Project: E.ON Drive

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E.ON Drive is bringing e-mobility onto the road – with high-performance infrastructure and intelligent solutions for ultra-fast charging.

E.ON's involvement with Change Maker partners to support the infrastructure to enable electrification of transport and ensure we all have the charging facilities we need – at home, at work, and on the go.

It also includes all the services, products, and programs that meet the E-Mobility needs of our (potential) customers.

In short, it's about electrically powered vehicles and the infrastructure – i.e. the hardware and software as well as advice – that's necessary for charging the batteries of these vehicles.

Website:
https://www.eon.com/en/neue-energie/e-mobilitaet.html

The keywords used to create E.ON Drive's startup idea were:

[mobility], [electric cars], [charging stations], and [infrastructure]

List of finalist ideas:

- Internet of Things app that helps you find the nearest charging station within a nationwide ultra-fast recharging infrastructure across the country.
- A website for people who want to develop hardware for electric cars.
- High-performance infrastructure and intelligent software solutions for ultra-fast charging.
- Startup for people to provide electric car charging stations for others.
- Instead of relying on gas stations, electric cars will have charging stations built inside shopping malls, office buildings, and more.
- People in a certain area get together and form a group, charging their electric cars at each other’s houses, creating a network of charging stations.

- Hardware that when installed at a residence can charge your car on the way to and from work.
- A software that is designed to communicate with people where their nearest electric vehicle charging station is located.
- A website that shares interesting things to do while on a road trip.
- Social network to share tips on charging electric cars.
- A website for people who want to develop software and apps for electric cars.

Ideas selected by the client:

High-performance infrastructure and intelligent software solutions for ultra-fast charging.

Hardware that when installed at a residence can charge your car on the way to and from work.

Software app that helps you find the nearest charging station within a nationwide ultra-fast recharging infrastructure across the country.

Short business description:

High-performance infrastructure and intelligent software solutions for ultra-fast charging.

The keywords used to create E.ON Drive's product naming were:

[electric cars], [e.on], [clean energy], and [city]

WattsUp	E4city Energy
PowerGrid	e.onCars
Electric Cooler	Volt
Charger Shaker	To-Go-Car
Ener4city	Fast Charge
Motive4city	UCharge
EonGo	EonChargeGo

Internally the client marketing department selected **Eon Drive** as the most catchy name.

What is the market volume of ultra fast-charging stations in Germany?

Germany currently has a total of 41,000 electric charging stations that account for 90,000 charging points, and around 1.5 billion euros.

The market volume of ultra fast-charging stations is hard to measure due to many factors. One of the important factors is the type of car. A pure EV driver, with a Tesla, for example, might have little need for these stations since they charge the car up quicker at home or office with a wall charger. Another factor is the type of charging station.

The need for ultra-fast charging stations has been revealed following an analysis of Service Station Survey data gathered annually by Bundesnetzagentur, the federal agency responsible for regulating energy and telecommunications. The analysis of data collected in 2017 revealed that while consumers mainly use mainstream charging points that belong to the two dominant firms, Fastned and Ionity, new demand for ultra-fast charging stations is steadily growing.

What is the market volume of electric cars in Germany?

Figures from Germany's national car association (ADAC) show that in 2021, the sale of pure electric cars amounted to 8.3 percent, which is an increase of 3.6 percentage points on last year. They also show that in 2030 they estimate that around 31.5% of new cars will be electric. A majority of them are plug-in hybrid electric vehicles which account for around 44% of all-electric cars in the country.

Bloomberg analysts estimated that the German market volume of electric vehicles was at about 250,000 vehicles during the first 9 months of 2021.

What is the projected market volume of electric cars in Germany until 2030?

The projected market volume of electric cars in Germany until 2030 is 500,000 - 800,000 cars.

Electric cars account for a small fraction of the total of the car market in Germany. In 2018, the electric car market share amounted to around 8%. In 2030, the share is projected to be between 13% and 16%, which equates to a market volume of between 800,000 and 1.1 million electric cars sold annually.

In particular, battery-electric cars will increase their market share from 8% to 10% by 2030.

Electric cars in Germany will have an increase in their market volume until 2030. This can be attributed to the market for electric cars decreasing every day since not enough people are willing to part with their vehicles and switch over to electric vehicles. As more companies reduce the prices for electric cars, it will be easier for people to find a way to purchase them.

What are the main electric companies offering ultra-fast charging infrastructure for electric cars?

General Motors, the U.S. Department of Energy, and Nissan have partnered with Electrify America to build electric highway corridors in the United States. On the other side, SemaConnect offers an electric car charger with an 8-foot charging cable, with the express purpose of avoiding the need for extension cords.

Currently, Volkswagen Group announced a partnership with Ionity electric car charging stations which are planning to deploy 400 ultra-fast charging stations by 2020. VW Group plans to deploy up to 3,000 ultra-fast electric-car charging stations across Europe by 2025. BMW, Ford, Daimler, and the Volkswagen Group also announced that they would invest nearly $300 million to build 400 high-speed electric charging points in Europe, which will complement the 300 charging points being set up by Ionity.

Electric car companies Tesla and GM have already announced that they will offer electric car customers ultra-fast charging infrastructure that will take as little as 20 minutes for a full charge. It is speculated that the charging infrastructure developed by the main electric companies would target Tesla customers by bringing them onboard while customers are away from home.

One main electric company offering ultra-fast charging infrastructure for electric cars is the Utility Electric System. It is an electric company based in Phoenix. Their charging station, known as Charger 9, has the capability to charge at up to 350 volts, meaning it only takes two minutes to charge electric cars. The Charger 9 can be found at an ACE Hardware store in Phoenix.

What are the main electric companies offering ultra-fast charging infrastructure for electric cars in Germany?

The German association of the energy industry said that Stromnetz is to build over 100 ultra-fast charging corridors by the end of 2021, this is their start to offer infrastructure for electric cars. The carmakers have to provide downloadable information at the research site "battery.electric.germany" - BMW, Ford, Audi, Toyota, Honda, Ford, Mercedes-Benz, Volkswagen, Opel, Ford, BMW, Renault, Jaguar, Volvo, and Nissan.

BMW, Audi, Porsche, Daimler, Volkswagen, and the Renault-Nissan-Mitsubishi alliance are some of the traditional German automakers that are moving towards electric vehicles which are driving the need for ultra-fast charging infrastructure in the country. BMW offers a model named the 530e, available nationwide by BMW dealers nationwide. The 530e iPerformance has an all-electric range of 25 miles, but it has the option to travel 300 miles after just a 10-minute

One of the main electric companies in Germany, EWE, announced last week that it will make it possible for electric car owners to charge their cars more quickly. EWE has initiated a pilot project that is meant to support the expansion of the country's fast-charging network, Fastener. EWE will be building 12 new fast-charging stations, which would provide around 340 different charging points, by the end of 2021.

One of the main electric companies offering ultra-fast charging infrastructure for electric cars is Allego. Allego offers the largest charging station for electric cars in Germany, which is powered by 100% renewable energy. Allego offers the most modern charging station for electric cars in Europe, providing ultra-fast charging cables. Allego has begun to build the largest charging station with both ultra-fast charging cables and solar panels.

What is the market volume of ultra-fast charging stations of Allego?

In 2019, Allego announced that it has reached its goal of investing $1 billion for 210,000 ultra fast-charging stations. As of today, Allego has already generated $600 million in revenue and is looking to expand and implement the technology across the United States and Europe within the next few years.

Allego provides solutions for electric mobility, from electric cars, buses, and trucks, to ultra-fast charging stations. The company Allego announced in early 2019 that it has re-developed its business model in order to focus more on the electric car industry-they increased their already established charging station in Germany by tenfold, with the opening up of new stations which are capable of dispensing charging in only 2-3 minutes. The Allego chief executive Karlheinz Neumann revealed that the company is now in the process of rolling out more of its ultra-fast charging stations where Germany is concerned.

What is the market volume of ultra-fast charging stations of Stromnetz in Germany?

There are above one thousand people that use the ultra-fast charging stations of Stromnetz in Germany.
Stromnetz, the German electricity company, is running 200 ultra-fast charging stations at the moment. They expect to have 300 by 2021. They are working with BMW to increase the number. As per the present, they are leading the market for this kind of service. The market volume for Stromnetz in Germany is 234,595 kWh.

What is the market volume of ultra-fast charging stations of Ewe in Germany?

EWE has reportedly developed and implemented a new, ultra-fast charging system. Ewe is a company that specializes in the development and implementation of energy technologies and solutions for households and industries. The company has developed and implemented a new, ultra-fast charging system that has integrated itself into the everyday life of the user.

EWE, the energy supplier of the energy world, has over 320 fast-charging stations in Germany, which are equivalent to one station for every 20,000 inhabitants. EWE believes that the 50% emissions target of the World Climate Agreement 2025 is achievable with existing supply development.

What are the main trends on ultra-fast charging infrastructure for electric cars?

The surveys show that the main trends of the infrastructure are connected with companies like ABB, Siemens, and Tayloe. These companies are among the world's largest players in the power and automation solutions for electric vehicles (EVs). ABB, Siemens, and Tayloe all invest in, partner with, and compete against one another in this niche.

As the market for electric cars accelerates, so does the race to build supporting infrastructure. There are many major players in this race, each developing their own ideas on the future of electric car charging.

Become the norm. Transitioning to ultra-fast charging systems will take some time, but they're going to become the norm eventually.

The latest trends on ultra-fast charging infrastructure for electric cars are that Tesla is installing high-power chargers at truck stops across North America.

How the ultra-fast charging infrastructure of Tesla works?

The brilliant engineers of Tesla have commissioned their proprietary chargers designed to increase the convenience of long-distance driving. The chargers can input up to 145 kW of power, giving the driver over 1000 miles of driving range in just an hour. This new technology is touted as “sufficiently more powerful than the typical 50 kW commercial charger,” which is the prevalent commercial type of charger currently in use across commercial buildings and on some public highways.

Tesla is the first car company to unveil a charging infrastructure that will charge their vehicles in minutes and not hours. The Tesla model s and x vehicles, which use lithium-ion batteries, can acquire as much as 170 miles range in as little as 30 minutes. In addition, Tesla partnered with many companies to help them create a small fast-charging station with a network of Tesla charging stations across the world.

Tesla started building one of the world’s most potent supercharger stations next to its factory headquarters in Fremont, California. The station would charge 500 homes and 2500 electric cars and supply the electricity to the factory and the homes, eliminating the cost and mess of running other power lines.

Eon Drive project is based on the mash-up of these companies:

Car2Go as a reference for GPS tracking application software between cars and charging stations.

Innogy as a pioneer of electromobility infrastructures.

Tesla inspires ultra-fast charging technology.

STRATEGY	STRATEGY	STRATEGY

BUSINESS PATTERNS	pay as you go	self-service	experience	on-demand economy	sustainability-focused	mobile first behavior	digital transformation	corporate innovation
	aikido	acquiring non customers	disruptive trends	product innovation	take the wheel	technology trends	augmenting products to generate data	combining data within and across industries
SECTORS	transportation	energy & utilities						
CATEGORIES	mobility	automotive						
CUSTOMER NEEDS	affiliation/belonging	saves time	connects	reduces risk	organizes	simplifies	reduces effort	integrates

STRATEGY STRATEGY STRATEGY

	avoids hassles	quality	provides access	badge value	design/aesthetics	attractiveness	
DIGITAL INDEX	digirati						
TAGS	transportation	smartphone app	electric cars	electricity	e-charging points	electric mobility	superchargers

E.ON Drive’s business strategy is based on the following types of business models:

Pay as you go:

In pay as you go pattern lets people of all skill levels come in and use industrial tools and equipment to build their own projects. With this model actual usage is metered and you pay on the basis of what you consume. Some mobile phone contracts operate on this basis i.e. the user can buy a phone card which gives them credit. Each call is metered and the credit is reduced as the ‘minutes’ are consumed (in contrast to subscription models where you pay a monthly fee for calls).

Self-service:

Part of the value creation of the service or product is transferred to the customer in exchange for a lower price. This is particularly suited for process steps that add relatively little perceived value for the customer. But in fact incur high costs. Customers benefit from efficiency and time savings. Efficiency may even be increased, as in some cases the customer is able to execute a value-adding step more quickly and in a more target-oriented manner than the company.

Experience:

Disrupts by providing a superior experience, for which people are prepared to pay. More advanced experience businesses can begin charging for the value of the "transformation" that an experience offers. An experience business charges for the feeling customers get by engaging it.

On-demand economy:

The On-Demand Economy is defined as the economic activity created by digital marketplaces that fulfill consumer demand via immediate access to and convenient provisioning of goods and services. Supply is driven via an efficient, intuitive digital mesh layered on top of existing infrastructure networks. The On-Demand Economy is revolutionizing commercial behavior in cities around the world.

Sustainability-focused:

Fast moving consumer goods companies that are serious about sustainability research the ecological impact of their products and services. Facts are needed for research-based green marketing while creativity and locality is needed for green storytelling. Brand defining employees and green marketers work together with product and service designers, ecological organizations and governments. These research and marketing efforts demand a sustainable premium on traditional low-cost prices. When the market response is insufficient, governments can provide grants for sustainability-focused companies.

Mobile first behavior:

It is intended to mean that as a company thinks about its website or its other digital means of communications, it should be thinking critically about the mobile experience and how customers and employees will interact with it from their many devices. The term is “mobile first,” and it is intended to mean that as a company thinks about its website or its other digital means of communications, it should be thinking critically about the mobile experience and how customers and employees will interact with it from their many devices.

Digital transformation:

Digital transformation is the profound and accelerating transformation of business activities, processes, competencies and models to fully leverage the changes and opportunities of digital technologies and their impact across society in a strategic and prioritized way.

Corporate innovation:

Innovation is the result of collaborative creativity in terms of devising and developing an idea into a viable concept, followed by a collaborative effort to turn that concept into reality and implement it as a product, service or process improvement. The digital age has become an impetus for business model innovation, as technology has dramatically changed how companies operate and deliver services to customers.

Aikido:

Aikido is a Japanese martial art in which the strength of an attacker is used against himself. As a business model, Aikido allows a company to offer something diametrically opposed to the image and mindset of the competition. The novelty of the value proposition attracts the type of customer who prefer ideas or concepts that diverge from the mainstream.

Acquiring non customers:

Acquiring non customers who traditionally did not seem to be target of customer value proposition. Customer acquisition refers to gaining new consumers. Acquiring new customers involves persuading consumers to purchase a company's products and/or services. Companies and organizations consider the cost of customer acquisition as an important measure in evaluating how much value customers bring to their businesses.

Disruptive trends:

A disruptive technology is one that displaces an established technology and shakes up the industry or a ground-breaking product that creates a completely new industry. A disruptive innovation is an innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market leading firms, products and alliances.

Product innovation:

Product Innovation is the creation and subsequent introduction of a good or service that is either new, or an improved version of previous goods or services. This is broader than the normally accepted definition of innovation that includes the invention of new products which, in this context, are still considered innovative.

Take the wheel:

The basic rules of creating and capturing economic value were once very rigid. Companies tried to execute the same business models better than their competitors did. New sources of sustainable competitive advantage can often only be attained from business model reinvention that is based on disruptive innovation and not on incremental change or continuous improvement.

Technology trends:

Organizations to carve out their places in the digital ecosystems that are defining their industries in the platform economy. Supply chains are morphing into global, complex, interdependent entities, forcing companies to extend planning beyond the four walls of the enterprise. Technology has become the essential tool for global supply chain planning and nearly every other current logistics challenge.

Augmenting products to generate data:

Because of advances in sensors, wireless communications, and big data, it's now feasible to gather and crunch enormous amounts of data in a variety of contexts—from wind turbines to kitchen appliances to intelligent scalpels. Those data can be used to improve the design, operation, maintenance, and repair of assets or to enhance how an activity is carried out. Such capabilities, in turn, can become the basis of new services or new business models.

Combining data within and across industries:

How might data be combined with that held by others to create new value? The science of big data, along with new IT standards that allow enhanced data integration, makes it possible to coordinate information across industries or sectors in new ways. Smart leaders across industries will see using big data for what it is: a management revolution.

KEY PARTNERS

- governance and municipalities
- parking operators
- charging stations
- insurances
- joint grid operations
- r&d (dana holding, panasonic)
- government loans
- Partnership with CLEVER
- Virta as a digital backbone
- Vestel - A multi-sector pioneer of sustainable technology solutions.

KEY ACTIVITIES

- app development and maintenance
- energy production
- energy distribution
- energy delivery
- engineering
- operation & maintenance services
- creating the infrastructure for charging cars
- new charging stations deployment
- social responsibility activities
- billing
- operations
- management
- engaging with partners
- software development
- big data

KEY RESOURCES

- renewable sources
- software
- new business models based on data from smart metering
- intelligent networks
- employees
- engineers
- talent
- new ecosystem
- supercharger network

KEY PROPOSITIONS

- internet-enabled mobility
- to build fleet charging solutions for electric cars
- be mobile every time
- charging by usage
- zero emissions
- supercharger network
- super fast charging

CUSTOMER RELATIONSHIP

- online
- digital
- self-service
- green
- b2b and b2c
- consumer-centric service provider
- modernization
- decarbonization
- sustainable products and services
- accessibility
- customer service experience

CHANNELS

- smartphone app
- app marketplaces
- public charging stations
- website
- email
- power stations

CUSTOMER SEGMENTS

- residents of large cities
- people who seek the tradeoff between ecological compliance and personal mobility
- e-mobility drivers needing to charge their car
- future drivers
- municipalities
- companies
- middle class
- green community

COST STRUCTURE

- cleaning service
- charging stations
- insurances
- staff
- parking agreements
- investment in renewable generation and consumer-centric retail business
- it systems
- maintenance
- app development & maintenance
- it operations
- technology development
- maintenance
- support
- marketing
- energy generation

REVENUE STREAMS

- sale of energy
- sale of innovative products (e-mobility, energy saving and smart home)
- infrastructure projects
- operation & maintenance services

STRENGTHS

- Ultra-fast charging is a new way for people to charge their electric cars saving time.

- The use of ultra-fast charging stations can allow electric cars to drive distances that are more than 7 times the distance that would be possible without these stations. This results in less downtime for electric cars that are charging.

- In September 2019, a report found that it would take 10 years before a country with a population of over 10 million could replace 90% of its gas stations by charging stations for electric cars. The biggest barrier would be the grid, not the cars themselves.

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WEAKNESS

- Any infrastructure upgrade is not easy. Installing charging stations is not easy too. Even when infrastructure is in place, owners need to switch to electric vehicles for them to be truly effective.

Furthermore, the volatility of electric car batteries would make it hard to implement aggregation services. Chemicals like chlorine and salt, as well as dust and pollen, could degrade the battery and shorten its life span.

- The main weakness of ultra-fast charging infrastructure for electric cars is the range anxiety caused by insufficient charging stations.

Many people do not know how far cars can travel on a single charge and avoid electric cars because they don't want to get stranded.

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OPPORTUNITIES

- The need for a reliable system of recharging, with a guarantee of a power connection, can never be underestimated. As the number of electric cars on the road has grown, so has the number of charging stations.

- Ultrafast charging infrastructure will allow electric cars to remain competitive in the vehicle market. More research is needed to determine the feasibility of greater range and faster charging before new infrastructure is put in place. There might be a lack of current battery technology for this.

- Most electric cars only need 30 minutes for a full charge. However, many electric cars will charge to a level that is sufficient for a complete day of driving after a charge of over 8 hours. This means that the car still needs a lot of charge for a full day. This is a common problem for electric car drivers.

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THREATS

- At first, electric cars were seriously slow and short-ranged and most people didn't see the point in them, but the latest ones can go 200 miles or more on a charge and charge "quickly."

Unfortunately, the proliferation of such vehicles, combined with the proliferation of charging stations, could drive up demand for electricity, causing blackouts and demand spikes.

- Based on the latest news articles, there are two main threats of ultra-fast charging infrastructure for electric cars, which are the limited supply of post-treatment technology and the cost of the infrastructure.

- The main challenges of ultra-fast charging infrastructure for electric cars are the decreasing battery lifetime and the high infrastructure costs.

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*SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company’s competitive position and to develop strategic planning. It assesses internal and external factors, as well as current and future potential. Identifying core strengths, weaknesses, opportunities, and threats lead to fact-based analysis, fresh perspectives and new ideas.

SWOT SWOT SWOT

STRENGTHS

- Well-designed ultra-fast charging infrastructure for electric cars can solve a lot of inconveniences that currently bother electric car owners.

- An ultra-fast charging station is a system that charges an electric vehicle in a matter of minutes-thus relieves range anxiety.

In addition, because the time required to charge will be less, people will be more likely to adopt electric vehicles.

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WEAKNESS

- Rapid Charging stations typically charge at a rate of 150 km per 30 minutes, but if the charge is interrupted for any reason before the end of the charge, the charge rate is slowed to 60 km per 15 minutes, and the likelihood of getting stranded increases

- The need for huge cost and space to install high power chargers- Issues related to the grid and the balance of power.

W

OPPORTUNITIES

- The increasing number of electric cars on the road also means that charging stations are sorely needed. The UPS's networks of stores and their long history of working with electric drivers will enable

- An infrastructure for ultra-fast charging should mainly aim to provide a personal charge point for each customer for ultra-fast charging purposes. Along with this, it should also provide an access point to the electricity grid.

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THREATS

- The infrastructure cost risks not being amortized in a reasonable period of time if the purchase of electric cars by citizens does not occur as expected.

- The risk that government stimulus will not occur according to the established plans.

- Although the concept of a charging infrastructure boom for electric cars with their quick charge capabilities sounds great in theory, there are a number of discouraging factors that could bring the growth of the industry to a halt.

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POLITICAL

- The main issue with this is the high cost. For the government to subsidize the cost, they would have to either provide a subsidy or provide a return on investment.

- The main political problems with launching an ultra-fast charging infrastructure for electric cars in Germany are dividing the population about the best way to proceed as well as political concerns about who should be the primary provider.

- Recent research and development projects have been driven by many companies and organizations to develop quick and cost-effective charging infrastructure for electric cars in Germany.

The efforts to develop the system have been stymied mainly by the lack of a central government plan. Different car manufacturers such as BMW and Volkswagen have offered such solutions separately.

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ECONOMIC

- The current infrastructure for electric car charging is very unequal in Germany. This means that the car needs to be driven a certain distance to find a charging station, which is a problem due to the limited range for electric cars.

- Rates differ evenly from location to location, which isn't a sustainable system. In addition, rates during peak hours are higher. In other words, the demand for electricity during peak hours is higher. Therefore, an electric car needs to invest a lot of capital to recharge at peak hours.

- The major economic hurdle for establishing an ultra-fast charging infrastructure in Germany is the lack of sufficient investment for this to happen.

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SOCIAL

- Launching an ultra-fast charging infrastructure for electric cars in Germany has shown to have some social problems.

One problem is that it is difficult to get a consensus in society in order to invest in such an infrastructure and because of this, many people see the project as not feasible and that it is just a waste of tax money.

- Another issue is when electric cars hit the market because the infrastructure will be in need of adjustments in order to meet the new technology because it may be too expensive.

- The main social problem of launching an ultra-fast charging infrastructure for electric cars in Germany is that the infrastructure suggests that the only people who can afford electric cars are very wealthy.

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TECHNOLOGICAL

- As of November of last year, there are seven fast-charging sites in Germany with fifty points of charge. Germany has many technical problems to solve when it comes to launching an ultra-fast charging infrastructure for electric cars.

One of the problems is that the charging station only has the ability to handle half of the current charging power. One of the other problems is that the process is too slow for electric cars.

- The main technological problems faced by the German government are the lack of a traction network for an electric vehicles, concerns about how to handle the load, the costs of building the grid, and the electricity needed to operate the system.

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*A PEST analysis is a framework to analyse the key factors (Political, Economic, Sociological, Technological, Legal and Environmental) influencing an organisation from the outside. It offers people professionals insight into the external factors impacting their organisation.

POLITICAL

Other factors such as the lack of favorable grid connection and lack of a central regulator could also be contributing.

- The main political problems to launching ultra-fast charging are not having the pockets of natural gas pipeline networks, or pockets of natural gas pipelines, depending on the region. This is due to the gas industry dissolution during the 1990s.

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ECONOMIC

- Various studies have shown that electric cars are seen as increasingly affordable to individuals, but the cost for the upkeep of electric charging infrastructure is often overlooked.

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SOCIAL

With an ultra-fast charging infrastructure, the electric car battery can be charged in less than 30 minutes and the car can be driven for another 250 miles. It's clear that this means that the cars will only be affordable to the affluent and not to the masses.

- The primary challenge is to set up electrical stations at intervals of 20 to 50 kilometers so that charging is possible even during long trips.

- In the Netherlands, there have been problems with different groups trying to figure out where to put charging stations.

- People argue that placing them in the right places will be essential because not everyone at a station can charge a car at a time. Cars will need to line up.

S

TECHNOLOGICAL

- Germany's sudden need to invest in a large infrastructure for electric cars has a simple cause: the adoption of a whole new standard of charging stations. A first basic problem is that you can only have one of those stations per every 40 electric cars.

The average German daily driving distance is about 30 kilometers - so those stations have to be distributed relatively evenly.

- But, as the charging stations need a lot of power themselves to supply the cars with electricity, any pull from the grid might be too.

- The key technology of the electric car is the battery, but the battery takes a really long time to charge- up to 14 hours on 300 kW chargers for a lithium-ion battery

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- Backed by ambitious carbon emission-free measures and financial help with the European Green Deal, the EV market is booming in Europe.

- By 2025, it is expected 1 in 5 new cars sold to be electric (worldwide).
- By 2030, it is expected 2 in 5 new cars sold to be electric (worldwide).

- In 2035 and beyond, in Europe (2040 in the rest of the world), it is expected that 100 % of new cars sold to be electric. It means that we need to prepare the ground for tomorrow's e-mobility and ensure that our charging infrastructures meet a demand that's about to grow exponentially.

- The current infrastructure for electric car chargers is not widespread. And they are not accessible to all regions, with varying densities existing in different countries. Owners of electric cars are unlikely to purchase a car knowing that it has problems with the charging station.

- The main problem when deploying an ultra-fast charging infrastructure for electric cars is the high installation and the uncertainty of not knowing when the investment will be recouped.

- According to the article in "Bloomberg," there are a few challenges when it comes to deploying an ultra-fast charger infrastructure. The first is the charge speed and distance. The article states that electric cars need an improvement of tenfold in charge speed to ensure it's up to the task. Secondly, the article touches on the fact that the chargers are still wired for homes, which are not compatible with the public.

- As of yet, there is no standard for electric car chargers, which means the various manufacturers could not agree on fitting them under one single standard. If one company decides to invest in the infrastructure, other companies could easily follow suit.