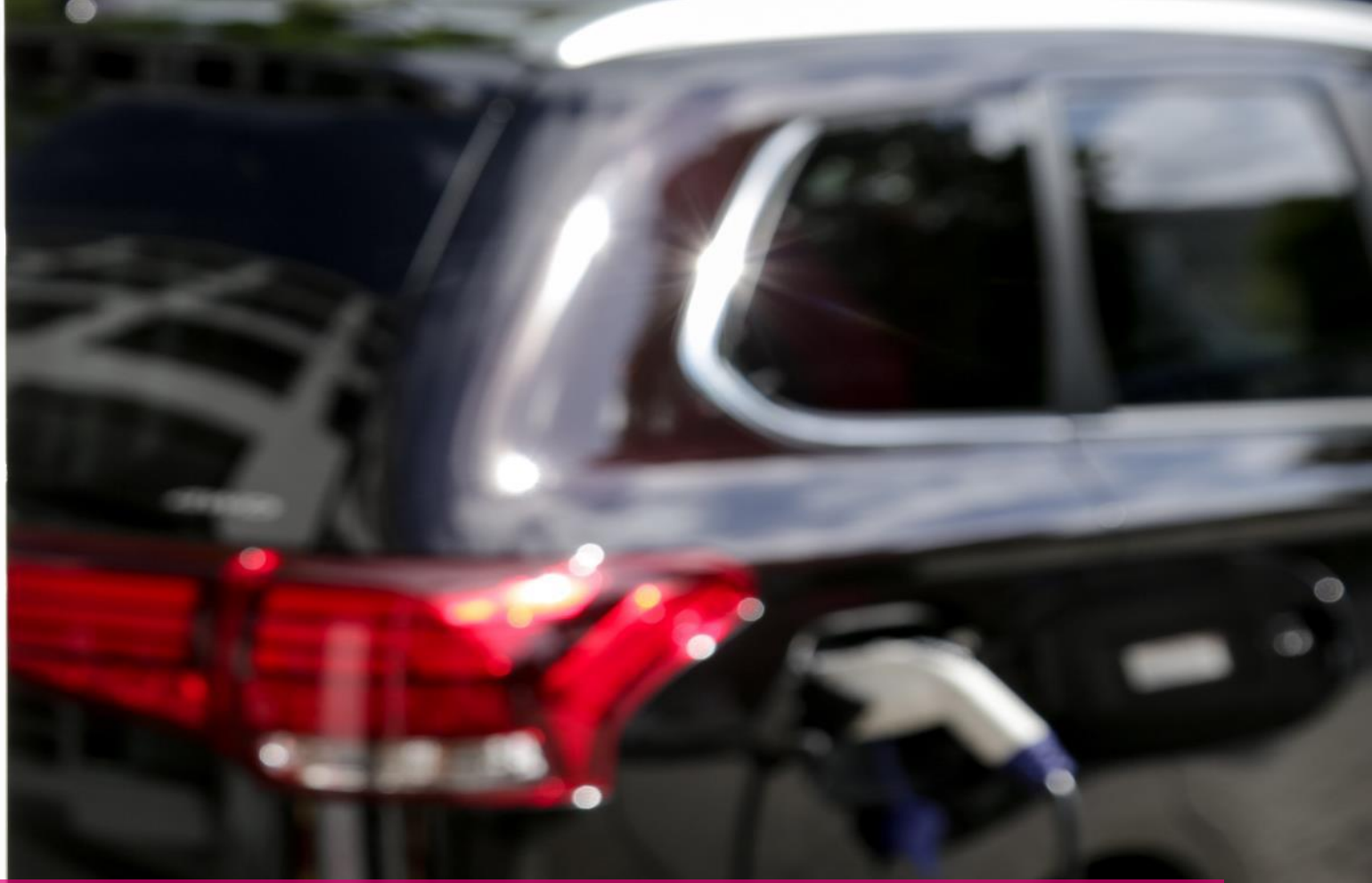




ELEKTRO-
LADESTATION



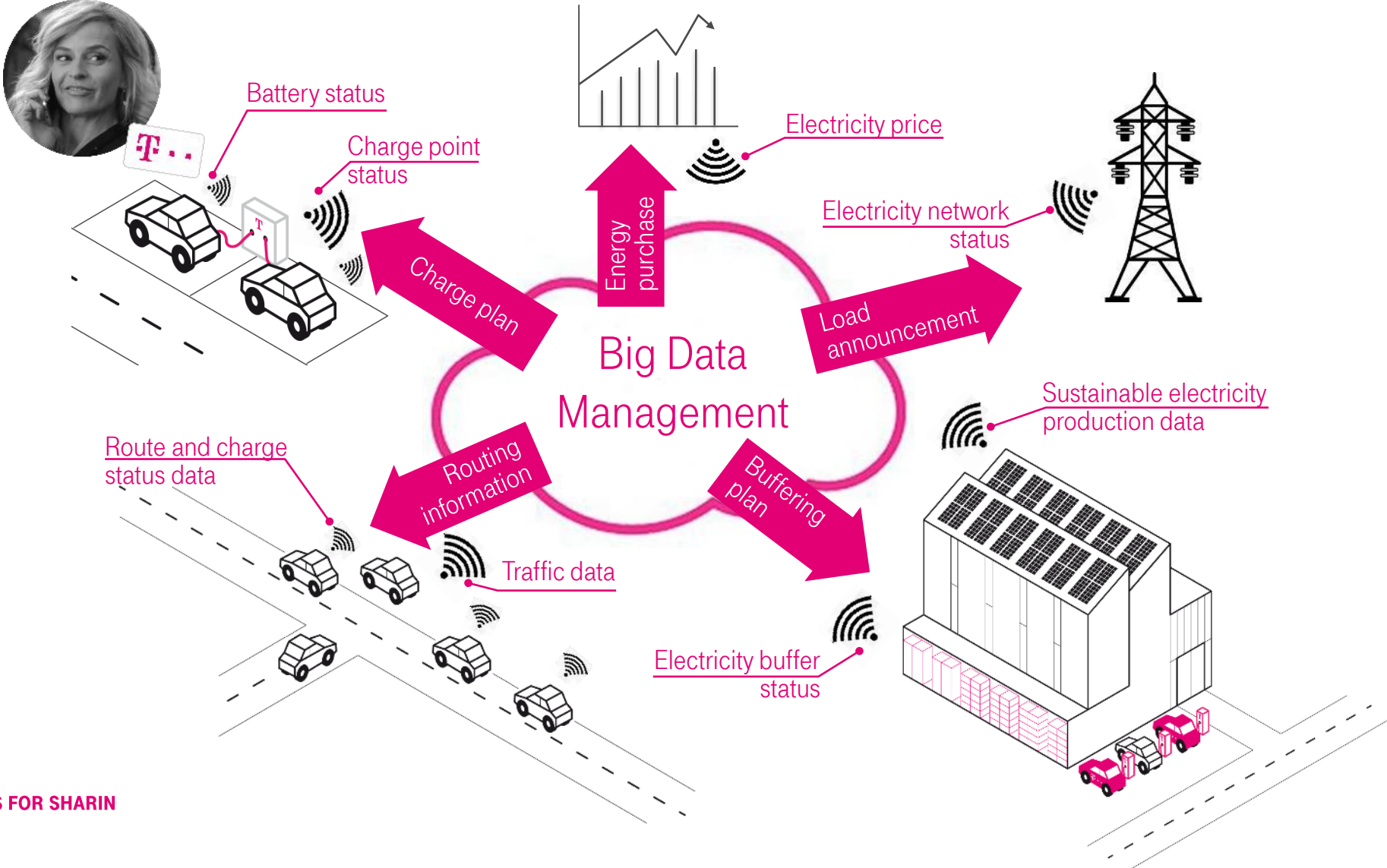
COMFORT CHARGE NETWORK

Bonn/Vienna, November 2018



LIFE IS FOR SHARING.

E-MOBILITY IS BASICALLY A LOGISTICAL ISSUE



THE FEARS RELATED TO E-MOBILITY: R.I.P

R
ange

Most people see 300km range as sufficient – mid-sized e-cars with 300km range are entering the market now

I
nfrastructure

Majority of cars is parked in public space, their owners depend on publicly accessible charging stations – this is where Deutsche Telekom enters the infrastructure market with lower investments than anybody else by revaluating already existing assets

P
rice

Already today, many people would buy an electric car with 300km range if it was available at the same price as a comparable car with combustion engine – Tesla's Model 3 will be sold at about the same price as a BMW 3 series car with two liters diesel engine



OUR RIGHT TO PLAY

	T . . .	Utilities	Automotive OEMs	Fuel stations
Nationwide usable infrastructure for AC				
Nationwide usable infrastructure for DC				
Nationwide service structure				
ICT-infrastructure				
Customer basis				

- Thanks to deregulation, utilities don't have an own network which would provide an advantage
- Fuel stations are often in remote areas of cities and in general don't have medium-high voltage connections with power reserves
- Utilities don't have nationwide service structure, only regional
- The combination of nationwide locations, usable electricity infrastructure and qualified service personnel is a unique advantage of a Telco operator



LIFE IS FOR SHARING.

FOUND DECEMBER 2017: COMFORT CHARGE DEUTSCHE TELEKOM'S CHARGE POINT OPERATOR

1 Deutsche Telekom has entered the e-mobility market and found Comfort Charge GmbH

2 Comfort Charge has a smart rollout concept to rapidly build a charging station network in Germany utilizing Deutsche Telekom assets and existing organizational structures for cost and time advantages

3 In addition to its CPO role, Comfort Charge bundles services of several Telekom entities and external sources as an end-to-end, one-stop-shop partner for B2B customers

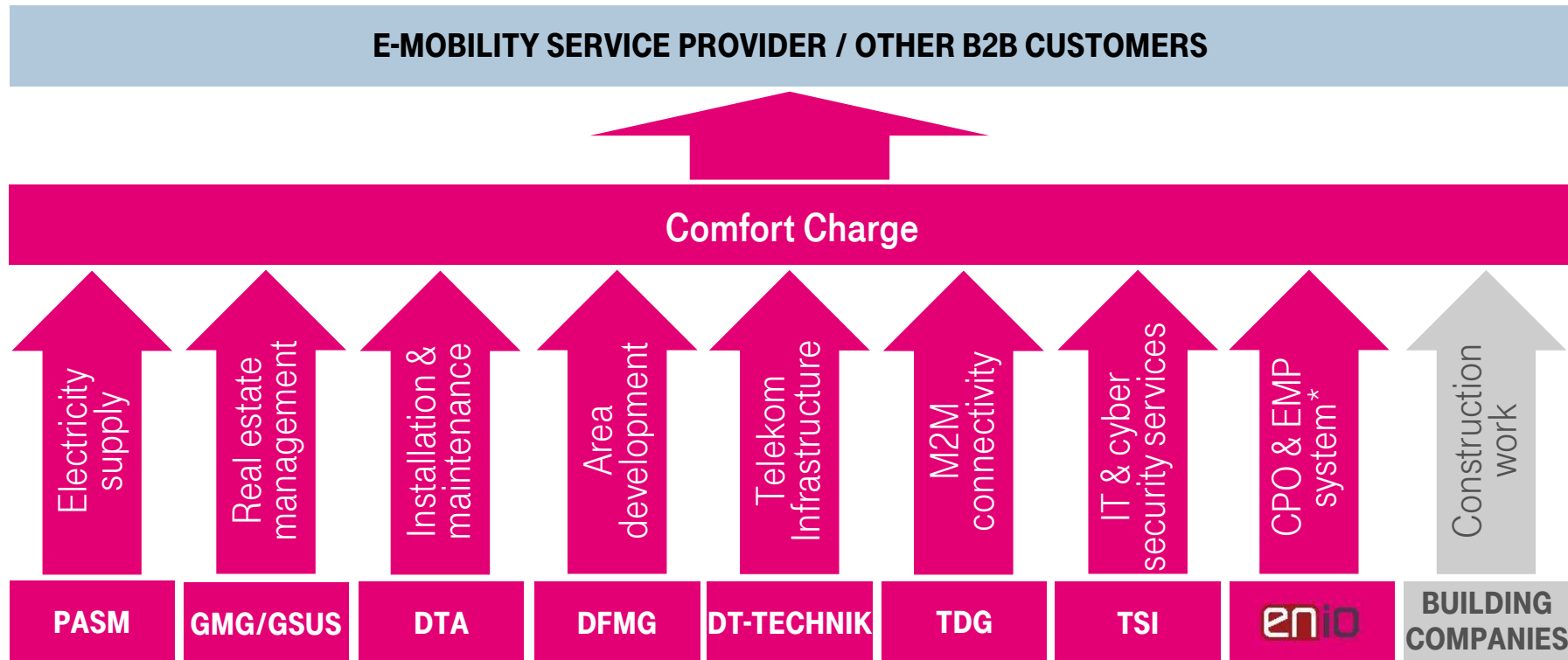


Telekom destination charger prototypes
(Darmstadt, Bonn)



LIFE IS FOR SHARING.

BUNDLING BY COMFORT CHARGE




*Deutsche Telekom tailored mandates of Enio's ETSweb system





LIFE IS FOR SHARING.

COMFORT CHARGE'S NETWORK FOCUS

Current	Charge time for 100km	Power Kilowatt	Current Volt	Amperage	Comment
AC	7 hours	2,3 kW	230 V	10 A	Household plug
	90min	11 kW	400 V	16 A	Comfort Charge on-street
	45min	22 kW	400 V	32 A	Comfort Charge on-street (one of two used)
DC	20min	50 kW	500 V	100 A	Still standard for most BEV in 2018
	10min	100 kW	500 V	200 A	Comfort Charge CCS without heat monitoring
	8min	120 kW	500 V	240 A	Currently maximum at Tesla Super-Charger
	7min	150 kW	500 V	300 A	Comfort Charge CCS with heat monitoring
	3min	320 kW	920 V	350 A	First model announced for 2019

 at on-street infrastructure

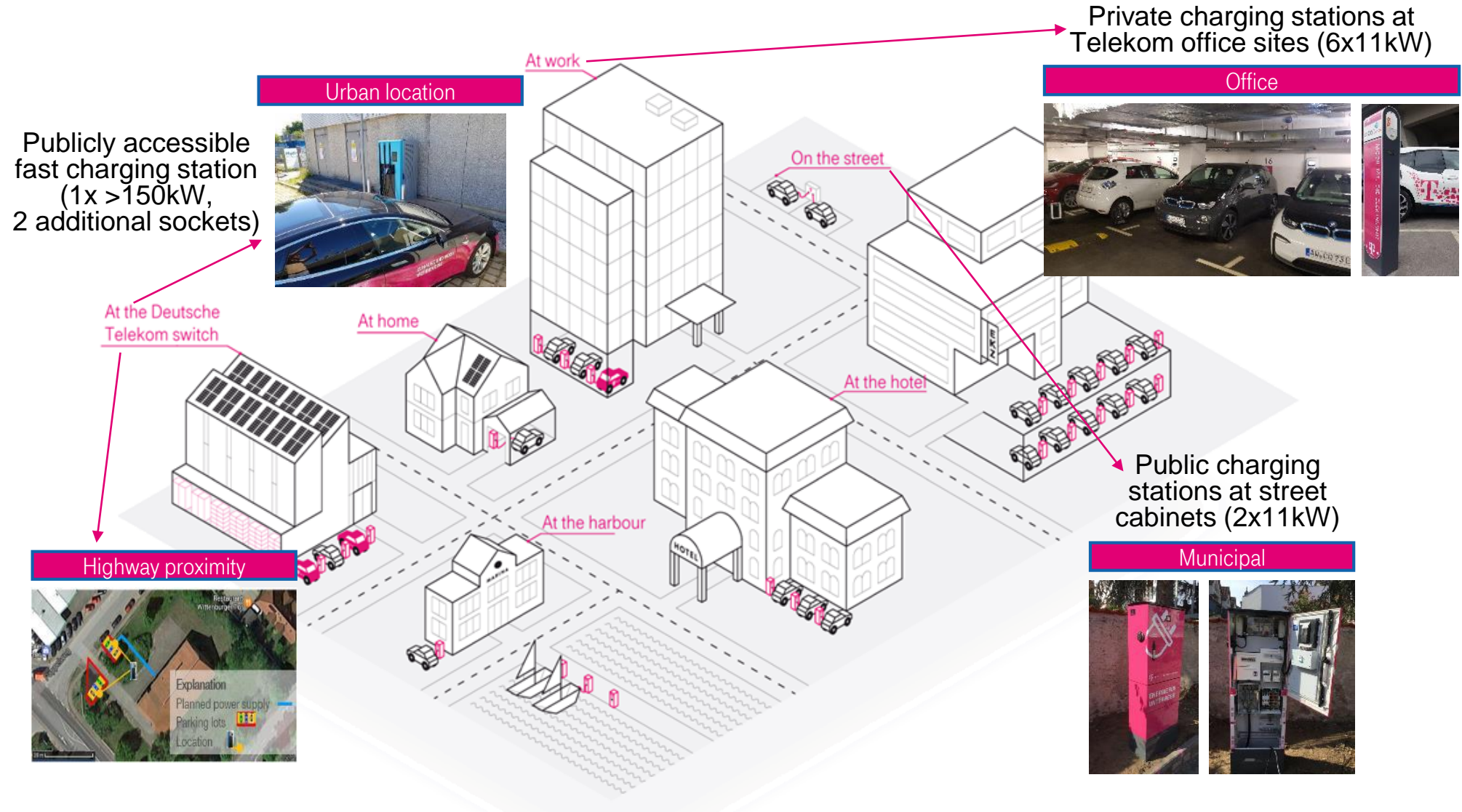
 at medium-high voltage transformers

 currently out of focus



LIFE IS FOR SHARING.

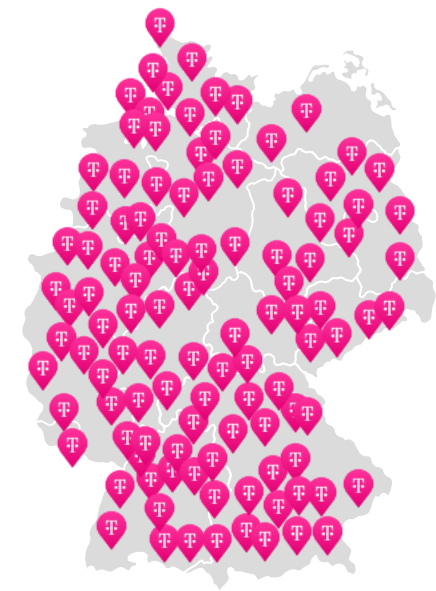
COMFORT CHARGE'S PUBLICLY ACCESSIBLE NETWORK



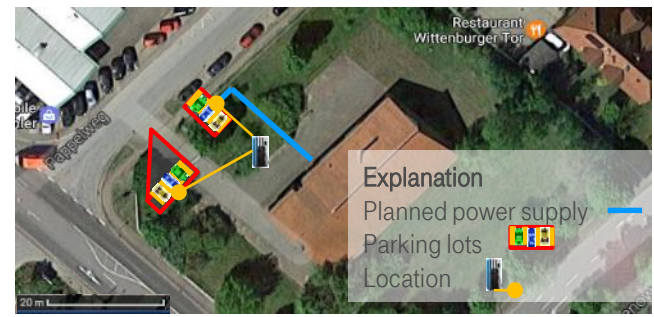
PUBLICLY ACCESSIBLE FAST CHARGING NETWORK

Rollout
already started

- Using our existing medium high voltage transformers, we are able to offer urban fast charging at up to 150kW, hence 7min for 100km range
- Future proof technique has been chosen operating at up to 1.000V and 375A
- The first 100 stations will be in operation by EoY 2018
- Until EoY 2021, we will build a dense charge point network across Germany leading to an average distance of 38km between two fast charging stations



MUNICH
(AT THE OLYMPIATURM)



WITTENBURG
(NEAR HAMBURG-BERLIN MOTORWAY)

FIRST COMFORT CHARGE FAST CHARGERS IN OPERATION

Olympia tower Munich



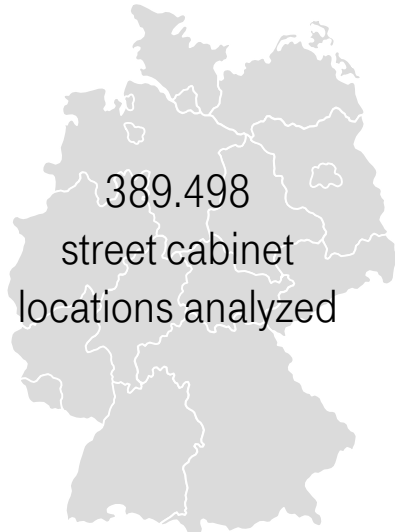
Wittenburg



LIFE IS FOR SHARING.

PUBLIC DESTINATION CHARGE SPOTS

Rollout starts 2019



Category	Street cabinets without power supply	Street cabinets already with power supply	Street cabinets with power supply by 2020*
A = very good location	n = 8.715 2%	n = 2.201 1%	Further potential of 98.700 locations 25%
B = good locations	n = 27.614 7%	n = 12.253 3%	
C = less suitable locations	n = 68.047 17%	n = 31.335 8%	
D = not suitable locations	n = 88.582 23%	n = 52.051 13%	

Potential for first wave: 14.454 locations
Our plan: 12.000 locations realized by EoY 2021

COMFORT CHARGE'S PUBLIC CHARGING CONCEPT

SYNERGIES
BY DOUBLE
USAGE OF
ENERGY
COLUMN

Energy column (EnAs)

- Grid connection to local operator
- Supplies electricity to the charging station and any telco infrastructure, e.g. to street cabinets

WIR INVESTIEREN FÜR SIE IN DAS
NETZ DER ZUKUNFT
Erfahren Sie mehr unter 0800 330 3000 oder
www.telekom.de/schneller

Satellite charging station

- Offers two Typ2 11kW plugs
- In case only one plug is occupied, 22kW are provided

Electricity supply with max. 15m
long cable in min. 80cm depth



LIFE IS FOR SHARING.

PILOT INSTALLATION DARMSTADT



LIFE IS FOR SHARING.



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