The Future of

Electrified Parking Automation

GORE EcoMotion

GORE Technologies AG

EcoMotion Teaser Germany, 2024



Demand Outgrowing Reality.

The surge in global car sales has resulted in an alarming scarcity of parking spaces, a dilemma further compounded by the exponential growth in the demand for electric vehicles (EVs) that far surpasses the available charging infrastructure. This tandem rise in vehicle ownership and EV adoption has created a pressing need for immediate and innovative solutions in parking and charging facilities.

Parking:

Recent studies indicate a staggering **50% increase in car sales** over the last decade, while the number of parking spaces has only risen by a mere **10% in urban areas**. This imbalance has led to congested streets and frustrated drivers, with an estimated 30% increase in time spent searching for parking spots.

EV Charging:

Simultaneously, the demand for EVs has skyrocketed, with global sales surging by 75% in the past year alone. However, the existing charging infrastructure is struggling to keep up, with **only 40% of the required charging stations** available in key urban centers. The escalation in car sales alongside the rapid adoption of EVs underlines the critical need for a transformative overhaul in parking and charging infrastructure.





The Dark **Nightmare**.

Existing parking garages, while serving as essential infrastructures, grapple with several drawbacks that impact their functionality and relevance in a rapidly evolving landscape.

Their traditional structures often occupy substantial real estate without maximizing the potential for accommodating more vehicles due to their need for roads, ramps, staircases, elevators and emergency exits. The layout and design frequently result in **underutilized spaces**, contributing to congestion and inefficiency.

With **minimal customer convenience**, severe security risks especially for female users and rising operating costs the classic parking garage faces the end of its lifespan.

The dramatic surge in EV adoption and the **lack of adequate charging infrastructure** within parking garages hampers the convenience for EV owners additionally. This limitation restricts the accessibility and viability of classic parking facilities for a growing segment of future orientated, conscious consumers.

The Gap Widens. 37x the EV-Chargers Required.



The adoption of electric vehicles (EVs) in Germany is rapidly increasing due to government incentives and expanded consumer choices. **Germany boasts an EV sales penetration rate of 37%**, significantly higher than the global average of 16%.

Despite challenges in expanding the public charging network, Germany high EV sales penetration rate, government support, and efforts by automakers and tech companies have significantly boosted EV adoption. For instance, leading OEMs like Volkswagen, BMW, and Daimler have unveiled multiple new electric models, contributing to greater consumer choice.

However, obstacles such as EV affordability, battery production capabilities, and especially the **lack of charging infrastructure expansion continue to hinder progress**. Germany's **public vehicle-to-charger ratio stands at 26.1**, lagging behind the global average of 15.9. Additionally, the percentage of fast DC charge points in the public infrastructure is at 16%, below the global average of 22%.



Analysis conducted by the German National Platform Future of Mobility (NPM) delivers a compelling argument for the burgeoning business opportunity 'Electrified Automated Parking'.

According to NPM projections, by the year 2030, Germany anticipates accommodating as many as **14 million batteryelectric vehicles** on its roads. However, one of the most pressing challenges in this scenario is the adequate provision of public charging infrastructure. Presently, there exist a mere **37,000 public charging points** throughout Germany.

NPM has analyzed and forecasted the demand for charging points, considering the potential 14 million electric vehicles in multiple scenarios. Their findings indicate a staggering need for up to 1.4 million public chargers to meet this demand by 2030 – that is **37 times the existing infrastructure**.

Smart Automation.

Existing automation solutions are inefficient and lack comprehensive electrification features. Europe's largest automated car park at DOKK1 in Aarhus (Denmark) opened in 2015 as a 'show case' for the future of automated parking.

The underground structure holds close to 1,000 vehicles at the time and offers fully automated parking with retrieval times under two minutes. Since opening the facility has stored more than 1 million vehicles and hence provides a necessary proof of concept that automated parking is accepted by customers.

Had the garage been developed with GORE's EcoMotion technology the facility would hold **additional 300 vehicles (+30%) with lower operating costs and have full EV charging capability** creating additional income for the garage operator.



New York City's latest innovation in automated parking, \$50 million 'Tribeca Car Vault' holds 140 vehicles and sells the individual parking spot for \$350,000 apiece.

Had the developers used GORE's EcoMotion system the project could have reached up to **25% higher ROI** and added an entirely new revenue stream to the project in **EV charging incomes**.



Time for a Revolution.

The Future of **Electrified. Parking. Automation.**



Garage Operation Robotics & Electrification.

Ground. Breaking.

Arrive. / *Parked.* // *Charged.* Drive off.

GORE's groundbreaking patented technology, EcoMotion, introduces an innovative automated parking and EV-charging solution.

For the first time ever, it addresses the future capacity demands of parking hubs, providing an impressive +70% additional storage capacity compared to traditional parking garages and +40% compared to the latest competitive automation technologies in the market. Furthermore, GORE EcoMotion ensures the charging of each stored vehicle during its parking duration.

This advancement is made possible through EcoMotion's pioneering Al-powered shuffle parking technology. By implementing our system, garages can achieve an outstanding 96% space productivity for parking spots, revolutionizing the landscape of parking efficiency. Simultaneously, it enhances customer convenience, fortifies security measures, and minimizes operational costs, significantly boosting property value.

At the Core of GORE's EcoMotion Technology Sits



System. Technology. Components.





Over 90% more space-efficient.

A conventional parking lot the size of a traditional football pitch holds approx. 192 cars.

The same amount of cars can held in a classic 4-story parking garage can reduce the required space by 73%.

Using GORE EcoMotion's CUBE in a 6-story layout compresses the required floor space to only 9% of the football pitch, whilst still holding 192 cars.



Classic Football pitch size Approx. 5180 sqm

= 192 Conventional Parking Spots



The (I) **Electrified Parking Platform** holds the vehicle and acts as a plug-in connector to the EV charging infrastructure. The (II) **precision belt drive** moves the Platforms in all directions to allow maximum efficient shuffling (controlled by the Al-driven SAAS). Lastly the (III) **modular steel frame structure** secures stability and maximum flexibility in terms of lateral and vertical expansion of the facility. Selected spots are additionally equipped with a lift connecting multiple levels of the facility.

Independent of size and capacity of any given CUBE, these components are always identical and thus secure maximum interoperability, ease of service and expandability. The self-learning, cloud-based and (IV) Alpowered Mathematical Core operates the entire EcoMotion portfolio per SAAS across all applications.





Electrified Parking Platform



Including optional

Integrated **Battery Storage.**



The **Electrified** Parking Platform functions as a decentralized energy system:

Decentralized storage of excess energy from renewable energy sources .The platform can be used as buffer storage. The stored energy can be used for vehicle charging or transmitted into the main battery storage facility of the structure.



GIRE EcoMotion harnesses Industry 4.0 and IoT technology within its drive train and control technology.

Its patented drive system drastically cuts drive power by 90% on flat surfaces, resulting in substantial energy savings. The pioneering toothed belt technology effectively curtails noise emissions by mitigating structure-borne noise.

The Electrified Parking Platform sits flush on the belt drive and gets moved 360 degrees by the drive train, powered by the underlying Al-powered SAAS.

Utilizing IoT capabilities, EPM enables real-time analysis and processing of data, streamlining vehicle parking and delivery times to their minimum.





Drive train successfully concluded pilot run of over 120,000 cycles and 3.5t weight. This corresponds to a lifetime of 10 years.



Lengthwise drive units moving Parking platforms forward / backward

Structural Frame hosting the belt drive unit, directly bolted to steel frame construction

Transversal drive units moving Parking Platforms sideways in both directions





Modular Steel Frame.



for Maximum Flexibility.

- Maximized space productivity in any new or existing building
- Modular structure allows full flexibility in design of layout, levels and optional additional features
- Standardized modules allow for series production and low unit cost and short delivery time
- EcoMotion system can be retrofit into existing parking facilities without structural construction work

Multi-Level Design (with lift) **Ground Erection possible** (and retrofit in existing structures)







THE CUBE AI-Powered Software & Digital Services (SAAS).

The EcoMotion store system operates on a cloud-based **sophisticated mathematical model that connects all CUBEs,** designed for continuous learning and process optimization using data-driven approaches.

This mathematical model operates in real time, determining the **most** efficient platform movement within the parking system to significantly reduce cycle times. Even during peak hours, waiting times at delivery/handover stations are minimized to enhance efficiency.





Additionally, EcoMotion boasts a digital interface that seamlessly integrates with **connected parking and smart city** concepts. This interface not only facilitates the incorporation of the EcoMotion parking system but also **supports digital payment for parking and additional services** offered by the car park operator, such as car cleaning.

Moreover, this interface serves as a gateway to **connect with external entities**, including car-sharing providers, hotels, and retail stores. This connectivity paves the way for EcoMotion to innovate and develop new business models centered around parking solutions



Outside Connection

Built-In Infrastructure



Solar Paneled Exterior Façade / Roof

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Every CUBE is optionallyt equipped with stateof-art solar power panels on both roof and façade to self-generate the maximum amount of power from inhouse sources.



Connection to Outside Renewables Energy

Each CUBE is directly connected to the external power grid to power the facility with renewable energy from nearby solar parks, wind power parks or hydropower plants.









The unique electrified platform optionally hosts latest technology battery packs to use the vehicle platform itself as energy storage facility.



Outside Connection

Built-In Infrastructure



Integrated Battery Storage Facility

Each CUBE is additionally optionally equipped with a full batallion of battery storage units to turn the CUBE into a power storage hub for both EV charging and nearby infrastructure.



GORE EcoMotion is **designed to fit all passenger vehicles, both in terms of size and weight**. Especially in North America and Emerging Markets vehicle measurements often outsize existing parking structures and make facilities inaccessible to a growing segment of customers.

The CUBE allows storage of all passenger vehicle types, including **traditional combustion vehicles, vintage cars, EVs** and all vehicle types with alternative fueling technologies (like LPG).

The system is therefore perfectly designed to manage the global transition from combustion vehicles to EV over the coming 20 years **without the need for CAPEX-heavy followup installations** of additional charging infrastructure.





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& EV-Charging Types

The EcoMotion technology is equipped with **charging capabilities for all standard EV-charging types** in the market. In addition the design reflects the potential future requirement for retrofitting of **new technology options**.

Since the EV is plugged directly into the Electrified Parking Platform which then automatically connects wirelessly to the electrification connector on the drive train, **retrofits are simply done directly to the platform** instead of having to shut down the facility to retrofit the frame itself.

This ensures **maximum future-proofness of the EcoMotion technology** and 24/7 operation of the CUBE.





Built-in **Fire Protection**.



Fires in parking garages pose significant risks, accounting for an average of 6,600 structure fires annually in the US alone. These incidents result in both civilian injuries and **hundreds of million USD in property damage** each year.

Vehicle-related issues, improper storage of flammable materials, electrical problems, and arson contribute to these fires. The enclosed nature of garages complicates firefighting efforts, causing rapid smoke spread and challenges in accessing and controlling the blaze.

These incidents not only **endanger** occupants and responders due to smoke inhalation and structural risks, they also pose an **immense danger to the building itself** and hence the entire investment.

GORE's EcoMotion parking technology incorporates **advanced fire protection features by design**.

When the system detects a temperature rise, the platform swiftly moves the vehicle toward the lift. Subsequently, the lift automatically transfers the platform including the vehicle to a designated fire-resistant basement area, promptly flooded to extinguish the fire.

The vehicle remains there until the fire is extinguished, ensuring **minimal** to no damage to the structure or other vehicles. Once the vehicle has been sufficiently cooled down, it is safely extracted from the facility.





Anti-Corrosion Design.



As vehicles move in and out, the **corrosive mix of melted snow and saltwater** carried by the cars tend to drip and trickle down, infiltrating the machinery.

Hence **corrosion becomes a major concern**, leading to rust formation, decay, and deterioration of critical components like the drivetrain and steel frame. This can compromise the structural integrity and functionality of the system and consequently reduce the lifespan of conventional systems.

The need for frequent maintenance and early replacements becomes inevitable, driving up maintenance costs substantially.

Melt Water Collection Reservoir within Platform



The **120-liter dirt and melt water collection reservoir** in EcoMotion's Electrified Parking Platform collects dripping water from the vehicle, stores it inside the platform until docked onto the parking spot.

Once at the designated parking spot the built-in **vacuum extracts the water** from the reservoir into a central disposal system.

This ensures **zero spill-over into the mechanical structure** of the CUBE and hence a superior lifespan, significantly lower needs for component replacements and thus lower maintenance costs.







THE **CUBE.** Additional Modular Services.



The CUBE boasts cutting-edge 3D vehicle scanning and video technology, providing the option to **detect exterior damage across body kits, undercarriages, tires, and paint surfaces**. As vehicles enter the CUBE, they traverse through an LED tunnel designed to optimize lighting, ensuring the identification of even the most minute issues.

All video and scan data are securely stored within a blockchain-powered archive, guaranteeing robust data protection and security measures. This technological innovation equips commercial parking garage operators to explore entirely new business avenues, including entering into repair services, spare parts provisioning, or facilitating secondary marketplaces for pre-owned vehicles.

Furthermore, this technology offers **seamless integration for car rental businesses**, allowing hassle-free and operationally optimized data capture for insurance-compliant damage detection. This facilitates a streamlined digital customer experience while ensuring adherence to insurance protocols.



THE CUBE.

How it works.

The Past Present.



Conventional Parking Garage

The conventional layout of parking garages **utilizes just 50% of the available floor space** due to the necessity of ramps, roads, elevators, staircases or fire escapes.

There is a **scarcity of EV charging spots**, often restricted to less than 10% due to insufficient electrical infrastructure. **Manual insertion and removal of cars** are necessary, and cars must be manually relocated to maximize the usage of available charging spots.

In the event of fire, there is a heightened risk of the entire floor being affected by the fire hazard.



Shuttle-based Parking Automation

Conventional automated garage layouts effectively **utilize only 65% of the available floor space**, while the remaining 35% is occupied by transport shuttles, transport alleys, and entry rooms.

In the event of a **technical failure of the shuttle all cars in the respective section become immobilized** until the repair is completed.

The system lacks the capability to plug chargers into EVs, usually resulting in a complete absence of EV charging spots.

In the event of a fire, there is a high risk of the fire spreading to adjacent vehicles due to the system's design limitations.



The Future.



GORE EcoMotion Cube

The innovative Puzzle Technology by EcoMotion enables the **utilization of up to 90% of the available floor space**, eliminating the need for ramps, roads, or shuttles.

This cutting-edge system offers a **flexible number of charging spots** that efficiently charge all vehicles within a section, thanks to the automated Al-powered shuffle mechanism.

The **360-degree belt-drive precision movement** ensures that in the event of a failure in one element, only one car gets stuck, while the system continues to operate seamlessly around the faulty element.

Moreover, the system boasts **immediate fire-extinguishing**, ensuring zero to minimal spill-over to adjacent vehicles, enhancing safety measures significantly.



Competitive Advantage.

At present, no other player in the market provides technology that matches GORE's EcoMotion offering in digital electric mobility, sustainable energy storage, and adaptable real estate design.

Competitors lack a comparable solution in terms of product design, offering less flexibility aligned with individual customer preferences for real estate design.

Furthermore, there is a notable absence of alternatives concerning digital interfaces, EV charging infrastructure, and energy storage systems.

Unlike EcoMotion's production method, competitors rely on manual manufacturing processes (with a batch size of 1) leading to detrimental impacts on costs, delivery timelines, overall quality, and service standards.

Main competitors automated parking





Competition	GORE EcoMotion
min. 30% less use of pace for parking	Efficient use of (limited) existing space
Parking systems less flexible	Tailored towards the needs of the customer and his building
Business case limited to parking	Offering the opportunity to create (digital) business models around parking (EPM parking system generating revenue)
Energy balance 40% worse	Outstanding energy consumption due to belt drive
No charging function	Integrated EV smart charging
Limited to passenger cars	Providing multi store options (e.g. motorbikes, bicycle, other)
Errors in system might impact availability of vehicle	Redundant parking system ensures access to vehicles
Average longer waiting time to deliver vehicle	Only 60-90 sec. to deliver vehicle due to direct control of platform and bi-directional conveying system





Vast Spread of Applications.







Custom design for display and shuffling of highly valuable vintage, luxury and sports cars for leading car experience venue Motorworld.

GORE EcoMotion is Motorworlds official cooperation partner for all future Motorworld venues and will deliver the first realization in 2025.







High-End Storage for **Vintage & Luxury Vehicles**.





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Automated Seaport Car Storage

Automated Seaport Car Storage



250,000 cars arriving per car transporter vessel per year

Inbound:

Vessels arriving carry between **3,000 -5,000 vehicles at a time**, 20% of those vehicles are EVs today, trending towards 50%

Outbound:

Cars delivered either to dealership or directly to customer, charged to 60%, washed and documented on damages

Today cars are manually loaded onto transporters, driven to classic offsite parking lots and get manually parked and charged by staff to wait for outbound departure.

The Future

Fully automated & electrified parking CUBE for 5,000 vehicles

Storage Capacity for **5,000 vehicles** at a time required, all spots equipped with **EV charging** to cover future demands

Built in solution for fire damage protection

Built in solution for **3D vehicle scanning technology** to detect exterior damages from oversea transport

Platform size and weight tolerance in line with largest and heaviest passenger vehicles in the market



Residential & Hotel Garage

in luxury Paris Development Hermitage Plaza







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Join the Future of

Electrified. Parking. Automation.



with

GORE EcoMotion

Fully automated parking & EV-charging hub



70% more space productivity

vs. conventional parking garage



25% additional ROI vs. established parking automation offers



New revenue streams through 100% EV charging capability



AI-powered SAAS powering all CUBEs

Experienced Realisation Group with leading Real Estate & Engineering Partners

Luxury appeal

& maximum customer convenience

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