Strategizing city networks and charging infrastructure



Our mission

Give freedom to the electric driver and accelerate the transition to sustainable mobility

Our goal

Build and operate a European network of 1000 fast charging stations on prime locations where all electric vehicles can charge with renewable energy from sun and wind

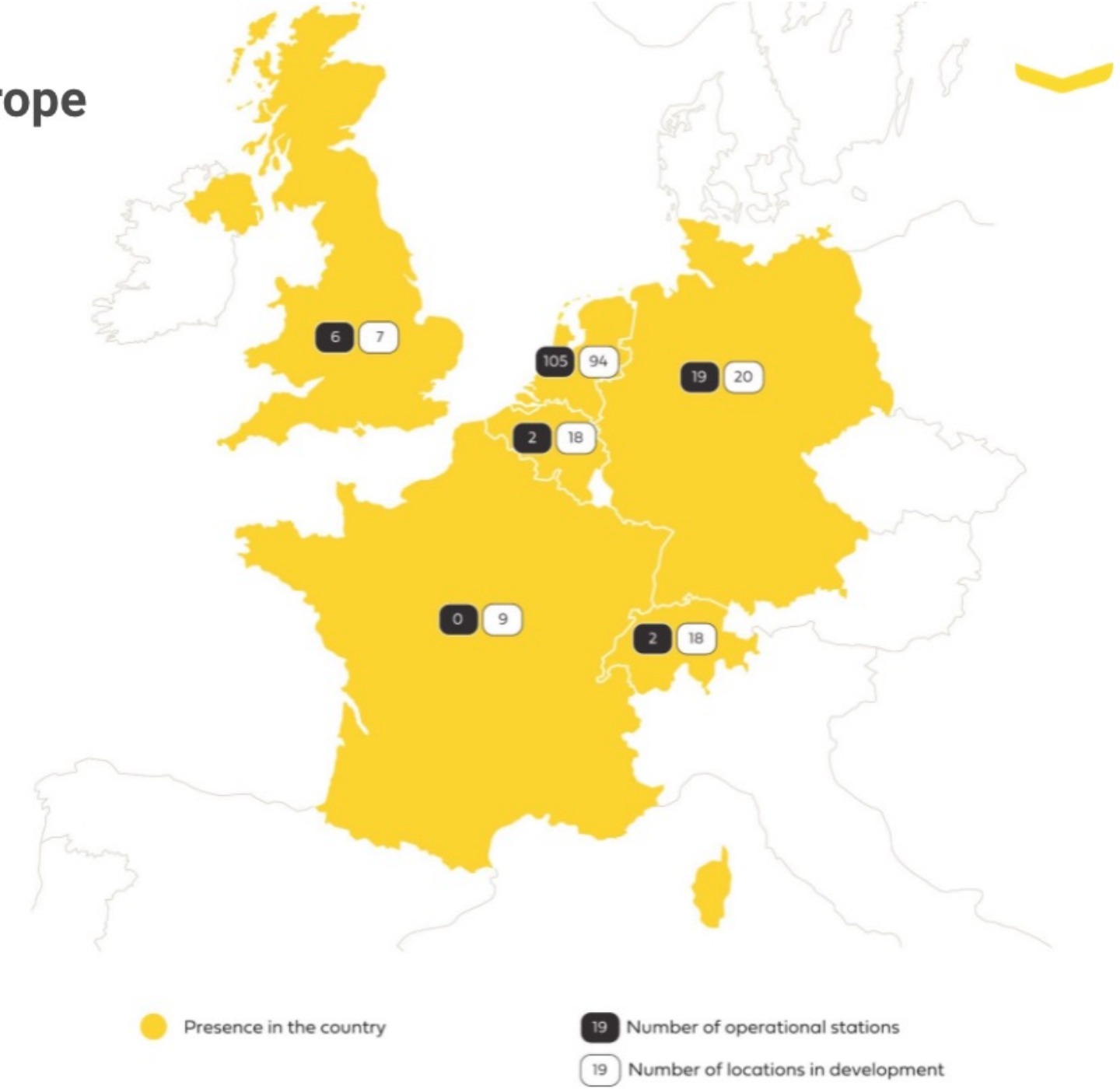


A rapidly growing network in Europe

- Currently over 135 operational stations

- Stations and offices in 6 countries:
  - Netherlands (HQ)
  - Germany
  - France
  - United Kingdom
  - Belgium
  - Switzerland

- In-house operational teams:
  - Location development
  - Site and station design architects
  - Construction and installation
  - Operations and maintenance
  - 24/7 customer support
  - Software team for app and chargers



Fastned builds a reliable brand and network of stations

To make fast charging as convenient as possible

Reliable

with a 99,99% uptime since 2014

Easy to find

via apps and navigation systems, at convenient sites with clear brand identity

Accessible

for every electric car, convenient payment, 24/7 access

Happy customers

Customers recommend Fastned to friends and family

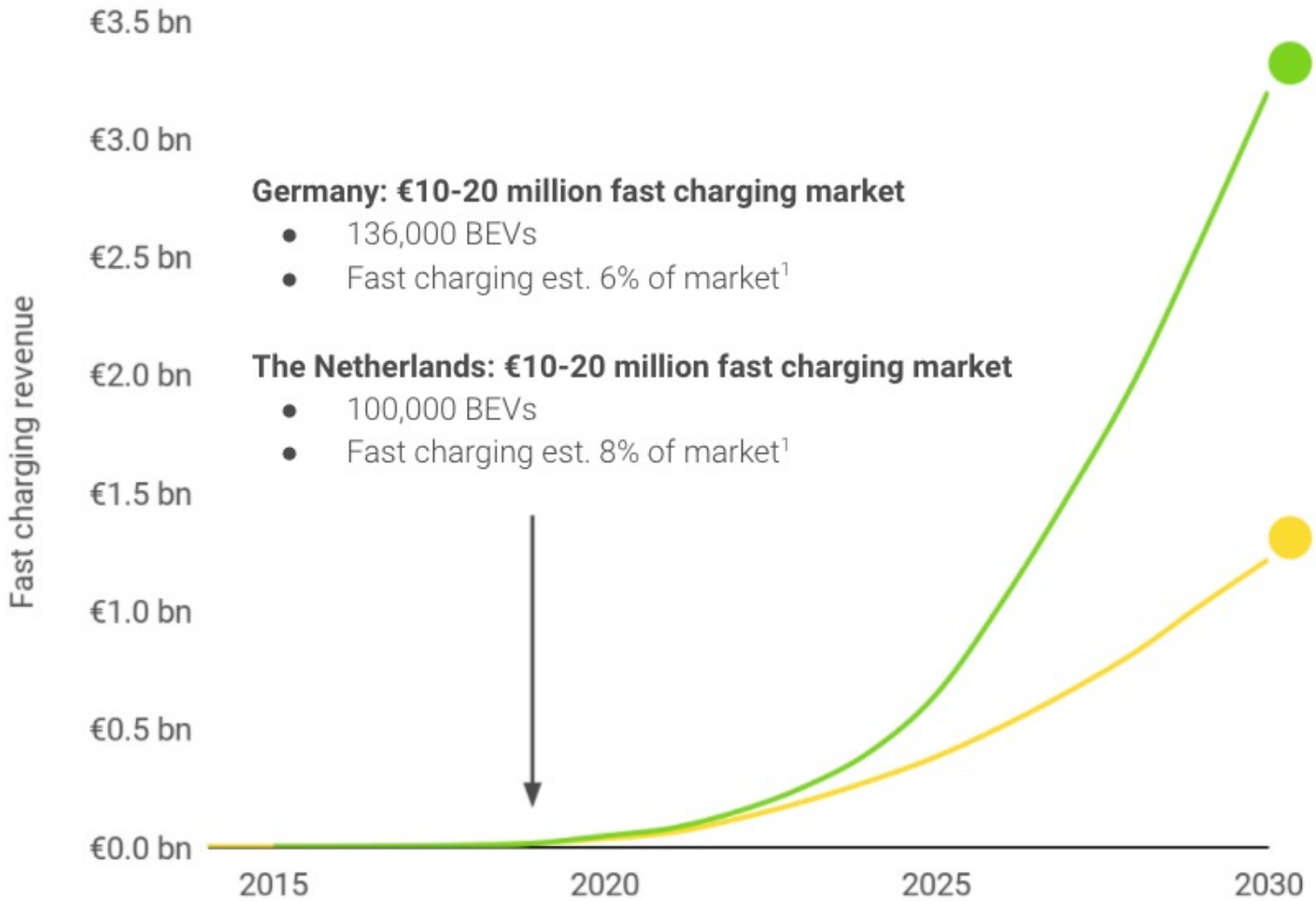


Charge speeds

Choosing the best matching charge speed depending on the location

	11 kW slow charging	50 - 150 kW fast charging	150 - 300 kW fast charging
			
	limited value for a customer with a short stopping time		
Customer perspective	• Only 20km range added in 30 minutes • Need for own charge cable • Investment with retailer or property owner • No additional revenues	• 150 to 450 km range added in 30 minutes • Ideal to charge at retail locations with longer dwell times • Suitable for locations with less traffic	• 450 to 900 km range added in 30 minutes • charging on the go • Suitable for larger locations with high traffic

The market opportunity: fast charging market expected to grow 75 - 195 fold between now and 2030



Germany: €10-20 million fast charging market

- 136,000 BEVs
- Fast charging est. 6% of market[1]

The Netherlands: €10-20 million fast charging market

- 100,000 BEVs
- Fast charging est. 8% of market[1]

Germany: €3.2 billion fast charging market (195x)

- Government target of 5,000,000 BEVs on the road (37x)[2]
- Fast charging 32% of charging (5x)[1]
- BEVs still only at c. 10% of cars on the road

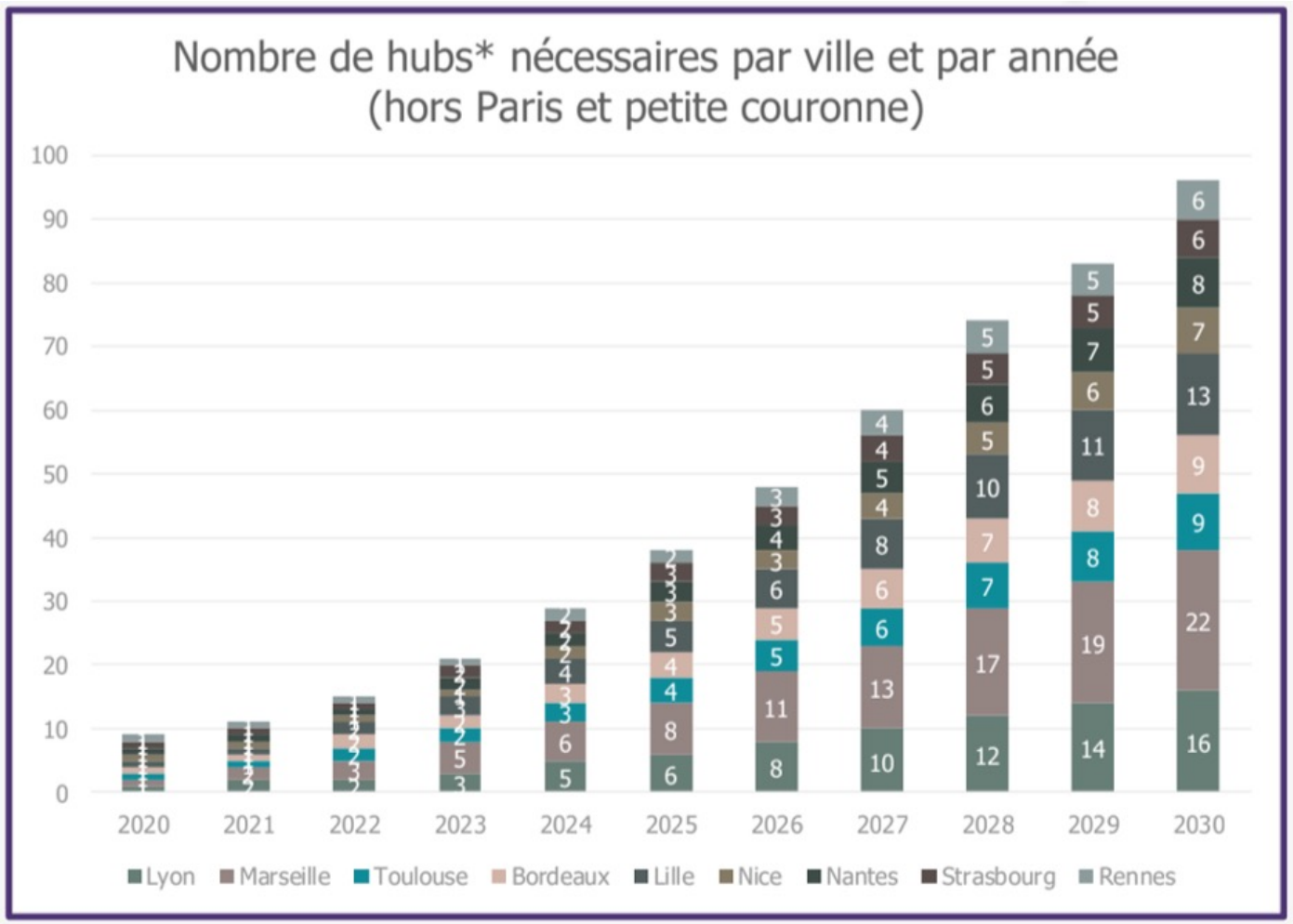
the Netherlands: €1.2 billion fast charging market (75x)

- Government target of 1,900,000 BEVs on the road (19x)[3]
- Government target of 100% of car sales to be zero emission
- Fast charging 32% of charging (4x)[1]
- BEVs still only at c. 20% of cars on the road

France, UK, Belgium, Switzerland expected to have similar paths

1) Charging ahead: Electric-vehicle infrastructure demand, McKinsey, 2) German government target of 10m EVs on the road, 50% estimated to be BEVs, 3) Target Dutch government 2030: 1.9m BEVs on the road (c. 20% of car parc), 100% of car sales to be BEV

Not just for long-distance travel: why fast charging hubs in cities?





* Hub : station de recharge comportant 14 bornes (soit 28 points de charge) et une puissance totale de 2 MW

Range and charging speeds are increasing

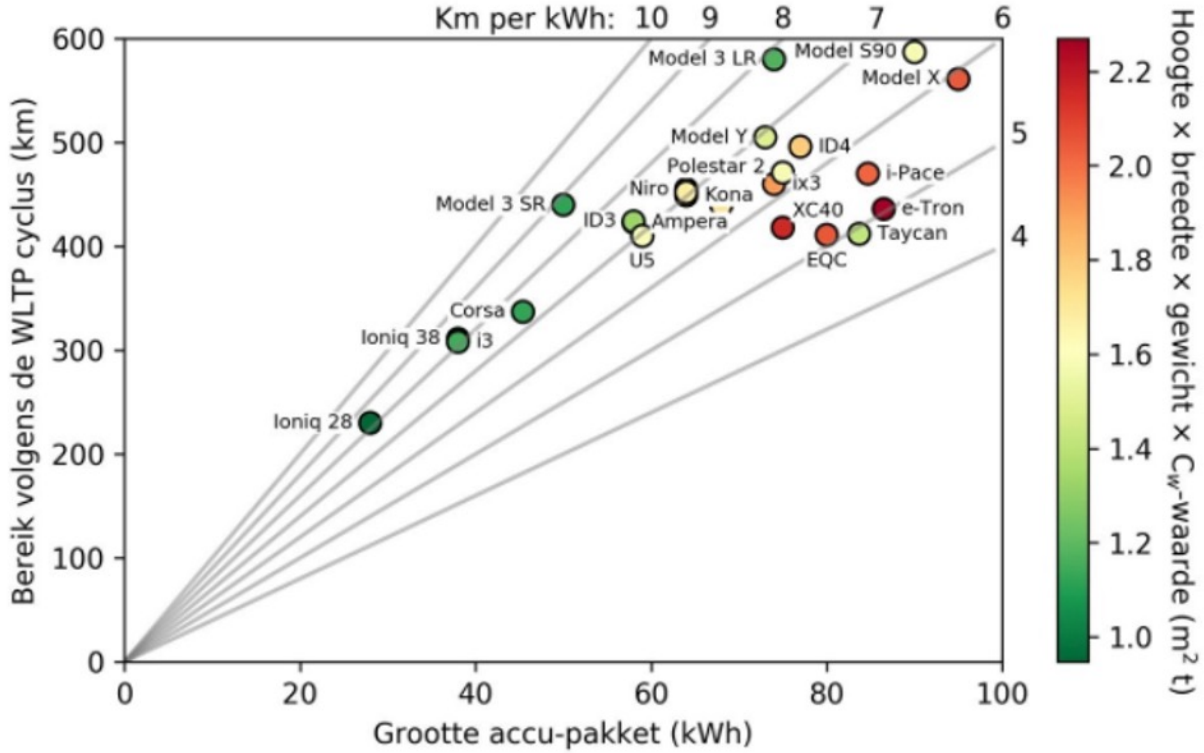
It takes ± 5 years for new cars to fully develop, produce and sell to the market

Increasing range

- Current new models all have a range of >300km.
- Average French driver refuels traditional fuel car after 450km.
- Premium cars can already drive >450 km nowadays.

Increasing charging speed

- Charging speed is determined by the car.
- Most new models are able to charge at more than 100kW.
- Premium cars are able to charge >250 kW.
- At +300 kW charging time goes down from 20 to 10 minutes



Hybrid car models are not considered as a relevant market

- Hybrid car models (with both fuel and electric engine) are a temporary solution, providing customers the long range that the first fully electric car models could not provide. New fully electric models with large range provide this as well. Hybrids models usually have a range of 10-50 km and cannot charge fast.
- EU regulations bring down the maximum allowed CO2 emission for all new cars. Hybrid car models help car manufacturers to reduce the average CO2 emissions per car on the short term. In the long term the hybrid models do not meet the stricter EU regulations, only fully electric cars have zero emissions.

Who needs fast charging in cities? Everyone!

Taxis and VTC need to quickly charge and continue their day

Car rentals need a place to charge

Residents without charging infrastructure at home or those who prefer the safety and convenience of charging quickly

Tourists passing through a city



How can cities promote future-oriented and customer-driven infrastructure?

1	Safety and comfort
2	Scalability with increasing demand
3	Visibility
4	Environment
5	Customer service and maintenance
6	Pricing

Enabling conditions to develop sustainable, high-quality fast charging infrastructure in the public domain

A / Fast charging as an independent business (not bundled with other services)

EV charging is an independent market that requires expertise in design, technology, customer service and maintenance.

Tendering services separately ensures that the best fast-charging offer wins. It also ensures that all market players can participate, and not just those owned or in partnership with petrol companies.

Example : APRR, France

Tender for 9 highway locations that are separate from the incumbent oil companies

B / Fast charging stations with 15 year + contract duration

The market share of EVs will be relatively low over the next years and then ramp up in 8-15 years. This is why contract durations of at least 15 years is necessary to have a sustainable business case.

Example : ASTRA, Switzerland

Concession term of 30 years

C / Sufficient space for safe, visible and scalable infrastructure

By the time a large part of the fleet becomes electric, busy charging stations will have to have a capacity of> 20 chargers (comparable to the large gas stations today) to avoid lines. This is why infrastructure build today should take into account these medium and long-term needs and ensure that there is space to make upgrades as more EVs hit the roads.

Example : APRR, France

Locations scalable up to 20 loading places

D / Open, transparent and non-discriminatory selection based on quality and reliability

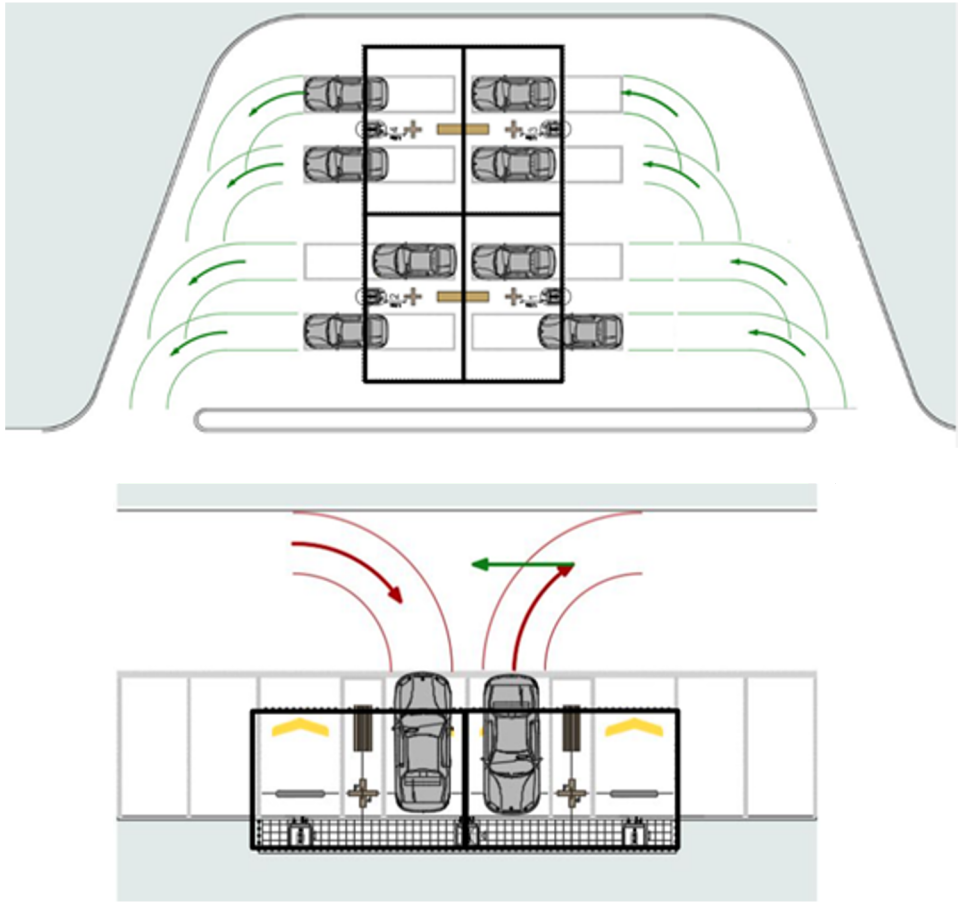
Charging service concessions must always be awarded through open and competitive, non-discriminatory, tendering procedures. In the first place, attention should be paid to the quality of the proposed total charging service (rather than just cost), and the associated consumer value, in order to ensure a high quality fast charging network.

Example : WVI, Belgium

Evaluation criteria only based on the quality of the charging service and not on the basis of the charging price to the customer

1 Safety and comfort

Drive-through stations are the safest solution



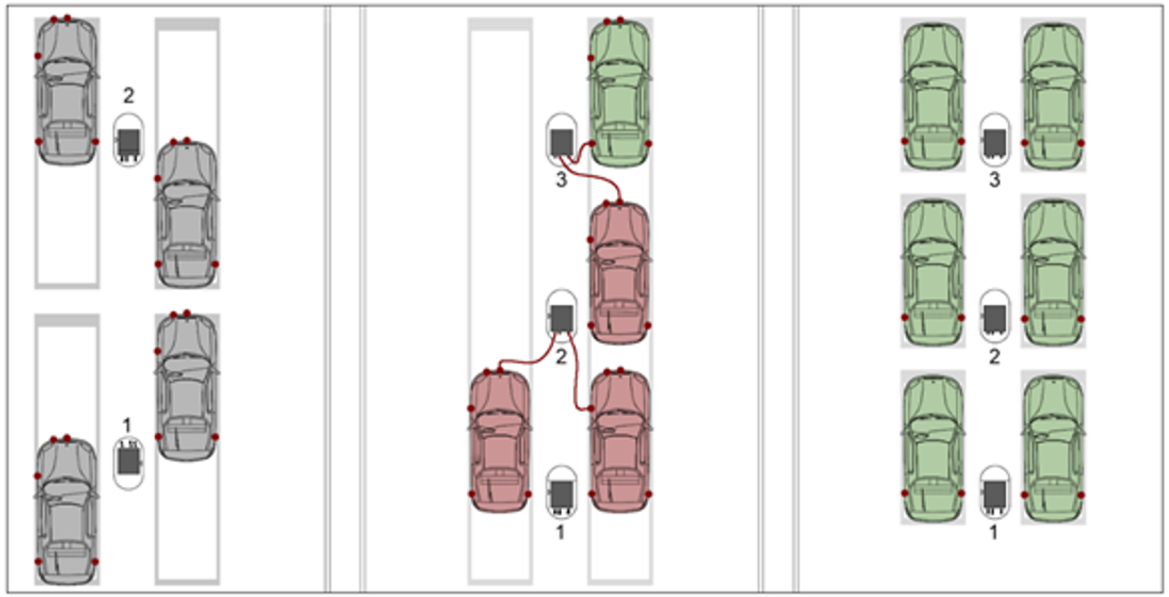
Safety should be the number one priority.

- ★ At drive-through stations, customers have enough space to leave the roadway, slow down and take a seat next to the loaders. This is done quickly and safely, without having to maneuver or re-insert for oncoming traffic.
- ★ In addition, stations should be designed in such a way that unsafe traffic flows, such as vehicles going the wrong way or reversing, are discouraged by ensuring that there is sufficient space for vehicles to maneuver around the charging vehicles.
- ★ Stations must be wide enough to accommodate all electric cars, including those with caravans and trailers.

Charging in a parking arrangement should be avoided in high traffic locations. In locations where charging can be combined with another activity, such as visiting a store, this can be a solution - in combination with adapted charging speeds. With parking charging, the traffic flows are blocked because vehicles wait until the chargers are available and then maneuver to drive in and out of each charging station. This is dangerous when vehicles are at higher speeds and increases waiting times for drivers.

1 Safety and comfort

Charger availability, regardless of the car brand

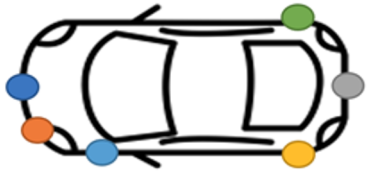


Fastned solution allows 4 cars to charge at the same time, regardless of the position of the charging port	Overcrowded, the chargers are too close together: one of the chargers is not being used, the station cannot be used to capacity	Ideal world in which the car manufacturers have standardized the position of the charging port at the rear
OPTIMAL	**NOT OPTIMAL**	**NOT REALISTIC**

More chargers do not always mean that more vehicles can load

- ★ Every available charger must be accessible to all customers at all times, regardless of whether their charging point is located at the front or rear of the vehicle.
- ★ The stations must be designed with a) the distance between the chargers, b) the number of chargers, c) the length of the charging cables, d) the type of plugs offered with each charger and e) the position of the vehicle to maximize the comfort of the customers and the use of the chargers.

The minimum dimensions for a quality drive-through station are 60m x 25m, plus a technical area (transformer + maintenance area) of 120m2.

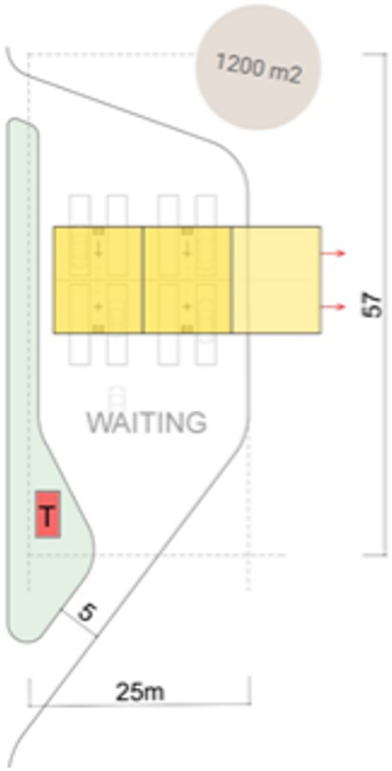


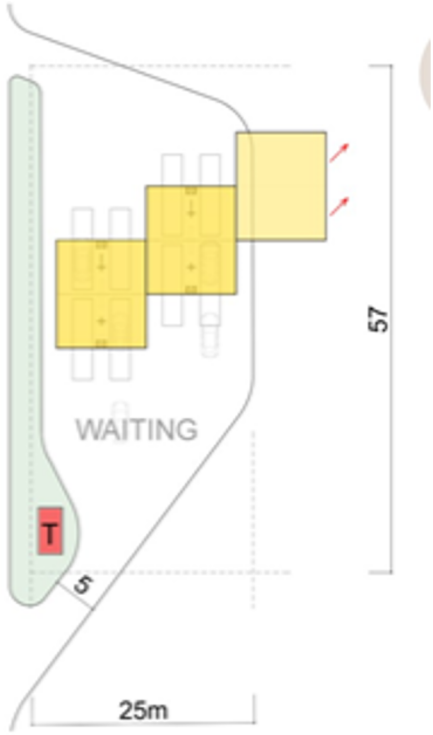
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Renault ZOE
Nissan leaf
Kangoo Electrique
Audi E Tron
Hyundai KONA
Mercedes hybrides rechargeables
Peugeot E 208
DS3 Crossback E-Tense
Tesla model 3, S et Y
Citroën Berlingo électrique
Volkswagen e-Golf

Emplacement de la trappe de charge suivant le modèle

2 Scalability

Design for fast growing demand





If you built it, they will come! Designing stations that can grow with demand

The main benefits of scalability are:

- ★ By providing sufficient surface for expansion, lines will be avoided in the future.
- ★ Operators can implement the latest technology as soon as it becomes available. With current technologies, customers can travel up to 300 km in just 15-20 minutes with 300 kW. Alpitronic's 1000 V chargers can supply up to 500A (with liquid-cooled CCS cable). In a few years, even more powerful chargers may be available that can greatly reduce charging time. These chargers can be installed during station upgrades.
- ★ The availability of toilets, rest areas and snack facilities will become more important in the future.. Operators must be allowed to develop these services for their customers.

3 High traffic locations with visibility

We need your help!! Finding prime peri-urban zones with space canopies for navigation and comfort





Why is it important to see stations from afar?

- ★ Canopies help customers navigate to the charging points without unsafe maneuvering or reversing.
- ★ Creates extra comfort by protecting customers from the rain and sun.
- ★ Canopies provide solar charging during the day and lighting by night.

4 *Visibility: Find the chargers*









4 Sustainability

Fast charging stations with a vision for sustainability



Towards a sustainable mobility system

Electricity must be supplied 100% with renewable energy from the sun and wind. Running electric vehicles on renewable energy is crucial for the transition to a low-carbon economy.

- ★ EVs that run on renewable energy emit no CO2 emissions. EVs that run on electricity from fossil fuels produce almost the same CO2 emissions as conventional vehicles.
- ★ Both the construction and operation of fast charging infrastructure can be done sustainably by:
  - Using sustainable, possibly reusable materials
  - Saving electricity through motion detectors and installation of LEDs.
  - Generating electricity through solar panels to run station operations

5 Customer service and maintenance

Quality first



Quality and uninterrupted service must be guaranteed

- ★ This can be done through regular preventive maintenance as part of a rigorous maintenance and repair program. Parties that do not employ their own maintenance technicians will have to demonstrate how they are going to organize this with an external party
- ★ Upgrading chargers and adding new charging infrastructure is also an important pillar in operating a high-quality and future-oriented system. The addition and upgrading of chargers, without significant spatial impact, must always be possible on the initiative of the operator who is implementing a data-driven upgrade plan.
- ★ If there are communication problems or other malfunctions that cause the chargers to be offline, customers must always be able to charge via a fallback system
- ★ Many electric vehicle drivers are new to the market. That's why everything from connecting the car to paying should be simple and intuitive.
- ★ Customer service teams must be available 24 hours a day, seven days a week, offering assistance on topics ranging from charger malfunctions and payment issues to all kinds of practical questions about this new and fast-growing market.

6 Price

Competition leads to fair prices

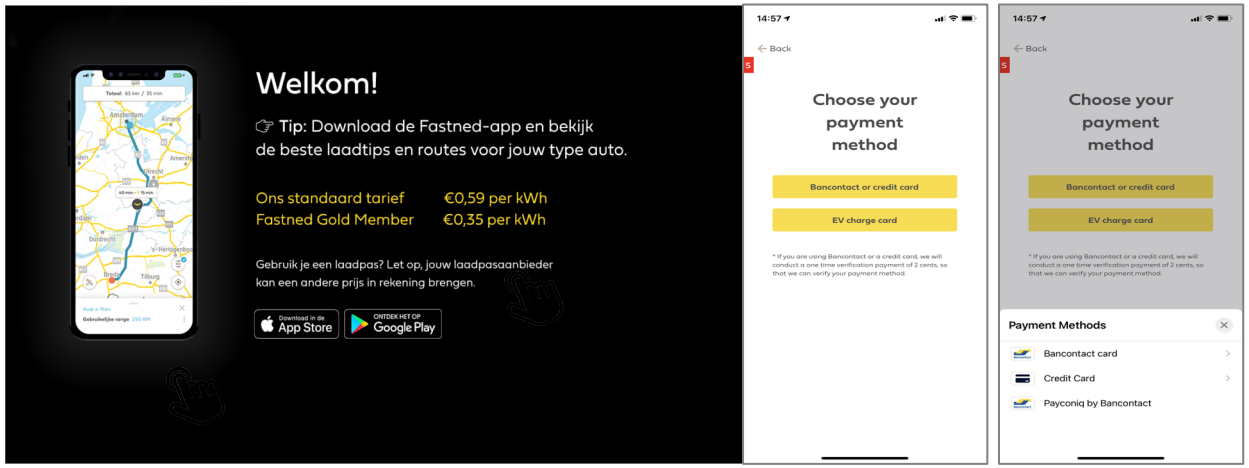


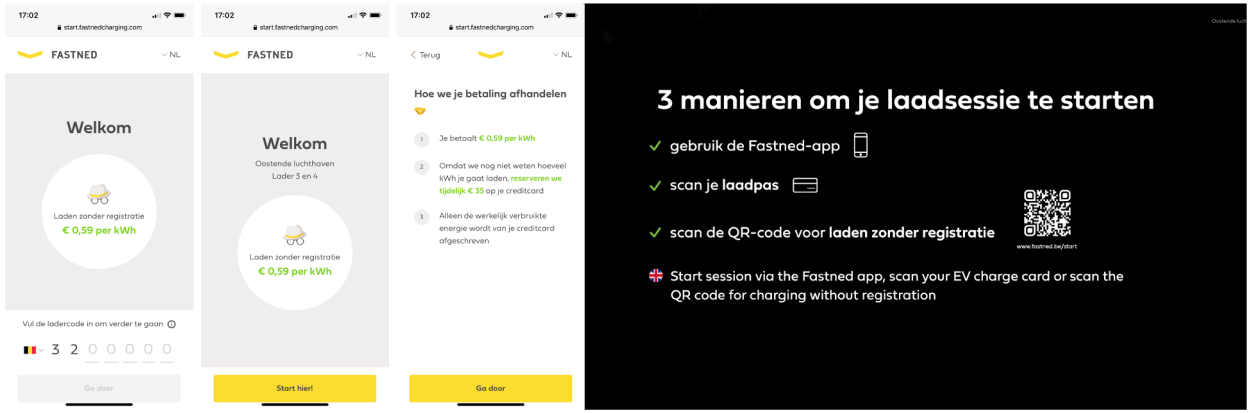
In a properly functioning market with a level playing field, competition leads to fair prices

- ★ There is no need to regulate the price level, the competition will do this, and more and more effectively as the market matures.
- ★ Pricing should be transparent and simple, with no hidden costs. It should also allow the operator to pay rent, amortize investments and, more importantly, invest in high-quality service, maintenance and expansions as demand increases.
- ★ Price changes should be possible through discussions / justifications if market developments (or technological advancements such as dynamic pricing) so require. Given the uncertainty of the market and the uncertainty of how it develops, prices will have to evolve over time.
- ★ Some companies are subsidized by other companies and can thus lower prices accordingly. This does not promote a sustainable, standalone business model. The government should make an effort to ensure that prices at least reflect costs and support a business case.

6 Price

Transparency to the customer





To clear, transparent prices, without hidden costs

★ Consumers often face unexpected costs, depending on the mobility service provider (MSP) they use. As part of its pricing policy, the government should require MSPs to disclose their fees charged at the time they are charged. ACM's Dutch price transparency policy is a good example of a government that requires MSPs to show a breakdown between the costs of the charging session and the costs of the MSP service.

★ Price transparency and ease of payment go hand in hand, the ways in which payment can be made must be freely determined by the operator (to be able to add ever newer and innovative methods), but they must also allow new customers or customers with rental cars to charge ad hoc (for example via QR code or bank terminal).



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