

Auto Bytes

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Smart lighting technologies: Choice of future mobility systems

Megatrends

In the overall structure of a vehicle, the design of its components, including the lighting system, holds an important place not just in terms of aesthetics but also safety. With autonomous vehicles and electric mobility being considered the future of the automotive industry, the automotive lighting market is looking for seamless solutions. It is now increasingly becoming integrated with the Internet of Things and has potentially turned from a component of illumination to facilitating communication. There has been a sea change in its manufacturing, testing and designs both in India and globally.

As automobiles are growing smart, we are witnessing a megatrend in the form of Adaptive Driving Beam (ADB) and Adaptive Front-lighting System (AFS). AFS installation rate has grown steadily over the years, up from 10% in 2015 to 16.8% in 2018, a figure expected to increase to 30% or so in 2025. Some other trends include digital intelligent automotive lamps, which are currently available in high-end models, as well as non-visible IR lighting – for both interior and exterior use – as part of Advanced Driver Assistance Systems (ADAS). Thus, lighting companies are innovating constantly to design solutions that would shape the future of mobility. Smart lighting technologies need significant development to address the needs for safety, meet emission norms and ensure lightweighting.

ADAS include smart technologies like detection of obstacles and other vehicles, fully automated parking and human-machine interfaces that meet and anticipate drivers' needs by enhancing interaction between the vehicle, the driver and the surrounding environment. Electric vehicles specifically demand a reduction in the battery load of the lighting system, which can be achieved by transitioning from halogen to light emitting diodes (LEDs) to improve range and efficiency of lumens (quantity of visible light emitted by a source).

The current trends in automotive lighting systems aim to enable drivers to navigate during the night with ease. Companies are seeking to make benchmarked products with combined features which would essentially make LED lighting systems the choice for the future of mobility. This would include gaining insights into various automotive lighting technologies and system approaches, including comparisons between LED/organic LED (OLED)/laser, daytime running lamp (DRL)/headlamp/interior lighting and AFLS, as well as comprehensive industry analysis, technology roadmaps and market metrics.

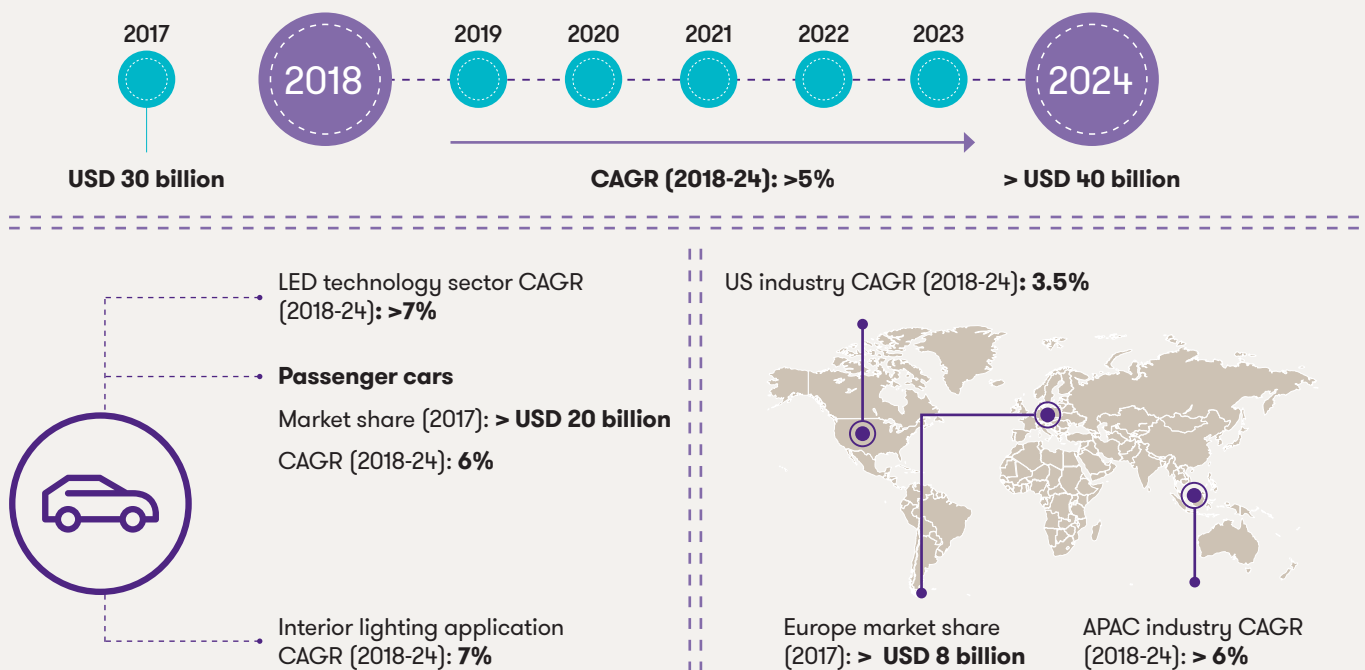
The way forward

Simultaneously, the challenge is to increase automation of critical manufacturing. The digital transformation in lighting does not only offer cost reduction, it also brings in several additional benefits. For example, lighting systems now utilise the network infrastructure in the building for control (and sometimes power) instead of using dedicated (and often costly) lighting solutions. Off-the-shelf protocols are supported by transparent gateways without (application) protocol translations and related development effort. Standard IP connectivity for lighting also enables much easier interoperability with other systems, such as Building Automation Systems (BAS), smart grids and cloud services, which are moving or have moved away from dedicated connection and protocols towards IP-backbones.

If India can leapfrog these technologies, there can certainly be a revolution in mobility. What is certain is that all automotive technologies - at least the software component - will be built in India for the world.



Automotive lighting market



*Global Market Insights

Sources

- Auto Tech Review
- NHTSA
- LED Professional
- Global Automotive Lighting Industry Report 2019

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