

Light+Building Autumn 2022

Goal is electrification and digitalisation

Due to rapidly rising prices for gas and oil and the need to secure the supply of raw materials, the subject of energy supply has taken on a whole new urgency. Now, more than ever, the promotion of sustainable energy generation, the reduction of consumption in buildings and the expansion of electro-mobility are central building blocks on the way to achieving the energy turn-around objectives set by the EU.

Concepts for the networked and intelligent city of the future – the smart city – already exist. At its heart is the safe and efficient networking of people, places and infrastructures. Since space in cities is limited, it must be used optimally.

However, the basis for smart cities and consequently an efficient and secure energy supply is the electrification and digitalisation of the infrastructure. Once this step has been achieved, the economic use of wind and sun as sustainable energy sources (smart grids) and the coupling of sectors are possible.

Key factor is innovation

Technological developments and innovations enable completely new approaches to solutions that are now absolutely topical for politics and society. The invention of the lithium-ion battery was decisive for the development of sustainable electromobility. The economic use of wind and sun as regenerative energies is only possible through technical excellence in generation, transmission and distribution ("smart grid"). Of central importance to this is the further development of information and communication technology. In the "final development" of a smart city, people, places and infrastructures will be networked with each other.



Interior lighting features all manner of shapes/styles.

Smart buildings make smart cities

Smart buildings are the basis of a smart city. This is where residents spend a large part of their time, either living ("smart home") or working in functional buildings ("smart building"). Through comprehensive networking, the data from the numerous sensors ensures, among other things, lower energy consumption.

According to the German Electrical and Electronic Manufacturers' Association (ZVEI), intelligent building automation



Design-oriented luminaires are now commonplace.

can reduce energy consumption and CO₂ emissions by 30% to 40%. Self-learning systems enable the intensive involvement of building users, for example, by controlling lighting, air conditioning and heating according to demand. Also, security systems can be implemented that not only detect dangers such as fire or burglary, but can predict them.

Smart lighting a building block

Another important part of the energy-saving potential is lighting. The arrival



Exterior lighting/street lighting is a vital component of the networked IoT.

of LED luminaires meant a giant leap forward for lighting technology as LED units save up to 80% of energy compared to conventional luminaires. Smart lighting also has a strong influence on people's wellbeing and sense of security. By adjusting the temperature of the light and light colour of LED luminaires, individual scenarios can be realised that increase wellbeing and productivity ("human centric lighting").

On a larger scale, LED street luminaires can form the backbone of a smart city. Equipped with WLAN, charging function for e-cars, emergency call button or sensor for traffic and weather measurement, they are an important component of the networked IoT.

Smart mobility with e-charging

Many cities have long suffered from gridlock and high pollution levels. New mobility concepts are therefore



LED technical developments make for innovative designs.

the basis of future smart cities. In addition to intelligent traffic management and networking of transport modes, the intensive expansion of electric mobility is the key to this.

While all the signs are pointing to growth in the registration of electric vehicles, there is still a need to catch up in the expansion of the necessary charging infrastructure. In the smart city, sufficient charging points must be available that are coupled with intelligent charging management. Ideally, the latter is integrated into an intelligent power grid ("smart grid") that provides regenerative energy economically and independently of time. This will avoid overloading of the infrastructure.

Conclusion and outlook

The challenges of the future, such as urbanisation and climate change, can only be solved with forward-looking concepts and innovative ideas. Smart cities are no longer a vision but are already being implemented. As early as 2014, the EU named 240 European cities that are pursuing more or less advanced smart city concepts.

In order to move beyond individual measures and pilot projects to efficient solutions, an intensive exchange between all stakeholders is necessary, both at national level and internationally.

Smart cities will only become a reality if the political decision-makers, urban planners, building operators, architects, consulting engineers, specialist planners, installers, in conjunction with citizen representatives, exchange ideas and work out viable solutions together.

Light + Building Autumn 2022

Light + Building Autumn 2022 in Frankfurt am Main offers an ideal platform for this important exchange. Here the focus will be firmly placed on concepts for building automation, smart cities, intelligent neighbourhoods and energy management, as well as advanced e-charging infrastructure and networked security.

It will take place from 2 to 6 October 2022 and will be accompanied by the Light + Building Digital Extension from 2 to 14 October 2022. ■