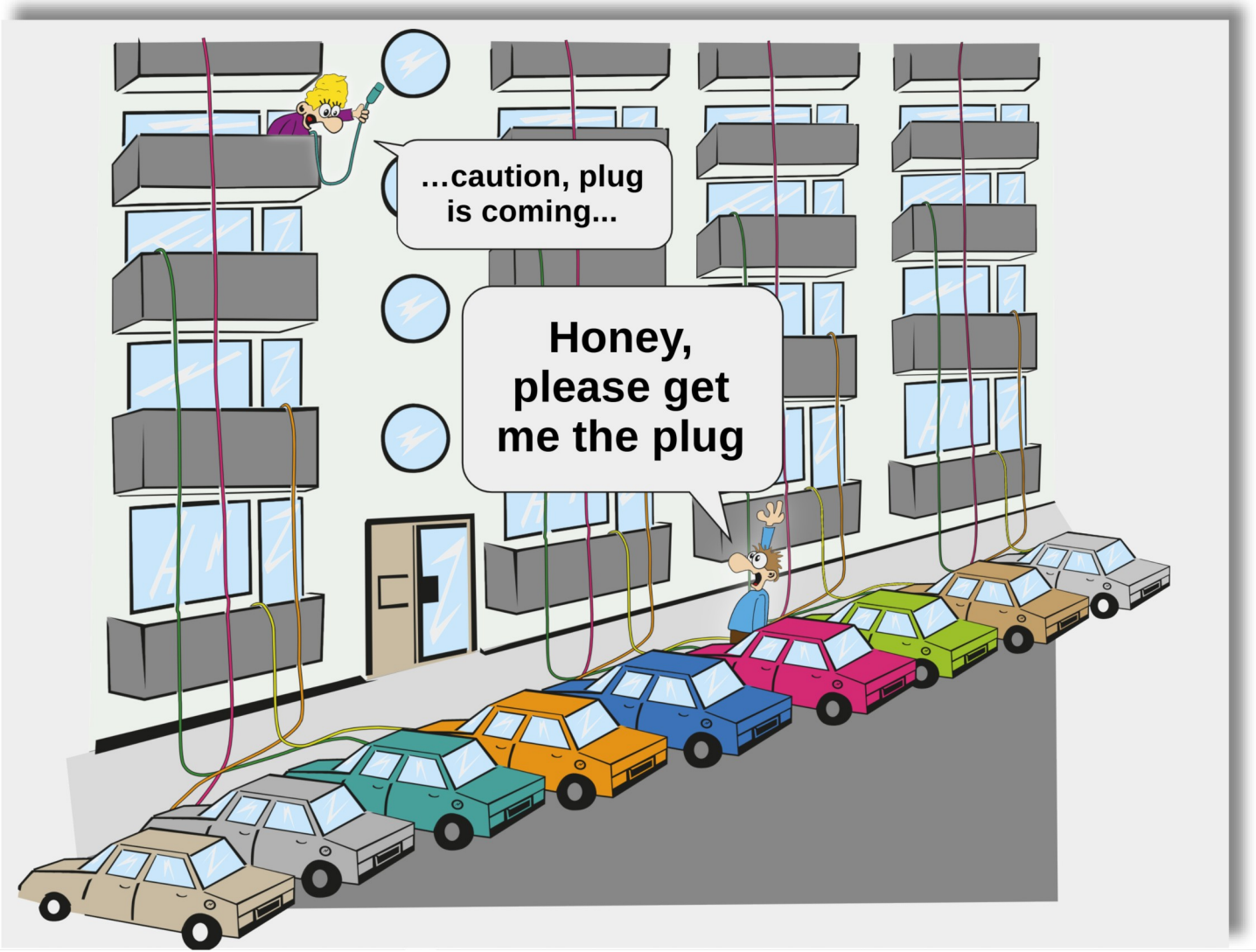
SIMPARQ

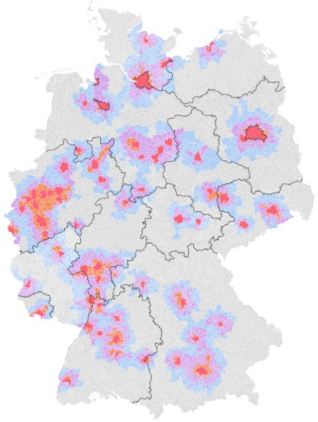
Smart Mobility

What are the major challenges in the urban transition to electric mobility?



SimParQ GmbH
Karl Grote

SIMPARQ

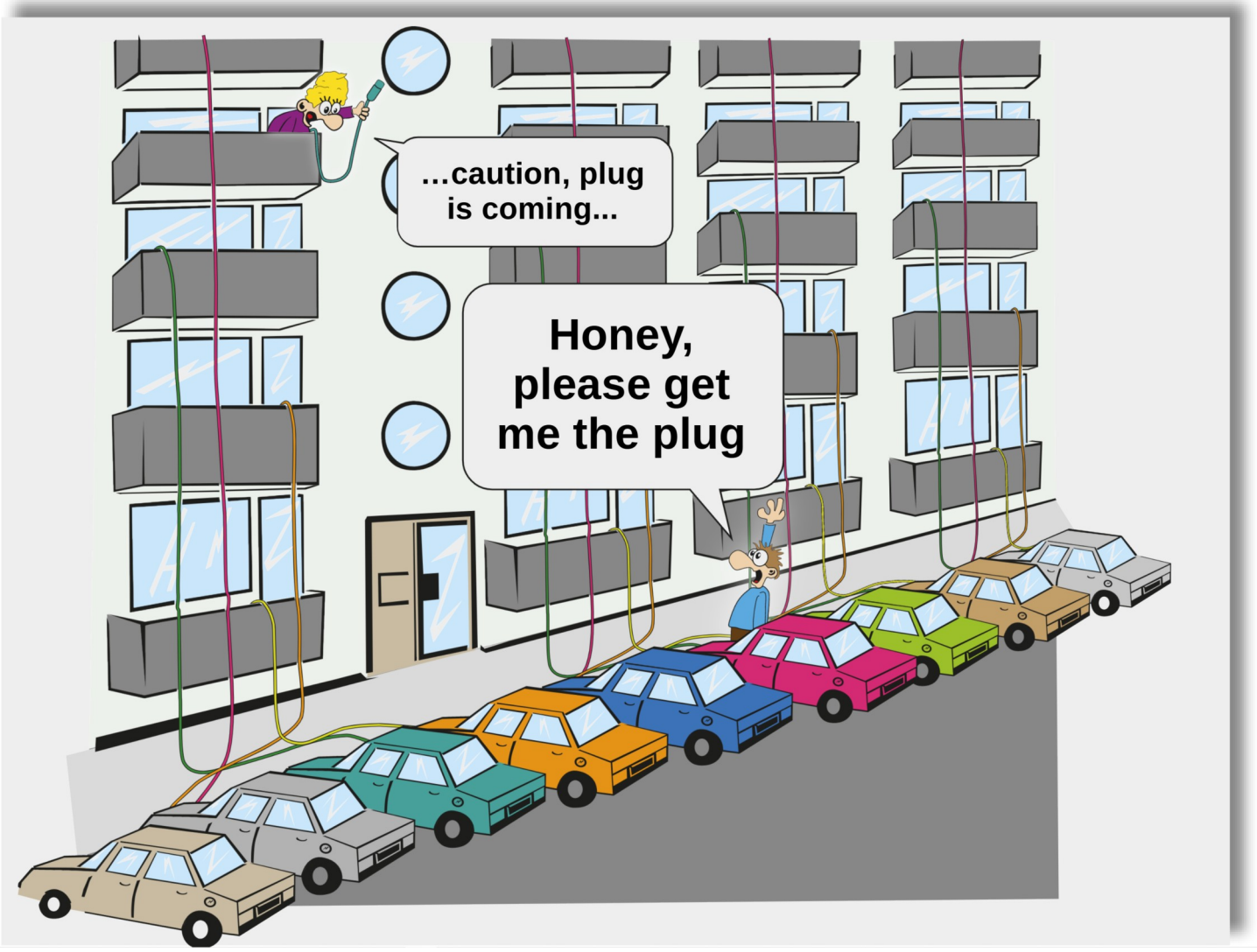


40% of all German citizens live in inner-city centers

Source: Federal Statistical Office 2024

City dwellers wondering ...

… where to charge?
… where to park?



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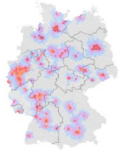


Drilldown

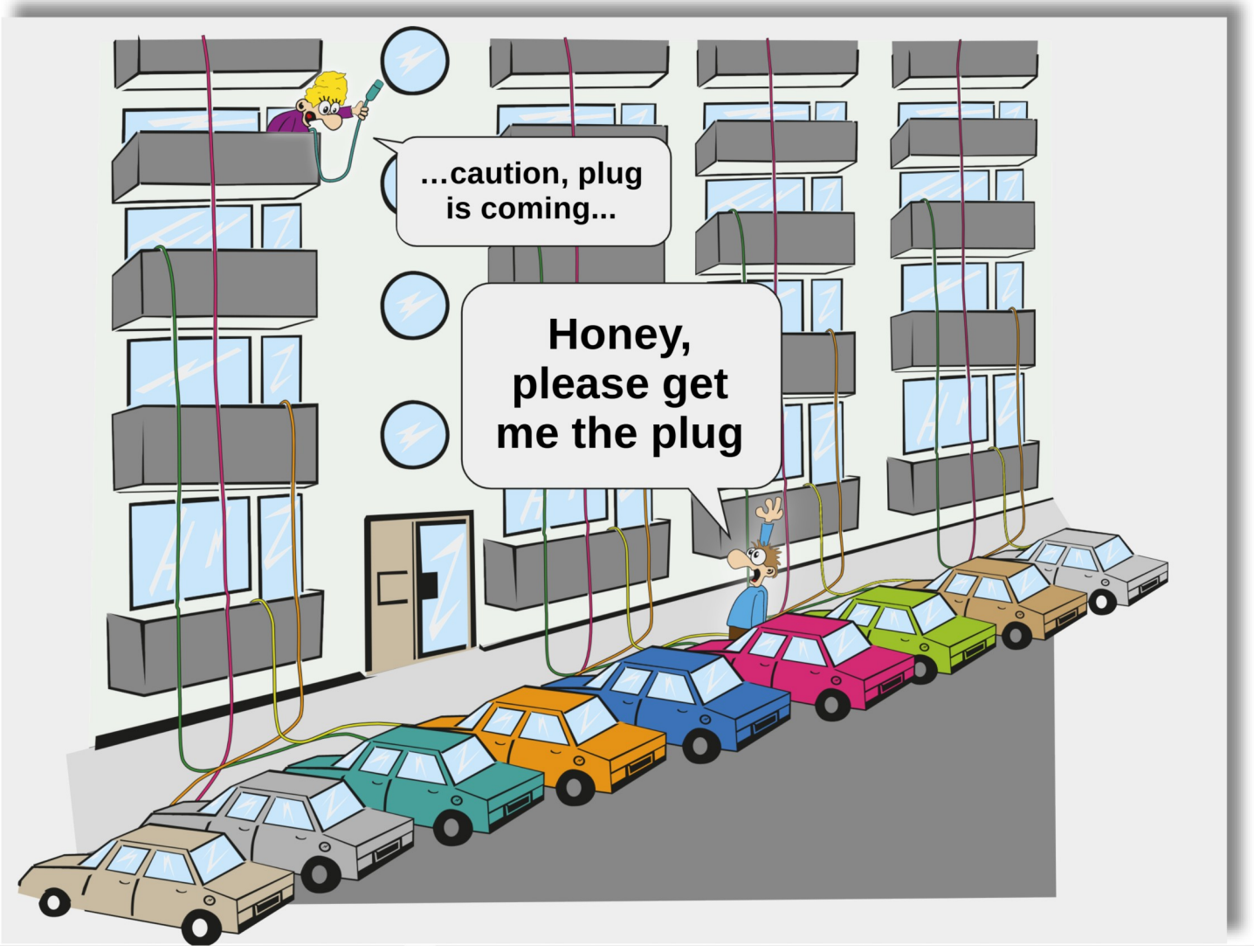
4 Major Problems:

Alternative public parking spaces are expensive

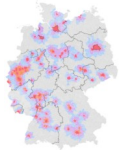
Unused parking spaces do exist in neighborhoods, but are not available for public use

Limited energy supply & insufficient energy infrastructure

Existing EV charging points do not meet customers' required use cases



SIMPARQ



Drilldown

4 Major Problems

Alternative public parking spaces are expensive

Unused parking spaces do exist in neighborhoods, but are not available for public use

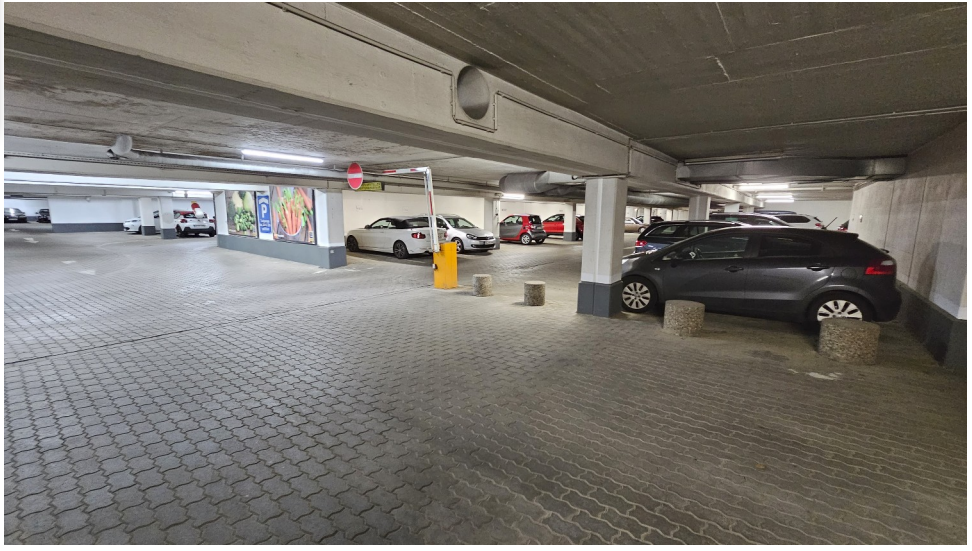
…

…

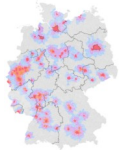
… examplary

Neighborhood Parking Neuss

- 250 Parking spots



SIMPARQ



Drilldown

4 Major Problems

...

...

Limited energy supply & insufficient energy infrastructure

Existing EV charging points do not meet customers' required use cases

... examplary

Duesseldorf Public Parking Garage

30 BEV Charging stations (22kW) – empty at night

Double fees:

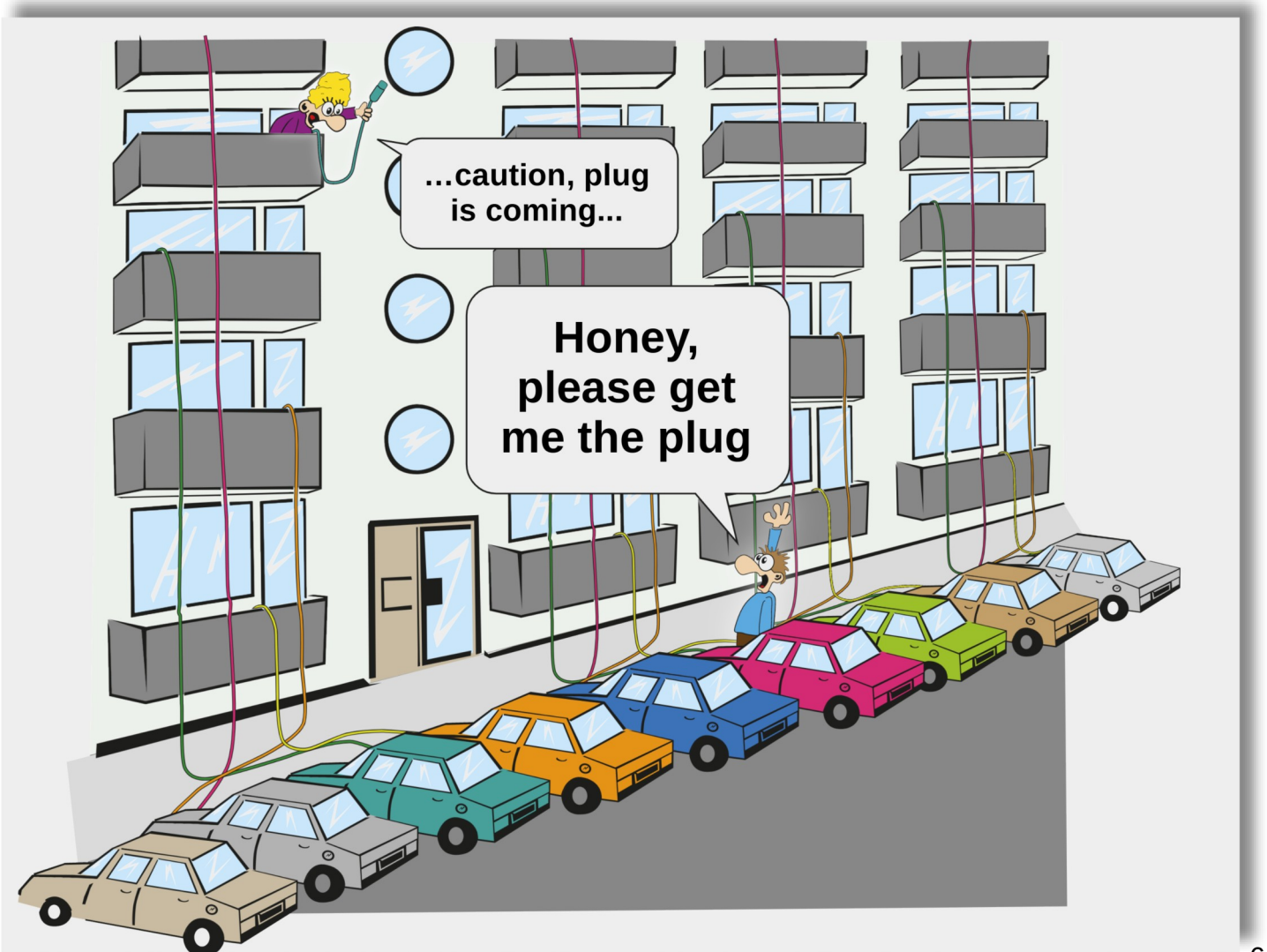
Parking > 2.50 €/h
Charging > .60 €/kWh

SIMPARQ

SimParQ is answering with two products

PARQnCHARGE®

Dynamic Parking®

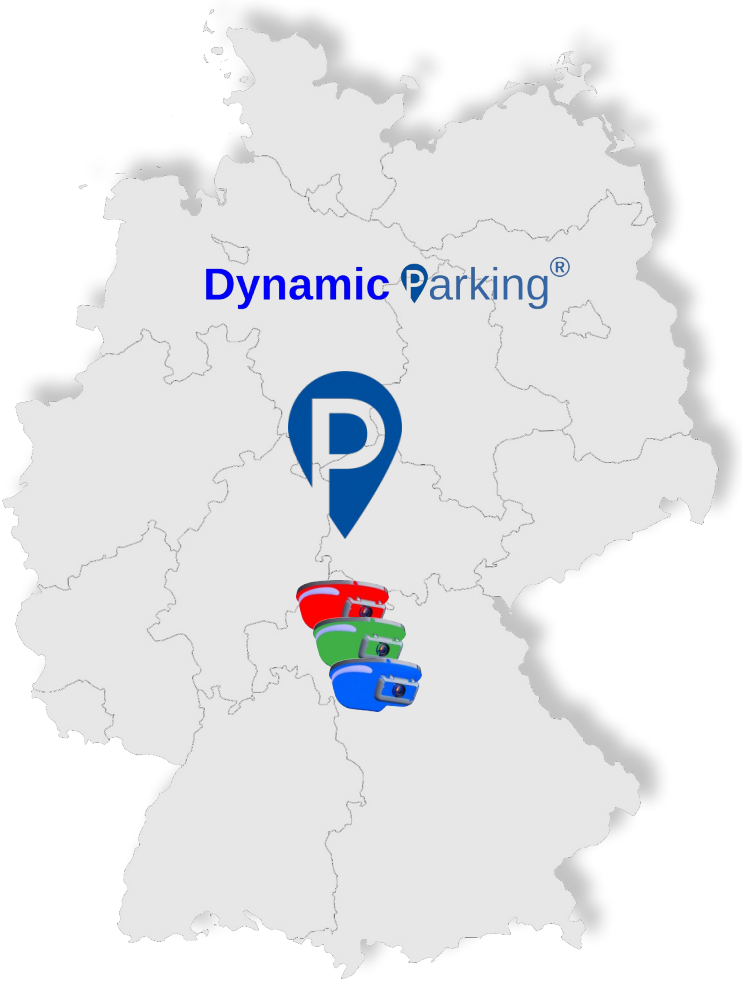


SIMPARQ

What do SimParQ solutions look like? (1)

(1) Charging Process is always linked to a parking process → focus on parking first

Parking is the key element!



"State of the Art" Technology in Car Park Management Systems (CPMS)

SIMPARQ

Match

RA-KL8136
RA-KL8136
RA-KL8136

Reconcil liation Coud

CPMS-Storage

Approximate project start price for a CPMS > 70 – 100K€ !!!

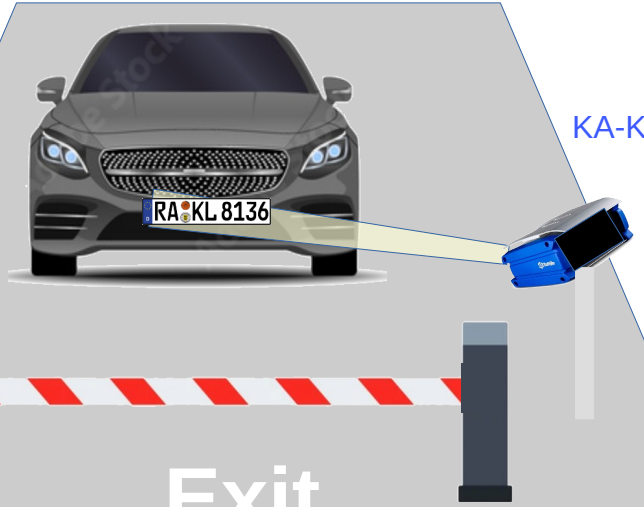
„Flow“ System

RA-KL8136

Entry

RA-KL8136

KA-KL8136



Exit

Inherent disadvantage of camera-based CPMS at the entrance/exit

MISMATCH

Reconcil liation Coud

RA-KL813
RA-KL1386
KA-KI8136

CPMS-Storage

„Flow“ System

ERROR

RA-KL183

Entry

RA-KL1386

ERROR

MISMATCH

Approximately 3 - 5 % of all parking transactions require manual assistance

ERROR

KA-KI8136

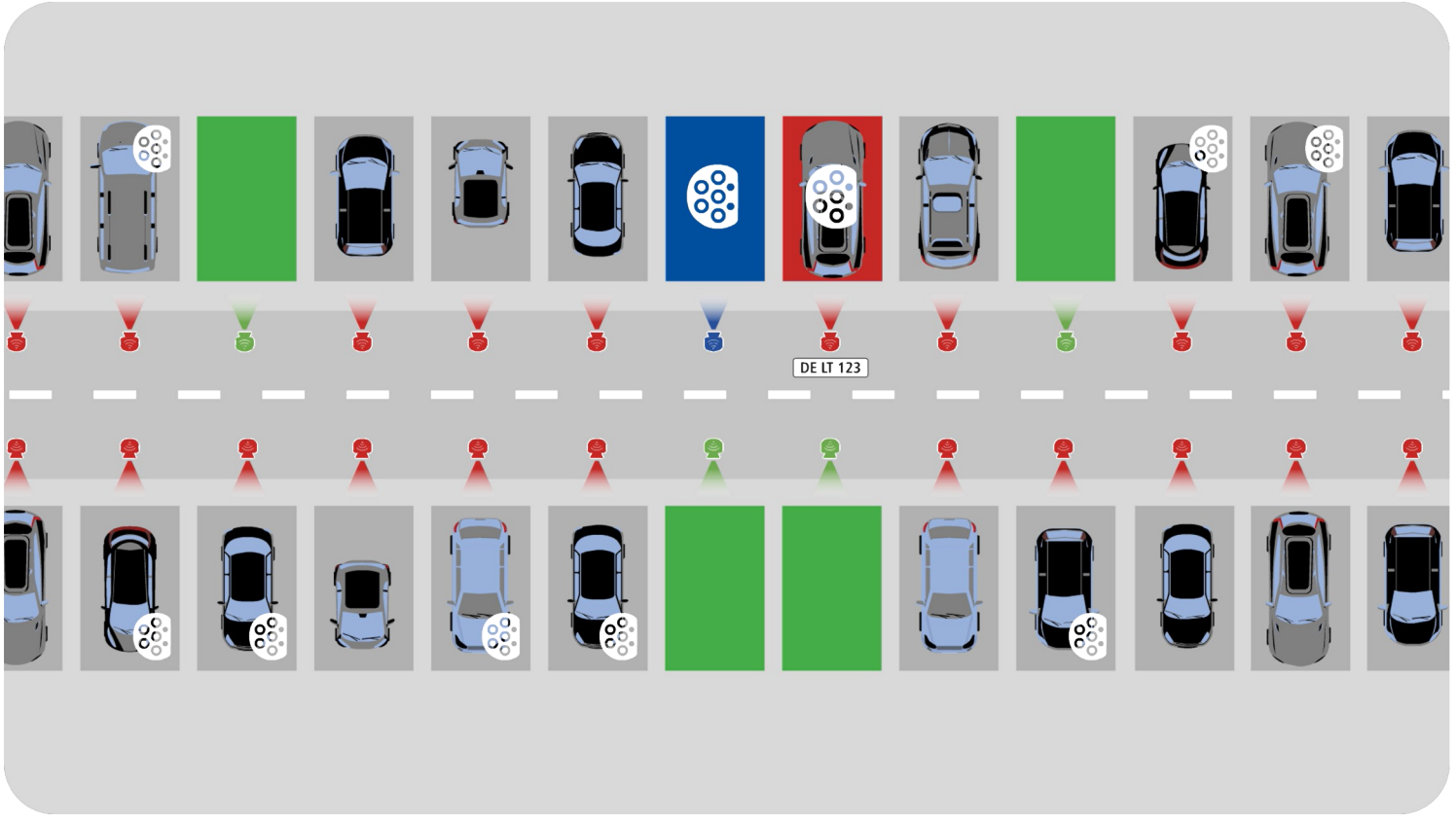
Exit

SIMPARQ

SIMPARQ
next level parking

Paradigm Changes + Products + Benefits Contact +

„Spot-“ Paradigma



Paradigm Differences

Dynamic Parking® SIMPARQ

Conventional Car Park Mangement Systems

„Flow-“ Paradigma

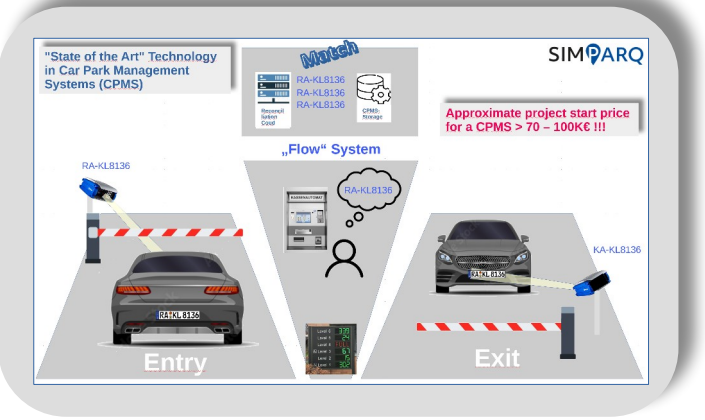
Conventional CPMS

(Car Park Management Systems)

with ANPR cameras at entry and exit

"Flow" between Entry and Exit:

– the system doesn't know where the car is parked!



SIMPARQ

„Spot-“ Paradigma

Dynamic Parking®

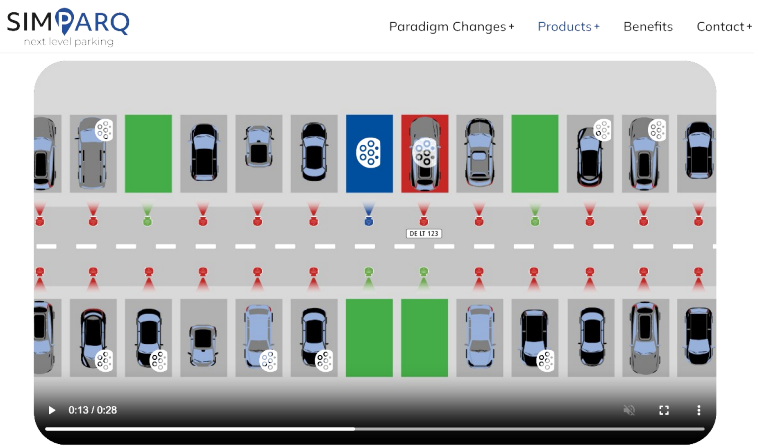
No cameras / barriers at entry and exit!

Each individual parking spot is managed / monitored by its own CPMS device with ANPR – AI enhanced!

All smart devices are connected to a cloud (SaaS Business)

All devices are IPGS (RGB) enabled – for free!

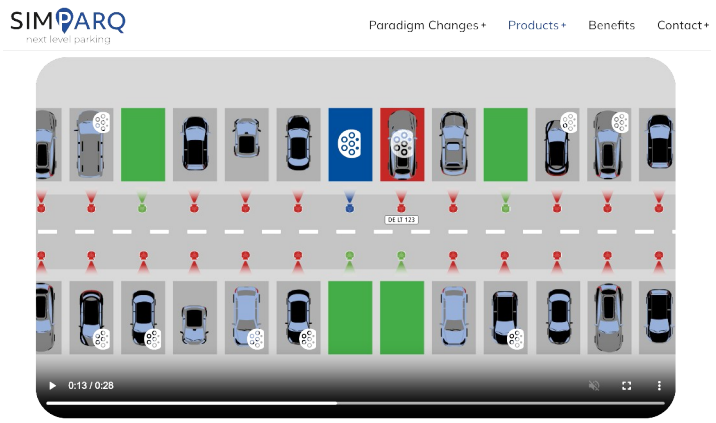
Cost per device is 50 Euros!



Animation at https://simparq-parking.com/dynamic-parking

SIMPARQ

Spot- Paradigma in Neighborhood Parking



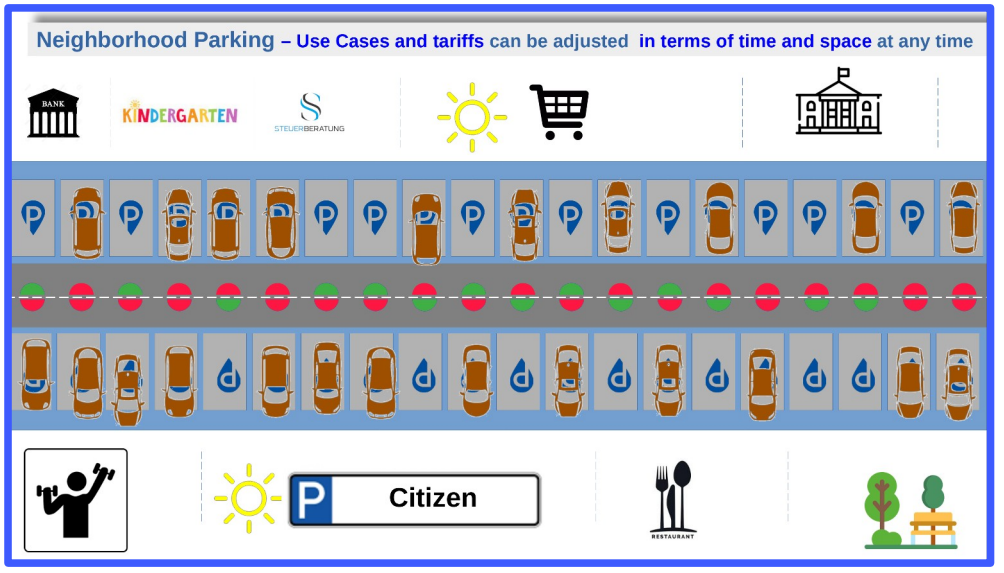
Dynamic Parking®

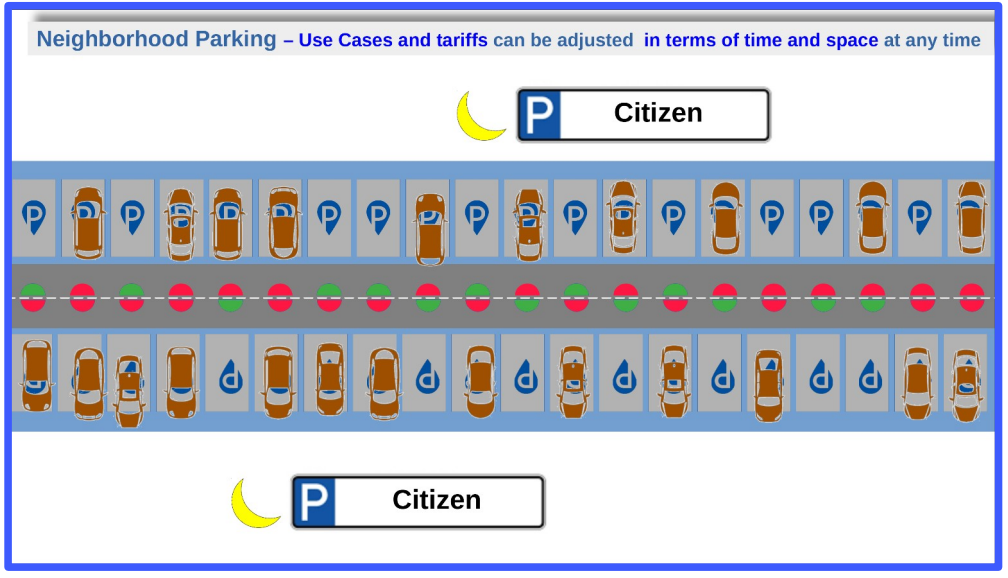
Mixed Parking Advantage: The Spot Paradigm allows individual use and management of each parking spot by its owner/operator, ...

... instantly adjustable – based on season, time of day, or events ...

... "instantaneously" switchable from the cloud or controlled via smartphone

... ideally supports sharing models in the day/night cycle (parking/charging)





OffStreet

Current Market Situation

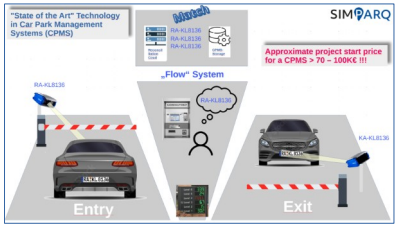
~ 1 Mio

~ 17.000

Operators / Utilities ...

APCOA PARKING · QPARK · CONTIPARK Interparking Group · Stadtwerke Düsseldorf · ...

> 1,5 Mio



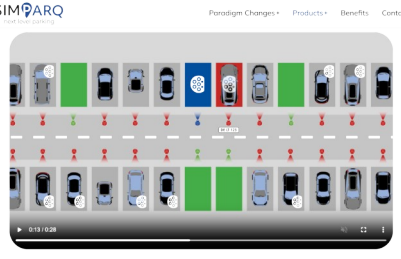
ANPR CPMS – Barrier or FreeFlow

"Neighborhoods": unmanaged – as no positive ROI

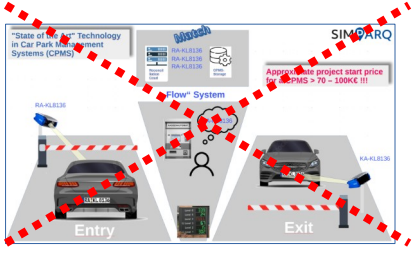
… existing CPMS technology unsuitable / too expensive (CAPEX / OPEX)
… fewer than 300 parking spaces – insufficient economies of scale
… mixed parking demand (varied types of use - different fees needed)
… primarily long-term (contract) parking management – unpopular / chaotic!

Neighborhoods in urban metropolitan areas – Landlords/Owners:

Housing associations, private owners, real estate funds, businesses, retail, project developers, ...



Dynamic Parking® fits!



unsuitable

The user journey illustrates the simple, AI-powered parking process

I

The user parks their car in an available parking space (indicated by a green LED or blue LED for charging stations)

The camera uses OCR and AI to detect the vehicle and license plate and generates a proof image

IIa

The user scans the QR code at the parking space

A parking space–specific QR code directs the user to the SimParQ website

IIb

The user selects their preferred chatbot channel (WhatsApp, Telegram, Web, ...)

On the website, the user can choose their preferred messenger to continue the process

III

The chatbot guides the user through the next steps and completes the payment process

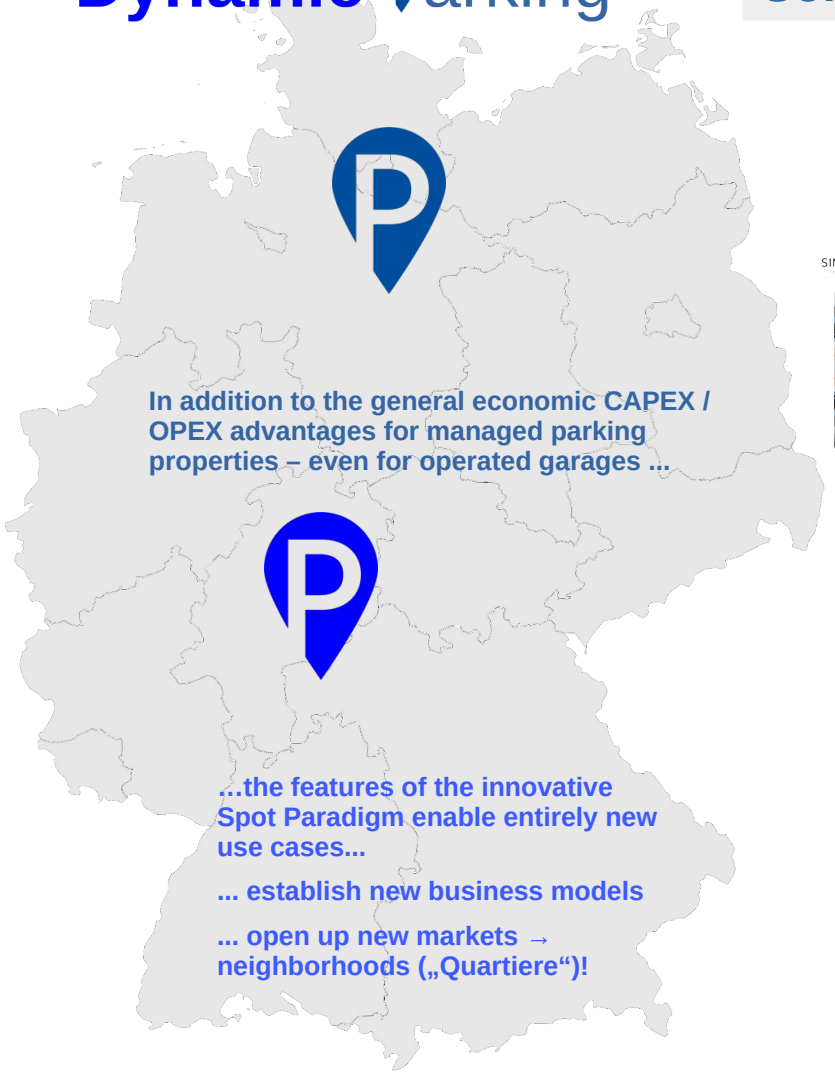
A genAI-powered chatbot guides them through the payment workflow

User- / Session linkage

Dynamic Parking®

Some Key Aspects of the Spot Paradigm

SIMPARQ



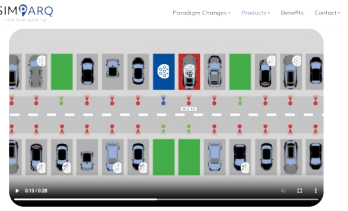
In addition to the general economic CAPEX / OPEX advantages for managed parking properties – even for operated garages ...

...the features of the innovative Spot Paradigm enable entirely new use cases...

... establish new business models

... open up new markets → neighborhoods („Quartiere“)!

I



WiFi based – customer smartphones work even without LTE in underground garages

Each parking spot can be used and priced completely differently → basis for Urban Hub strategies

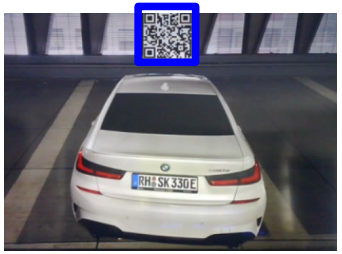
***GREEN / RED / BLUE* spot occupation signalling as an inherent standard feature**
(BLUE=Charging station ready)

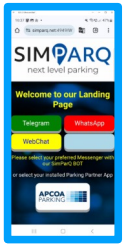
II

Multifunctional unique QR code and smart camera device at the parking spot for use, deployment and service.

Inherent fraud protection:

The camera also secures the QR code against quishing !





QR-Code ... for user contact ("linking") at the parking spot

... Deployment: registration of the smart device into the cloud

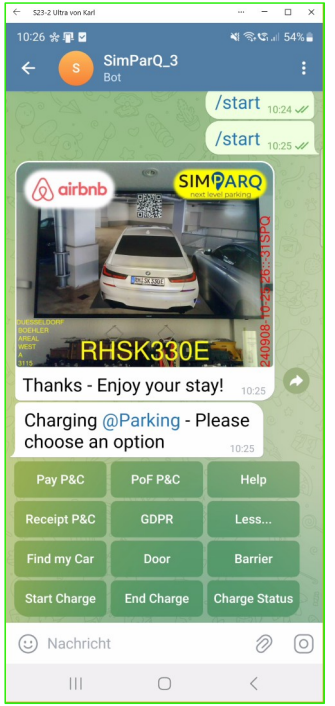
... as a Token, LPN (License Plate Number) as a Token (additionally) only optional for Pay Machine

... Photo as "enforcement evidence"

... Spot streaming to the operations center / user smartphone

III

User interaction via Messenger – no parking app download, no registration → **"Short Term“ Parking Business**



iOS /Android

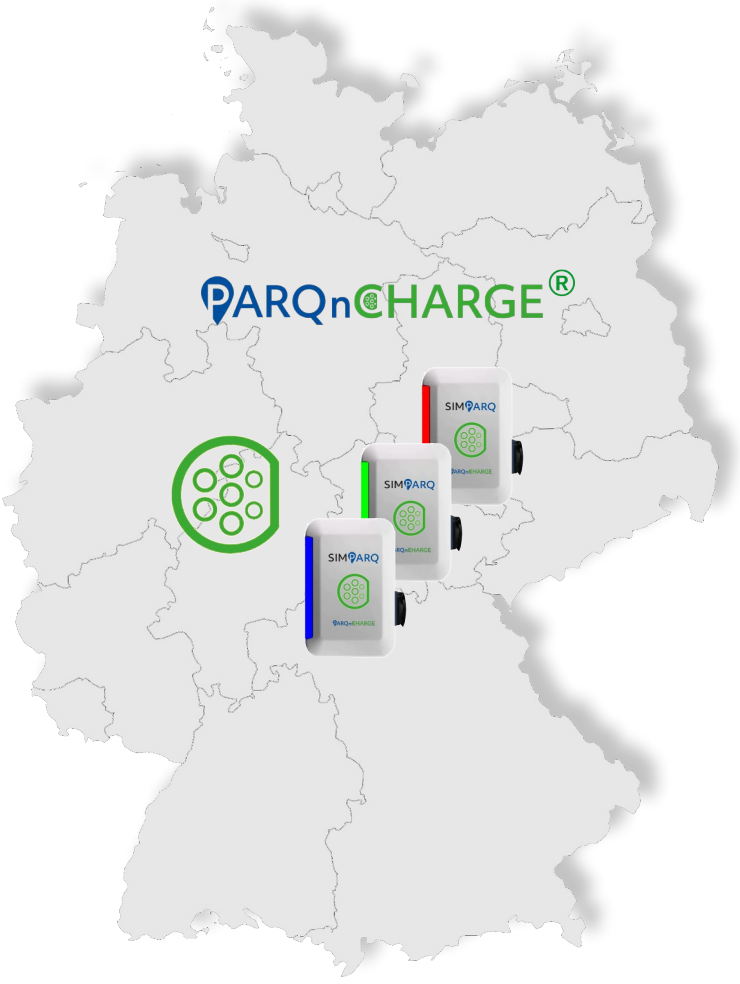
SIMPARQ

What do SimParQ solutions look like? (2)

(1) Charging Process is always linked to a parking process → focus on parking first

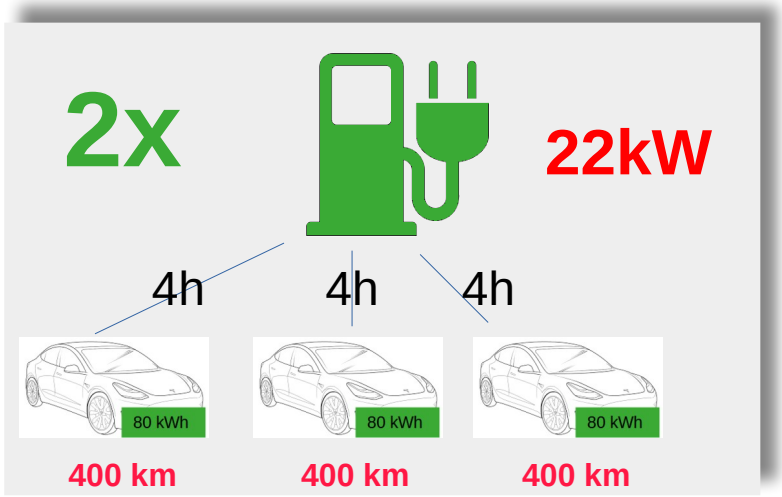
Parking is the key element

(2) The solution to the charging problem is now very simple ...



Solution: Redistribution of available energy over 12 hours ...

SIMPARQ



12h

44 KW available over 12 hours do supply ...

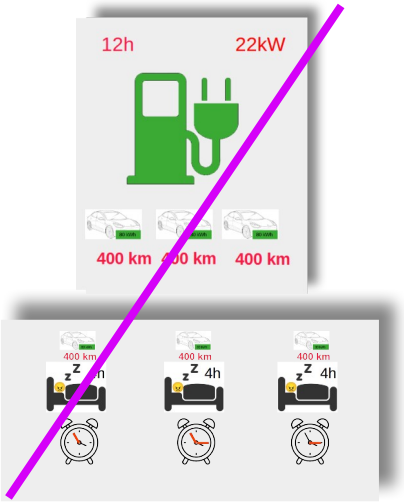
6 BEVs with 400km range

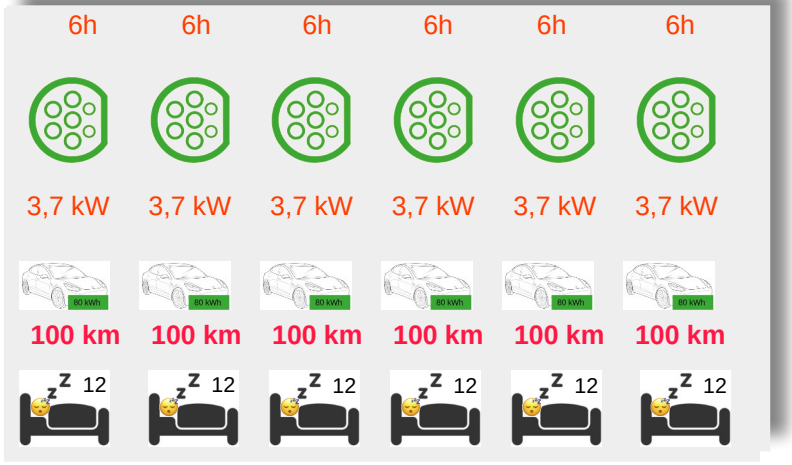
24 BEVs with 100 km range

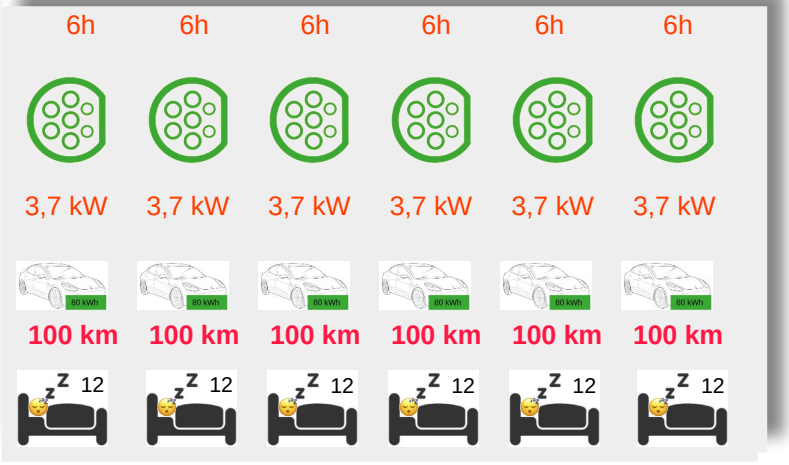
The average daily driving distance of a car is statistically only 41 km !!!

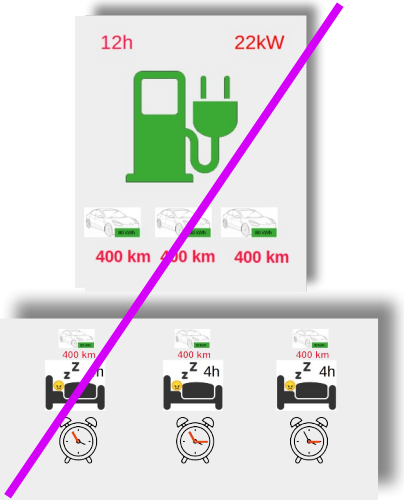
... Customer benefit – 12 hours of uninterrupted nighttime rest!

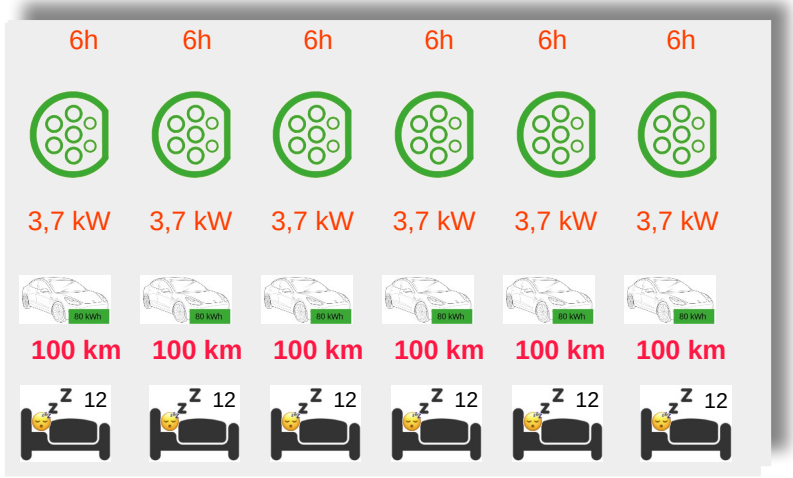
SIMPARQ

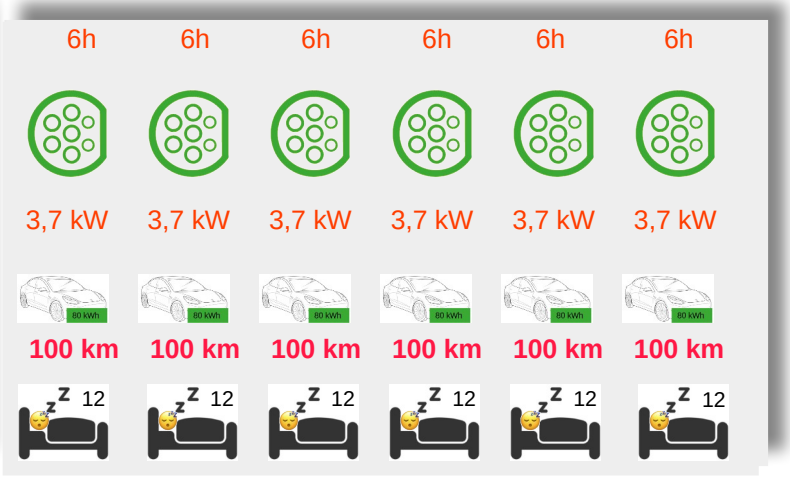












Charging Station Regulation ...

... is the biggest cost driver for charging stations

Verordnung über technische Mindestanforderungen an den sicheren und interoperablen Aufbau und Betrieb von öffentlich zugänglichen Ladepunkten für elektrisch betriebene Fahrzeuge 1

- Eingangsformel
- § 1 Anwendungsbereich
- § 2 Begriffsbestimmungen
- § 3 Technische Sicherheit und Interoperabilität
- § 4 Punktuelles Aufladen
- § 5 Anzeige- und Nachweispflichten
- § 6 Kompetenzen der Regulierungsbehörde
- § 7 Ladepunkte mit geringer Ladeleistung
- § 8 Übergangsregelungen
- Schlussformel

Bundesministerium der Justiz

Bundesamt für Justiz

SIMPARQ

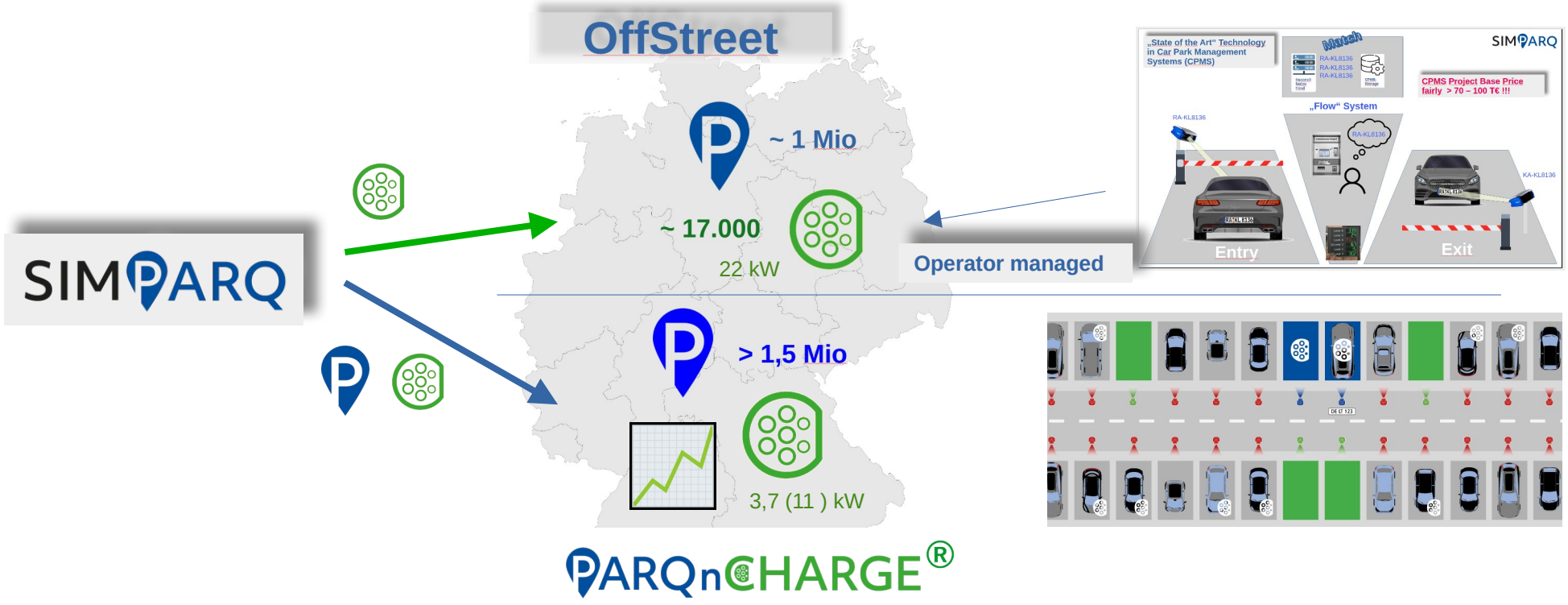
Bundesministerium der Justiz | Bundesamt für Justiz

§ 7 Ladepunkte mit geringer Ladeleistung

Ladepunkte mit einer Ladeleistung von höchstens 3,7 Kilowatt sind von den Anforderungen der §§ 3 bis 6 ausgenommen.

SimParQ nutzt diesen 3.7kW Vorteil ...
... Ladepunkte sind viel günstiger (20% von €2.500)
… und benötigen keine zusätzliche Infrastruktur
„Hausnetz“ reicht meistens für ~ 30 Ladestationen!

3,7 kW (*11kW*)



3.7 kW is ideal for neighborhoods (with the lowest CAPEX – no need for infrastructure expansions), especially in terms of quick payback in sharing models. (11KW inherent – for non public use!)

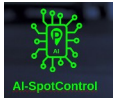
At 3.7 kW, BEV charging becomes attractive for parking operators!
E.g. Overnight in garages / Airport charging during the traveler's absence

First AI-Integrations…

without

OCR LP-Recognition

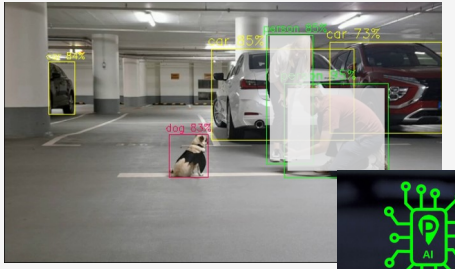
with AI



Inference Analysis of NLP / Situations + Gen AI (fut.)

Clustered (fenced) Parking Spaces for different pre-determined Use Cases

void



AI-Use Case Identfication @ Spot→ Chaotic Parking possible

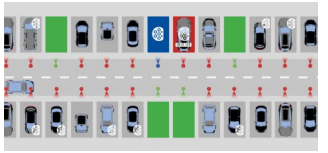
Enabling Future …e.g. Touch Point Marketing

Fachhochschule Dortmund

FB Informationstechnik
Prof. Dr. Björn Schäfer

SPICE – Smart Parking & Integrated Charging Ecosystem
- funding requested -

SIMPARQ



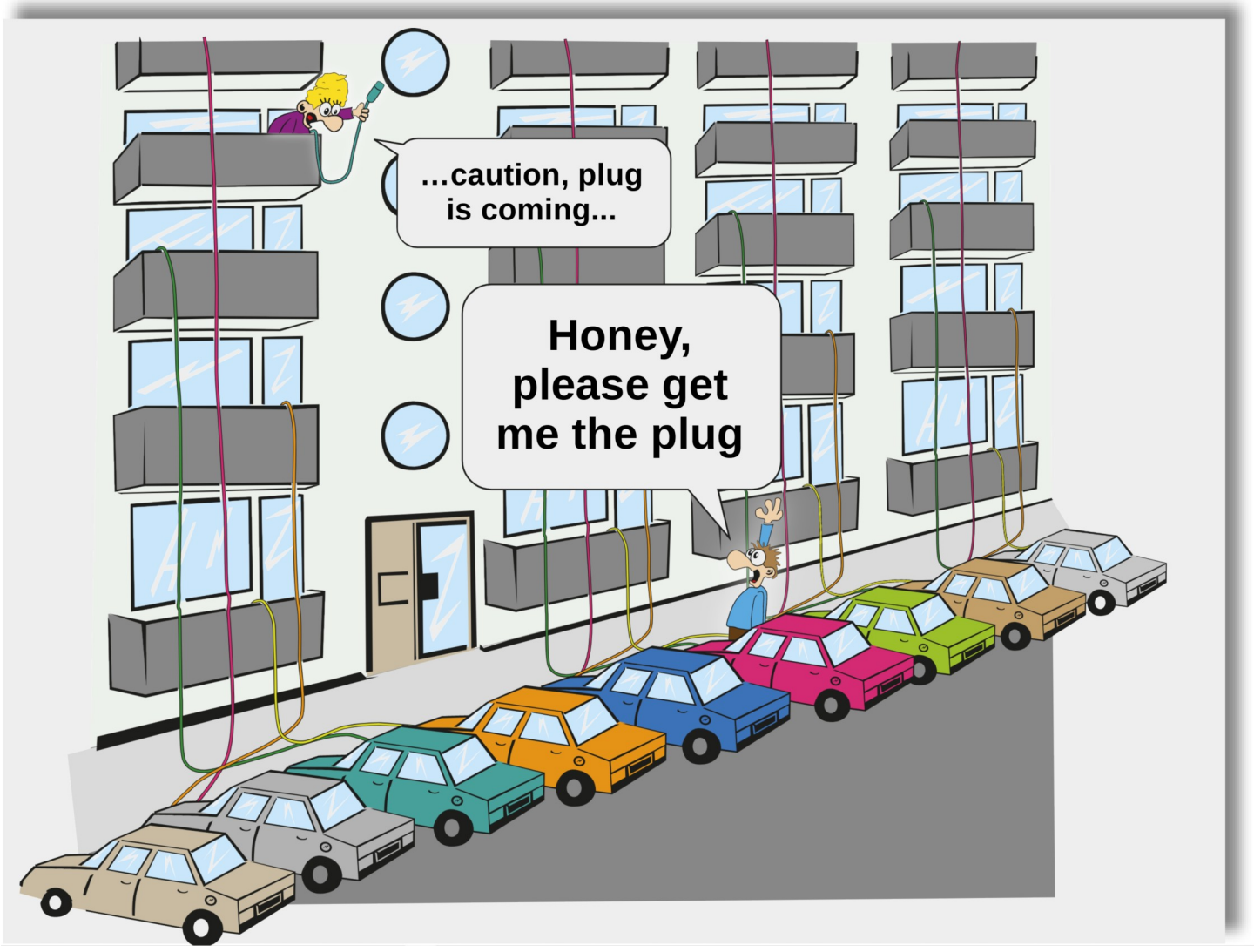
Research collaboration with a focus on applied AI methods in Smart Mobility

- **Implementation of innovative smart mobility services** such as parking reservations with EV charging, indoor navigation, and dynamic space repurposing
- Integration into **Urban Digital Twins** for accurate, semantically rich infrastructure mapping and real-time updates powered by SimParQ data
- **Connection to municipal data platforms** enabling expanded parking guidance, live traffic information, and energy forecasting
- **User-friendly communication through AI language models (LLMs)** as an alternative to complex apps, including natural language and voice interaction – enabling new business models!
- **Enhanced license plate recognition using deep learning models** (YOLO, OpenALPR) for higher data quality and more efficient operational processes
- **Machine-learning-based forecasting** for dynamic pricing, occupancy prediction, and precise energy demand modeling

SIMPARQ

Smart Mobility

✨ Thank you for your time and attention! 🚗⚡

SimParQ GmbH
40670 Meerbusch

Karl Grote (CEO)
Karl.grote@simparq.com