATION & MORE FOR MORE

Innovative more for more strategy



Mobile service revenues

€ bn



¹ Without EU roaming impact

² Average growth rate adjusted for IFRS 15 impact; 2021e visually adjusted for IFRS 15

1 BROADBAND: GROWTH WITH FTTX COVERAGE & SPEED

Broadband revenue growth drivers



BANDWIDTH INCREASE

Higher speeds yield low churn and good gross-add momentum



INCREASED CUSTOMER LOYALTY

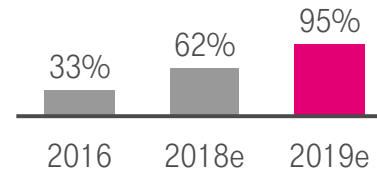
High-speed customers vs. ADSL broadband



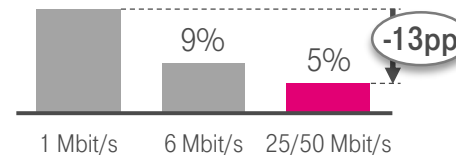
TV GROWTH

Smart content investments & leading platform increase broadband attractiveness

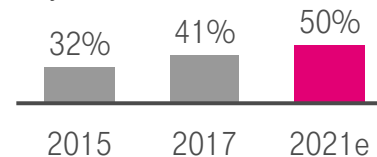
Availability of ≥ 50 Mbit/s



Broadband churn rate 2017, %

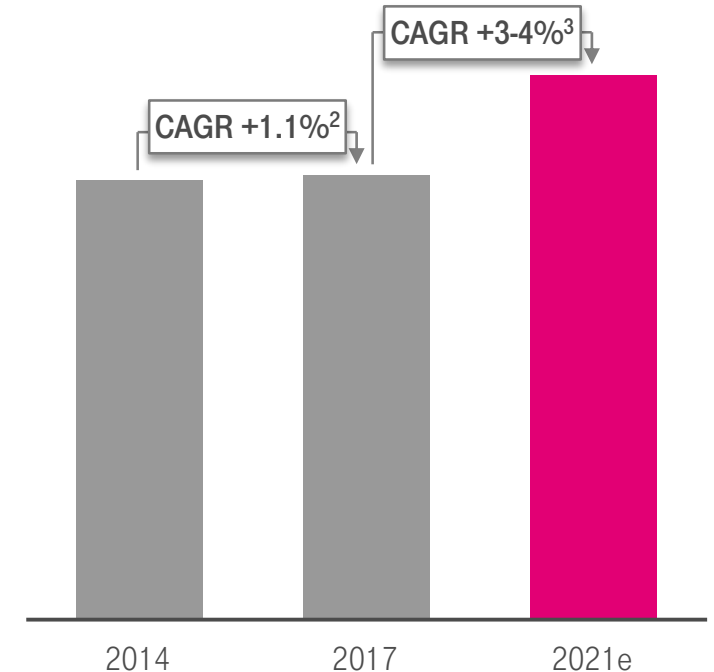


Pay-TV share, %¹



Broadband revenues

€ bn



¹ Customers with at least one booked paid package ² FY 2014 restated (supplement accesses allocated to voice only revenues) during 2015

³ Including business IP products (e.g. DLAN, Company Connect); average growth rate adjusted for IFRS 15 impact; growth 2017-2021e without definition change approx. 1 pp lower

1 TV: CONTENT AGGREGATOR WITH SMART INVESTMENTS

TDG is the only growing TV operator

TV net adds FY 2017,
k¹

260

TV market share,
%

8%
2017

12%
2021e



-65



-67



-91



¹ TDG including Entertain IPTV and Sat, Vodafone Coax and IPTV lines, Telecolumbus incl. Primacom & Pepcom

² Since start in Oct. 2017

Our differentiators drive further growth



BEST CONTENT AGGREGATOR

- Exclusive series: 3.7 mn views²
- Smart content investments with high customer perception



BEST USER INTERFACE

- Award winning experience: Best image/audio quality
- Differentiating features: Voice control, 2nd screen, mobile app



LEAD IN SPORTS CONTENT

- Most popular sports content: Bundesliga Conference & 3. Liga
- Exclusive sports rights: BBL, Ice hockey



NEW TARGET AUDIENCE

- Focus on young audience
- New segments: Housing industry

1 WHOLESALE: DRIVING GROWTH WITH FIBER MONETIZATION

Stable Wholesale access base & ARPA growth



SUBSCRIBER GROWTH

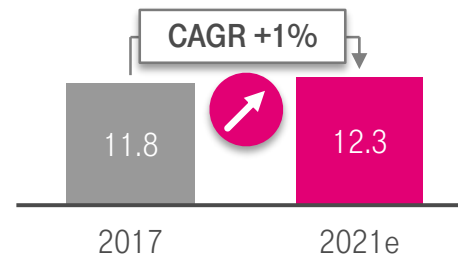
- “Kontingentmodell” as reliable long-term model to provide access to our fiber infrastructure
- Low churn due to attractive wholesale platform (bandwidth)



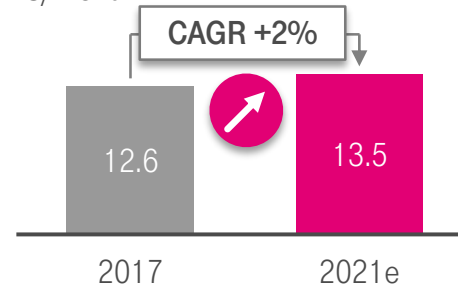
ARPA GROWTH

- ARPA increase driven by shift ULL/BSA
- Stable regulatory environment (fixed IP BSA pricing up to 2022)

Wholesale access base,
mn

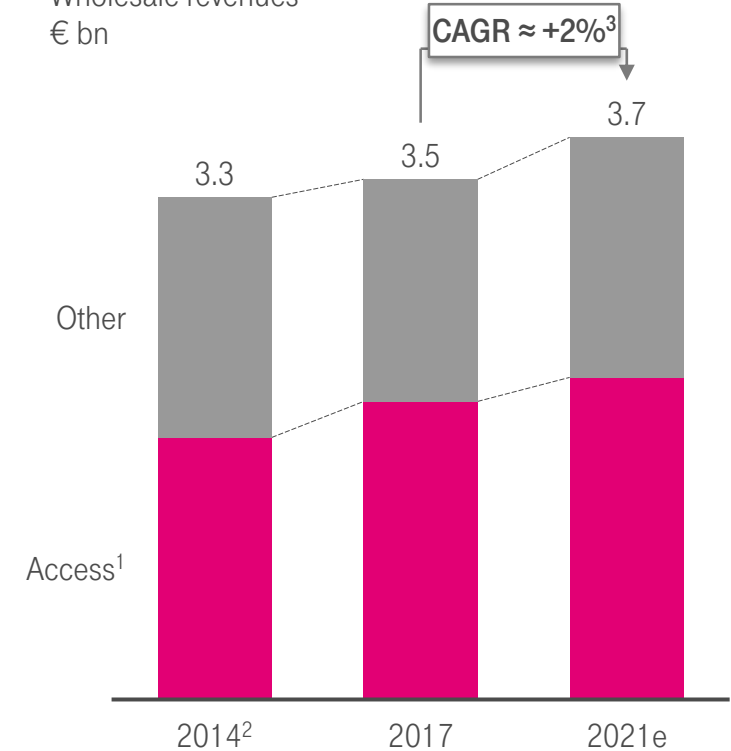


Access ARPA growth
€/month



Ambition

Wholesale revenues
€ bn



¹ Carrier customers ² FY 2014 restated (€70 mn shifted from “Wholesale” to “Others”) during 2015 ³ Average growth rate adjusted for IFRS 15 impact

1 SERVICE: TOWARDS A LEADING CUSTOMER EXPERIENCE

Leading customer experience in products and service



PROACTIVE

- **Big data analytics** for early fault detection
- **Proactive customer information** in case of critical incidents, contract changes, IP migration, etc.

SMS/year for proactive customer interactions

>1.8 MN



FLEXIBLE & DIGITAL

- **Self-service** via Mein Magenta App for reduction of service calls (e.g. contract status & changes, invoice, data usage)
- **Self-administration** for SMB (e.g. Cloud PBX)

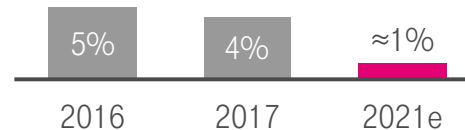
Share of resolved requests in digital channels, %¹



SIMPLE & SEAMLESS

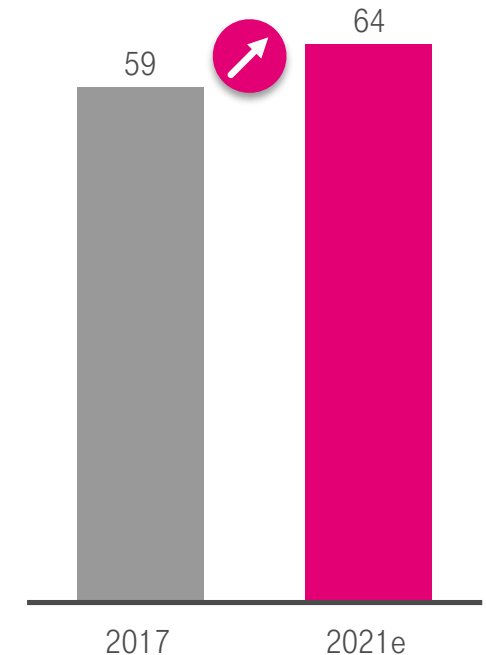
- **Simplification** of product portfolio
- **Seamless customer service** on all channels (e.g. web, hotline, shop)

Rate of complaints, %



Ambition

Customer loyalty (TRI*M), in points



¹ E-Service Share Interaction, year end 2017

2 LEAD IN BUSINESS PRODUCTIVITY



B2B growth areas



CONNECTIVITY & INFRASTRUCTURE

Mobile, fixed network, cloud IaaS and M2M



AGILE WORKPLACE

Smartphone, tablet, notebook and office software



BUSINESS APPLICATIONS

Horizontal, vertical and cloud SaaS

2 MITTELSTANDSINITIATIVE 2.0: SECURE ICT SOLUTIONS FOR SMB

B2B market leadership driven by digitalization

MITTELSTANDS-
INITIATIVE
1.0

2014–2017

- **Growth in mobile & broadband revenues**
- **IT solutions:**
SAP & cloud infrastructure for SMB with automatic provisioning
- **Business connectivity solutions**
- **Security:** Mobile security & firewall solutions

CAGR 2014–2017
+1% ✓

+19% ✓

+11% ✓

+17% ✓

MITTELSTANDS-
INITIATIVE
2.0

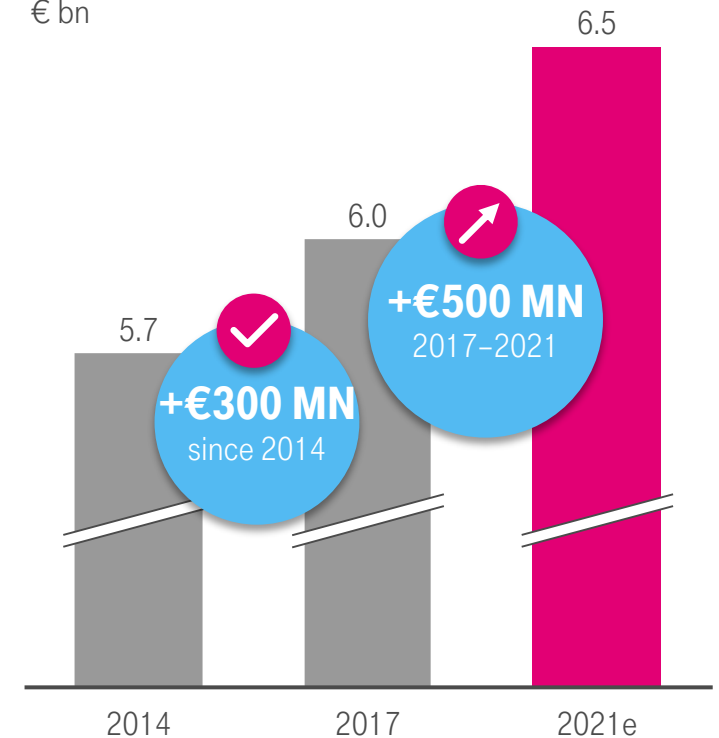
2018–2021

- **Further growth in mobile & broadband**
- **Connectivity & infrastructure:** M2M/IoT
- **Agile workplace:** Cloud PBX & office solutions
- **ICT solutions & business applications**



Ambition

€ bn



3 LEAD IN TECHNOLOGY



**LEAD IN
TECHNOLOGY**

Drivers for network leadership



FIBER ROLLOUT

FTTH/B rollout with intelligent area and technology mix within stable Capex envelope



COOPERATION & CO-INVEST MODELS

Increase of coverage with intelligent cooperation models



MOBILE

Extension of leading mobile network position in reach and quality



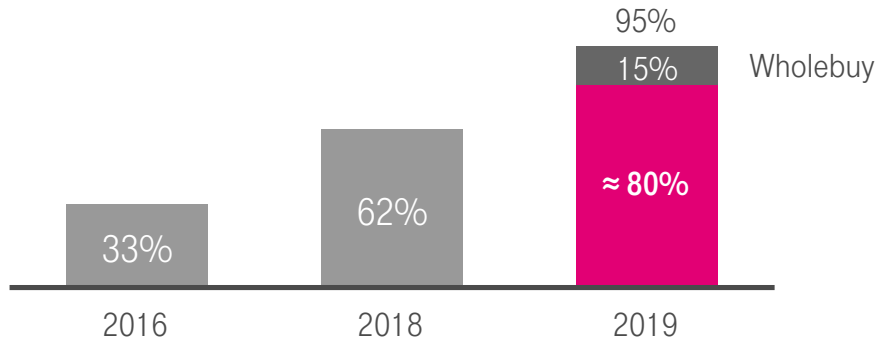
NETWORK INNOVATION

Innovation leader in 5G network technology and efficient rollout technology

3 FIBER ROLLOUT: NOT MANY WHITE SPOTS LEFT

TDG building the leading infrastructure in Germany

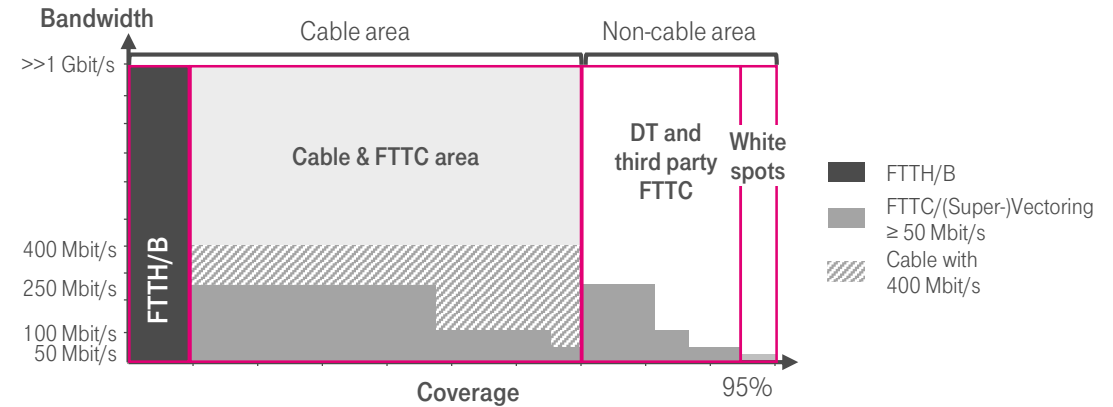
Vectoring coverage



- ✓ Reaching ≈ 80% HH coverage with vectoring in 2019 (≈ 62% in 2018)¹
- ✓ ≥100 Mbit/s in 70% of HH (in 2019)
- ✓ Introduction of Super-Vectoring (up to 250 Mbit/s)
- ✓ Wholebuy potential 15% (in 2019)

15 MN
homes connected
with Super-Vectoring
by end of 2018

Expected market broadband coverage end of 2019²

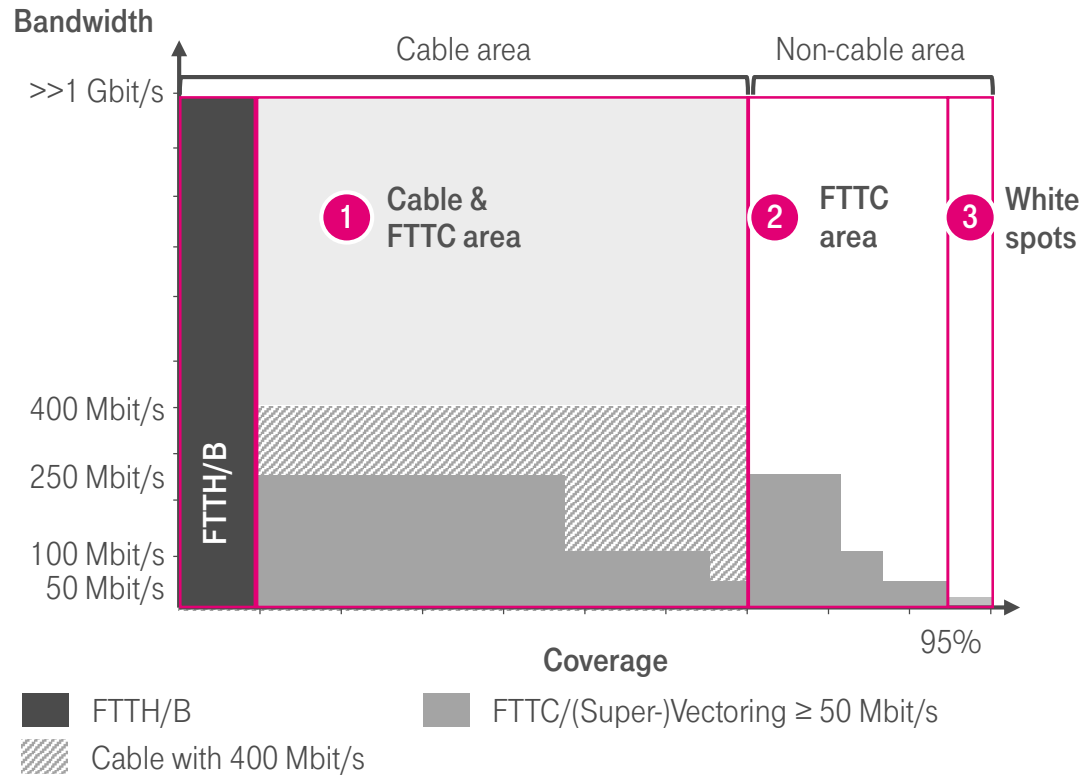


- Only 5% “white-spots” end of 2019
- 70% coverage with 1 Gbit/s by **cable** expected
- Further **subsidies** expected

¹ Bandwidth ≥50 Mbit/s, delayed due to long regulatory process ² Schematic illustration

3 FIBER ROLLOUT: SMART AREA AND TECHNOLOGY MIX

Expected German broadband coverage end of 2019¹



¹ Schematic illustration

Rollout priorities



B2B areas

Connecting 80% of businesses in business parks with fiber (by early 2020s)

1

Cable area

+

2

FTTC area

Areas with strong competition and winback potential for customers lost to cable/other operators

3

White spots

Subsidized rollout of areas with very low bandwidth and high customer demand

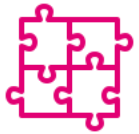


Cooperations & co-invest models

Shared investment for efficient rollout & wholebuy

3 COOPERATIONS AND CO-INVEST MODELS

Cooperation models



JOINT VENTURES

- **Joint rollout** of fiber infrastructure with **larger regional carriers** (e.g. EWE)



RENTING NETWORK ELEMENTS

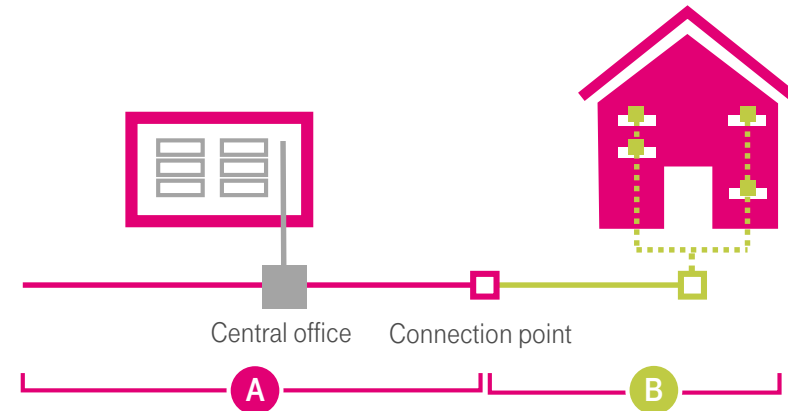
- **Renting complementary infrastructure** from regional players (e.g. municipal services)



WHOLEBUY

- **Renting infrastructure & active equipment** based on **commercial wholesale** models (market potential 15% in 2019)

Investment oriented & fair commercial models



OPEN NETWORK, BASED ON FAIR RETURN, RISK SHARING, AND RECIPROCITY

- A** Commitment Model with **annual upfront payments** for bitstream **connection fee**
- B** **Investment oriented connection fee** per line charged to **retail service provider**

3 FIBER ROLLOUT: RAMPING UP TO 2 MN HOMES PER YEAR

Guardrails fiber rollout



SMART INVESTING

- Improving rollout efficiency with trenching, data driven rollout, and “FTTH factory”
- Status 2020: **≈ €1,000 per home passed¹**



SMART AREA & TECHNOLOGY MIX

- **Smart area mix** between B2B areas, competitive areas, FTTC areas and white spots
- **Efficient technology mix with FTTH, FTTB and WTTB** (potential: 20–30% of homes where we have fiber available)



SMART COOPERATION & CO-INVEST

- **Joint fiber rollout** with regional players (e.g. EWE)
- **DT will sell and buy wholesale fiber access** based on **fair return**, **risk sharing** and **reciprocity**

MAINTAINING
STABLE CAPEX €4.2 BN
P.A.²

MINIMUM IRR
7.5%³

RAMPING UP TO
2 MN HOUSEHOLDS
P.A. BY 2021

SHARING INVESTMENT RISKS
WITH PARTNERS

¹ Incl. area & technology mix ² Stable total Cash Capex vs. 2017 ³ Internal Rate of Return for FTTB/H

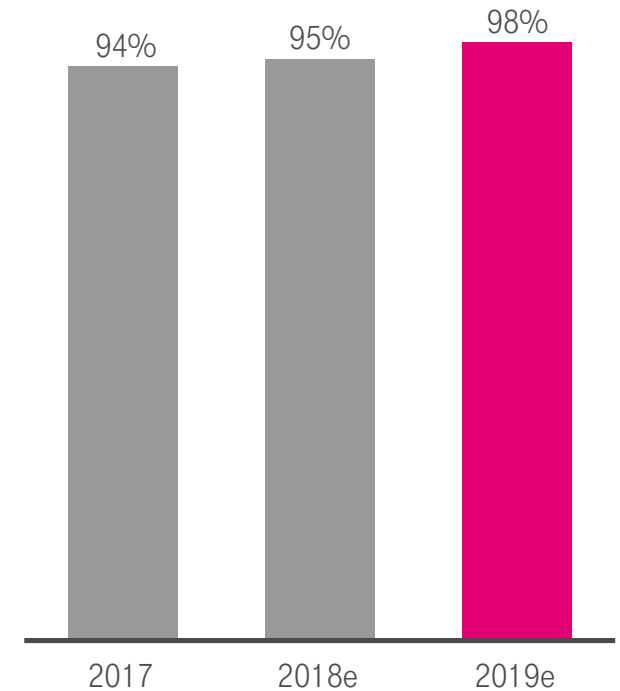
3 MOBILE: BEST NETWORK IN GERMANY



Reach of LTE network

- ✓ ≈ 80% mobile sites connected via fiber
- ✓ 27,000 mobile sites end of 2017
- ✓ Winner of all major mobile network tests

LTE Pop coverage



3 MOBILE: EXTENDING MOBILE LEADERSHIP POSITION

Key priorities



NETWORK EXPANSION

- Unprecedented site expansion (≈ 2,000 additional sites p.a.)
- Differentiation with **customer driven rollout**



QUALITY IMPROVEMENT

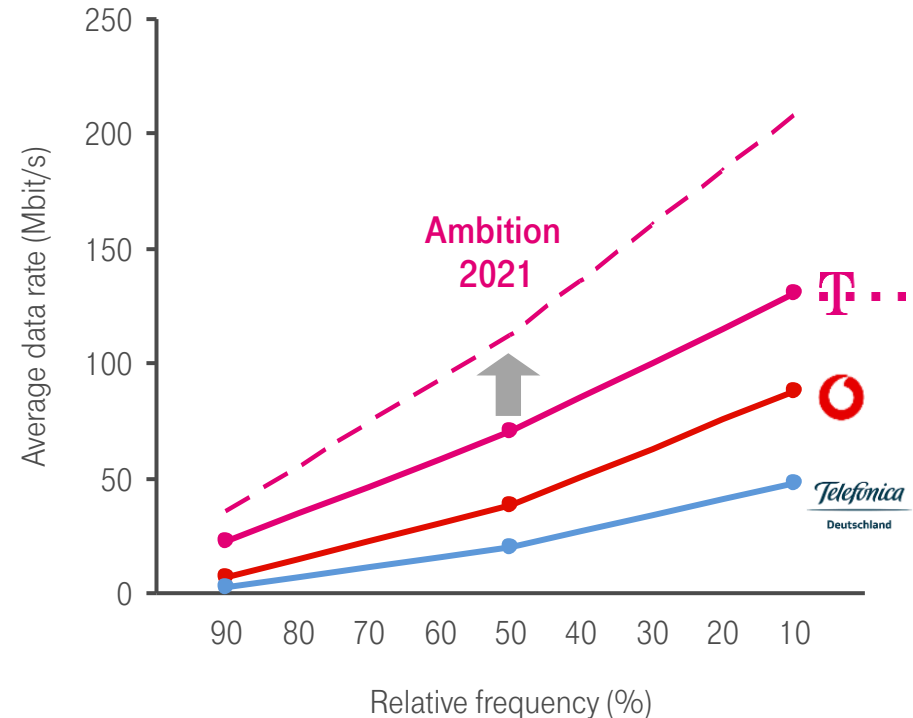
- Improve **coverage of highways & train tracks**
- Enhance **indoor coverage & quality**
- Extend lead in **fiber backhaul**



NETWORK INNOVATION

- **Top-speeds in city-centers of 1 Gbit/s**
- Increase of capacity with **massive MIMO**
- **Mobile Edge** for low latency use cases

Ambition: Best customer experience



Source: Connect Mobile Network Test 2018

3 NETWORK INNOVATION: FORERUNNER IN 5G TECHNOLOGY

5G enabling new speed and efficiency levels

1,000x HIGHER NETWORK CAPACITY

10x LOWER LATENCY

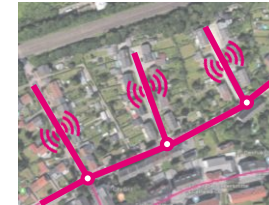
10x HIGHER SPEED
>10 Gbit/s

4x INCREASED EFFICIENCY
€/Mbit/s as efficiency factor¹

¹ Network capacity costs per incremental busy hour capacity

Pilot use cases with strong partners

WTTH/FWA
POTENTIAL



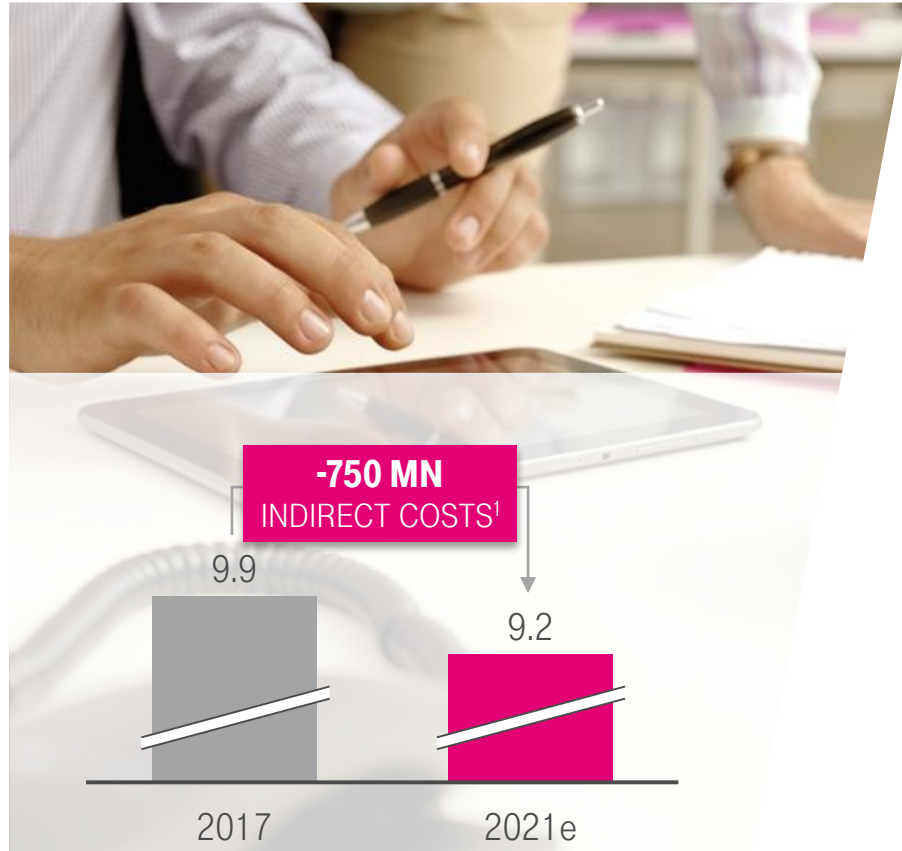
- Trials successfully completed
- Capex savings potential through synergetic rollout with FTTH

5G PILOT
CASES WITH
STRONG
PARTNERS



- Pilot cases already initiated
- Innovative solutions leveraging 5G features (e.g. drones, Augmented Reality, remote maintenance)

4 VALUE TRANSFORMATION



¹ Net cost reduction

Key drivers for cost reduction



AUTOMATION

Data analytics and smart processes

€300 MN



OPERATIONAL EXCELLENCE

Predictive servicing and maintenance, less complaints and process optimization

€250 MN



PLATFORM RETIREMENT

Retirement of platforms, investment in state-of-the-art infrastructure

€200 MN



LEAN & AGILE ORGANIZATION

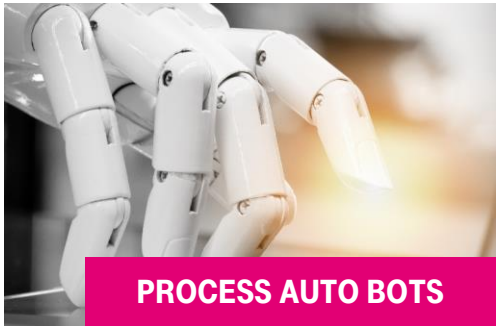
Lean commercial and sales units, agile central functions and reduction of executive functions



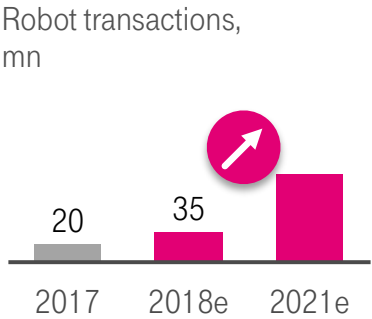
4 AUTOMATION: BOTS FOR CUSTOMER INTERACTIONS AND SIMPLIFYING PROCESSES

€300 MN
Savings

Key drivers for cost reduction



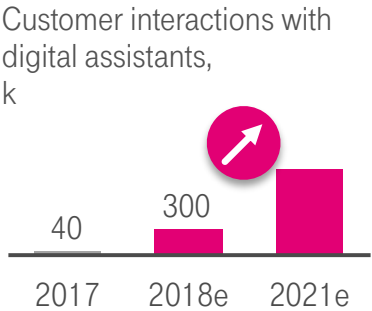
- **Agile bot development** to automatize repetitive tasks
- Significant **reduction of development time** compared to traditional IT
- **1,500 bots** implemented in 2017



Example: Field Service App



- **Chat bots** for improved experience & efficiency in customer interaction
- **AI supported chat** to improve service experience



- **E2E field service process** in a single app
- **Optimized processes** and handover in technology & service
- **Dynamic workflow** to avoid manual errors

4 OPERATIONAL EXCELLENCE: IMPROVING SERVICE PROCESSES

€250 MN
Savings

Reduction of complaints through efficiency measures and self-service

Ambition

Customer complaints per quarter

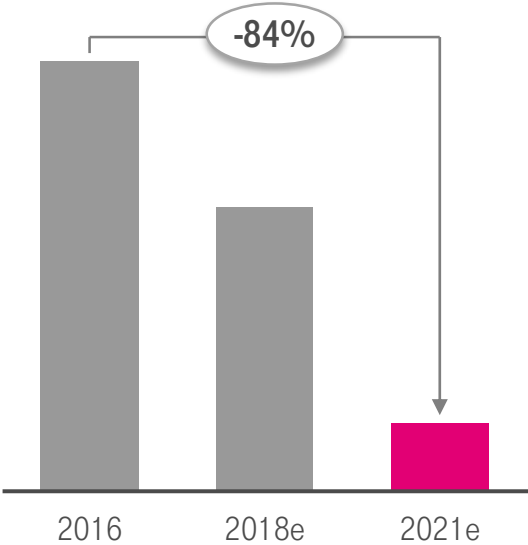


Mein Magenta App
as central contract
management tool

Data analytics
to solve occurring
issues in advance

Training of experts
to solve requests in
first contact

Dedicated product teams
ensure end-to-end quality



Self-Service

Reliability

Service Quality

Product Quality

4x
Monthly
App usage

≈99%
Adherence to
appointment
2021¹

>80%
Contact
resolution rate
in 2021²

70 PTS.
TRI*M
Entertain TV

¹ 2017: 92% ² Q1 2018: 66%, survey based on customer SMS feedback within 24 hours

4 PLATFORM RETIREMENT: SIMPLIFICATION AND END OF LIFE

€200 MN
Savings

Key drivers for cost reduction



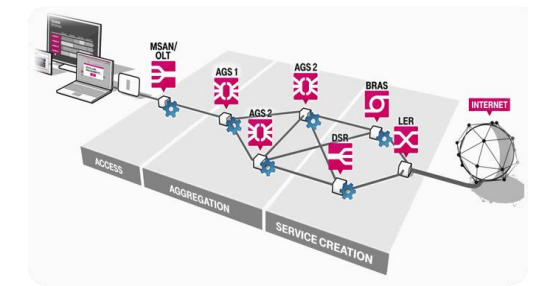
- **Standardized production model** for all access technologies
- **BNG migration** and **IP transformation** for mass market will be finished in 2019
- **Retirement of multiple legacy transport platforms** and closing of locations



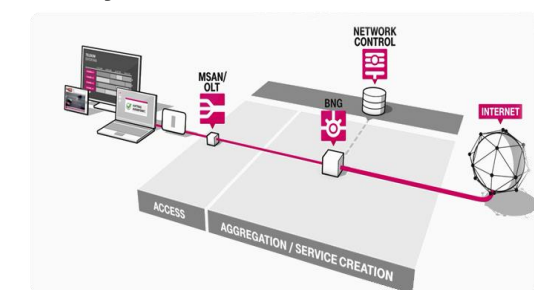
- **Micro-service architecture** and increased use of **open source** technologies
- **Decoupling of architecture** and **retirement of older IT platforms**
- **Agile methodologies** to improve delivery time

Example: BNG transformation

Legacy architecture



Today's architecture



4 LEAN AND AGILE ORGANIZATION: ACCELERATED DECISIONS AND IMPROVED COLLABORATION

Key areas of agile methods and organization



- Consolidation of **management functions** and reduction of **hierarchy** to foster accountability
- Introduction of **product-tribes** and **skill-based chapters**



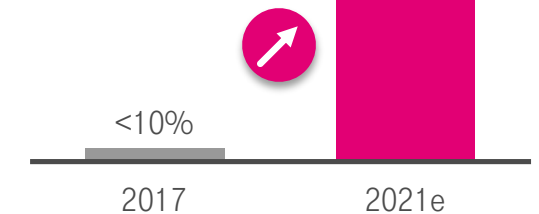
- Strong focus on **software and product development**
- Improve time to market by **agile delivery processes**
- Strong usage of **AI & big data analytics**



- **Reskilling** for future capabilities
- **Agile methodology** like scrum or design thinking as standard of collaboration
- **Agile Academy** launched in Jan 2018

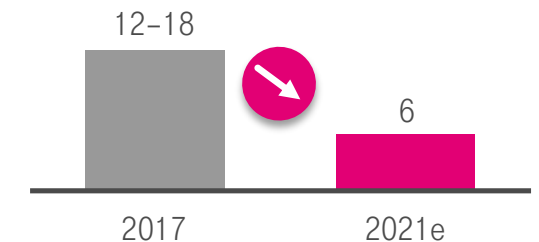
Increased agility...

Share of projects with agile/flexible delivery



... for faster time to market

Average delivery time of software projects, months



FINANCIAL OUTLOOK

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

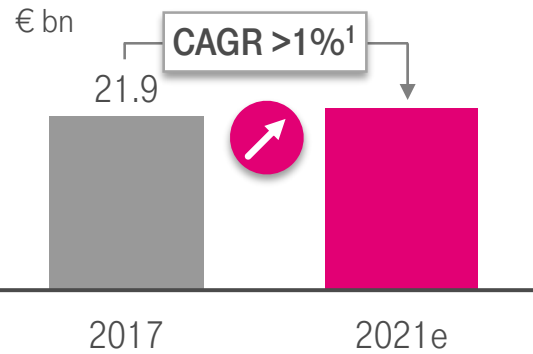
EUROPE

GROUP DEVELOPMENT

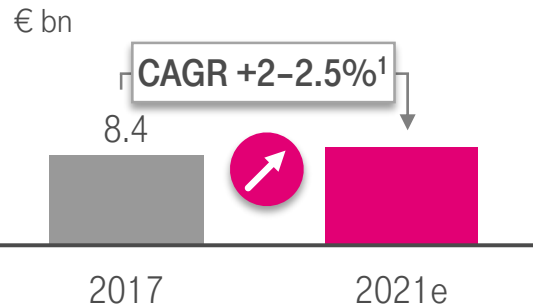
FINANCE

FINANCIAL OUTLOOK

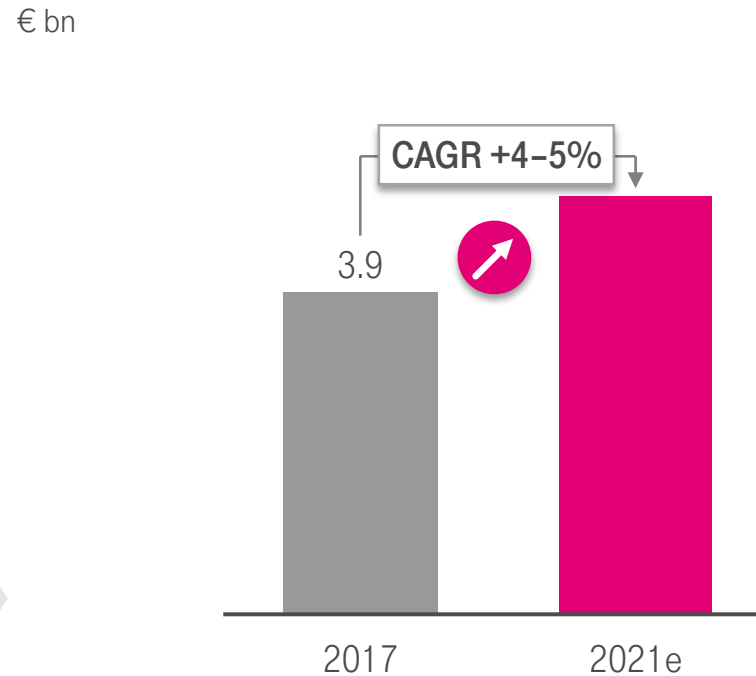
Revenue growth



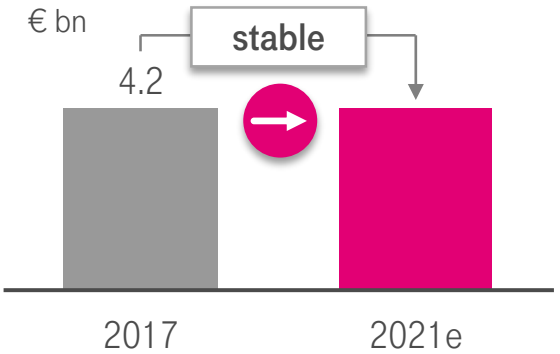
Adj. EBITDA



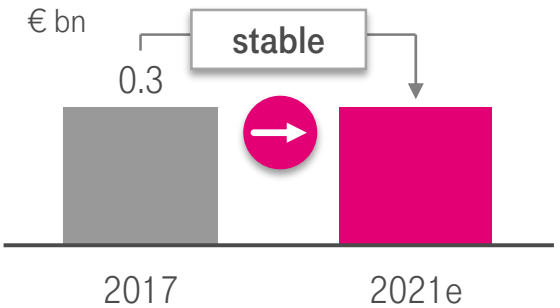
Cash Contribution²



Cash Capex



Special factors (Cash)



¹ Average growth rate not adjusted for IFRS 15 impact

² Cash Contribution = Adj. EBITDA – Cash Capex – Special factors (Cash)

MID TERM AMBITION LEVEL

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT

FINANCE

MID TERM AMBITION LEVEL

LEAD IN CUSTOMER EXPERIENCE

Mid term ambition level

Year

- #1 in **Mobile** service revenue: CAGR $\approx +2\%$ ¹
- #1 **Broadband** revenue: CAGR $+3-4\%$ ²
- **MagentaEINS** share of broadband households: $\approx 30\%$

2017–2021e
2017–2021e
2021e

LEAD IN BUSINESS PRODUCTIVITY

- Growing **B2B** revenues by +€500 mn

2017–2021e

LEAD IN TECHNOLOGY

- Ramping up to **2 mn households** p.a.

by 2021e

VALUE TRANSFORMATION

- Reduction of **Indirect cost** by €750 mn (net)

2017–2021e

FINANCIALS

- Growing **Revenue**: CAGR $> 1\%$ ³
- Growing adj. **EBITDA**: CAGR $+2-2.5\%$ ³
- Growing **Cash Contribution**⁴: CAGR $+4-5\%$

2017–2021e
2017–2021e
2017–2021e

¹ Average growth rate adjusted for IFRS 15 impact ² Including business IP products (e.g. DLAN, Company Connect); average growth rate adjusted for IFRS 15 impact; growth 2017–2021e without definition change approx. 1 pp lower
³ Average growth rate not adjusted for IFRS 15 impact ⁴ Cash Contribution = Adj. EBITDA – Cash Capex – Special factors (Cash)

DEUTSCHE TELEKOM CAPITAL MARKETS DAY 2018



LIFE IS FOR SHARING.

SYSTEMS SOLUTIONS

ADEL AL-SALEH

KEY MESSAGES

01

TRANSFORMATION STILL UNDER WAY

T-Systems has struggled with growth and profitability, however, since the 2015 CMD has invested heavily in transforming its portfolio (growth topics and All-IP), and de-risking legacy contracts.

02

PORTFOLIO WITH STRENGTHS AND WEAKNESSES

T-Systems portfolio consists of telecommunications (TC), classic IT, and multiple growth offerings; in most, but not all, of its offerings T-Systems has a clear right to play and proven track-record.

03

STRATEGY: EVOLVE PORTFOLIO

T-Systems strategy focuses on successful transition of the business to digitalization and growth areas, while further strengthening our TC business and managing the decline in legacy segments.

04

ACCELERATE THE TRANSFORMATION

Four transformational streams launched to address business challenges, reinvigorate sales, and substantially improve profitability.

05

FINANCIAL OUTLOOK

We are confident to grow our EBITDA 2017–2021 and generate a positive cash contribution from 2020.

REVIEW 2014 – 2018

WHAT HAPPENED TO THE OLD PLAN?

CMD 2015

CHANGE OF REVENUE MIX AND INCREASED PROFITABILITY ARE THE KEY ELEMENTS OF TSI 2015+

TSI 2015+ TRANSFORMATION PROGRAM

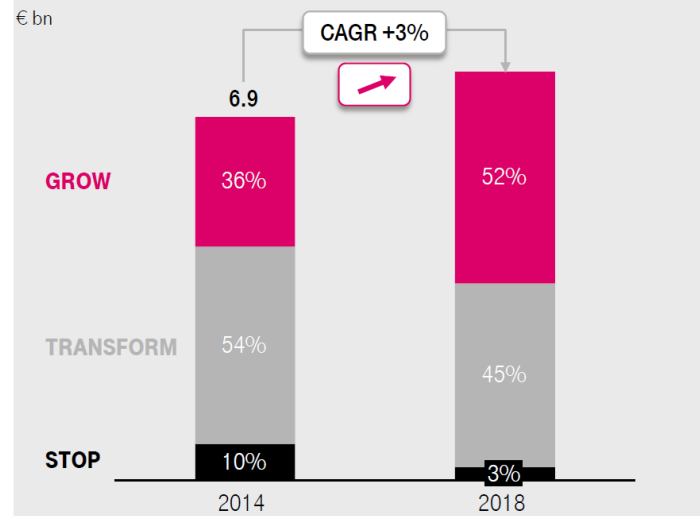
T-SYSTEMS MARKET UNIT

GROW

TRANSFORM

STOP

- **Grow:** Invest in non-labor intensive, virtualized services, e.g. M2M, platform business, Dyn. Workplace, Cloud
- **Transform:** Massive reduction of production costs by increasing “Buy”-share, e.g. via partnering
- **Stop:** Discontinuation of unprofitable business with focus on countries, contracts and portfolio elements



GROUP STRATEGY

COST AND PORTFOLIO TRANSFORMATION

LEAD IN BUSINESS

SUPERIOR PRODUCTION MODEL

EUROPE

GERMANY

T-MOBILE USA

FINANCE

16

What we delivered





- Stopped more than 20 bad contracts
- Addressed three major loss contracts
- Invested in growth areas

What went wrong

- Execution of transformation plan
- Compromise in cost reductions
- Weak portfolio management discipline
- Inefficient organization structure

CHALLENGED PERFORMANCE IN A COMPETITIVE MARKET

FINANCIALS

Ambition level 2018	Achievements 2017	Delivered/on track
<ul style="list-style-type: none"> Revenue TSI > 1% CAGR (2014–2018e) expected [pro forma: CAGR > 2%] Adj. EBIT margin TSI around 6% (2018e) [pro forma: ≈ 7%] Adj. cash contribution TSI positive from 2017 [pro forma: ≈ €500 mn] 	<ul style="list-style-type: none"> -1.5% CAGR (2014–2017) 1.7% €126 mn 	  
<ul style="list-style-type: none"> Maintain TRI*M index above peer average at current levels of 84 points 	<ul style="list-style-type: none"> 88 points (+4pts) 	

QUALITY

BUSINESS CHALLENGES & FOUNDATIONS TO BUILD ON

Business challenges

REVENUE

- Impacted by classical IT erosion, not compensated by new growth areas
- Sales set-up/structure/tools and processes, capability gaps, internally focused

LOSS MAKING CONTRACTS

- Three years of abnormal loss levels
- Risk management upgraded
- Improved focus on implementation and transition periods

COST STRUCTURE

- G&A too high relative to our size
- Cost of delivery a challenge

Strong foundations to build on

MARQUE CLIENTS

NETWORK AND TELECOMMUNICATION ASSETS/CAPABILITIES

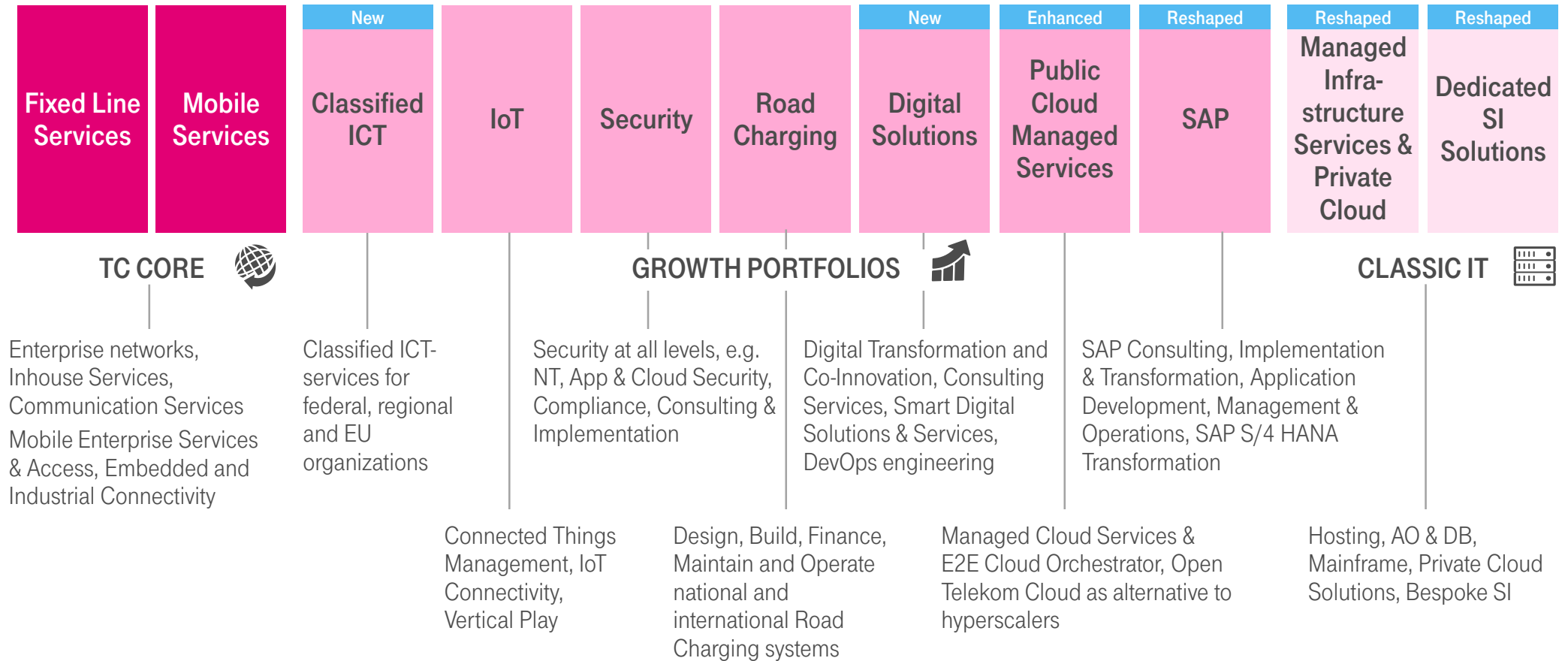
BREADTH OF PORTFOLIO

SKILLS & EXPERTISE

INVESTMENTS IN GROWTH AREAS

COMMITTED EMPLOYEES

NEW PORTFOLIO STRATEGY DEFINED



STRATEGY 2018 – 2021

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT

FINANCE

FOUR TRANSFORMATIONAL INITIATIVES TO ADDRESS CHALLENGES



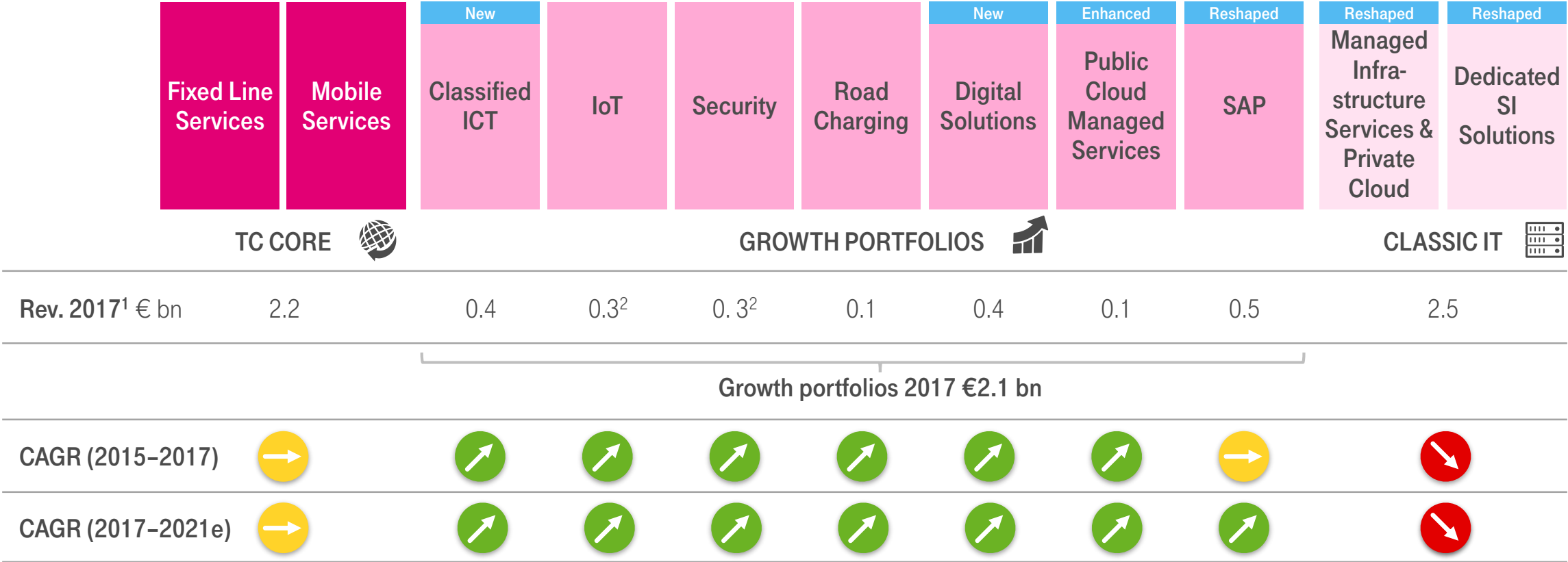
1 PORTFOLIO: SIGNIFICANT CHANGE BY PORTFOLIO MANAGEMENT

Portfolio focus

- **PORTFOLIO-ORIENTED BUSINESS MANAGEMENT**
Creation of portfolio units with full accountability and P&L responsibility
- **PORTFOLIO STRATEGY** evaluated via four lenses
- **CLEAR STRATEGY** for each offering, including invest, divest, M&A
- **MANAGEMENT SYSTEM** and measurements **in place** to support new model



1 PORTFOLIO: REVENUE EQUALLY SPLIT BETWEEN THREE CLUSTERS



¹ Revenue different from reported TSI segment view, due to further entities and intragroup charges ² DT-View

1 PORTFOLIO: INTERNET OF THINGS

Integrated platform built on our connectivity

- **Emerging multi-billion market**, growing at +20%
- DT revenue today at €0.3¹ bn, **growing > 20% p.a.**
- Platform from connectivity to big data
- 5G/NB-IoT enabling technologies
- Strategic partnerships (Azure, SAP, Software AG, vertical solutions)

¹ DT-View

Client example

European market leader in property damage restoration

- E2E condition monitoring solution for **digitalizing management**
- Easy **retrofit solution** with tailored plug & play metering-box, managed connectivity, device management & service concept
- From **idea to implementation in < 2 years**

Further customers



1 PORTFOLIO: SECURITY

Becoming leading European provider

- **Dynamic-growth market** with 8% growth
- Double-digit growth since launch, now revenue at €0.3¹ bn, **growing > 10% p.a.**
- > 1,400 security experts – German leader
- Largest security operations center

Selected Partners



¹ DT-View

Client example



**World leading supplier
of industrial, process and specialty gases**

- **Outsourcing of worldwide Security operation center**
- **Complete level 1 & 2 monitoring** in the Security incident & event monitoring (SIEM) for all locations worldwide
- **Operation & engineering** of SIEM platform
- Customer is highly satisfied with **Telekom Security performance and customer centricity**

1 PORTFOLIO: DIGITAL SOLUTIONS

Support European enterprises on their digital journey

- **Multi-billion market** growing double digit
- **€0.4 bn revenue**, expected **growth of 10% p.a.**
- End-to-end digitalization from ideation and innovation to integration
- 4,800 digitalization experts

Client example

Large international computer manufacturer

- Order picking system based on **smart glasses**, providing warehouse pickers with all the information about the next component at the right time
- **From cloud** to data glasses to strive for **reduction of operating times**, human errors & facilitation of complex processes.

Further customers



BARMER

1 PORTFOLIO: DIGITAL SOLUTIONS



GROWTH & SUCCESS

4,000

Implemented Digital Projects 2017



EXPERTISE & COMPETENCE

4,800

Digitalization Experts



370

IoT Solution & Integration Experts



280

Data Analyst & Big Data Experts



230

Enabling Technologies Experts



620

Digital Platform & Architecture Experts



100

(Co-)Innovation & Digital Change Experts



470

Mobile and Network Solutions Experts



720

(General) Management Consultants and Digitalization Experts



830

Industry Digitalization Consultants & Experts



730

Cloud Transformation and Integration Experts



450

Agile/DevOps Experts

1 PORTFOLIO: SAP

Capitalize on SAP's market growth

- Recognized market leader in Germany
- **€0.5 bn revenue**, 1%–2% growth today, expected to grow > 5% p.a. going forward
- Lead SAP S/4 HANA transformation
- Lead SAP in public cloud
- SAP on open Telekom cloud certified

Client example

Europe's largest bus manufacturer implements SAP S/4HANA

- Migration of **SAP R/3 to SAP S/4HANA** as part of the client's business process modernization program
- Transformation follows **agile approach** based on combination of SAP's and T-Systems' best practices
- Client's benefits: **increasing speed and innovation taking proactive actions** throughout complete production process

Further customers



SHELL



1 PORTFOLIO: SAP



EXPERTISE & COMPETENCE

4,000

SAP experts



6.7 MILLION

SAP users



10,000

SAP instances

Biggest single SAP system with

850,000

SAPS



Largest SAP hosting provider

600 TB

HANA database



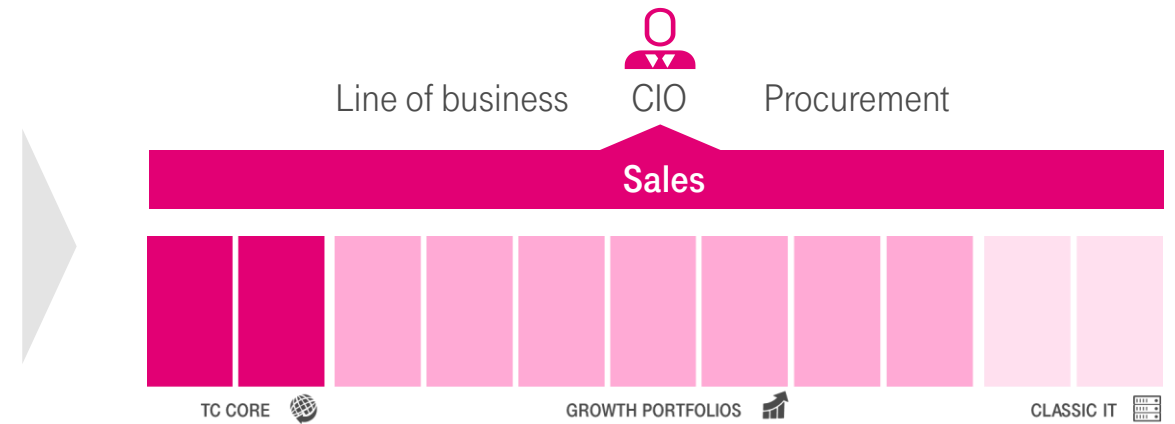
15

Global competence centres

2 SALES: HOW WE EXECUTE BETTER IN SALES

Sales revitalization

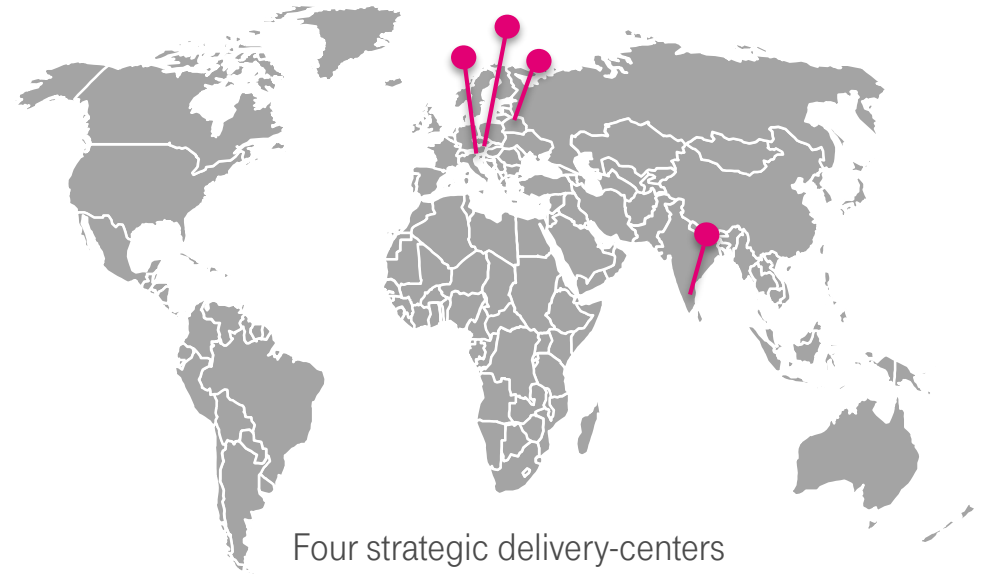
- **Integrated sales** and **go-to-market organization** – Responsible for entire portfolio, supported by portfolio sales specialists
- Return to significant signings per year **> €6 bn**
- **Drive client centricity** → Increase client facing time **+ 25%**
Structured/consistent sales management approach
- Simplify and Improve **tools and processes**



3 DELIVERY: HOW WE EXECUTE BETTER IN DELIVERY

Delivery integration

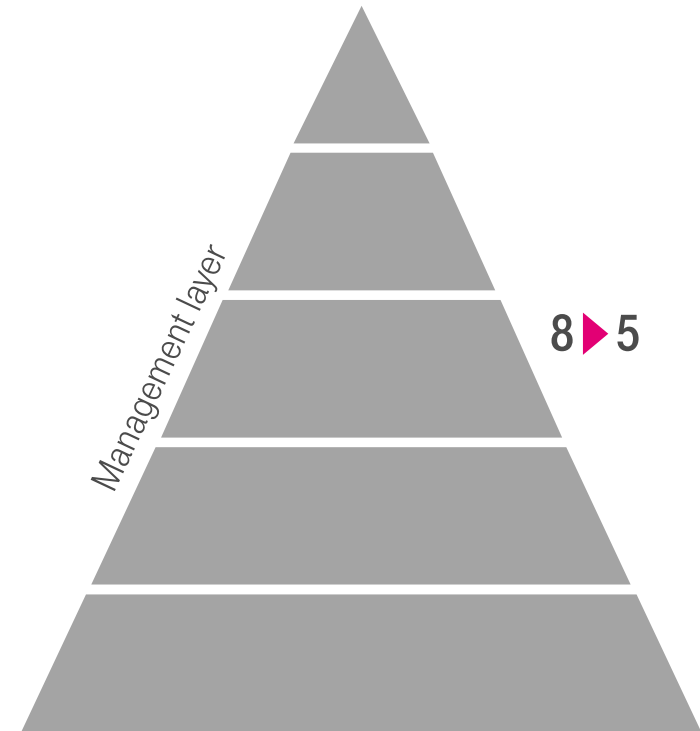
- Integrate **delivery functions within the portfolio units**, creating end to end cost transparency and clear ownership
- Cross delivery function driving **standardization, automation** and **tooling** → saving **> €100 mn**
- **Digitalizing client interfaces** and **workflows**
- **Cross delivery function** to manage and drive **right-shoring-strategy** → saving **> €100 mn**



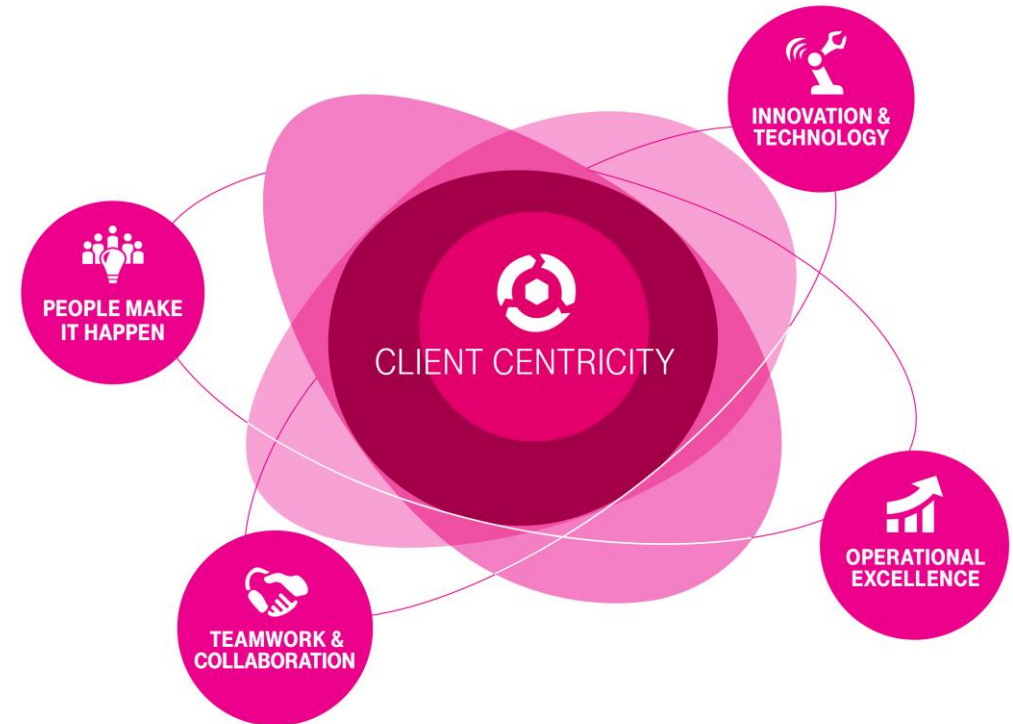
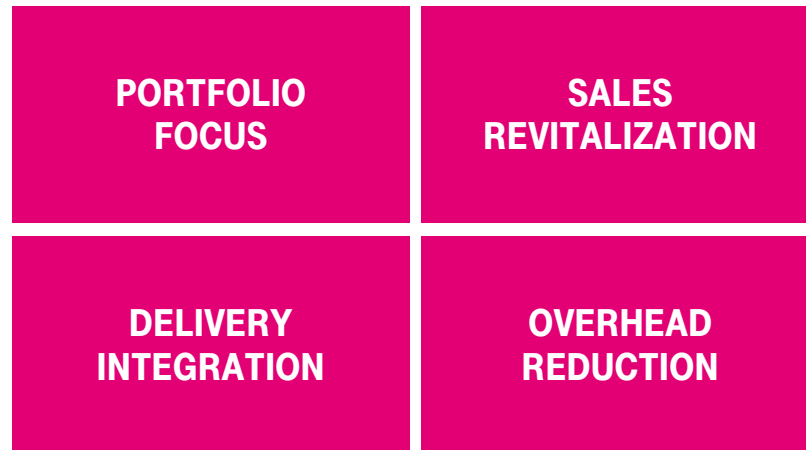
4 OVERHEAD: LEAN OVERHEAD SUPPORTS OUR AMBITION

Overhead reduction

- **Simplify** central functions & general administration, processes and structure
- Reduction of management layers
- **Create agile organization designs**, fit for growth areas, and efficient structures for mature areas
- Cost saving > €100 mn



TRANSFORMATION SUPPORTED BY FIVE BUSINESS PRINCIPLES AND CHANGE MANAGEMENT PROGRAM



STRONG MANAGEMENT SYSTEM & CHANGE MANAGEMENT PROGRAM

LESSONS LEARNED FROM THE PAST HELP IMPROVE EXECUTION

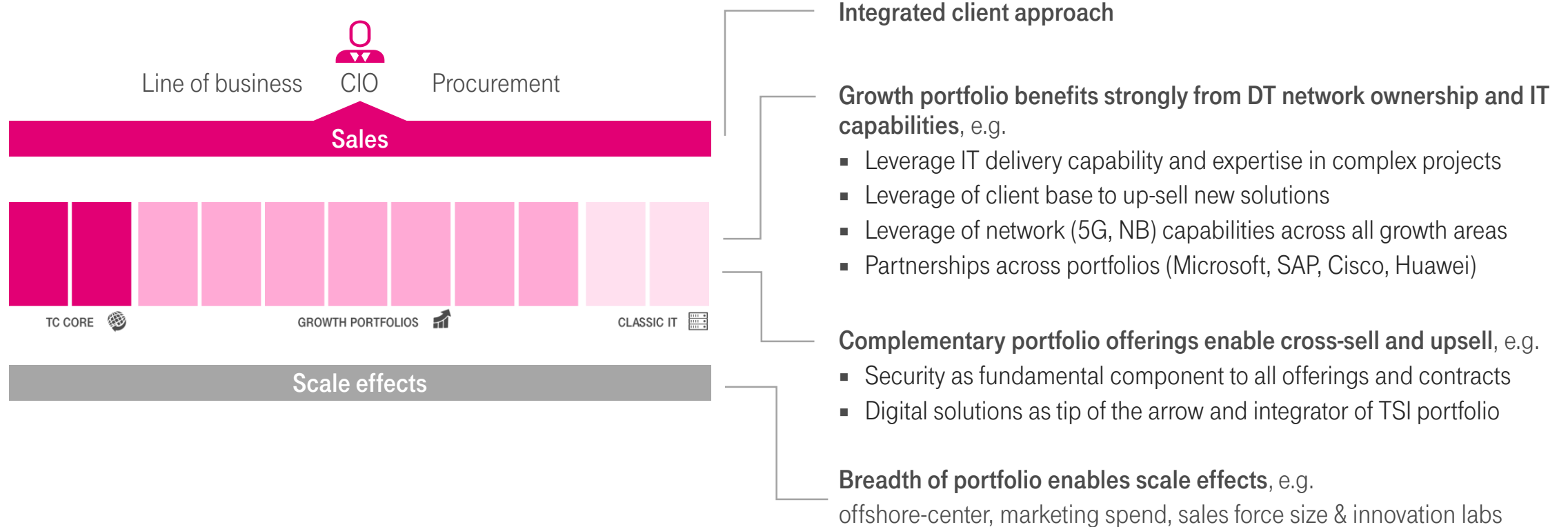
From...

- **Revenue decline** due to sales set-up and portfolio gaps
- **Loss making contracts** burden our results
- Good conceptual work, however **not bold enough approach or execution**
- **Too little automation, offshoring and digitalization/standardization – cost disadvantages**
- **Cultural change** not explicitly targeted

To...

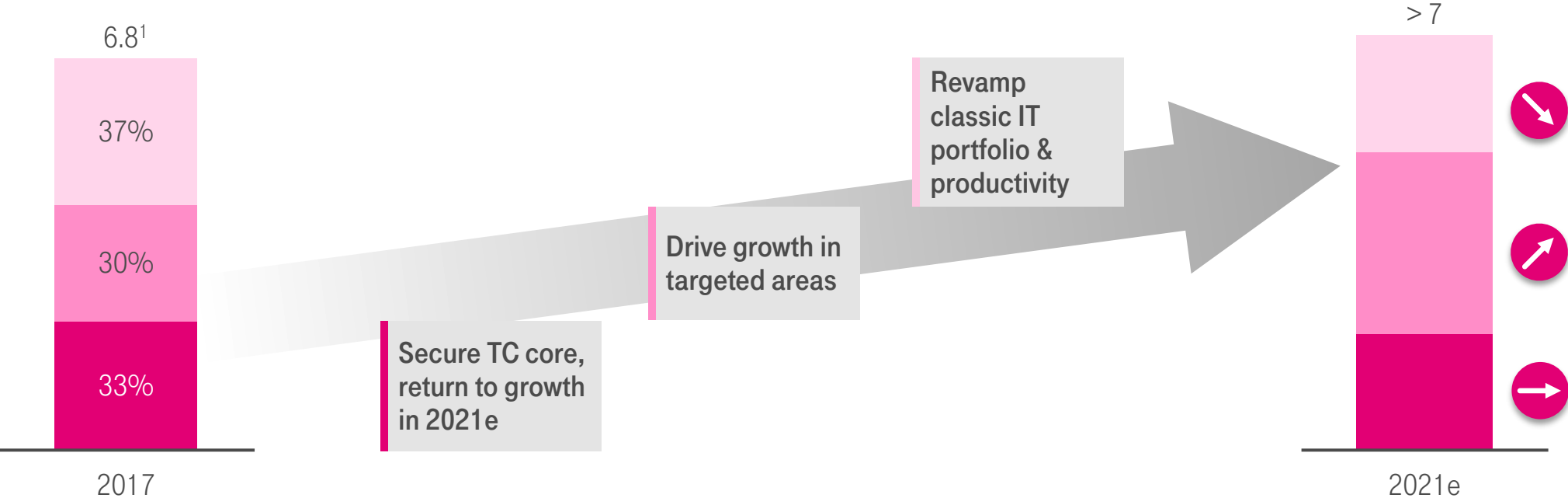
- **New sales** organization set-up. Strong initiative with new **spirit, client centricity and opportunity tracking**
- **Clearly defined portfolio**, focused on growth
- Implemented improved **risk-management**
- **Rigorous execution** with strong management team, new skills and capabilities
- **Structured cost reduction** program and current **sense of urgency** supports **change and workforce-program**
- Strong focus on mindset with **new change management program**

T-SYSTEMS LEVERAGING FULL POTENTIAL



STRATEGY EXECUTION TO EVOLVE OUR REVENUE MIX

New revenue mix as result of our strategy – Leveraging our core and legacy to drive growth in new areas



¹ Revenue different from reported TSI segment view, due to further entities and intragroup charges; Security and IoT DT-View

SOUND PROFITABILITY-BASIS THROUGH > €300 MN SAVINGS

Measures

- Delivery right-shoring-strategy
- Delivery standardization, automation and tooling
- Overhead reduction

Gross-savings

> €100 mn

> €100 mn

> €100 mn

> €300 MN

FINANCIAL OUTLOOK

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

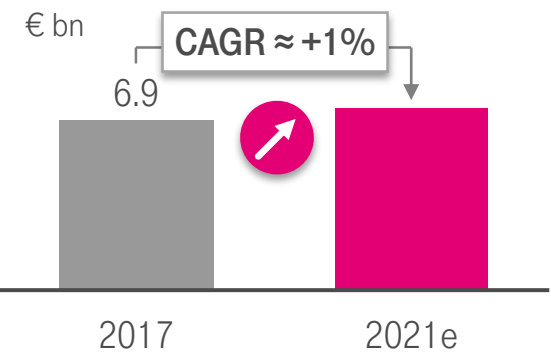
EUROPE

GROUP DEVELOPMENT

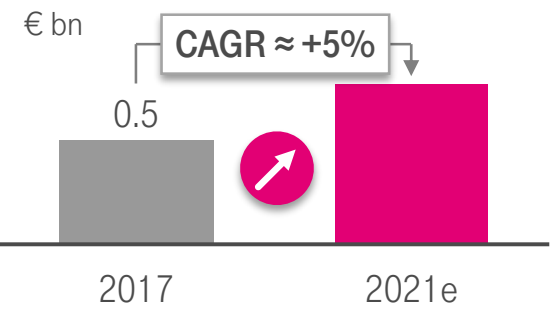
FINANCE

FINANCIAL OUTLOOK

Revenue growth

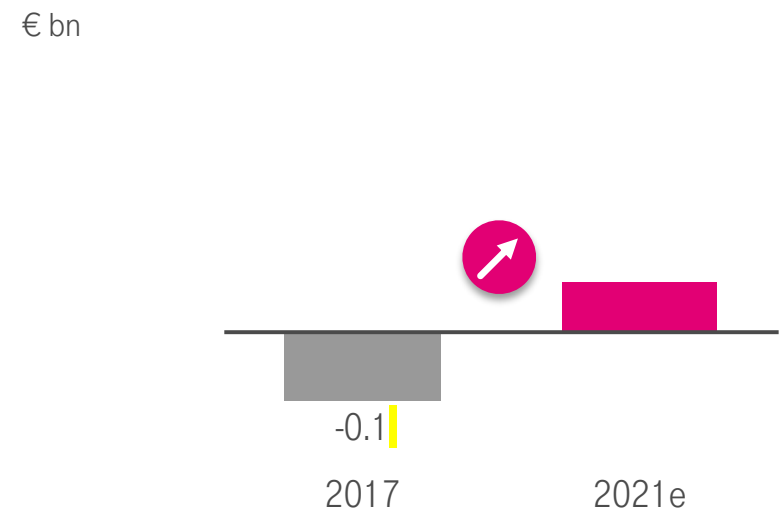


Adj. EBITDA

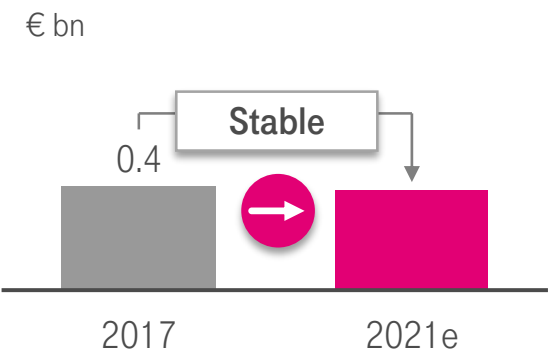


¹ Cash Contribution = Adj. EBITDA – Cash Capex – Special factors (Cash)

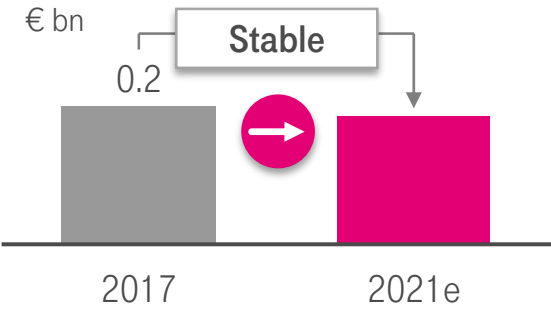
Cash Contribution¹



Cash Capex



Special factors (Cash)



MID TERM AMBITION LEVEL

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT

FINANCE

MID TERM AMBITION LEVEL

FINANCIALS

QUALITY

Mid term ambition level

Year

- Growing revenue: CAGR +1%
- Growing adj. EBITDA: CAGR \approx +5%
- Adj. EBITDA margin: 8–10%
- Cash Contribution¹ breaking even

2017–2021e

2017–2021e

2021e

2020e

- Maintain TRI*M index above peer average at current level

Above 80 points
in 2021e

¹ Cash Contribution = Adj. EBITDA – Cash Capex – Special factors (Cash)

DEUTSCHE TELEKOM CAPITAL MARKETS DAY 2018



LIFE IS FOR SHARING.

TECHNOLOGY & INNOVATION

CLAUDIA NEMAT

KEY MESSAGES

01

SUPERIOR PRODUCTION MODEL

We are entering the final stages of our peer leading superior production model. While we have learned lessons on the way, we can broadly confirm financial and customer experience benefits.

02

LEAD IN 5G

We will leverage our superior fiber networks and modernized SRAN to lead in 5G. Within an overall stable CAPEX envelope, we will focus on:

- 1) smart capacity/speed upgrade
- 2) FWA
- 3) selected new products/solutions.

03

ACCELERATED DIGITALIZATION

Our agile approach to IT transformation will enable accelerated digitalization for better customer experience and lower cost in accordance with the superior production model.

04

LEAD IN CUSTOMER EXPERIENCE AND BUSINESS PRODUCTIVITY

To lead in customer experience and business productivity, we have market proven innovations and a compelling innovation pipeline going forward.

REVIEW 2014 – 2018

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT








FINANCE

REVIEW 2014–2018

ALL-IP TRANSFORMATION

PAN-EUROPEAN NETWORK

INTEGRATED NETWORK STRATEGY

	Ambition level 2018	Achievements 2017	Delivered
ALL-IP TRANSFORMATION	<ul style="list-style-type: none"> All integrated countries 100% IP-based 	<ul style="list-style-type: none"> Slovakia, Croatia and Hungary 100%, Greece 45% (100% in 2019¹) Germany 67% (consumer 100% in 2019, business finished in 2020) 	
PAN-EUROPEAN NETWORK	<ul style="list-style-type: none"> Backend and frontend data centers set up Geo-redundant Network Operations Centers established Services fully migrated to Pan-Net 	<ul style="list-style-type: none"> Backend data centers in Hungary and Poland in 2017, Greece in 2018. Frontend according to roll-out plan Set up in Romania and Germany Selected services migrated 	  
INTEGRATED NETWORK STRATEGY	<ul style="list-style-type: none"> LTE pop-coverage Germany & Europe: 75%–95% Germany: ≈ 80% Fixed high speed internet HH coverage ≥ 50 Mbps² Europe: ≈ 50% Fixed high speed internet HH coverage ≥ 100 Mbps 	<ul style="list-style-type: none"> Germany 94% and Europe 94% ≈ 80% HH vectoring coverage in 2019 32% 	  

¹ Intentional postponement by one year in Greece to refocus invest on access ² Depending on regulatory adjustments

SUPERIOR PRODUCTION MODEL– SUCCESSES/LESSONS LEARNED

Digital Transformation

- Our shift towards an agile approach to IT transformation with **upside on customer experience and lower cost in accordance with promised savings**

Source: CMD 2015 commitment



We confirm
CMD 15
gross cost savings
of €1.2 bn for early
2020ies as well as
customer experience
benefits

ALL IP Migration

- Peer leading IP migration
 - Scope: Simplification across all (!) layers
 - Achievements: Complete or close to completion in all major markets
- We see clear customer experience benefits and network cost savings**

PAN-European Network

- Modified approach: Focus on value creation through virtualization and cloudification
- We centralize services only when it **accelerates time to market**

Integrated Network Leadership

- Clear differentiation by integrated networks: **We create the basis for FMC commercialization**
- Superior fiber backhauling: **We have a competitive advantage for 5G experience**
- Mobile technology leadership in Germany and in 9 out of 12 European countries: **We create a better customer experience and can monetize it**

CUSTOMER BENEFITS OF ALL IP MIGRATION ARE PROVEN

Customer benefits

Precondition for plug & play

- Auto-provisioning (without filling in credentials)
- Improved customer satisfaction regarding provisioning

Fewer incidents

- 38% fewer tickets in provisioning

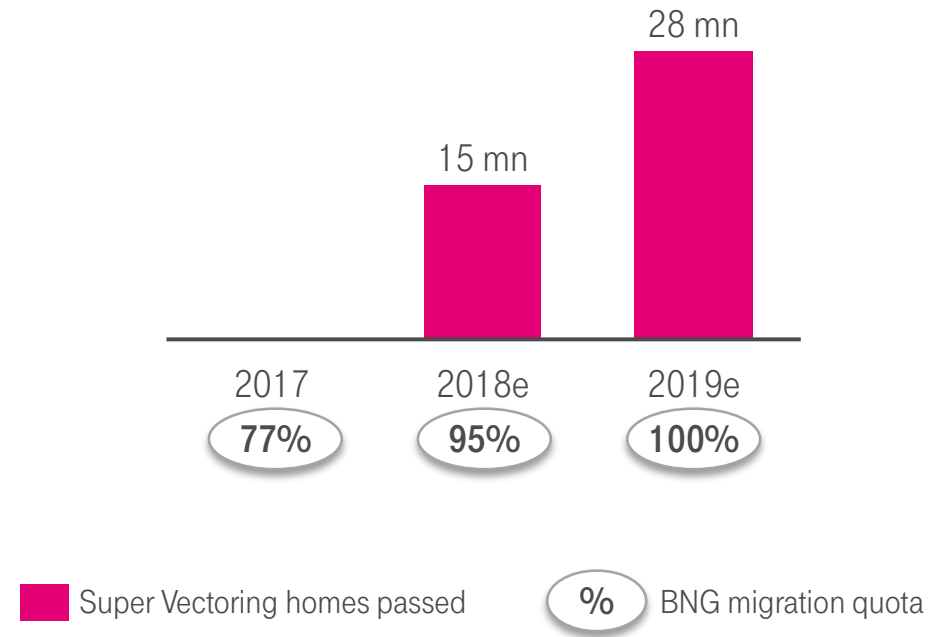
Massive speed uplift

- Simplification of aggregation network layer (BNG) as basis for product innovation
- Example: 250 Mbps Super Vectoring product



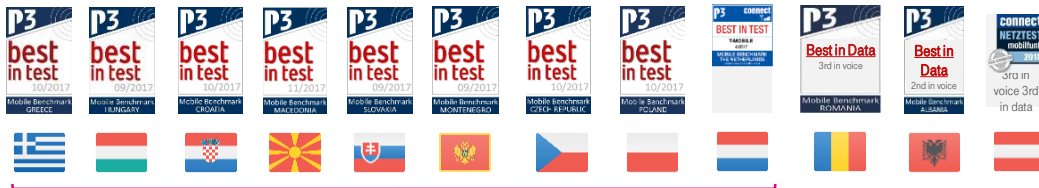
BNG migration as basis for (Super) Vectoring

of Super Vectoring homes passed/BNG migration quota



INTEGRATED NETWORK LEADERSHIP IN GERMANY AND EUROPE

Mobile network leadership for best customer experience



P3 Benchmark 2017:
Mobile technology leadership in 9 of 12 countries

Connect Test
2017

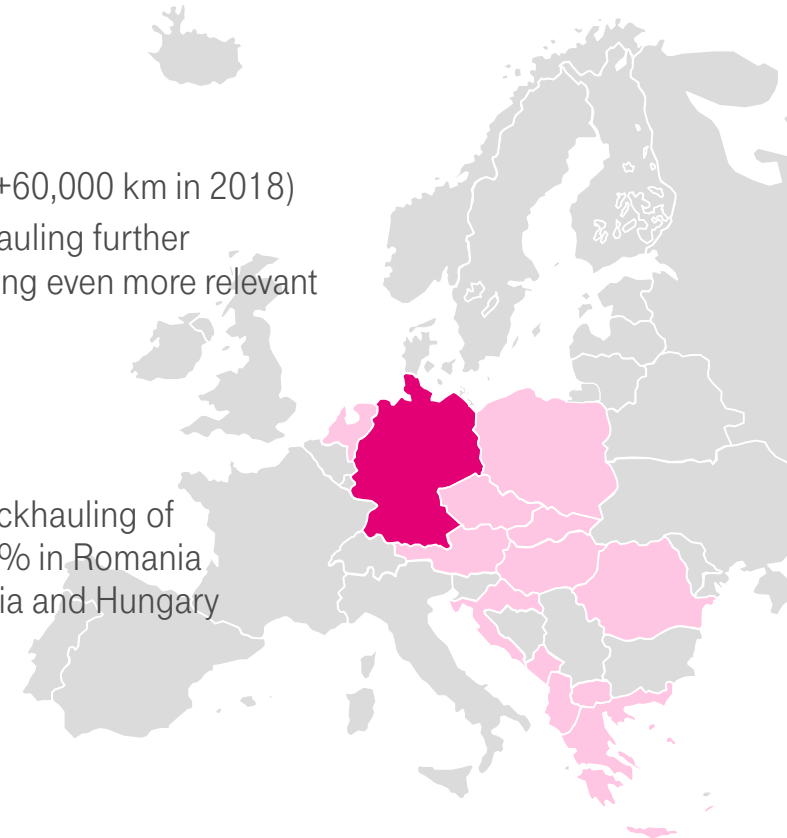
Fiber advantages – status 2017

GERMANY

- 455,000 km fiber (+60,000 km in 2018)
- ≈ 80% fiber backhauling further increasing, becoming even more relevant with 5G

EUROPE¹

- 240,000 km fiber
- Exemplary fiber backhauling of 74% in Croatia, 51% in Romania and 47% in Slovakia and Hungary



¹ w/o TM NL

STRATEGY 2018 – 2021

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT

FINANCE

TECHNOLOGY & INNOVATION AMBITION

Our strategy

GROW

LEAD IN CUSTOMER
EXPERIENCE

ONE CONNECTIVITY
& PERFECT SERVICE

LEAD IN
TECHNOLOGY

INTEGRATED
GIGABIT NETWORKS

LEAD IN BUSINESS
PRODUCTIVITY

SECURE ICT SOLUTIONS
& BIG IOT

SAVE FOR GROWTH INVESTMENTS

SIMPLIFY, DIGITALIZE, ACCELERATE

Our Technology & Innovation contribution

1 LEAD IN TECHNOLOGY

- Integrated network leadership: Fiber build out and leadership in mobile experience¹
- Smart 5G leadership

2 VALUE TRANSFORMATION

- Broadband production innovation to drive Opex and Capex efficiencies, IP-migration completion
- Agile approach towards IT transformation to accelerate digitalization

3 LEAD IN CUSTOMER EXPERIENCE AND BUSINESS PRODUCTIVITY

- Market proven innovations in B2C and B2B with compelling innovation pipeline going forward

¹ Covered in segment chapters

1 WE WILL DEPLOY 5G SMARTLY



CAPABILITY

APPLICATION AREA

ECONOMIC RATIONALE

- Enhanced mobile broadband

- Starting with areas of interest (cities, campus networks; as overlay on 4G)

- More efficient than 4G from 2021 onwards

- Gigabit speed on higher frequencies/millimeter waves

- Complement to FTTH/B in (sub-) urban areas

- Depending on topology, more cost-efficient than FTTH/B, faster time to market

- Massive IoT
- Low latency, QoS

- In selected areas of interest

- Enable new revenue streams

1 ENHANCED MOBILE BROADBAND

From today's LTE networks ...



Current frequencies

- 800 MHz/900 MHz/1800MHz/2.1 GHz/2.6 GHz

MIMO (multiple input multiple output)

- 2T2R, 4T4R or even 8T8R antenna architecture without usage of massive MIMO

Radius of cell coverage

- Radius of higher frequencies physically lower
- In a standardized environment the radius of 1.8 GHz is two times bigger compared to 3.5 GHz

... towards a broader 5G ecosystem



... will be enlarged by use of additional spectrum bands

- 700 MHz and especially 3.x GHz

... and the evolution towards massive MIMO

- Massive MIMO architecture typically 64T64R on 3.5 GHz within a practical size/dimension of the whole antenna

... lower on 3.5 GHz but optimized by beamforming and smaller cells

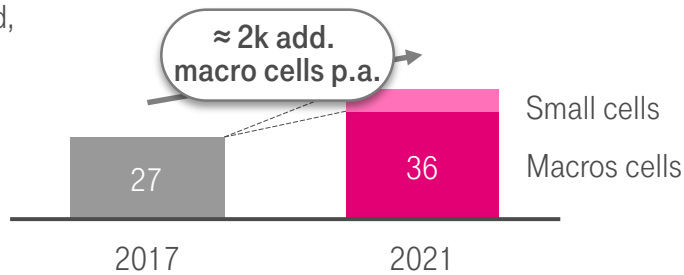
- Active antenna technology, massive MIMO and dynamic beamforming optimize coverage and minimize the impact of a reduced radius of cell coverage

1 GETTING READY FOR 5G TO LEVERAGE FUTURE EFFICIENCIES

5G readiness, e.g. cell densification until 2021

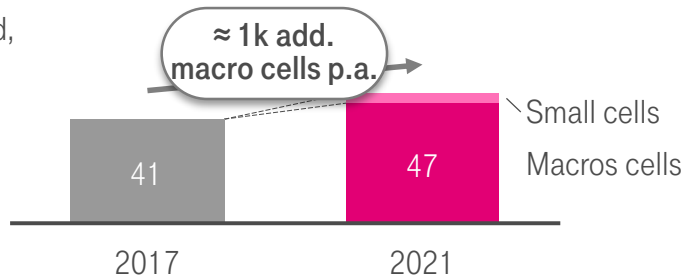
Germany

Cell sites, estimated, k



Europe

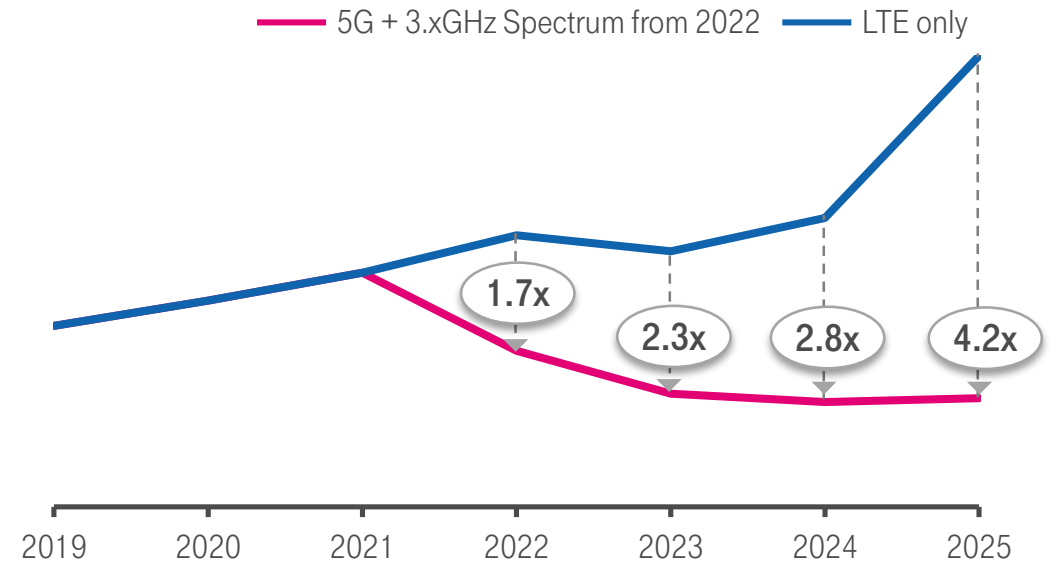
Cell sites, estimated, k



- Cell densification starts in areas of interest (cities, campus networks)
- Superior fiber backhauling and SRAN

Cost per Mbit/s for 4G/LTE only vs. with 5G overlay

€ per Mbit/s as efficiency factor¹



¹ Network capacity costs per incremental busy hour capacity, assuming annually increasing traffic demand of 45%

1 WITH 5G FWA, WE CAN PROVIDE GIGABIT SPEED FAST

We trialed FWA in different topologies of Germany ...



... with promising results

Explanation

- Millimeter wave frequencies 26 (licensed) and 60 (unlicensed) GHz
- Enables Gigabit speeds
- Number of HH depends on topology (line of sight is mandatory)
- Designed to be at least competitive with cable

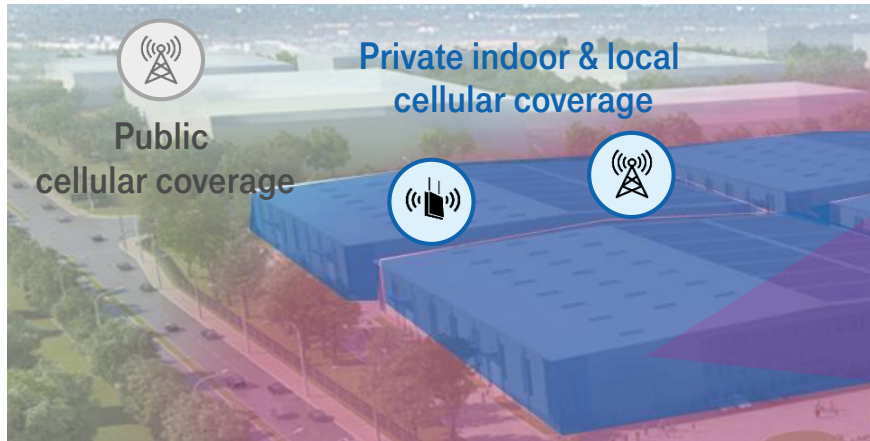
Benefits

- Initial Capex demand – 30–50% of FTTH/B. Only after 20 yrs. TCO of FTTH/B more favorable due to higher annual OPEX for FWA
- Faster time to market
- Less underground construction capacity needed
- Equipment reusable
- De-risking fiber roll-out

20–30% of HH where fiber is available in the streets

1 CAMPUS NETWORKS ARE FIRST SOLUTIONS WITH 5G/EDGE

Operator managed campus networks



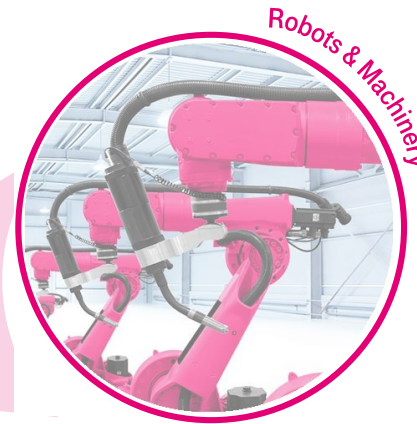
“Dual Slice” Campus

- Connectivity infrastructure
- IoT device management
- Starting now with 4G



Autonomous factory

- Tailored network configuration
- Edge cloud for low latency requirements (robot steering)



Potential 5G application areas:

(Multi-) Local

▪ CAMPUS NETWORKS

- Information augmented visions
- Immersive media, event-driven
- (Decentral) energy management

... and beyond:

- Connected drones
- Emergency health care

1 REAL TIME ECONOMY OPENS BOUNDLESS OPPORTUNITIES

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

Today...

- Humans experience the internet via app or browser on certain devices
- Computing power, storage and algorithmic intelligence hosted in central data centers or on the devices (PC, smartphone, car, etc.)
- Connectivity experience differentiates via speed and coverage

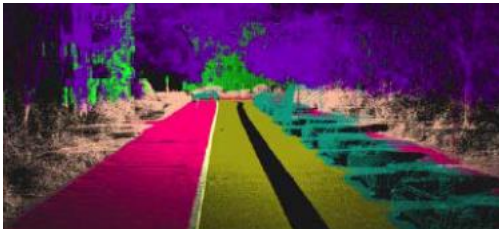
... and in the future

- ... also experience connectivity naturally according to human senses (via voice recognition, ear plugs, lenses, glasses, textiles, etc.)
- ... also in (edge) clouds deeply embedded into the networks
- ... also via low latency, precise positioning, security and massive IoT

2 BROADBAND PRODUCTION INNOVATION DRIVES EFFICIENCY

Examples

AUTOMATED FIBER ROLL-OUT PLANNING

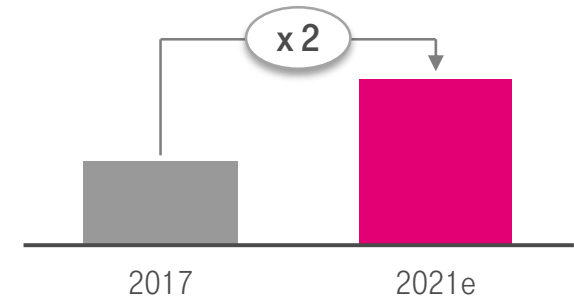


Description

- 3D surface planning put into point cloud
- Applying machine learning
- Generating automated passive infrastructure planning
- Pilot starts in Q3/2018

Impact

- Increase of planning **productivity** by **FACTOR TWO**



“ACCESS 4.0”

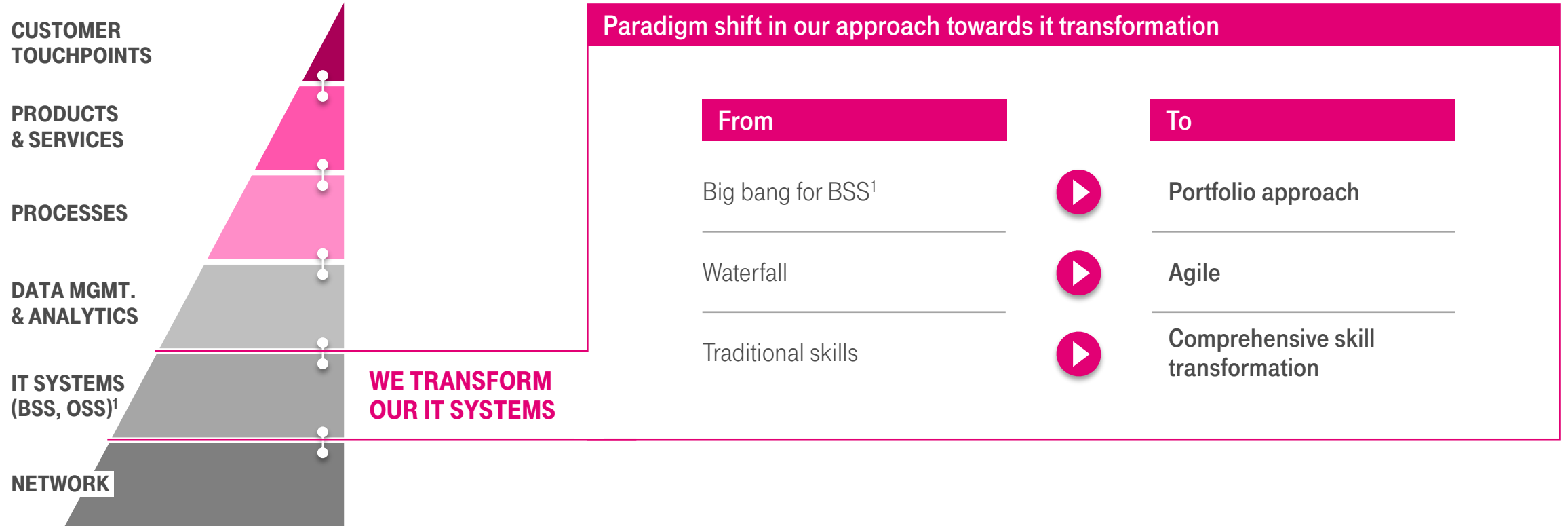


- Ongoing R&D project to split software and hardware components in wireline like OLT¹ + MSAN (“access virtualization”)
- Potential partnering discussions started

- IT will **disrupt** current ecosystem of OEMs (massively lower procurement prices)

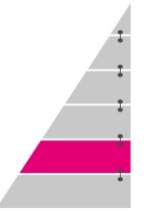
¹ OLT = Optical line termination: the endpoint of our passive optical network, mostly located in street cabinets

2 IT TRANSFORMATION ENABLES ACCELERATED DIGITALIZATION



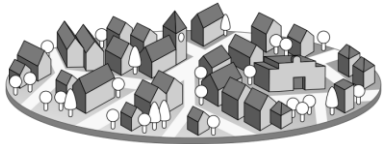
¹ BSS: Business Support System/OSS: Operations Support System

2 NEW PORTFOLIO APPROACH REDUCES TRANSFORMATION COMPLEXITY



From

Attempt to replace legacy by big bang



- Design for single purpose
- High complexity

To

Portfolio approach with strong business-IT alignment



Selective Greenfield



- Agile scrum teams for dedicated projects:
 - Fiber roll-out
 - Retail FMC
 - B2B FMC



Decoupling



- Esp. customer touch points from the business support system



Modernization



- Modernization for bulk of systems by creation of reusable (Micro-)services

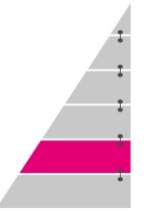
Impact

... reduced delivery time

... mitigated risk (compared to big bang)

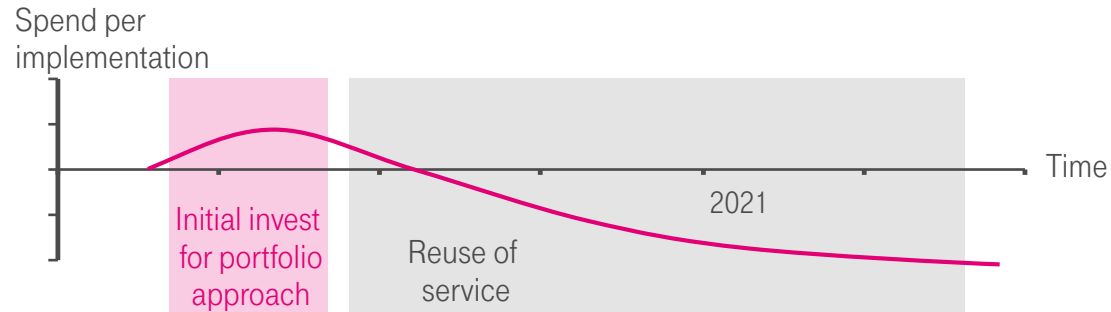
... higher reusability to reduce IT cost midterm

2 CLEAR IMPACT EXPECTED ESPECIALLY ON TIME TO MARKET

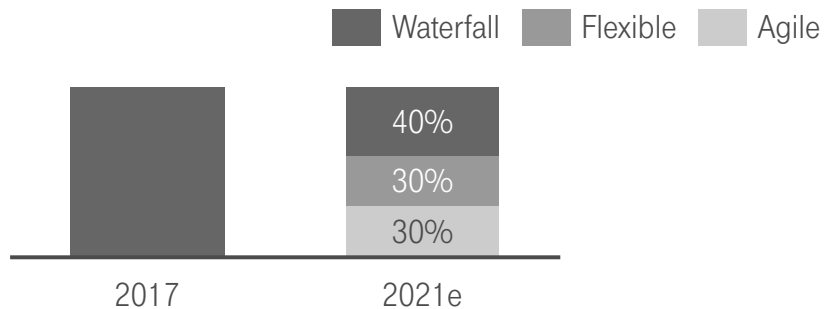


Portfolio approach with payback of 2–3 years

Initial invest for portfolio approach

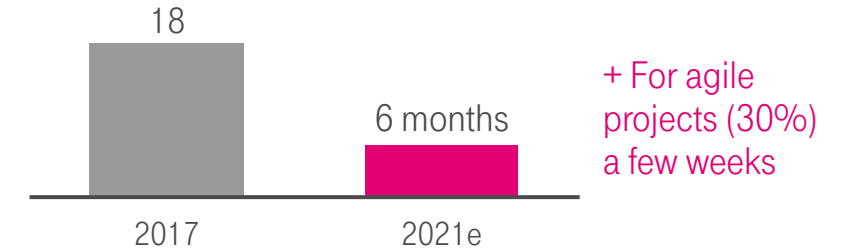


Degree of delivery modernization, % of delivery



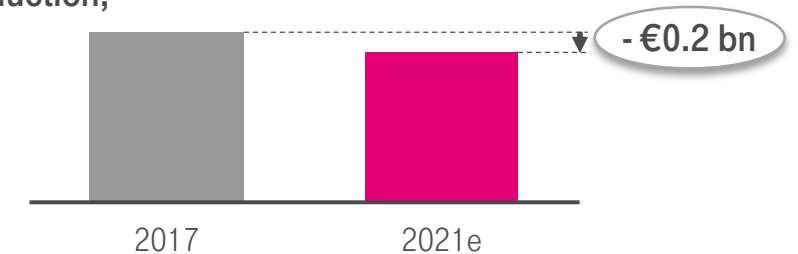
Impact of IT transformation

1 Average delivery time, month



2 Enabling process efficiencies in segments, % of delivery

3 IT spend reduction, bn €



3 LEAD IN CUSTOMER EXPERIENCE INNOVATION

Market proven

Entertain/TV

- 3.1 mn users in Germany, 4.2 mn in EU
- €2 bn revenues in Germany and EU



Hybrid router

- 370,000 users



Smart Home

- Launched in 7 countries
- 283,000 HH, 80% YoY growth in Q1 2018 in Germany



NOW

Recently launched

Connect App

- Launched in Germany, 1.4 mn users
- 3.9 (Android) and 4.3 (iOS) rating in app store



Inflight connection

- Europe's first and only solution combining LTE and satellite



To come in the future

Smart speaker

- Voice control of Telekom services
- Integration of local partners

Entertain over the top

- TV for everybody

Smart Glasses

- JV with Zeiss



NEW

3 LEAD IN BUSINESS PRODUCTIVITY INNOVATION

Market proven

NB IoT in 8 countries

- 200 projects with NB IoT applications, e.g., **predictive maintenance solution** for bridges, roads, buildings etc.



Smart City projects

- In 10 countries



Recently launched

City pass

- White label solution for digital city services
- Blockchain based



AR Maintenance

- To enhance workforce capabilities esp. in field organizations



Soon to come

Campus networks

- Leveraging 5G capabilities and edge cloud locally

Connected drones

- Starting with drone detection on LTE

Energy Management

- Piloting 5G capabilities for low voltage network steering



3 FINALLY, WE DRIVE CULTURAL TRANSFORMATION

Global excellence in Technology & Innovation, e.g.

Claudia Nemat
Lead



Walter Goldenits
Technology Germany



Alex Jinsung Choi
Research &
Technology Innovation



Omar Tazi
Prod. Innovation &
Customer Experience



Peter Leukert
Telekom IT

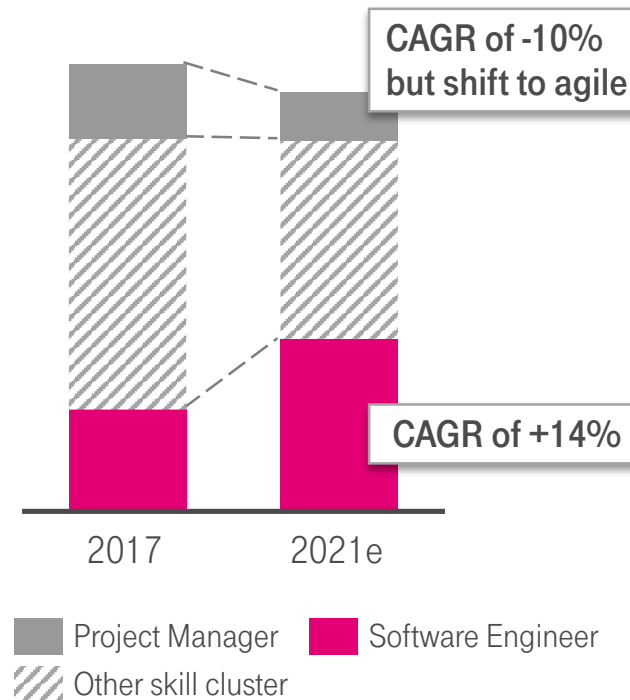


Jean-Claude Geha
International
Technology & Services



Comprehensive skill transformation

Illustrative org. unit



Agile working mode

Illustrative changes

- Reduction of organizational hierarchy level in innovation functions by 44%
- 50% of all people in VTI central functions will work in tribes/squads instead of classical line organization
- Introduction of DevOps in Technology Germany

MID TERM AMBITION LEVEL

GROUP STRATEGY

GERMANY

SYSTEMS SOLUTIONS

TECHNOLOGY & INNOVATION

T-MOBILE US

EUROPE

GROUP DEVELOPMENT

FINANCE

MID TERM AMBITION LEVEL

TECHNOLOGY LEADERSHIP

VALUE TRANSFORMATION

	Mid term ambition level	Commitment/Year
	<ul style="list-style-type: none"> ▪ Gigabit rollout in Germany ▪ Gigabit rollout in EU ▪ Mobile network leadership in Germany ▪ Mobile network leadership in EU ▪ 5G innovation leadership 	<ul style="list-style-type: none"> ▪ Ramp up to 2 mn HH p.a. by 2021 ▪ Ramp up to 0.75 mn HH p.a. by 2021¹ ▪ Outdoor LTE coverage 99% in 2020 and leading in customer experience ▪ Outdoor LTE coverage 99% in 2021 and leading in customer experience
	<ul style="list-style-type: none"> ▪ IP transformation completed ▪ IT transformation 	<ul style="list-style-type: none"> ▪ Greece in 2019 ▪ Germany B2C in 2019 ▪ Germany B2B in 2020 ▪ Delivery from 18 months today to 6 months on average in 2021 ▪ IT spend reduction of €0.2 bn in 2021

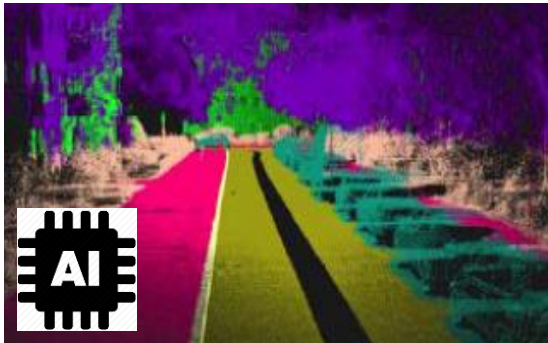
¹ FTTH/B and Cable ED3.1, excluding Romania

DEMONSTRATOR SESSION

3 Topics presented simultaneously in Circuit Training Mode. Your individual starting point is printed on the back of your badge.

1

AUTOMATION OF FIBER ROLLOUT PLANNING



- Use of Digitalization and artificial intelligence for planning of fiber rollout
- Benefit: Efficiency, speed, accuracy

Presented by:
Walter Goldenits, CTO Germany

2

5G NEW RADIO + FIXED WIRELESS ACCESS

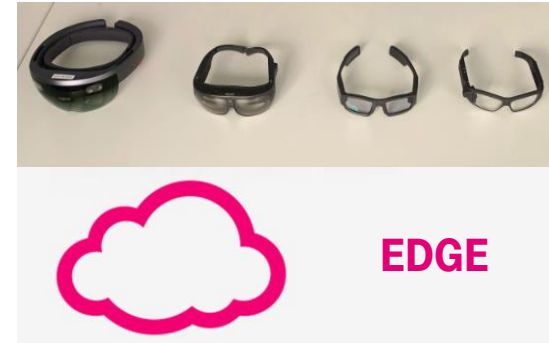


- 5G New Radio: Massive MIMO and beam forming
- Fixed Wireless Access Equipment
- Benefit: capacity and flexibility

Presented by:
Antje Williams, Executive Program Manager for 5G

3

AUGMENTED REALITY + EDGE COMPUTING



- Quality shift in rendering results with edge based vs. on-device rendering
- B2B use cases
- Benefit: Productivity, convenience

Presented by:
Alex Choi, SVP Research & Technology Innovation

Pass by on the way to the Evening Event:

TRENCHING + HORIZONTAL DIRECTIONAL DRILLING



- Trenching Machine
- Horizontal Directional Drilling Machine
- Benefit for DT: Efficiency, speed