

Stefan Rustler Discusses Overcoming Challenges and Pioneering Innovations at ENNOVI in the e-Mobility Sector

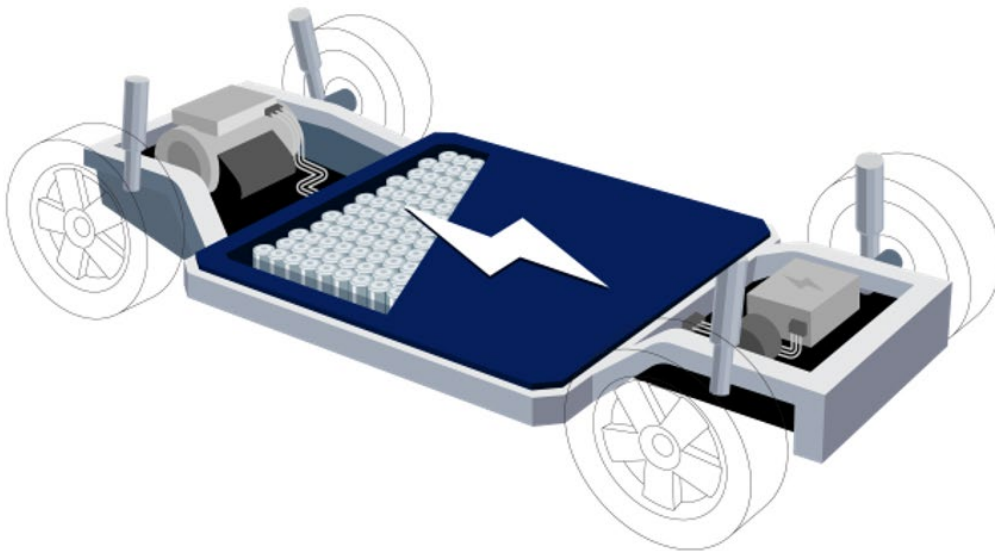


Figure 1. Cell-to-Pack example

One Automotive Industries recently met with Stefan Rustler, the CEO of ENNOVI, to discuss the various challenges and accomplishments experienced during his tenure. ENNOVI, formerly known as Interplex, is renowned for its innovative and customized interconnect and mechanical products serving diverse industries. Upon joining, Rustler faced a decentralized structure and unclear market strategies, which he addressed by transforming the company into a focused entity dedicated to the future of automotive technology. This included fostering innovation, speeding up processes, enhancing team capabilities, and emphasizing sustainability.

ENNOVI differentiates itself in the e-mobility sector by concentrating on electrification, hybrid vehicles, and autonomous driving. The company's global footprint and talented workforce enable it to meet customer needs worldwide, reinforcing a culture of commitment and speed. Among the recent innovations Rustler is excited about are ENNOVI-Net, a 10Gbps+ Ethernet

connector solution designed for autonomous driving, and ENNOVI-CellConnect, a versatile battery interconnect system. These technologies not only improve reliability and signal integrity but also streamline assembly processes and reduce environmental impact.

Quality and reliability are paramount at ENNOVI, achieved through patented innovations like the double-layer flexible printed circuit and advanced lamination processes. These advancements reduce production times, minimize environmental impact, and enhance the structural integrity of EV battery modules. Sustainability is a core pillar for ENNOVI, integrated into every aspect of its operations. The company has been recognized with the EcoVadis Platinum Medal for its outstanding sustainability performance.

Looking ahead, Rustler envisions ENNOVI playing a pivotal role in the evolving global e-mobility market. With a strong global presence and a commitment to attracting and retaining top talent, ENNOVI continues to drive innovation and stay ahead of industry trends through its five core pillars: Speed, Innovation, Best Talent, Global Reach, and Sustainability. Follows Automotive Industries interview with Stefan Rustler, CEO of ENNOVI

Automotive Industries: Hi Stefan, what are some of the key challenges you faced when you first joined ENNOVI, and how did you overcome them?

Rustler: When I first joined the company, it was still known as Interplex, a world leader in innovative and customized interconnect and mechanical products serving customers in different industries. At that time, we were more decentralized and missing clear market strategies. Our goal has been to build a company that is fully focused on the car of the future, serving our customers with innovative solutions making them successful in the fast-moving Automotive market. We have set up a company differentiating ourselves by innovation, speed, the best talent, a global footprint and a strong commitment to sustainability. During the last 2 years, we have been focused on adding talent to our organization, further improving our engineering capabilities and servicing our customers faster through better processes.

Automotive Industries: How does ENNOVI differentiate itself from other companies in the e-mobility sector?

Rustler: We redefined the strategy of ENNOVI and are laser-focused on the car of the future. Together with our customers, we are developing solutions for electrification, hybrid cars and autonomous driving. Our global footprint and our strong talent base give us the advantage to serve our customers wherever they need us. Commitment to our customers and speed are important parts of our company's culture.

Automotive Industries: Can you share any recent innovations at ENNOVI that you are particularly excited about?

Rustler: ENNOVI is committed to serving the world's leading Automotive OEMs and Tier 1 manufacturers and helping them reach an electric future faster – from anywhere in the world. This year, we have introduced several innovations and added new capabilities to our offering.

ENNOVI-Net is a customizable Automotive 10Gbps+ Ethernet connector solution that has a standardized USCAR interface, but, uniquely, has press-fit pins rather than through-board solder pins which improve the reliability of the board connection, which is of increased importance for mission-critical – autonomous driving applications. Additionally, using ENNOVI Automotive approved press-fit solutions, the assembly process is much simpler, faster and environmentally cleaner, and the common issues arising due to variations in applied solder paste are eliminated. Furthermore, compared to soldered pins, the shortness and lower

capacitance of the press-fit solution reduces resonance, thereby enhancing the overall signal integrity of the connector.

ENNOVI-CellConnect cell contacting system represents a paradigm shift in battery interconnect technology, empowering OEMs and gigafactories to scale production and meet the growing demand for electrified mobility solutions. This versatile platform offers unique customization options and is compatible with prismatic, cylindrical and pouch cell formats. It supports the robust connection of individual cells with the flexibility to create larger modules or advanced cell-to-pack and cell-to-chassis configurations while streamlining the assembly process and optimizing material costs.

Lastly – ENNOVI is particularly excited about its innovation around lamination processes for cell contacting systems. ENNOVI has pioneered the use of both hot and cold lamination, eliminating the need for costly trays or foams. Cold lamination requires less energy in production and is therefore a cost-efficient and green technology. With our ability to offer and recommend different lamination material combinations, we are uniquely positioned to offer OEMs and Tier 1 suppliers a streamlined, more adaptable solution to help them control costs while offering robust solutions.

Automotive Industries: How does ENNOVI ensure the quality and reliability of its products in such a rapidly evolving industry?

Rustler: One of the key innovations within the ENNOVI-CellConnect platform is the replacement of conventional flexible printed circuits with a flexible die-cut circuit. This new roll-to-roll capability not only reduces production times and bill-of-material (BoM) costs but also minimizes the environmental impact when recycling the excess copper.

We patented a double-layer flexible printed circuit and flexible die-cut circuit design. Larger battery packs connect more cells and hence require more wiring traces in a flexible printed circuit or flexible die-cut circuit. The double layer allows you to stack the copper layer on top of the other, making it possible to match the space needed by a flexible printed circuit. Additionally, the use of automotive-grade polyethylene terephthalate (PET) materials and hot-bar solder lamination ensures optimal thermal resistance and component attachment without compromising integrity.

More recently, ENNOVI has qualified PET insulation foils and adhesives from multiple suppliers by testing them for their bond strength, durability, and environmental impact. As a result of this research, ENNOVI has a database of recommendations for the most effective material combinations, bypassing the trial-and-error approach that has long been a staple of the industry.

ENNOVI's ability to offer hot or cold lamination processes for the cell contacting system positions it uniquely in the market, providing enhanced flexibility and efficiency to global OEMs and Tier 1 suppliers. By optimizing the selection of PET foils and adhesives, ENNOVI is improving the structural integrity and lifespan of EV battery modules and reducing manufacturing cycle times and environmental footprint. As the industry moves towards more sustainable, efficient manufacturing practices, ENNOVI's goal is to reduce or eliminate the need for adhesives altogether.

Automotive Industries: What role does sustainability play in ENNOVI's business strategy, and how is the company working towards it?

Rustler: ENNOVI holds sustainability as one of its core pillars. In doing so, the company has integrated a sustainability mindset into its operational framework. By quickly adapting to the changing demands of the global sustainability targets, ENNOVI has been able to position itself as a leader in sustainability performance.

ENNOVI is focused on several initiatives, such as:

- Increasing renewable energy adoption throughout our facilities, ultimately reducing our overall carbon footprint and dependency on fossil fuel and supporting the e-mobility market in reducing Product Carbon Footprint.
- Utilizing treatment and reuse of water through onsite recycling systems, especially in areas identified for water stress.
- Reducing or eliminating the reliance on adhesives and other materials that may impact the environment through improved product design.
- Working with suppliers that support the same level of commitment to sustainability in their business strategy.
- Collaborating with customers to ensure sustainable designs.
- Regular assessments of Environmental Impact to identify opportunities for improvement and establishing more targeted and effective strategies moving forward.

ENNOVI prides itself on its continued recognition for outstanding sustainability performance by EcoVadis, the world's most reputable provider of business sustainability ratings. This year, ENNOVI secured the EcoVadis Platinum Medal, for the fourth time, placing it in the top 1% of over 130,000 companies assessed worldwide. This accolade aligns with ENNOVI's mission to positively impact the e-mobility sector with a host of strategic initiatives to reduce energy consumption, water use, waste generation, and greenhouse gas emissions, alongside the company's intense efforts in recycling and sustainable energy use. ENNOVI also focuses on training and awareness programs to bolster environmental impacts, human rights, fair trade practices, and ethical business conduct. This prestigious EcoVadis rating, which uses a transparent and evidence-based framework to evaluate a company's commitment to sustainability, not only reinforces ENNOVI's leadership position in sustainable practices within the e-mobility sector, but also solidifies the trust and confidence of our customers, stakeholders, and the broader community.

Automotive Industries: How do you see the global e-mobility market evolving in the coming years, and what role will ENNOVI play in that evolution?

Rustler: ENNOVI believes in an accelerated adoption rate of EV cars and is fully committed to supporting the transformation in the Automotive market. Based on our strong commitment to the e-mobility sector, we have the agility to act at speed in realizing the needs of OEMs and Tier 1 suppliers on a global level – from product, process and manufacturing innovation. Our maxim is to electrify faster: we are at the forefront of propelling the EV market forward, transforming customers' ideas and requirements into reality through end-to-end competencies in battery platform, power and signal interconnect solutions.

Automotive Industries: How important is it for ENNOVI to maintain a global presence, and how do you manage operations across different regions?

Rustler: ENNOVI has a global management team of strong and proven leaders who have decades of relevant industry and technical experience. As a focused e-mobility solutions business operating in one of the fastest growing markets, we continuously drive customer

service excellence and shape our operations to prosper by investing in our manufacturing and R&D sites, currently across major geographies.

Automotive Industries: What initiatives does ENNOVI have in place to attract and retain top talent in the industry?

Rustler: ENNOVI believes that every voice counts in shaping the future of electrification, where collaboration and trust empower the free exchange of ideas for collective success. We foster growth and fuel innovation through continuous development and provide a transparent and equitable compensation structure where rewards are not just tied to the individual but also to the company's achievements.

Automotive Industries: How do you stay ahead of industry trends and ensure that ENNOVI remains competitive in the market?

Rustler: Our dedication to transformation is embodied in our five core pillars: Speed, Innovation, Best Talent, Global Reach, and Sustainability. This means adapting swiftly to rapid market shifts through agile structures and empowering innovation in every facet of our operations, strategically extending our global presence, advocating for sustainability best practices, and cultivating a team of exceptional talent.