

No energy transition without KNX

In a panel discussion at the KNX Smart Energy Summit online event "Smart Energy Management with KNX", four experts discussed how KNX is being used to manage the digitalisation of the energy transition.

How can you manage energy flows in a building? This was an area of interest for KNX at a very early stage, and it was also very early on that the focus went beyond the boundaries of a single house or building: how can energy management be managed within a neighbourhood or even an entire city? KNX already gave the answer at Light+Building in 2012: in the Galeria of Messe Frankfurt, the KNX Association presented "KNX City" - which demonstrated that even then the concept of a Smart City could be tackled with existing KNX products.

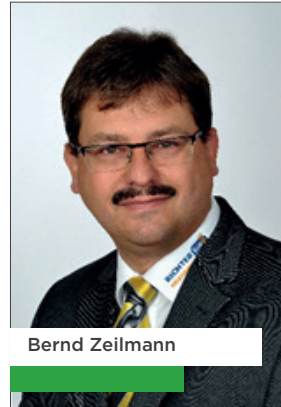
From smart home to sector interconnection to smart city

Nine years later, the concept of the smart city is still being discussed. So was KNX too early with this? "I would say we were future-oriented very early on", responds Helmut Haßenpflug, Managing Director of IGT GmbH, spontaneously. However: the needs were simply not there at that time. There were already discussions about sector interconnection and the electrification of mobility in 2012. At that time, however, the number of electric cars in the whole of Germany was a mere 4,500 units. By the end of 2020, there were already 350,000 electric cars on our roads and according to the plans, there should already be 1.1 million by the end of this year. Whatever the actual figure will be at the end of the year - it is now reaching a level "where it starts to get interesting", says Helmut Haßenpflug. "We can make good use of the experience we have gained over the past nine years. After all, sector interconnection, including e-mobility and Wallboxes, must first be managed. With the products we have now, we can make that happen."

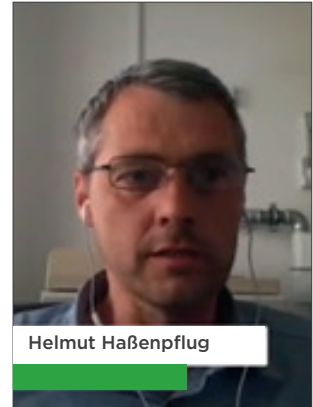
Yet in the past nine years, KNX itself has not stood still, on the contrary: KNX has evolved rapidly. Helmut Haßenpflug knows this from his own experience, because he carried out the first energy management installations based on KNX in his own house in 2012. "At that time, the effort was still relatively high, a lot of things had to be programmed by hand", he recalls. These days, it's easy via ETS.

KNX becomes part of electromobility

But now KNX is facing new challenges. For example, to be able to charge electric cars in the smart home and integrate them into the energy management system. KNX is becoming part of electromobility: the car needs to know what the house is doing and vice versa, and the data for this comes via the KNX backbone. KNX takes on the role of the conductor in the energy concert and harmonises the processes between up to five Wallboxes of different



Bernd Zeilmann



Helmut Haßenpflug



Jürgen Leppig



Hermann Schmidt

types and manufacturers, the PV system with associated inverter, the battery storage and the consumers in the smart home. "The fact that this is already possible without the domestic fuse blowing out shows the performance of KNX in this environment, which is now picking up speed significantly" says Haßenpflug.

But with increasing demands and the ever-expanding application possibilities of KNX, the need for consultation is also growing. Jürgen Leppig, Chairman of the GIH Bundesverband e.V., can tell you a thing or two about this. After all, end users are not only interested in energy management, but also in convenience: "Anyone who has had experience with home automation via KNX will no longer want to do without the convenience in the future", he observes time and again. Another topic that is becoming increasingly interesting due to demographic developments is senior-friendly housing. Here, too, KNX has many interesting possibilities to offer that allow older people to stay in their own homes longer than before - which is often their greatest wish.

All this can be done very efficiently with KNX, because the system is so flexible that "every problem can be solved in practice", at least that is Jürgen Leppig's experience. This is not least due to the resourcefulness and innovative spirit of the approximately 500 KNX members in 50 countries, who now offer a wide range of different KNX devices, so there is hardly a wish left unfulfilled.

Optimise private consumption with KNX

And that for example the heat pump usually only communicates via Modbus and does not communicate via KNX yet? This is not a problem, there are devices that have Modbus interfaces and convert this protocol to KNX. The heat pump can now also be controlled via the KNX HEMS. A year ago sonnen joined the KNX Association, now the HEMS has the possibility to control the consumers in the house, including the charging points, according to the battery storage, to perform dynamic load management and to optimise the own consumption. "But we are far from finished with the building enclosure: KNX is suitable for sector interconnection - that's where we are entering completely new territories!", Leppig is pleased to say.

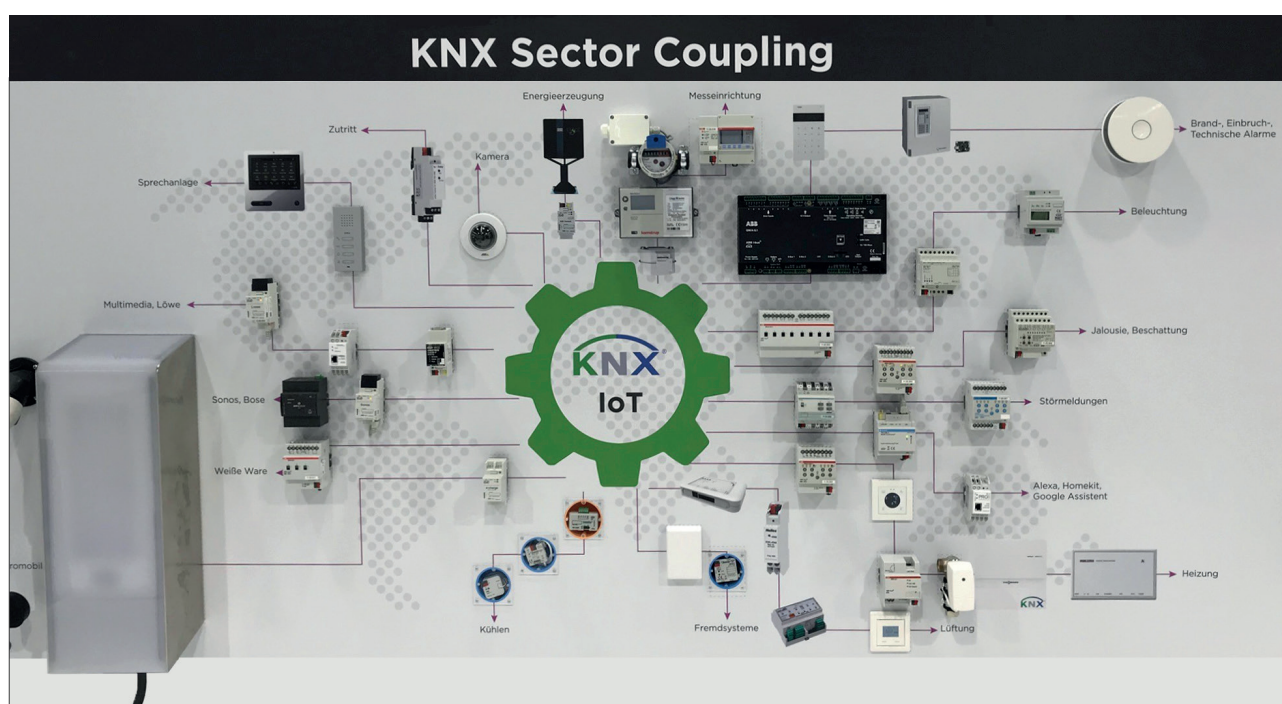
The need for consultation remains high

But as widespread as KNX may be today - in Germany, the market share of KNX in smart homes and commercial buildings is 46 percent - the system is still far from being a no-brainer. The smart home landscape is still too fragmented, there are many competing and overlapping systems, so that the inexperienced person is initially at a loss. In addition, the smart home is constantly evolving. So what is "really" future-proof? "My experience is that customers first have to be advised and convinced of KNX, because they are overwhelmed by the variety and complexity of the offers on the market. They can't even verify it themselves", says Hermann Schmidt, Managing Director of HSc Informatik. He himself has been convinced for a long time, because, in his own words, he landed on KNX back in 2009, having already started automating his own house before that. Why did he choose KNX? "Because KNX is not a proprietary system. For I have seen many a system disappear into oblivion, proprietary solutions simply tend to disappear", says Schmidt.

KNX grows with the challenges

KNX, on the other hand, is a good basis because it is constantly evolving, just as the smart home is constantly evolving. And evolving is the opposite of disappearing. Another advantage: "A KNX system can be set up as an open system, but also as a closed system. That is an important aspect in terms of security. Just as it is important to ask the question of what happens if the internet should fail. With KNX, in any event, the house is then not dead, but the Smart Home continues to work undisturbed. He uses the example of a CHP project that he has been involved in since 2012 to show how important it is that KNX continues to develop. A company had decided to purchase a CHP unit (40 kW thermal output, 15 kW electrical output) in order to be able to activate it when needed. And that was because the supply via the grid was very unstable. A gas boiler is also switched on as required. In addition, secondary buildings 150 m away were integrated. Now the system is being expanded to include an existing PV system and a 70 kW lithium-ion battery storage system is being integrated into the energy management system. Of course, redundancies and backup power supplies are also available.

"They all have to communicate with each other, but KNX interfaces are rare in these sectors, especially Modbus is common there", says Schmidt. Nevertheless, he was able to solve the problem relatively easily because there are now many gateways that convert the various interfaces to KNX: "In this specific example, we used the EibPC² from Enertex Bayern." But what the example shows above all: "Since 2012, the system has been in operation and continues to be expanded - no problem for energy management on the basis of KNX."





Do not ignore the electrical trade!

Admittedly, this is not a problem for experts like Hermann Schmidt, who not only learned the electrical installation trade, but also has a degree in computer science. But what is the general situation in the electrical trade? After all, it is ultimately the electrical trade that has to implement the home and building automation and set up the energy management systems on site. "Energy consumption is to be reduced by 50 percent by 2050", says Bernd Zeilmann, head master of the Guild for Electrical and Installation Engineering Bayreuth. "But the electrical trade was not involved enough. Many companies don't know this field well - we could only meet the target with young skilled workers." That's why the new profession of "electronics technician for building systems integration" was created to make it all happen. "My fear, however, is that we will not manage to cover the demand that will arise in the near future through the new training." Skilled workers remain scarce.

Bernd Zeilmann regrets that although a lot of money is being invested at the level of engineering, the fact that the electrical trade is also facing completely new demands is usually overlooked. Anticipatory energy control is the goal, "so we have to take into account self-consumption and own generation, record the state of the grid to reduce grid costs, we have to take into account the electricity market because there will soon be flexible electricity prices and planning the entire process 96 hours in advance. At the end of the day, it is no one other than the trades that have to implement all this in the buildings in an economically attractive way. But what it actually looks like in reality is explained by Schmidt using the example of the "FNN Project Group Grid Integration Electromobility", in which

he participates. The representatives of the network operators, the automotive industry, the electronics industry and science meet there. This is where the technical regulations for the grid integration of electric vehicles are drawn up. The focus of the work is currently on the control box for dynamic control. KNX is an important interface here - all of which is also highly relevant for the trade. "But I am the only craftsman at the table," Schmidt says succinctly. What should be done, then? In his opinion, it is not enough for a crafts enterprise to participate in a project now and then. "Because if the craftsman who set up a project is suddenly no longer available for some reason, it often doesn't work afterwards." This must not happen and therefore it is necessary that the craftsmen learn and understand the systems from scratch, so that they can approach the construction systematically. So systematically that a new specialist company could seamlessly take over the project if necessary. Bernd Zeilmann is also of this opinion: "A great many craftsmen must be skilled in KNX, so that each company can immediately pick up where another has left off. We need to get into the vocational schools!" But do the functions of the existing KNX systems and the devices of the KNX members even suffice to be able to successfully implement the energy transition? According to Zeilmann, the fact that KNX is independent and already widely used is in itself a good prerequisite. Hermann Schmidt also insists: "KNX must create intelligent interfaces that everyone understands, something comprehensive, like KNX IoT." Bernd Zeilmann sees it the same way: "For that, more intelligence has to go into the systems." Building on this, he would like to see fewer device types in the future, for example by integrating the actuators and sensors.

According to Helmut Haßpflug, all the prerequisites are

fulfilled and KNX is already equipped to play an important role in the energy transition. All the necessary systems are available on the market: "We can combine them with the existing home energy management systems on the market." This already works very well in the smart home. However, there is still work to be done in the sector of heaters and ventilation. Too few providers currently equip their devices with intelligent interfaces or do not even want to disclose the interfaces - especially in the higher performance ranges.

Jürgen Leppig takes a fundamental approach to the issue: The entire topic of home automation needs to be brought to the attention of the general public. This is not about the technical discussions in detail. The end users should not even notice the complex technology behind it: "This only works if we can offer convincing solutions." The smart meter gateways that now have to be introduced offer new opportunities for this. The combination of smart metering and smart home could achieve the final breakthrough. But this would require more standardised solutions instead of proprietary ones to be put on the market. The demand, however, is growing and he is convinced: "The solutions will come when the market is there."

One thing, though, is already certain today, Bernd Zeilmann concludes: "Sector interconnection, the energy transition and climate protection are not possible without KNX".

Helmut Haßenpflug, Managing Director of IGT GmbH: "KNX already integrates wallboxes of different types and manufacturers, the PV system with the corresponding inverter, the battery storage and the consumers in the smart home into the energy management - without the domestic fuse blowing out. This shows the power of KNX in this environment, which is now picking up speed strongly."

Jürgen Leppig, Chairman of the GIH Bundesverband e.V.: "Anyone who has had experience with home automation via KNX will not want to do without the convenience in the future. And KNX makes it easy to implement a home energy management system because it is so flexible that any problem can be solved in practice."

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The variety of KNX devices that can already be used in the IoT environment today: They thereby fulfil the requirements to be able to realise sector interconnection and load shifting. In particular, charging points for electric cars can be integrated into smart homes and smart buildings - this is how the energy transition will succeed.

Thanks to the resourcefulness and innovative spirit of the approximately 500 KNX members in 50 countries, who now offer a wide range of different KNX devices, almost every problem can be solved in practice, and hardly any automation wish remains unfulfilled.