Europe's compound semiconductor industry

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Efforts for making the world a better place include schemes to cutting carbon dioxide emission, increase energy efficiency and reduce the number of accidents on our roads. Compound semiconductor devices are playing a role in all of these efforts, with chip manufacturers in Europe making key contributions.

Silicon dominates the rapidly growing solar industry, but it is widely tipped to be knocked off its throne by thin-film technologies based on compound semiconductors. CIGS and CdTe lead the way, but in places that are really sunny and dry, such as the South-West US, triple-junction cells based on traditional III-Vs are starting to win significant business. Azur Space Solar Power operates in this market, and has technology developed by one of the world's leading universities in this field, Fraunhofer ISE.

After solar energy has been converted into electricity, it then has to be transformed from a DC form to an AC one that can be fed into the grid. Silicon electronics can be used for this, but far higher efficiencies are possible with SiC. In Infineon and ST Microelectronics, Europe has two of the world's leading suppliers of this class of electronic components.

Lighting currently accounts for about one-fifth of the world's electrical consumption, and to trim this energy bill governments around the world are phasing out the incandescent bulb. In its place are mercury-ridden, rarely dimmable compact fluorescents, which are facing a growing threat from LED bulbs delivering higher efficiency. In Europe Osram is leading the way with this technology, and it promises to trail blaze the introduction of new forms of colour mixing, which can take efficiency to a new level.

Accidents on roads can be reduced with the widespread introduction of collision warning systems based on automotive radar. These have been available for a decade or so, but have been too expensive for widespread adoption. One way to help to get the cost down is to replace a handful of GaAs chips for generating, amplifying, emitting and detecting these 77 GHz signals with a pair of SiGe chips. Infineon is leading the way in this endeavour.

Details and further insight will be provided during the talk to get a taste on what is happening in Europe's compound semiconductor industry as well as an outlook on what to expect in the next few years.