CONTROL UNIT & GATEWAY

## *Telematics for electric vehicles*

iWave took a look on the current electric vehicle (EV) market and evaluated the benefits of telematics in these. To connect to an EV, users can utilize a telematics control unit or a gateway. The company provides both. CAN, CAN FD, CANopen, and J1939 play a role in this.

Outlook for annual global passenger-car and light-duty vehicle sales, to 2030
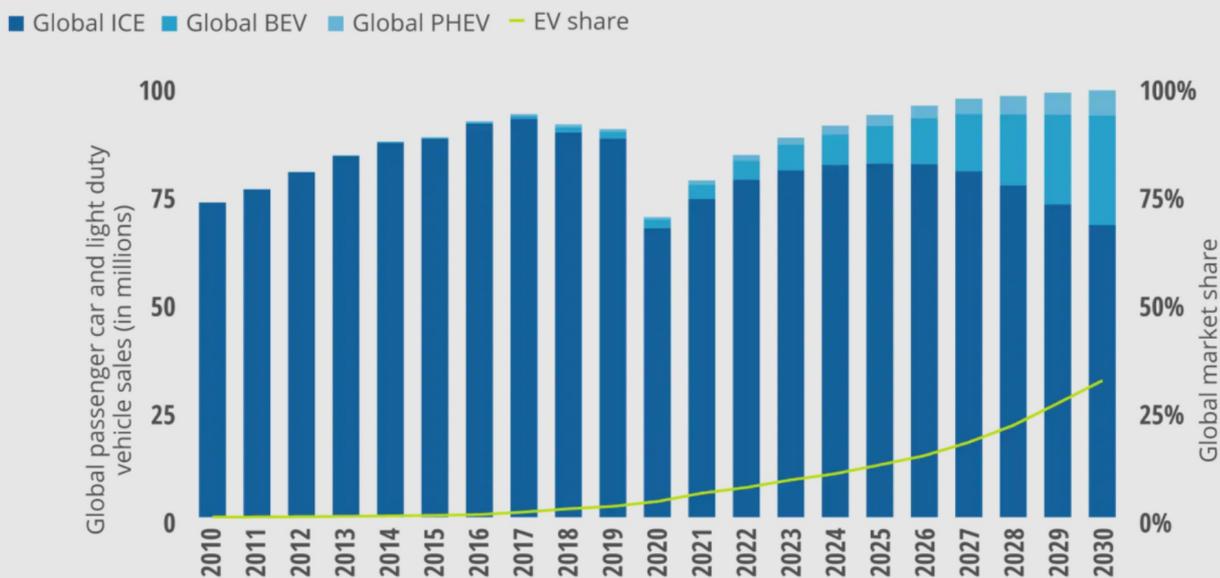
Source: Deloitte analysis, IHS Markit, EV-Volumes.com[16]

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(Source: iWave)

The company stated in a current press release: Since 2019, The electric vehicle (EV) market has taken great strides and is set to transform the automotive industry. Automotive OEMs (original equipment manufacturers) have increased spend on R&D on electric models and sustainable technology. Governments have introduced regulations and incentives to accelerate the shift to electric vehicles. Europe spearheaded this development, where EV adoption reached 8 percent due to policy mandates such as stricter emissions targets for OEMs and generous subsidies for consumers. Consumer attitude and increase awareness has led to a greater adoption of electric vehicles. A Deloitte report suggests that the global EV markets is to grow with a CAGR (compound annual growth rate) of 29 percent achieved over the next ten years: Total EV sales growing from 2,5 million in 2020 to 11,2 million in 2025, then reaching 31,1 million by 2030.

Benefits of telematics for EV according to iWave

- Driving experience: In EV, it is important for the driver to know the range of the vehicle, know their next charging station, and plan their trip accordingly. The telematics unit can determine the location of the vehicle, and through mapping and information on the range and available chagrining infrastructure, can help pre book the charging spot at a location to save time.
- Charging analytics and EV energy usage: Telematics can help monitoring the charge level, battery health, and provide valuable data required to improve the vehicle algorithms. Continuous updates and advancements on charging time, battery size, and weight are being taken up by EV manufacturers. The real-time data provides the manufacturers with a data source for their development and analytics. Such analytics can also help notify on the battery status of your vehicle.
- Fleet management and route mapping: A lot of last mile delivery trucks are now powered through batteries. Field service managers can work through a route management, benchmark vehicle utilization, monitor charge reporting, and measure whether their plans are effective in reducing costs and emissions.
- Alerts and notifications: The telematics units can determine the state of charge of the battery and alert the driver through an SMS on the need to find a chagrining spot immediately. Alerts such as an issue with the battery can be provided on real time to the driver to avoid troublesome situations on the road.
- Firmware update: With continuous advancements on the charging algorithms and software of an electric vehicle, the telematics unit can also act as a bridge for firmware update of the ECU (electronic control unit) and electronics within an electric vehicle. The telematics unit with LTE connectivity can be connected to a server for updates and an OTA update mechanism.

Telematics hardware for EV

To connect to the electric vehicles, users can utilize a telematics control unit or a gateway. The telematics control from the company, comes with three integrated CAN interfaces as well as wireless technologies such as 4G, Wifi, and Bluetooth. Different CAN interfaces can be connected to the different terminals within the EV backbone to tap different data points on different CAN

networks.

The telematics control unit (TCU) iW-Rainbow-G26 from iWave, comes with three CAN interfaces (high-speed CAN, low-speed CAN, and CAN FD). This enables a connected network within the vehicle while collecting data from the vehicle electronic systems. The CAN network enables real-time analytics. The TCU serves as a data for various connected vehicle applications building the bridge between the vehicle and the various cloud platforms serving applications such as predictive maintenance scheduling, fleet management, and personalized driving experiences. The IP30-rated device, also supports the protocols ISO 15765-4, ISO 11898, CANopen, and CiA 447.

EV management with telematics: Receive notifications when batteries reach critical status and is time to charge, planning of charging cycles based on the peak electricity rate times, performance reporting and finding out impact and return on investment through electrification, as well as recharging priorities based on state of charge and operational schedules (Source: iWave)

iWaves' telematics control unit (left) and their telematics gateway (right) come both with CAN (Source: iWave)

The telematics gateway iW-Rainbow-G41 from the company, provides four CAN interface (also high-speed CAN, low-speed CAN, and CAN FD). The gateway also encompasses sensors that can enable applications such as e-call, driver behavior analysis, and idling time. With the support of multiple protocols (ISO 15765-4, ISO 11898, and J1939) and edge firmware, the gateway is suitable for applications ranging from heavy duty trucks, vessels, industrial machinery, and passenger cars. The IP66-rated product acts as one multi-purpose device catering to various vehicles and mobility infrastructure.

Unlike conventional vehicles, EVs do not follow mandatory telematics data standards, making data access a challenge, the company said. Hence, the Linux-powered telematics control unit provides the software to be compatible with different makes and models of electric vehicles.

The wireless technologies provide the capability to power different use cases such as SMS alerts and notifications to the drivers and fleet owners. Wifi can help in firmware update of the ECU and vehicle electronics when connected to the user's home networks and lay the foundation for the use cases. EVs have unique metrics that need to be monitored to optimize their performance, range, and return on investment, making telematics a must for electric vehicles, the company concluded.

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