strategy&
Part of the PwC network

EV Charging Market Outlook

A quest for profitable growth in the fast growing, yet highly competitive, EV charging market

EV Charging Market Outlook

Focus areas and our approach

Global viewpoint focused on key regions (Europe, US and China) developed by Strategy& and PwC covering:

- Underlying market drivers, value chain definition and key revenue pools
- Ways to play to realize the revenue pools, their 2035 potential and current financial performance per way to play
- Considerations for profitable growth going forward per way to play

Deep dives:

- Public fast charging operator and owner way to play
- Deal making activity by deal type, way to play and acquirer

Our insights are based on:

- ✓ Interviews with industry executives and analysts and
- ✓ Insights from work by PwC Autofacts® and Data Insights teams
- ✓ Customer survey with a focus on the US, EU+ Norway and China (n = 3,000+)

100bn+ EUR market in ’35 chased by strong competition fuelled by high M&A activity, profitable growth requires focus

Market drivers and value chain

- **By 2035,** BEVs to account for **60-90+%** of new sales leading to **370+m BEV parc** across Europe, US and China
- **210+m** required charging **infrastructure** build-up for the BEV parc
- **Battery capacity/ charging speed, dwell-time** and **access** to a location determine where charging happens
- Private (slow) charging to account for **most chargers**, but **public fast charging** being the **fastest growth** segment in energy used and lowering end user “range-anxiety”

Ways to play and financial performance

- **100+bn EUR** charging sales market by ’35 (excl. electricity sales), a shift **from one-time** HW, installation sales to **recurring** operational sales on public infrastructure to its owners and value added mobility and energy services
- Many **established and new** players compete for market share **combining one** or **more steps** of the value chain through one of **7 ways to play**
- While most plays show **strong growth** (40+% p.a.), so far, **only select few** providers have a **positive EBITDA**

Considerations for profitable growth

- True value of charging unlocked when **capabilities across various traditional sectors** brought together
- Products and services to be **designed end-to-end** with **B2B and B2C customer centricity** and integrations across the ecosystem to enable **seamless user experience and unlock recurring life-time value**
- **Choice** and **build up** of **sales channels** is key to **growth**
- **Operational excellence** and **cost base control** while maintaining strong access to capital important to **scale and grow profitably**

CPO deep dive

- The highest (>6x) **EV/Sales (23B)** multiples observed
- Business model with **high capex**, but **strong returns/ payback** possible if infra-structure **utilised** – leading Norwegian market with **~2-5 year** payback

M&A deep dive

- The market sees a **push for consolidation** – Out of ~300 tracked M&A deals (‘12-’22), **financial sponsors accounted for 40%** with inter-sector players 20%, O&G/Utilities 17% and automotive players for 3%

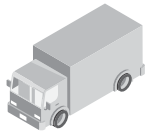
Source: Strategy&

Underlying market drivers, value chain definition and key revenue pools

While there are an increasing number of use-cases for charging of all road transport types, light vehicles are the most mature

Electrification by transport type

Light vehicles

Road trans. type	 Passenger cars	 Light vans	 City buses	 Heavy vans	 Other buses	 Trucks**	 Off-road
Typical driving	3 trips per day á 12km*	20-250 km per day (multiple stops)	Continuous driving during day	Distribution routing (long/short)	Daily long distance trips	Long distances and day/night driving	Various usage in industrial and construction sectors
Charging location	Mostly private – public on long-distance trips or if private unavailable	Charge at workplace, on the road and at home	Charge at destination/end stop or depot hub	At workplace, destination/hub or on-the-road	At destination or private hub	Charge at client site + hub	Mostly private charging
Battery size	~50 kWh (e.g. VW ID.4 Pure) to ~120 kWh (e.g. Lucid Air Dream)	~35 kWh (e.g. MB E-Sprinter) to ~90 kWh (e.g. Maxus eDeliver9)	80-300kWh+	120kWh+	200-600kWh	500-1000kWh+	300-600kWh
Charging speed	Depending on location, grid and dwell time <22kW-150+ kW			<22kW-600kW+			<22kW-350kW+
Maturity***							

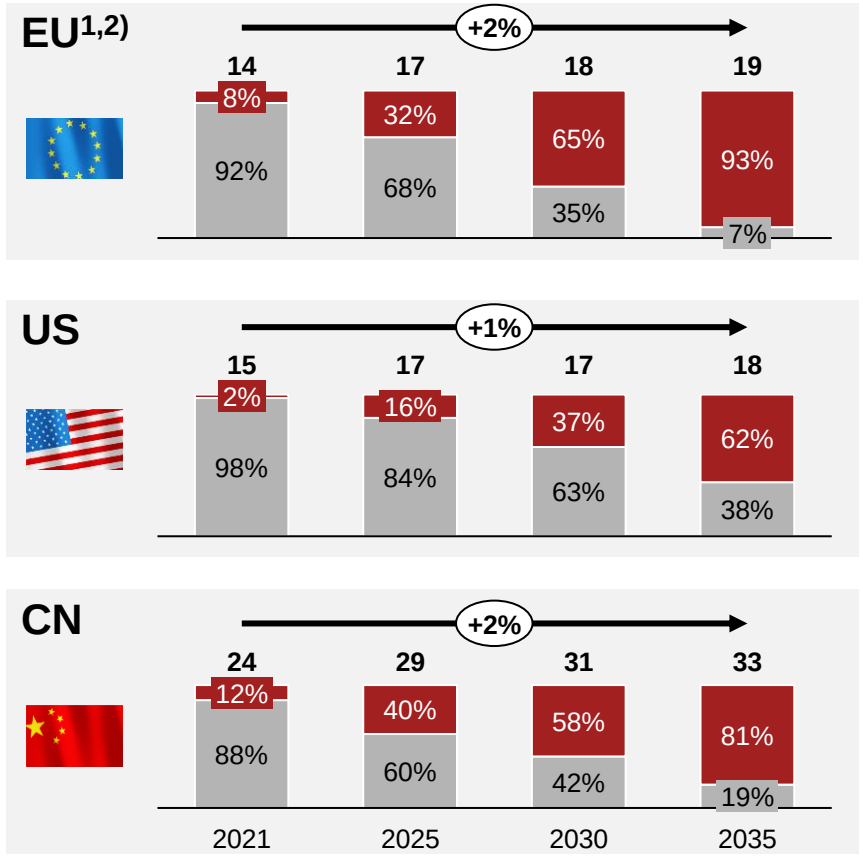
* Varies by region with especially US drivers driving longer distances; ** Varies by type of truck – see https://www.strategyand.pwc.com/de/en/industries/automotive/commercial-vehicle-ereadiness.html, https://www.strategyand.pwc.com/de/en/industries/transport/the-dawn-of-electrified-trucking.html ; *** Maturity based on technical availability of models, TCO affordability, charging infra vs charging need

Source: Strategy& analysis

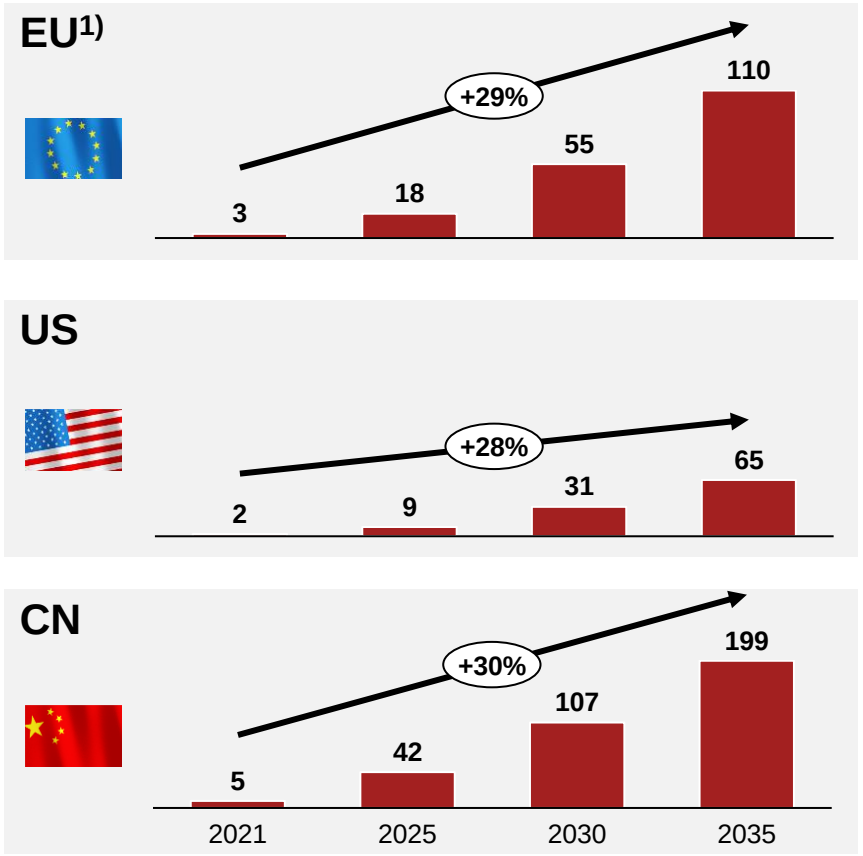
The transformation of the auto industry is in full swing – BEVs with 60-90+% of new sales & 370+m of total BEV parc by '35

Regional BEV diffusion (passenger cars and light vehicles)

Light vehicle sales (million vehicles)



BEV light vehicle parc (million vehicles)



Key takeaways

- The EV charging is coming of age with more regulatory and commercial certainty around BEV adoption with 60+% share by 2035 in US 80+% in CN and 90+% in Europe
- Development in BEV share of new sales in China and US highly dependent on policies to be implemented
- The majority of the parc will remain non-BEV in '35 due to the replacement rate unless further regulation is introduced

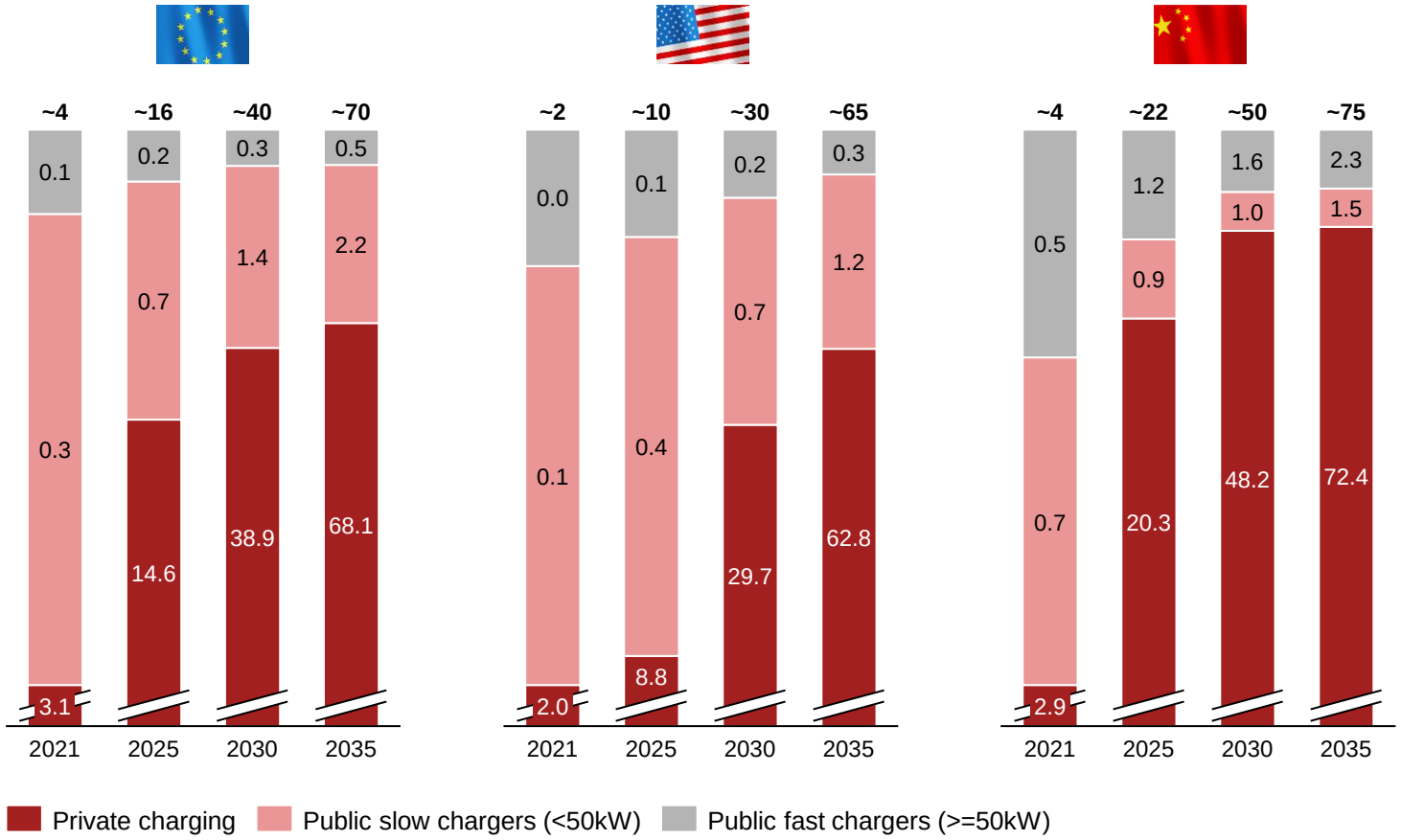
Source: PwC Autofacts analysis; 1) EU: EU27 + UK + EFTA; 2) Assumed below 100% BEV share of new sales in 2035 as it is expected some exemptions for OEMs to clear inventory, biofuels, and exemptions for specific vehicles etc.
BEV = Battery Electric Vehicle

BEV Non-BEV

Leading to a ~210m charging infrastructure needed, charging availability determines the mix of chargers regionally

Charging infrastructure, locations and behaviour

Installed base of charge points by geography (millions)



Comments

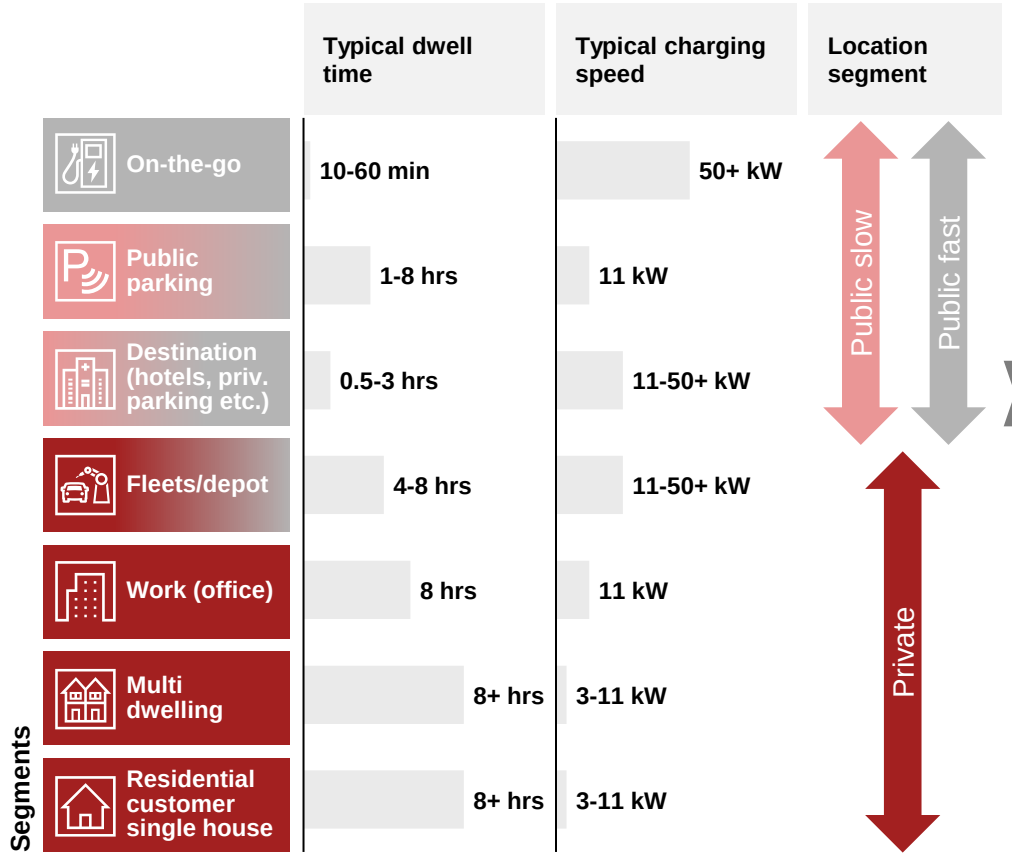
- Growing adoption of BEVs drives the need for charging infrastructure leading to a ~210m installed base of charge points in 2035
- Overall, private AC/slow chargers will form the majority of the installed base as consumers prefer charging at home or at work, where dwell time is higher
- While the US BEV parc will still be smaller than the EU BEV parc in 2035, the US driving patterns drive a larger need of charge points relative to the parc size
- For China, the starting point is a proportionately larger share of public fast, yet not well utilised/located chargers. Going forward some of the public fast charging will be served by battery swapping

Source: Strategy& analysis

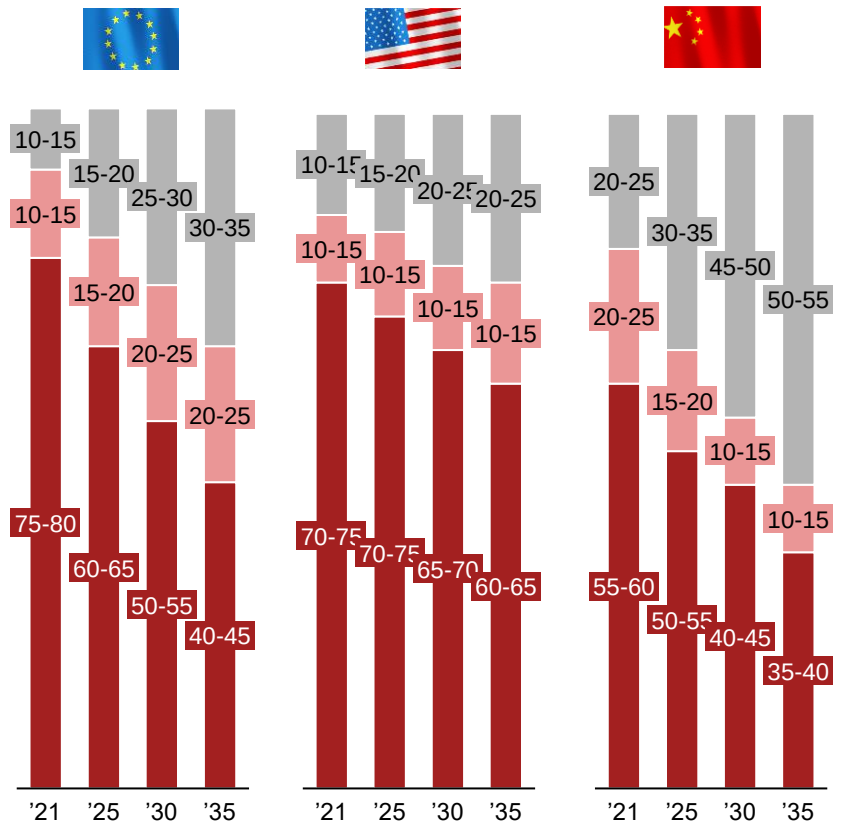
Public fast chargers to capture a growing share of electricity demand, driven by on-the-go and destination charging

Charging segments and behaviour

Charging locations and use cases



Charging by location (% of electricity demand)



Comments

- Aside of battery capacity/ charging speed, dwell-time and access to a location determine where charging happens
- Destination and on-the-go charging represent the best use case for fast charging given low dwell time
- Public fast chargers to capture a growing share of electricity demand due to higher and increasing average throughput as car and charger speeds increase

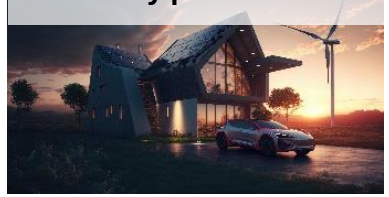
Private charging | Public slow chargers (<50kW) | Public fast chargers (>=50kW)

Source: Strategy& analysis

The EV charging value chain has six main revenue pools, ranging from charge point hardware to additional VAS[1)]

Main revenue pools and model parameters

Charging market components for private and public charging segments

Charge point hardware	Charge point software	Land and asset	Electricity provision	Charger related services	Add. e-mobility Software led value added services
					
• Production/sale of charge point hardware (AC and DC chargers) and necessary accessories, incl. wholesales and resell/financing margins	• Development of software to operate and monitor the charge point, i.e. Charge Point Management Systems (CPMS)	• Real estate rights and ownership of one or multiple charge stations with related CAPEX cost	• Energy procurement contract (including GoOs) • Local distribution system operation responsible for operating infrastructure necessary for electricity supply to the charge point station (at required power level)	• Hardware service provision, incl. installing all charge point components • Management/operations of charge point network (sourcing electricity, maintenance, IT network, customer service etc.)	• Access to and admini-stration of charging service to end customers across multiple CPO networks (incl. roaming), i.e. E-Mobility Service Provider (EMSP) • Other software driven services
End customer price per charger	Monthly subscription fee per charger	Value earned on ownership of charger and location rights	EUR/kWh cost (energy + grid connection) charged to CPO	Cost per charging station and allocation per charger and socket + costs to operate and develop charger network	% applied on top of charging fee going to the CPO

Trend towards aggregation of Revenue pools by charging players – either in-house or via strategic partnerships

Revenue pools currently out of scope: Demand from PHEV/Electricity hedging/Smart energy (vehicle to grid and behind the meter solutions)/additional digital and non-digital Value Added-Services for end consumers, operators and owners

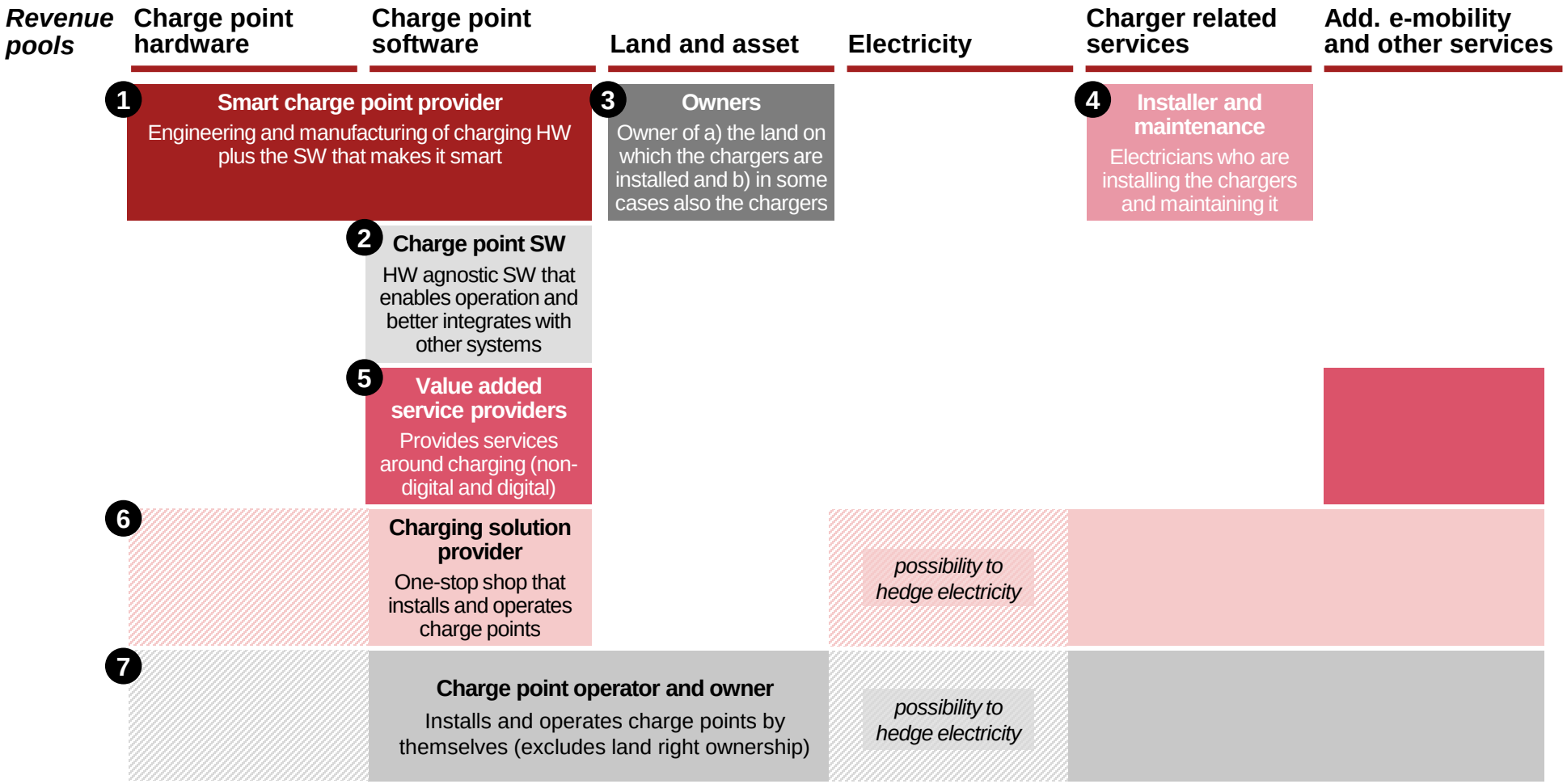
1) Value added services
Source: Strategy& analysis

Key revenue lever

Ways to play to realize the revenue pools, their 2035 potential and current financial performance per each

Across the charging segments and revenue pools we see seven key plays tapping into one or more pools

Ways to play in the revenue pool/customer segment matrix



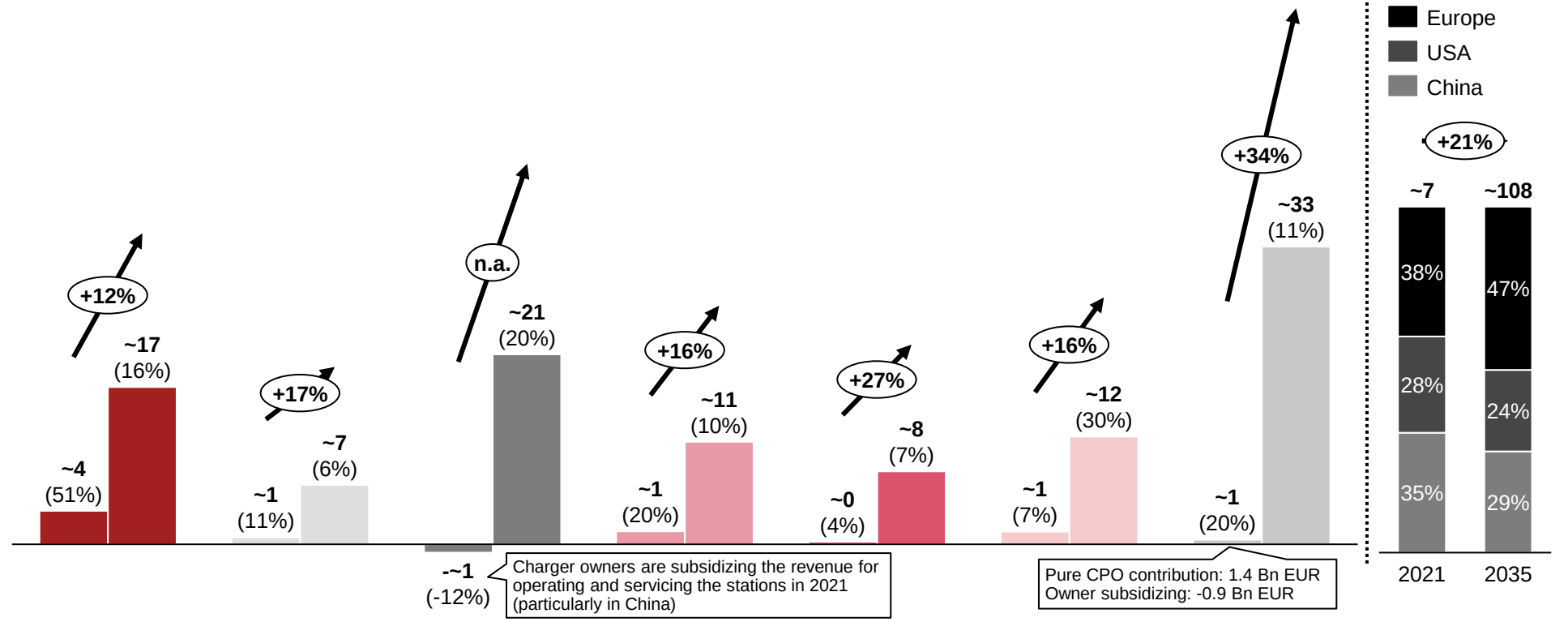
- Taking the 6 revenue pools, we see 7 distinct ways to play in the emerging EV charging ecosystem
- On the one hand focused plays targeting purely software or services; a hardware only play will no longer work (needs strong SW/integration)
- On the other hand combinations of revenue pools into end-to-end solution providers or operator and owner plays

Source: Strategy& analysis

100bn+ charging market by '35 with strong growth across plays, market sees shift from one-off sales to recurring revenue models

Revenue pool size[1)] for each way to play, excl. electricity[2)] 2021-2035

Revenue pool development 2021-2035 per business model [EURbn], market share of year total [%], and CAGR [%]



1. Smart charge point provider
2. Charge point management software
3. Owners (site and charger)
4. Installer and maintenance
5. Value added service providers
6. Charging solution provider
7. Charge point operator and owner

Total

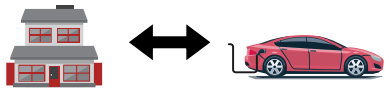
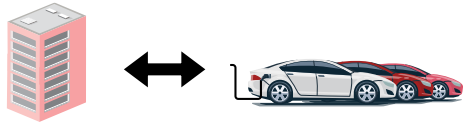
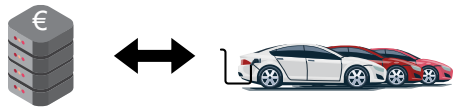
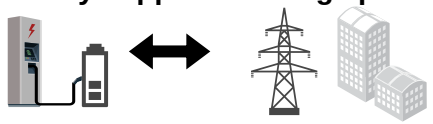
Comments

- Shift from one-off HW and installation services to recurring operation and value added services
- Smart charge point providers with slowest growth due to combination of needed further roll-out and HW upgrade and falling HW costs
- Owners in 2021 with negative value due to operational costs not leaving any revenue left for the infra owner – more mature market in '35 allows for significant revenue capture by owners
- Additional e-mobility and other services doubling in share of total revenue pool as the market matures, enabled by SW integrations and optimisations

Note: 1) Revenue available; 2) Revenue pool for electricity not included in graph (EUR ~4bn in 2021 and EUR ~120bn in 2035), this revenue pool will become increasingly addressable through the adoption of BiDi and taking trading and hedging positions
Source: Strategy& analysis

With BiDi charging and BESS availability, additional revenue pools open up in energy management behind & in front of meter

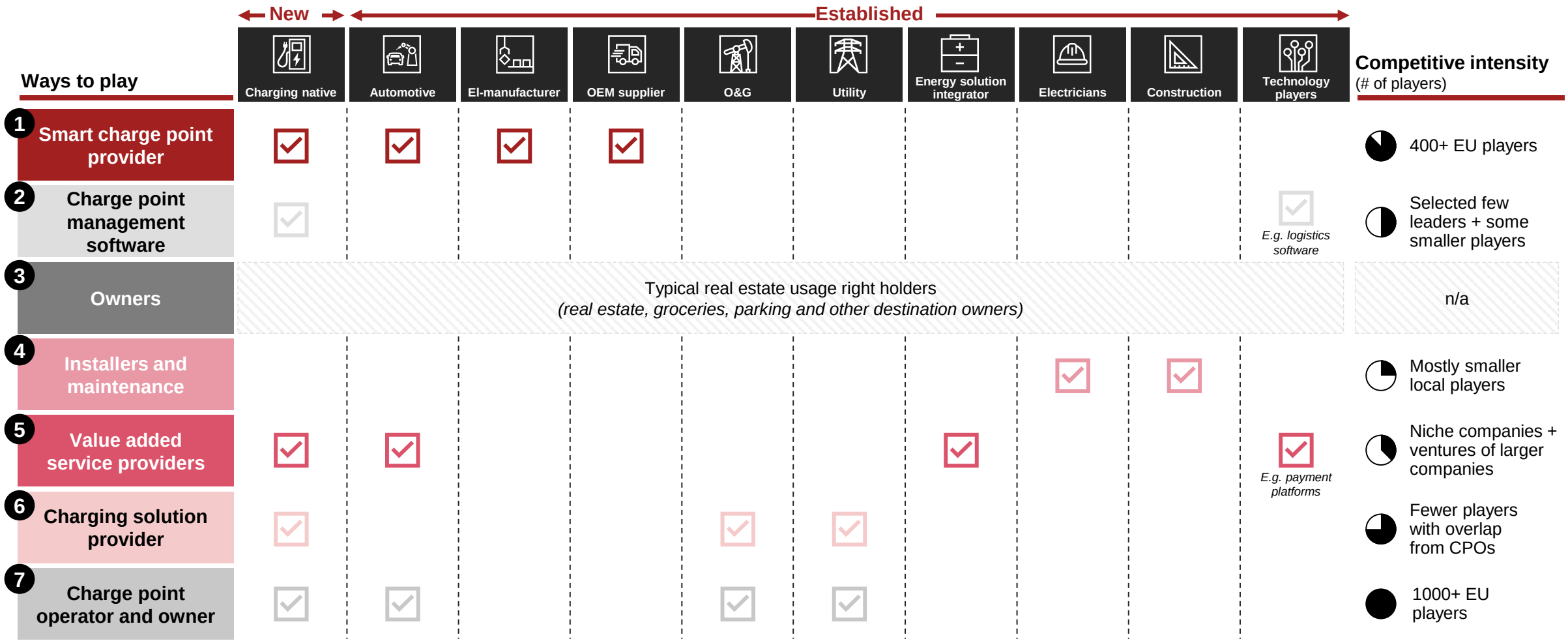
Additional charging revenue pools – selected players

		Type of charging	Smart charging	Bidirectional charging
			V1G 	V2G 
Behind the meter	Cost and consumption optimisation at single asset	Load balancing/ peak shaving	**Storage at private location** 	• Adjust charging power to solar production • Modify charge rate or charge time • Define charging strategy	• Use EV battery as stationary storage for residential home or emergency power bank
			Cloud storage at condominium 	• Equip parking spaces with wallboxes 1:1 • Manage limited charging power	• Use fleet of EVs as cloud storage for solar buffering and peak shaving
In front of the meter	Value maximisation across multiple assets	Asset backed trading	**Asset backed trading** 	• Charge EVs whenever wind generation exceeds grid capacity	• Build up storage capacity based on EV fleet for wholesale trading
			Battery supported charge points 	• Battery supplemented load mgmt. • Batteries can be charged when demand in grid is low and support charging in times of high demand	• Selling battery capacity to local DSO flexibility markets
		Frequency containment reserve (utilization level monetisation)	**Frequency containment reserve** 50Hz ▲ FCR 	• Huge basic set of charging EVs allows prequalification for ancillary services	• Prequalify fleet of EVs for frequency containment reserve just like dedicated stationary storage

Note: BiDi – Bi Directional, BESS – Battery Energy Storage Systems, DSO – Distribution System Operator
Source: Strategy& analysis

The charging market attracts many new and established player types competing regionally and globally for market share

Type of players active across the strategic plays



Source: Strategy& analysis

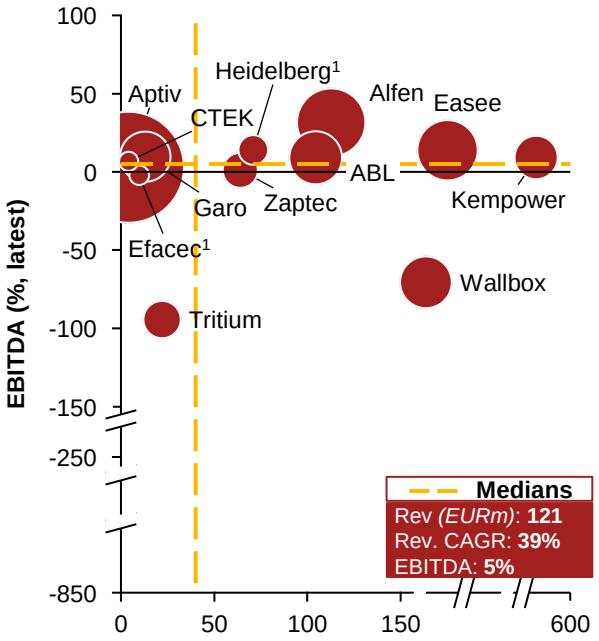
● High competitive intensity ○ Low competitive intensity

While most plays show strong growth (40+% p.a.), only select few providers (mainly SCCPs) have so-far a positive EBITDA

Financial performance selected players with publicly available financials per way to play

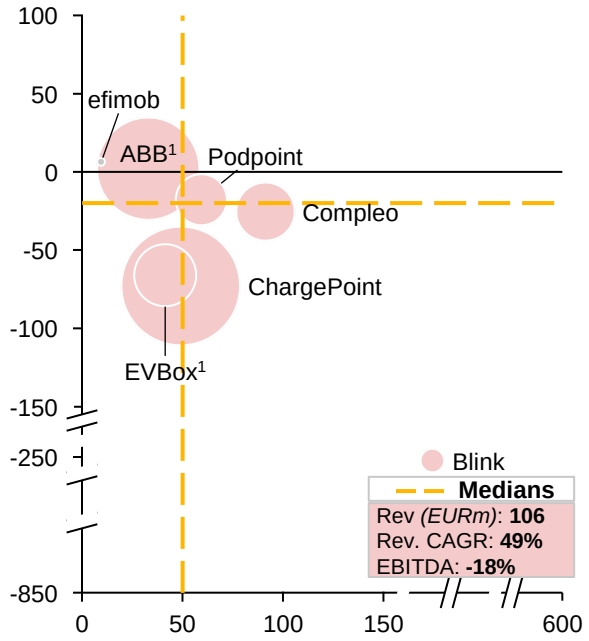
EBITDA margin (%) vs. '19-'22[1)] revenue CAGR (%)

Smart charge point provider (SCCP)



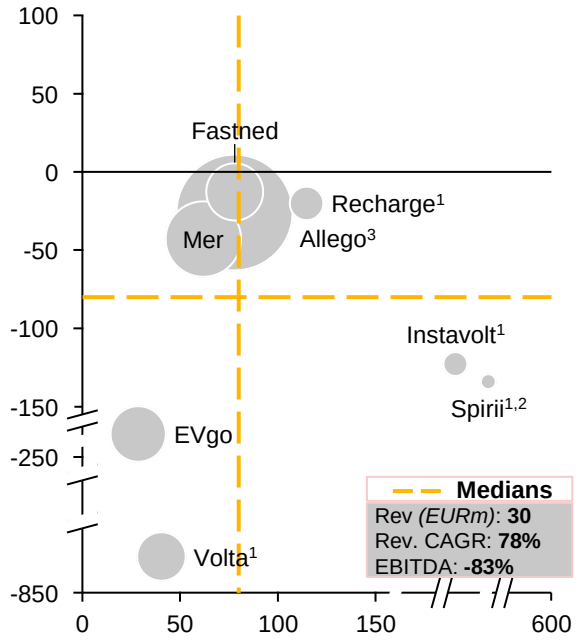
Most mature business model with volume and set up to allow for positive EBITDA already while growing fast

Charging solution provider



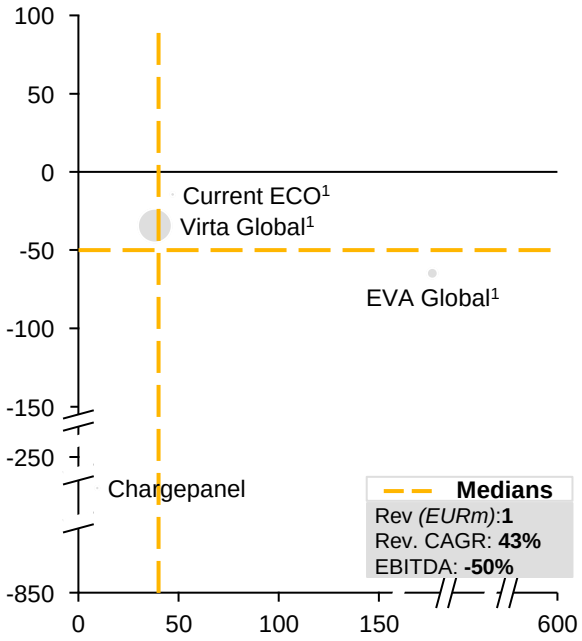
Slightly negative EBITDA margin, but they are showing strong growth

Charge point operator and owner



Infrastructure-like cash-flow profile, low utilization drives negative EBITDA, but strong roll-out and sales CAGR

Charge point management software



Data available only on a few companies, growth phase and early adoption drives negative EBITDA

Note: 1) If not published 2022 financials, EBITDA % '21 and CAGR '19-'21 is used 2) 2) Spirii's growth is calculated based on gross profit (estimated revenue based on 60% GM) 3) Revenue based on Q3'22 full year 2022 guidance, EBITDA margin based on YTD Sep'22 revenue and YTD Sep'22 EBITDA

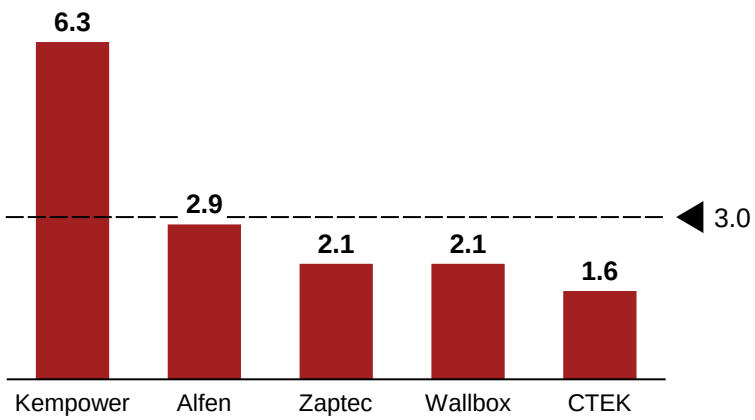
Source: CapitalIQ, Valu8, Eikon, Orbis, Company reports

Size by Revenue (EURm)

CPOs and owners with highest EV/sales multiples, reflecting strong investor sentiment

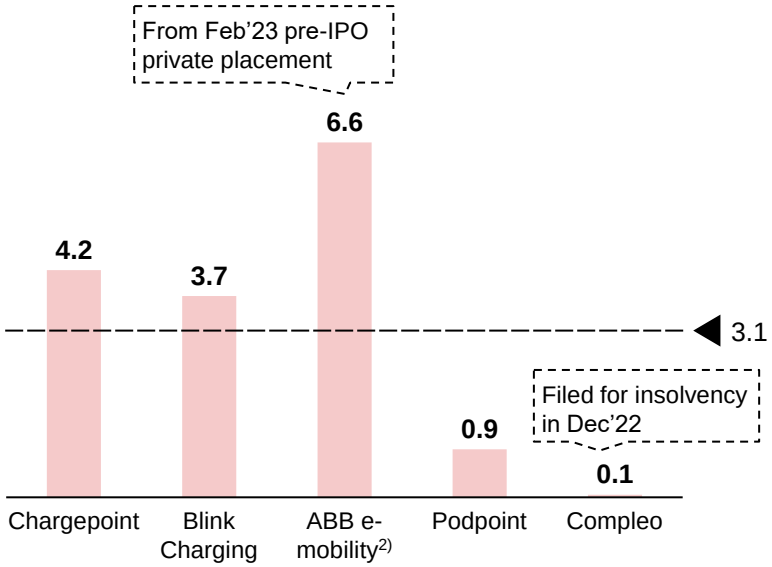
EV/sales ('23E) multiples[1] per way to play for publicly listed players EV/sales

Smart charge point provider



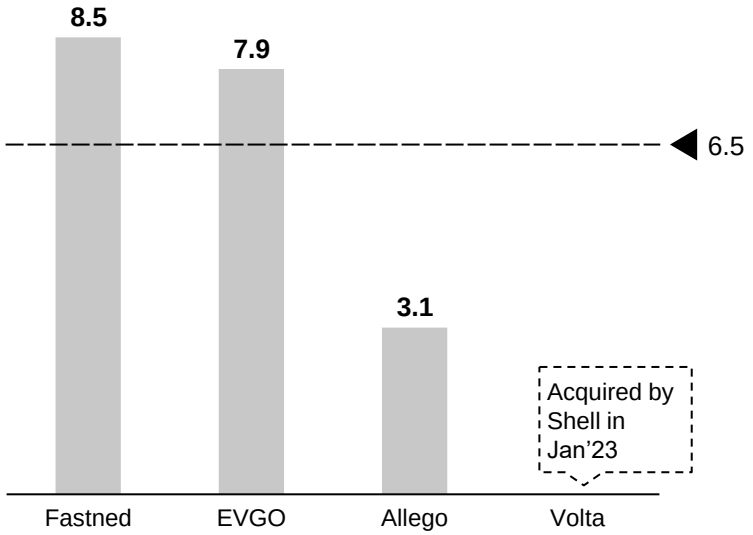
Smart charge point providers trading at attractive EV/sales multiples with still strong outlook, although their growth is expected to slow following the next 5-10 years of significant infrastructure ramp-up

Charging solution provider



Solution providers are struggling to scale profitably, leading to financing issues for certain players, whilst market leaders (like ChargePoint and Blink) are expected to grow strongly and trade at higher multiples

Charge point operator and owner



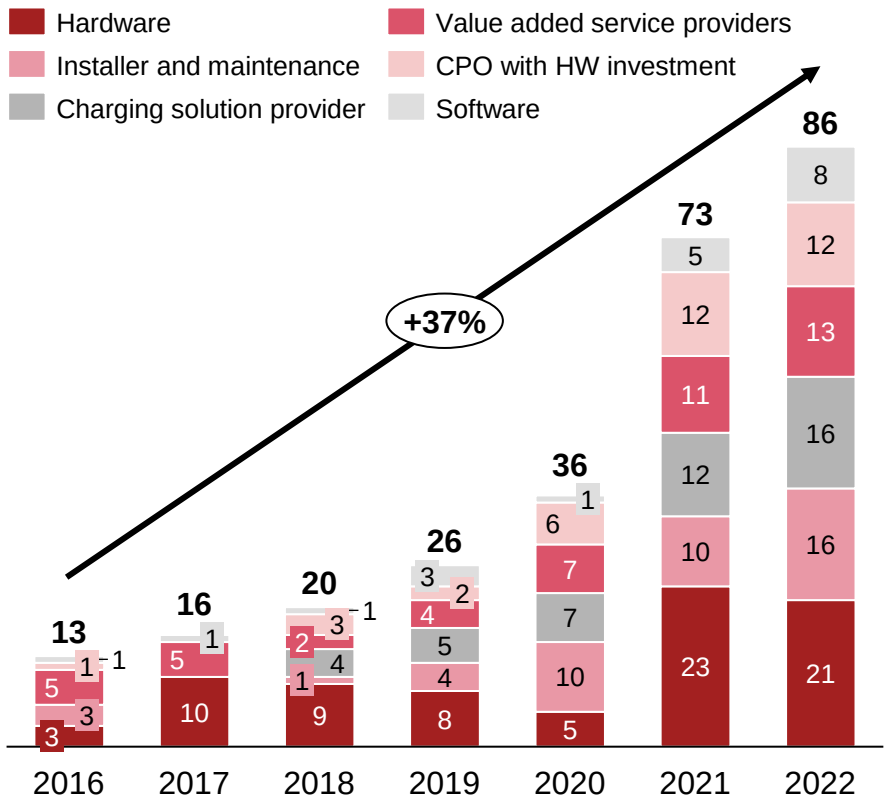
CPOs and owners trade at highest EV/sales multiples as these are expected to capture a large share of future revenue pools as the installed base grows and charger utilization increases

Note: 1) as of 26th April, 2023 2) CHF325m raised for 12% equity (CHF 2.7bn valuation) and 2022E revenues of CHF ~410m (CMD Feb'22 estimate). USD/CHF exchange rate of 0.9 used.
Source: Capital IQ, Strategy& analysis

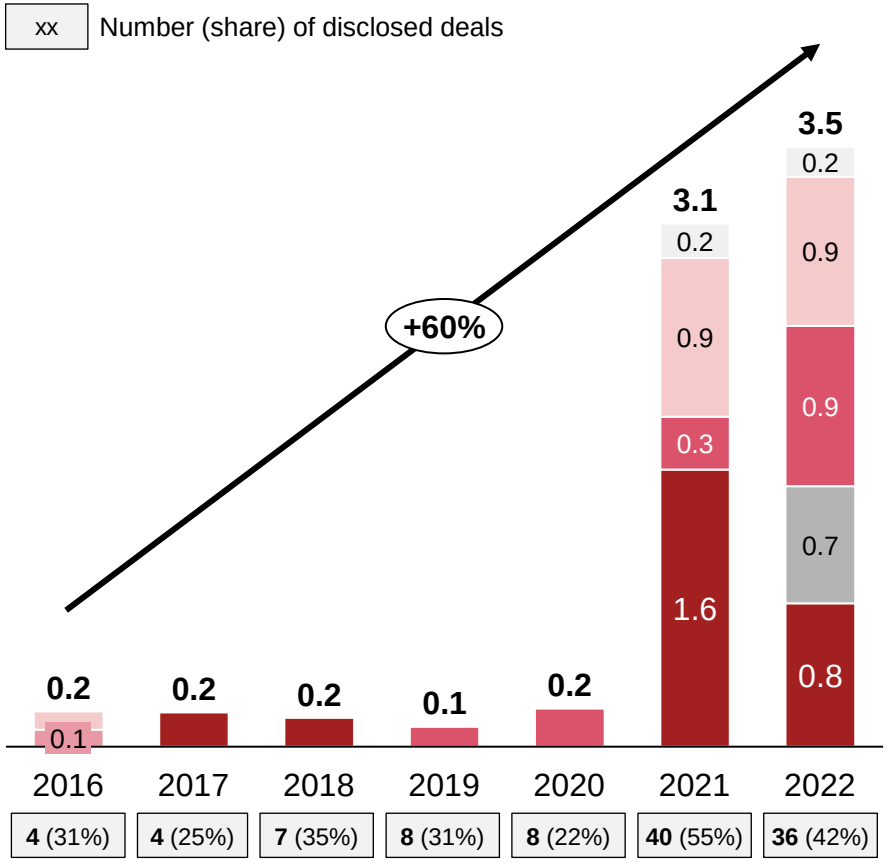
Strong increase in M&A deals recently with highest activity within HW and increasing interest across other ways to play

Number of EV charging M&A deals[1] and transaction value of disclosed deals

Number of EV charging M&A deals[1] per way to play



Transaction value EURbn (disclosed transactions)



Comments

- Strong increase in M&A deal activity in ’21 and ‘22
- 86 M&A deals[1] in ’22 (out of ~300 transactions – see Deep dive 2, of which the 36 disclosed deals amounted to a deal value of EUR 3.5bn (avg. EUR ~100m)
- Hardware investments account for a significant share of the deals (~30%), but lately there has been strong increase in activity across other ways to plays

Note 1) M&A deals include the PitchBook deal types *Buyout/LBO; Corporate and M&A and PE Growth/expansion*. Early stage financing, public markets deals and debt financing deals are excluded here. See Deep dive 2 for more details
Source: PitchBook, Strategy& analysis

Considerations for profitable growth going forward per ways to play

Focusing on select business model considerations dependent on ways to play will be key to achieve profitable growth

Business model considerations by ways to play

Ways to play	Selected elements of business model	Considerations for profitable growth going forward – capabilities to develop
1 Smart charge point provider	➡ **Sell as many chargers as efficiently through scalable channels with smart features to monetize installed base through asset lifetime**	• Design with lifetime value (SW and services) and wider energy/mobility ecosystem integration • Global production (inhouse/contract manufacturing) and quality control • Strong sales channels and partner network focus including end user and installer activation
2 Charge point management software	➡ **Increase adoption of latest software across the installed base as the EV charging hardware roll-out accelerates, usage and integration pricing**	• Clear customer value proposition with key functionality to operate charge points efficiently • Cloud-based solutions with self-service sales and marketing to enable maximum scale of cost-base • Modern UI, intensive collaboration to capture data and generate insight/increase uptime
3 Owners	➡ **Income from rental of premises to CPOs, dwell time spend at destination and potential to co-own chargers with usage linked returns**	• Consider ownership options (land only vs. land + charging infrastructure) • Offer attractive adjacent offerings to consumers and attract other businesses to locations • Ensure an intelligent utilization of charge points
4 Installers and maintenance	➡ **Install as many chargers as possible and become point of contact for customer support and hardware maintenance**	• Become a go-to resale partner for hardware providers • Maintain local footprint and proximity to clients • Strong after-sales offering
5 Value added service providers	➡ **Capture sustainable share of revenue from existing players/end-users as the market matures, enabled by software integrations**	• Enable seamless EV charging user experience • Integrate with the wider charging ecosystem • Leverage data to deliver increased value through insights and analytics
6 Charging solution provider	➡ **Grow installed base and monetize land owners through a complete charging solution delivery**	• Software-driven with hardware provisioning through contract manufacturers • Customer centricity and integration in customer journey • Maintain cost-base control and strong access to capital while scaling
7 Charge point operator and owner	➡ **Maximise electricity throughput while maintaining electricity mark-up and cost to serve across the charging network**	• Clear location strategy (public/fleet) securing key sites early and optimize against grid availability • Customer centricity and integrations (car/routing, payment, dwell time location attractiveness) • Cost base control (HW, el-prices), operational excellence and optimize own vs third party[1)] financing

Note: 1) Third party typically include financial sponsors such as infrastructure funds
Source: Strategy& analysis

Deep dive One:
Public fast charging operator and owner

CPOs must manage the various stakeholders efficiently to enable the best possible charging experience for EV drivers

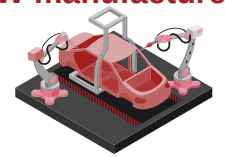
Charge point operator (CPO) ecosystem

Charging station location owner
Business that provides EV charging at their private or public locations (such as gas stations, retailers, public car parks etc.)

Roaming platform
MSPs and CPOs collaborate with roaming platforms to ensure broadest charging network possible (aggregators)

EV driver / user (B2B & B2C)

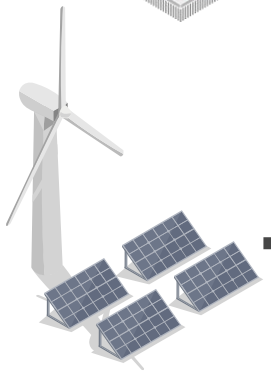
Car OEMs & charger HW manufacturers

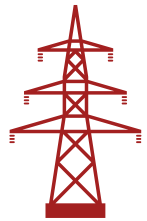


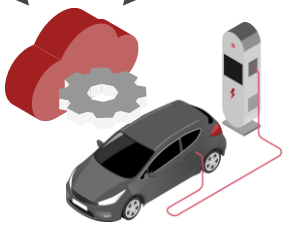
Subscription
EV driver subscribes to eMSP platform

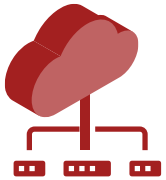
Hardware
Car OEMs are building EVs with more powerful batteries that provide longer ranges and higher charging speed

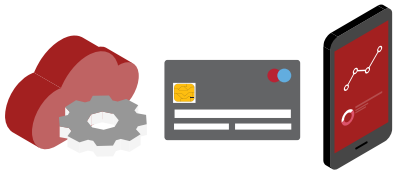
Cheaper and faster chargers are built, and battery energy storage is offered onsite to enable peakshaving











Energy supply
Energy providers supplying energy

TSO/DSO[1)]
Transmission/distribution
Operating the transmission (central) grid and distribution (regional) grids connecting to the charging station

CPO
Charge Point Operator
Installs, manages and operates charging stations through charge point mgmt. software

Roaming agreement
between CPO and MSP

eMSP
Mobility service provider
provide access and payment services to drivers over mobile applications

Regulation
(emissions/tax, permitting, parking, charging standards)

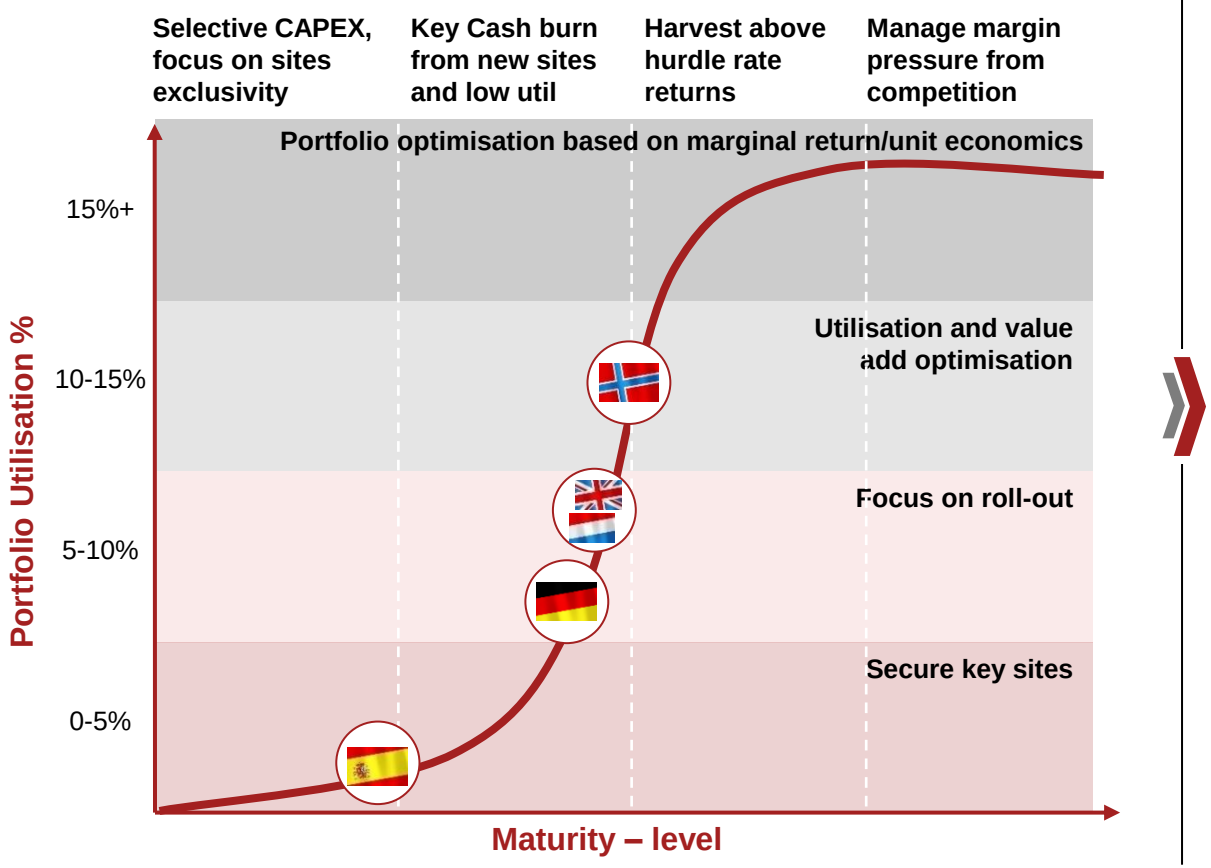
Financing
(banks, regulatory incentives, infra funds, OEMs)

Note: 1) Transmission system operator (TSO), Distribution system operator (DSO)
Source: Strategy& analysis

We expect the CPO business to follow four key development stages based on ability to drive utilisation and maintain pricing

CPO utilization rates – indicative positioning

Public charging utilization rates in selected European countries



Comments

- Assuming an ability to retain price mark-up on purchased electricity, **utilization of installed chargers is the key driver for profitability for CPOs and owners.** From our experience, we observe four key stages of fast public network business build up in Europe with similar lessons globally:

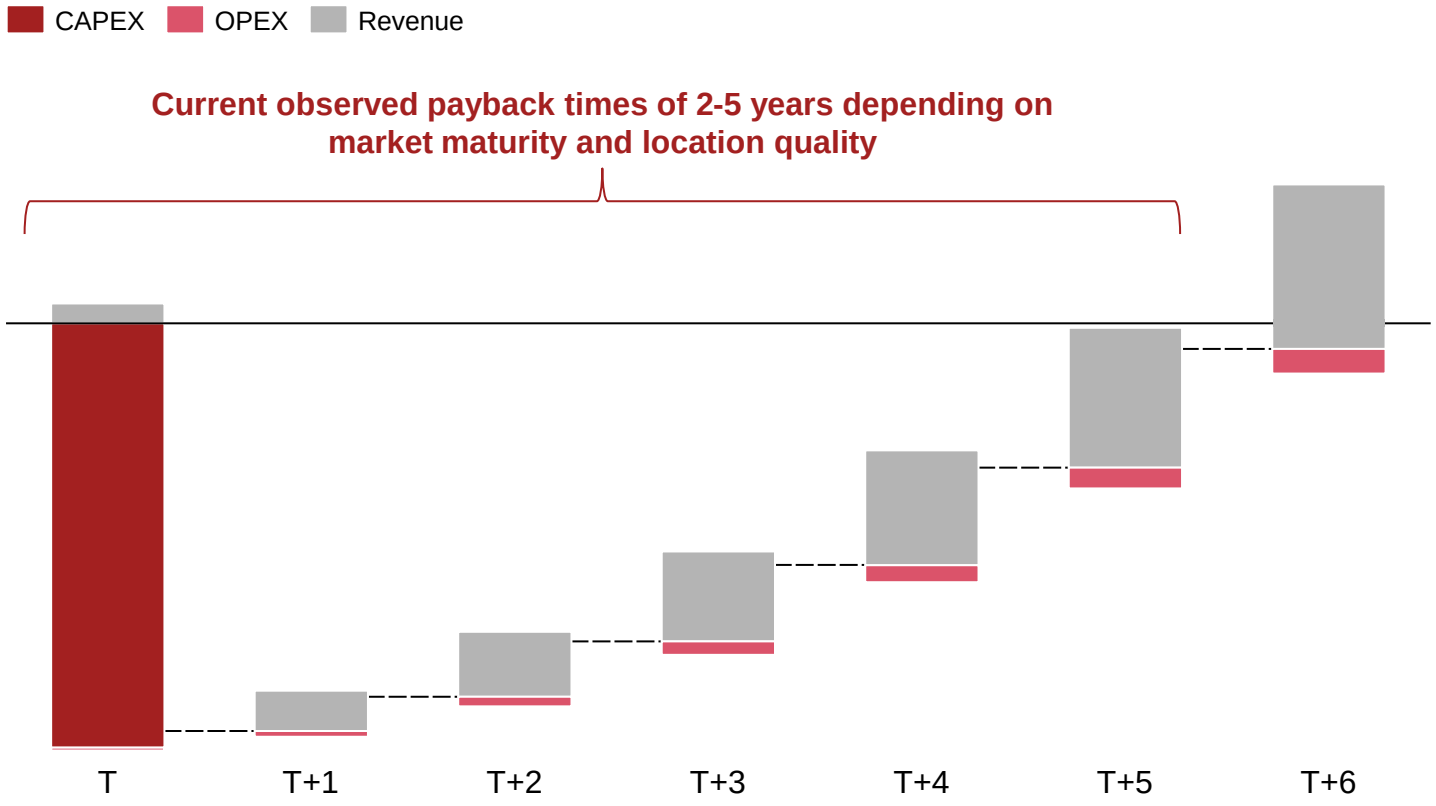
1. **Selective CAPEX, focus on sites exclusivity**
   - When the BEVs stock is low and not so many chargers needed, focus is to secure key sites for future roll-out. Installed chargers typically with utilisation <5%. Italy, Spain at the phase
2. **Key Cash burn from new sites and low utilisation**
   - As BEV sales/stock increase, the focus is on a quick roll-out to avoid charging anxiety. As Infrastructure growth outpaces BEVs, utilisation improves only to 5-10%. Current stage for Germany, UK, Netherlands
3. **Harvest above hurdle rate returns**
   - As the stock of BEVs increase further and utilisation increases to 10-15% like in Norway, the focus shifts to optimising utilisation through right partnerships and additional value add
4. **Manage margin pressure from competition**
   - Going forward, especially in late 2020s/early 30, with increased competition and increased margin pressure to focus on further business network optimisation (managing expansion and closures selectively)

Source: Strategy& analysis

The CPO business model is asset heavy with significant capex, but potential for strong returns and short asset payback

Typical CPO cash flow

Typical CPO cash flow development



Key considerations impacting cashflow

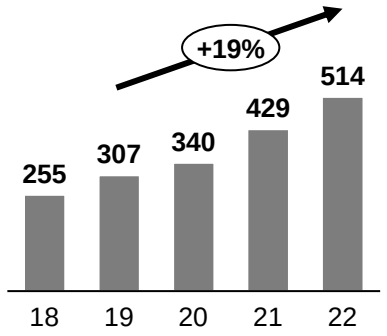
- **CAPEX**
  - Optimise charger power, sub-stations/grid connection, onshore power generation to current demand
  - Scale for future growth (increase # of chargers, higher power/connection) to ensure positive customer experience
- **Revenue**
  - Maximize charger uptime/utilisation
  - Stable and fairly perceived electricity price mark-up with dynamic, demand-based pricing
- **OPEX**
  - Deploy digital and agile support function
  - Prioritise maintenance to maximise asset lifetime and uptime
  - Control power cost through PPA and hedging

Source: Strategy& analysis

Fastned illustrates the unit economics of CPO and owner driving ROIC up through higher kWh per station and stable OPEX

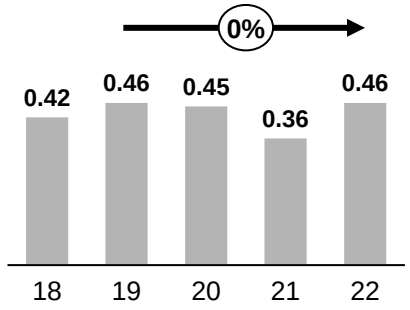
Fastned average station economics[2)]

Initial investment, EURk

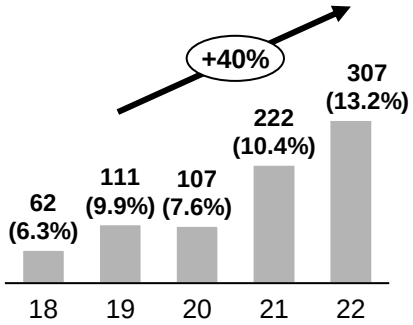


- The growth in CAPEX driven by average number of chargers per station increasing from 4 to 5+ ’21-’22 and related site costs such as grid connections and other station related costs

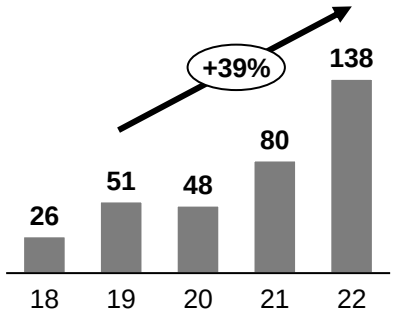
Gross profit per kWh, EUR



kWh per station (utilisation), thousands

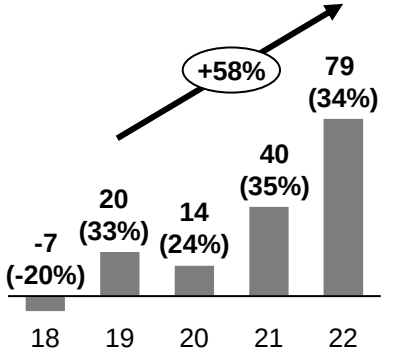


Gross profit, EURk



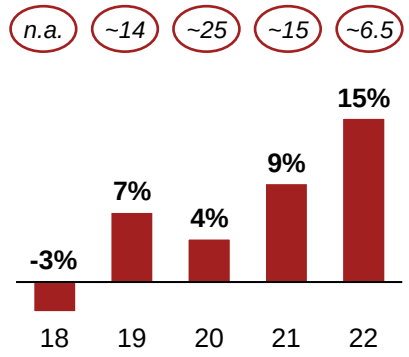
- Despite volatile electricity markets, Fastned has maintained a stable gross profit per kWh
- The strong growth in gross profit per station is driven by the increased utilisation (6% to 13%) and higher power output chargers yielding 50% CAGR in kWh per station

Operational EBITDA[1)], EURk



- The strong EBITDA development is mainly driven by the increased volume
- Operational costs per station remain fairly stable, although larger stations and high inflation drive some cost increases

Station ROIC, %



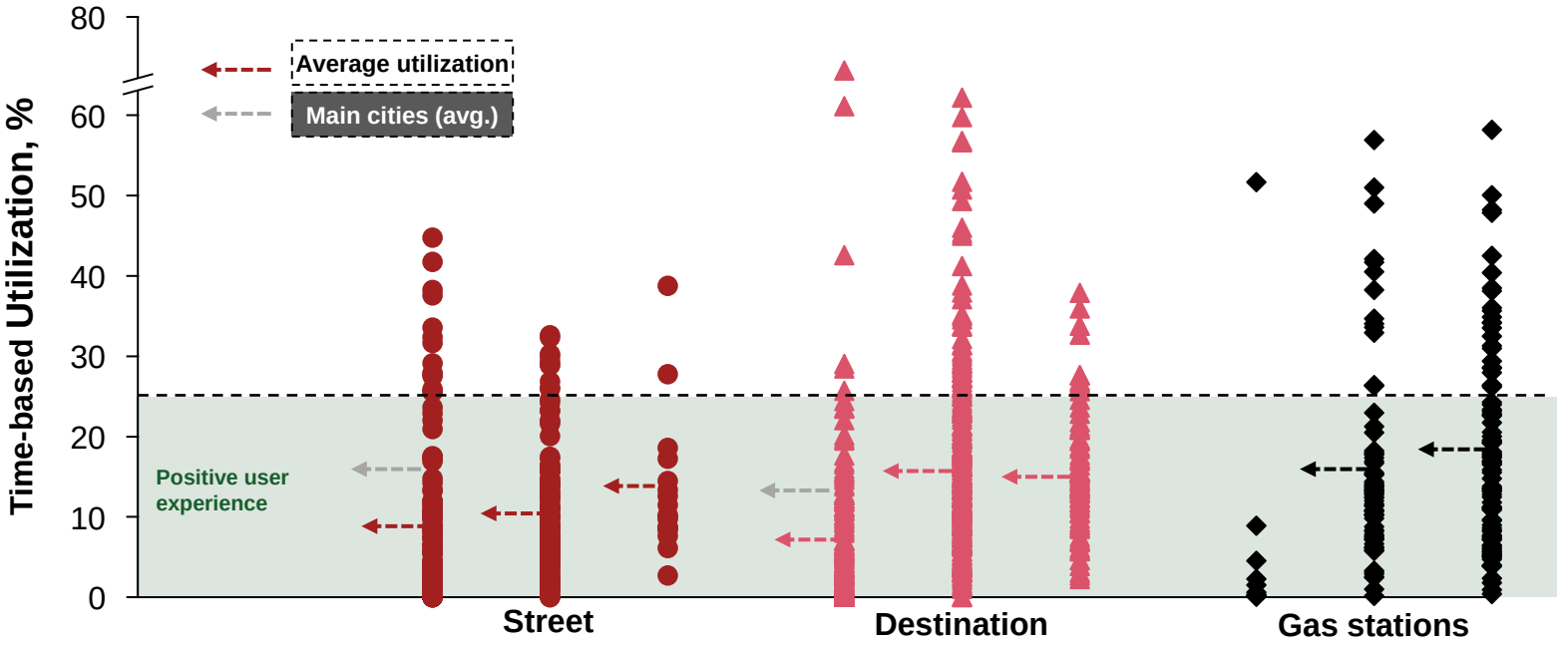
- Utilization is the key driver for higher profitability, as seen by Fastned’s station economics
- Fastned’s current station EBITDA and capex levels implies a station ROIC of ~15%, which implies a 6-7 years payback period

Payback period (yrs)

Note: 1) Operational EBITDA margin is defined as “Gross profit from revenues related to charging + other operating income/(loss) - network operation costs – exceptional item”
2) Annualized Q4 station economics each year
Sources: Company reports, Reuters, Strategy& analysis

In a maturing Norwegian market, observed utilisation reflect positive ROIC and a payback of ~2-5 years for majority of sites in urban areas

Observed time-based utilization[1] and estimated ROIC for Norwegian CPOs



Est. payback[3] (in # of years)	Street: Slow ≤22kW	Street: Fast 50kW[2]	Street: Ultra-fast 150kW+	Destination: Slow ≤22kW	Destination: Fast 50kW[2]	Destination: Ultra-fast 150kW+	Gas stations: Slow ≤22kW	Gas stations: Fast 50kW[2]	Gas stations: Ultra-fast 150kW+
Average (all locations)	~6.0	~6.0	~5.0	~14.0	~3.0	~4.0	n.a.	~3.0	~3.0
Average (main cities only)	~2.0			~3.0					

Comments

- Observed average utilization rates for Norwegian CPOs of ~13% (median of 11%) across ~1000 public charger stations
- Highest average utilization (~18%) observed for the ultra-fast (150kW+) on-the-go chargers at gas stations
  - High traffic volume and limited competition drive demand – customers' low dwell time lead to preference for 150kW+
- AC street chargers with low utilization across the full sample, but if including only chargers in larger main cities, the average is ~18%
- Overall, attractive payback for AC street charging (~3yrs), as well as fast charging at destination and gas stations (~3yrs)
- Achieving higher utilisation levels needs to be considered in connection with "positive user experience" especially avoiding queues (rule of thumb under 25% utilisation)

Note 1) Average observed utilization from 16.12.2022 – 13.03.2023. Based on average of daily computed utilization data from ~1'000 charging stations 2) Only 50kW chargers (e.g. 38kW or 125kW are not included) 3) Using average utilization rates. Charger ROIC = Operational EBITDA/Capex. Payback = 1/ROIC
Source: CPO charging data, Strategy& analysis

Deep dive Two:

Deal making activity by deal type, way to play and acquirer

Different industry players are actively carving out material positions across the EV value chain

EV charging market consolidator archetypes

	A Industry players	B Oil and gas	C Utilities	D Automotive	E Financial sponsors
Description	• Companies **established** in the EV charging market • Seek opportunity to **expand their EV charging portfolio** through additional HW investments (new products and or geos), with additional software and services to strengthen solution offering	• Companies historically active within both **upstream and downstream** activities • Focus gradually **shifting towards renewables** and adjacent market horizontals • Typically active in **fuel and retail segment** either directly or through partners	• **Energy providers** supplying households and businesses with power • Play in both asset-light solution and asset-heavy CPO + ownership model • For asset-heavy business model, an increasing move to co-ownership with financial sponsors	• Car makers and suppliers to the industry see an opportunity to **take part** in the EV charging market • Combination of **M&A, JV** and **in-house** organic development of capabilities required to succeed	• Successful first movers typically attracting funding from **investment companies** etc. and being used as a **platform** for further M&A roll-up • Infra-funds acquiring CPOs and owners, while traditional PEs looking broadly across HW, SW and services
Capabilities leveraged in EV charging market	HW-oriented with production or service capability	Owner of attractive gas station locations	In-depth knowledge of energy markets	Car point of sale key to sell B2C charger HW	Acquiring early succeeders and adding capabilities
	Knowledge on how to operate an EV charging business	In-depth knowledge of energy markets	Access to energy through own production/contracts	Existing R&D capabilities	No legacy from adjacent markets gives “clean slate”
	Established customer base from existing charging network	Existing service partner set-up	Grid integration with advanced metering and balancing	Existing service partner set-up	Access to capital
	Pure play EV charging business	Established customer base from fuel and retail	Established customer base from energy provision	EV ecosystem to create customer lock in	Network and partnerships

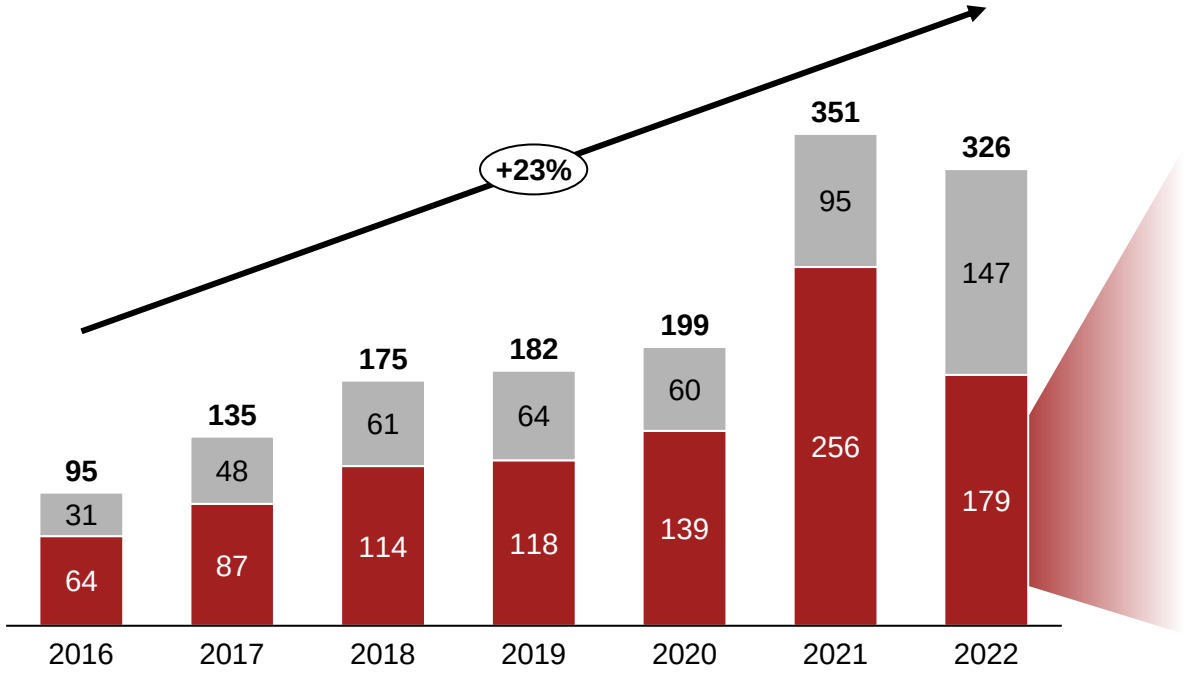
Charge point hardware | Charge point software | Land and asset | Electricity | Services | Additional value add | No single/clear connection

Source: Pitchbook, PwC Strategy& analysis

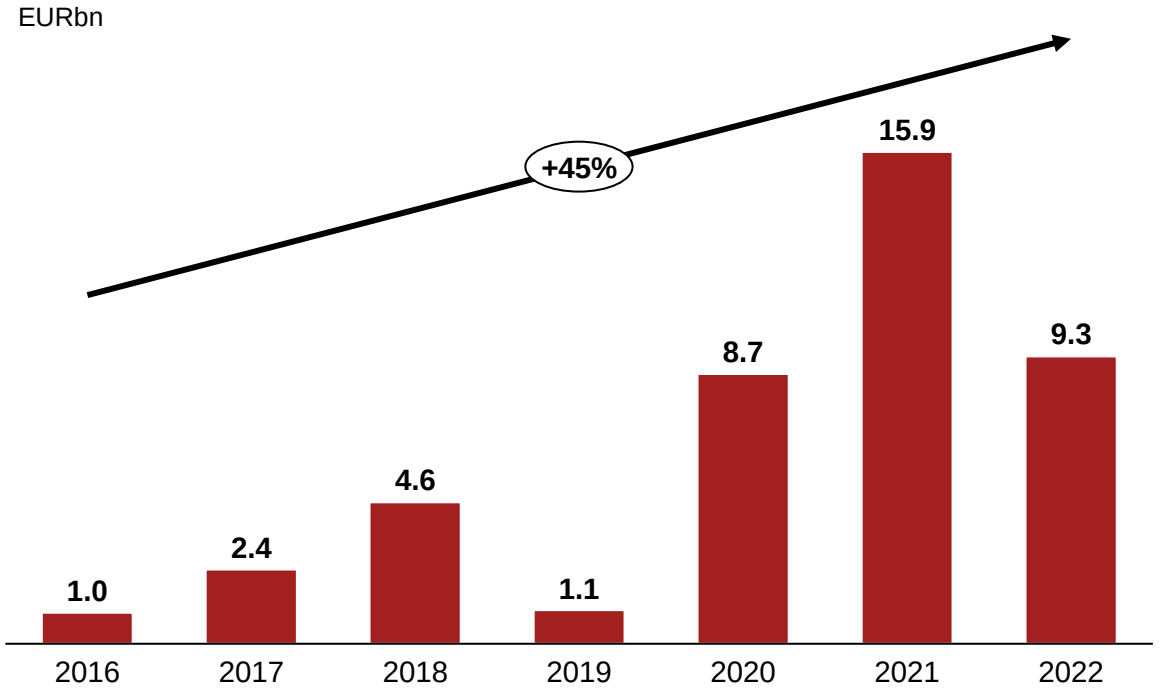
EV charging has seen a steady increase in # of deals (350 in ‘21 and 326 in ’22) and a marked increase in their value

Number of deals and transaction value of disclosed deals

Number of deals



Transaction value (disclosed transactions)



Deal Date: From: 01-Jan-2012;

Deal Option: Search on a full transaction; Deal Status: Completed; Announced/In Progress;

Deal Types: All Buyout Types; Other Private Equity Types; All VC Stages; All Round Numbers; All Series; M&A/Control Transactions; Non-Control Transactions; Other M&A Transactions; Public Investments > IPO; All General Debt;

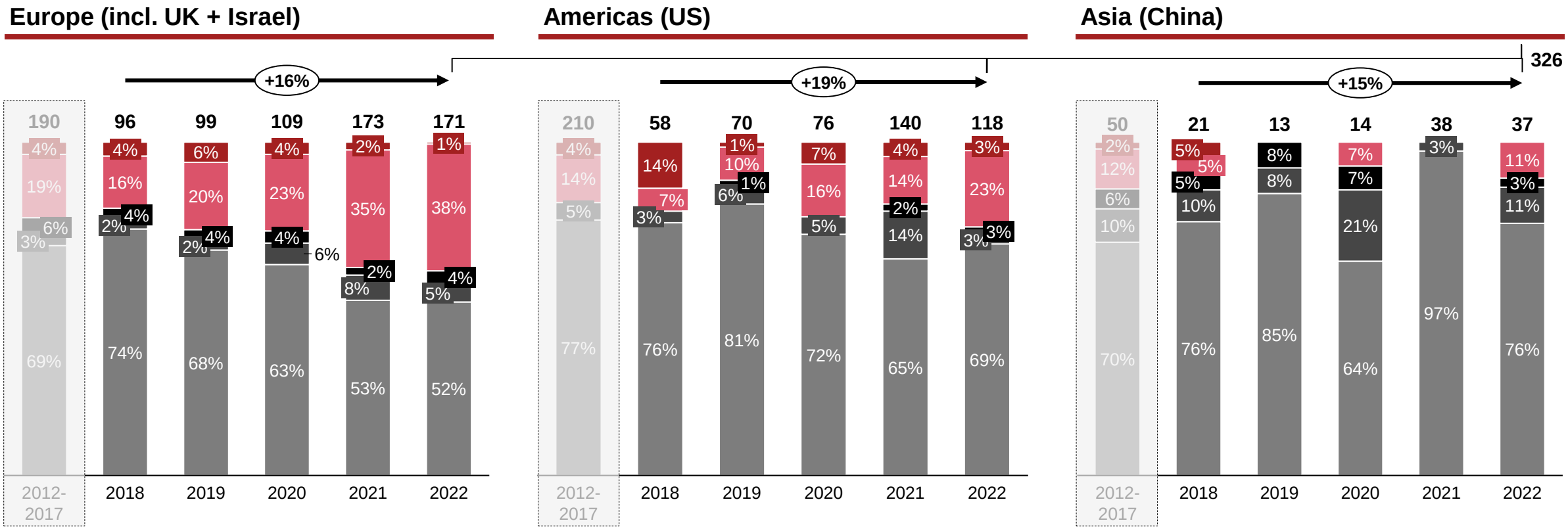
Locations: United States; Europe; Asia > East Asia > China; Middle East > Israel; Search HQ Only;

Emerging Spaces: Energy > Electric Vehicle Charging Infrastructure; Keywords: electric vehicle charging; ev charging; public charging infrastructure; vehicle charging; charging software; charging solutions; charging infrastructure; Search Emerging Spaces OR Keywords;

Source: PitchBook, Strategy& analysis

Europe leads the shift from early stage financing to M&A given the more mature market, US with significant uptick in ’21-’22

Types of financing split on locations



The European market is the most mature and sees the most M&A deals, which is mainly driven by financial investors

The US market is not as mature within EV charging, however, there is a high level of financial activity

The Asian market is lagging in terms of quantity of deals, but experience the same growth (%) as Europe and the US

Early Stage: Product Crowdfunding, Equity Crowdfunding, Accelerator/Incubator, Seed Round, Angel (individual), Early Stage VC, Later Stage VC
Public Equity: PIPE (Private investment in public equity, Reverse merger, IPO
M&A: Buyout/LBO; Corporate and M&A, PE Growth/expansion
Debt: Debt Refinancing, Repayment, Convertible Debt
Source: PitchBook, Strategy& analysis

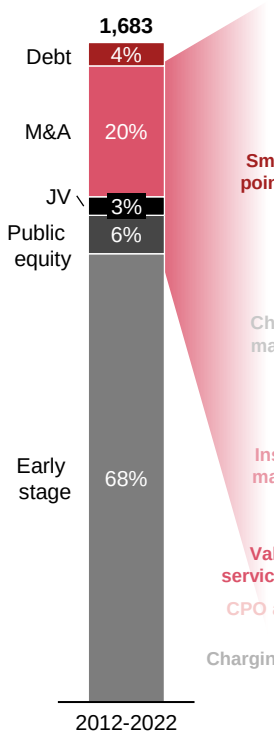
Early stage | Public equity | JV | M&A | Debt

Out of ~300 tracked M&A deals, financial sponsors account for 40% with inter-sector players 20% and Utility and O&G 17%

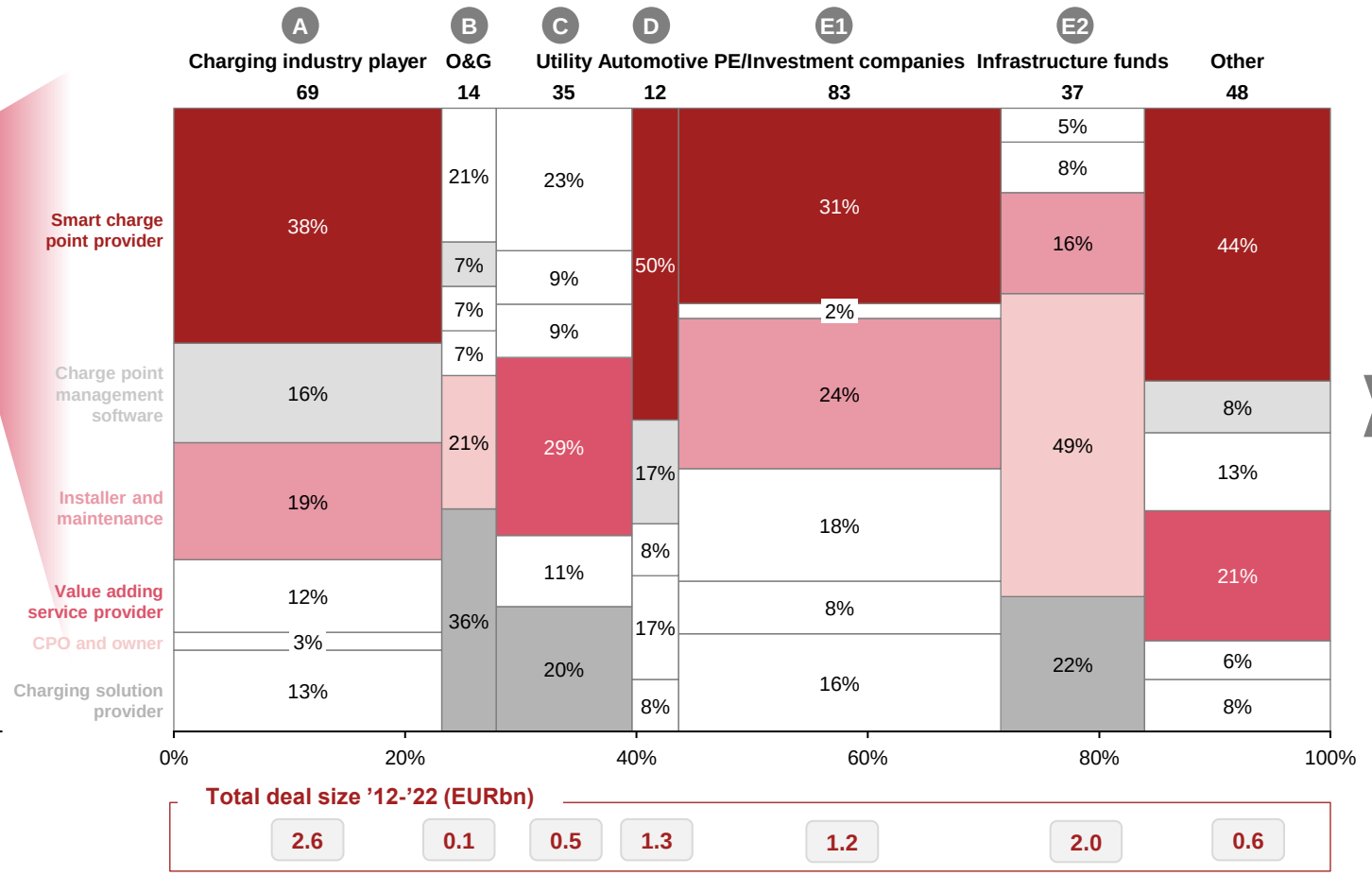
2012-2022 – M&A transactions by buyer and target type (ways to play)

Colour highlight for segments with higher than market average share of M&A

Total # of deals



M&A deals by business models allocated to investor types



Total deal size '12-'22 (EURbn)

2.6	0.1	0.5	1.3	1.2	2.0	0.6

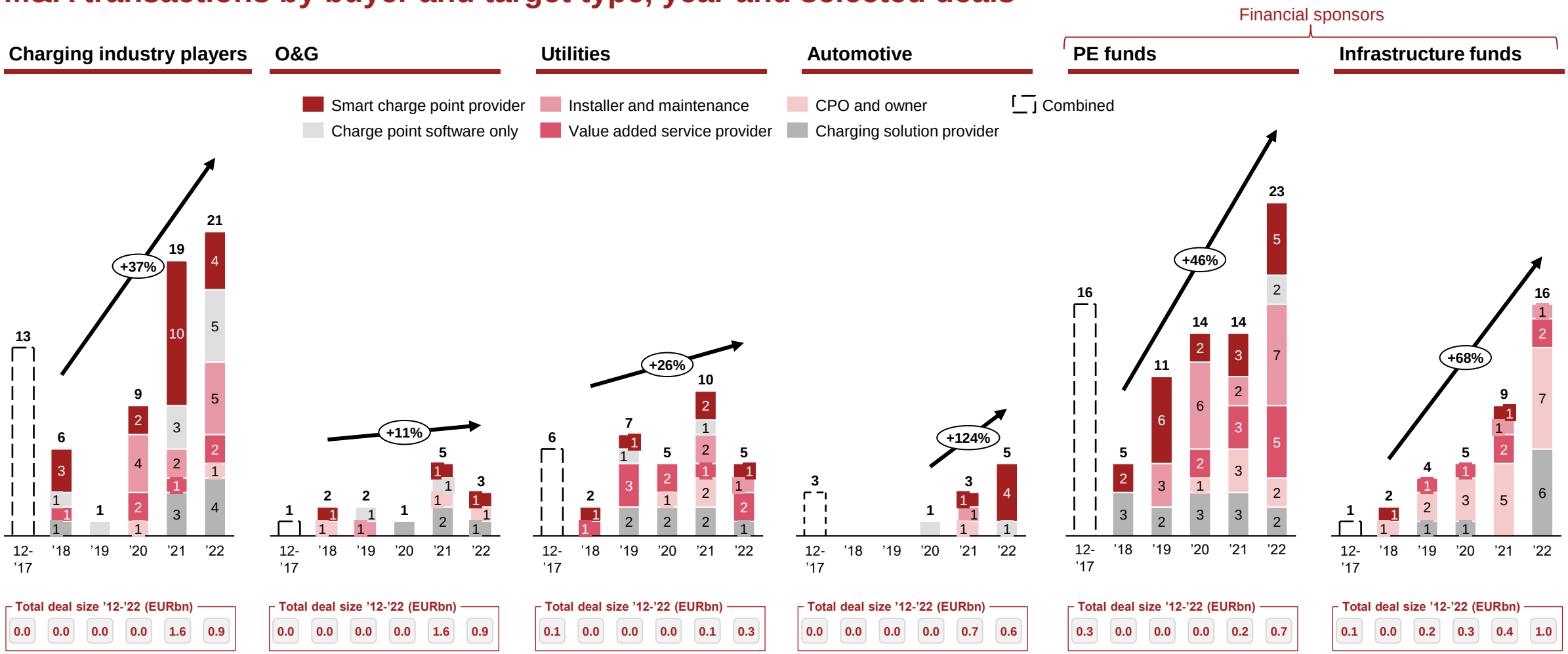
Key deal rationale per investor types

A	**Charging industry player**	• Geographical expansion and scale of operations • Strengthened solution capability (higher vertical integration)
B	**O&G**	• CPO and owner deals (asset ownership) • Software to optimize operation of its charging network
C	**Utility**	• Solution capability • Energy mgmt. value add (e.g. grid integration with advanced metering and balancing)
D	**Auto-motive**	• Investing in hardware to enable roll-out of charge points and improve accessibility • Software for a seamless charging experience
E1	**PE/ asset mgmt. companies**	• Invest broadly across hardware, software and services • Generally increasing investment appetite
E2	**Infra-structure funds**	• Focus on CPOs + owner (e.g. asset ownership deals) • Strong recent increase in investments

Source: PitchBook, Strategy& analysis

Generally strong interest in the EV charging space with financial sponsors showing particular increase in # of deals

M&A transactions by buyer and target type, year and selected deals



Source: PitchBook, Strategy& analysis

Authors and contributors

Authors

Christian Brickenstein
Partner
christian.brickenstein@
strategyand.de.pwc.com
Automotive Strategy

Henning Rennert
Partner
henning.rennert@
strategyand.de.pwc.com
Automotive Strategy

Milos Bartosek
Director
bartosek.milos@
pwc.com
Infrastructure and Mobility Deals

Contributors

Editorial:

Jørgen Frost Bø
Markus Andersen
Steven van Arsdale
Daniel Adam
Tim Joussen
Noel Kretz

Regional input:

Panos Stergiopoulos
Massimo Leonardi
David Rodriguez Villanueva
Vladislava Iovkova
Akshay Singh
Jun Jin