



Global Energy Solutions e.V.

For Prosperity and Climate Neutrality

Interview with GdW

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Bert Beyers: How do you achieve climate-neutral solutions in the area of spatial heating and heating? We will talk about this with Ingrid Vogler and Michel Böhm from the Federal Association of German Housing and Real Estate Companies (GdW). First of all, good day and greetings to Berlin. How many flats does the GdW represent?

Ingrid Vogler: The GdW represents a total of almost 3,000 housing companies that manage about 6 million flats. We have 40 million flats in Germany, about half of which are rental flats. This means that we represent just under a third of the rental housing market.

So, it is not a small association.

Ingrid Vogler: No, it's even the largest real estate industry association in Germany.

And you also have a veritable task, namely climate neutrality by 2045 for these millions of homes.

Ingrid Vogler: Like all owners in the building sector, we are facing this task, yes.

I don't think we'll be able to avoid the topic of the war in Ukraine in our conversation. Tenants are feeling the effects of higher gas prices directly. In addition, there are many efforts in Germany to become less dependent on Russian gas. Does this play a role in your considerations regarding climate neutrality?

Ingrid Vogler: As a housing industry, we cannot influence the origin of natural gas imports. However, we are working intensively on all short-term possibilities to save energy, such as optimising heating systems and informing tenants about energy saving. We are talking about a saving

potential of about 15 percent of energy consumption. All the other measures are long-term. We cannot convert the building stock to renewable energies very quickly. We have been working on energy renovation for 30 years. And have always been converting buildings to other energy sources. The changes vary from coal in the new federal states; and in the old federal states there were still many night storage heaters and oil-fired heaters. And we were happy, from a climate policy point of view, that so many systems were converted to gas. And now we see that natural gas has become a risk both in terms of energy and security policy. But we can't do anything about it very quickly, we can only continue to increase our efforts.

The cities are essentially built, the villages too. And if we have the topic of climate neutrality in mind, it is essentially about the old buildings or the existing building stock. What possibilities does one have?

Ingrid Vogler: Our strategy has three parts. The first is to reduce energy consumption through energy renovation. The second strategy is to deal with which energy source you supply the building with. And the third strategy is how the user deals with the building. This involves both supporting the user with digital technologies and understanding the user. We have noticed that in the last few decades the indoor temperature in buildings has risen by about one Kelvin per decade. And especially in very well energy renovated buildings, the temperatures are much higher, sometimes 23 degrees on average for the whole building. And people quickly get used to it. Before the refurbishment, the buildings had indoor temperatures of 20 to 23 degrees in the living space, but the building average was more like 18 to 19 degrees. This is increasingly getting in the way, and there are not enough ideas yet on how we can fully achieve our goals with energy savings.

What energy sources are used to supply the buildings?

Ingrid Vogler: Half of all buildings in the housing industry are connected to local and district heating networks. On a national average that is only 14 percent of all flats. And at the same time, oil plays practically no role in the housing industry, only in one percent of flats. Across Germany, a quarter of all flats are still heated with oil. So, in the housing industry we have a lot of district heating and a lot running on natural gas.

After all, we are considering on how the housing stock can become climate-neutral by 2045. Let's talk about heat pumps. Does it make any sense at all in the existing housing stock?

Ingrid Vogler: Theoretically, definitely. We would also like to. But there are a few conditions. The problem in existing buildings is not even the technology of the heat pump, but probably rather the heat source. In an urban context, we have difficulties in obtaining the heat for the heat pump. Now, the fact is that we have a lot of district heating. But the pipes are not

everywhere either. And then there are some questions: Is the plot big enough to drill many wells for a brine heat pump? Can we fit an air-water heat pump on the roof or somewhere on the property? Is that possible from an acoustic point of view? Can we tap into a sewer? Can we tap into a watercourse? We also have projects in the housing industry where, for example, solar thermal energy is used to heat a storage tank, which in turn serves as a heat source for the heat pump. But these are all projects that are not off-the-shelf, where each project has a special prerequisite. And nothing, unfortunately, is as simple as gas condensing technology, which is what we have so far. It's a bit easier in new buildings, where the heat pumps are smaller and you can think about how to combine location, building and heat pump right from the start. In general, heat pumps in apartment buildings are not as easy to build as in single-family houses with the larger plots per square metre of living space.

Is the heat pump a technology that can also make mass?

Ingrid Vogler: It has to. Especially in the loose settlements on the outskirts of the city. Our housing estates are mainly from the 1950s to the 1970s. There, in the more loosely built-up areas, i.e., without the perimeter block development of the inner cities and largely without high-rise buildings, we don't have such bad chances of working with heat pumps. We have a pilot project in Karlsruhe, and with the renovations we've done in the last 20 years, we're doing quite well there. You don't need the highest efficiency standard there. Rather, we need a low-temperature capability of the heating system of about 55 degrees for the flow and 60 degrees for hot water. We have to get there. But we don't have to install underfloor heating. We will work with several building blocks, and we will need a lot of building blocks.

How much will the heat pump module bring in total?

Ingrid Vogler: If I'm hopeful: a quarter of the flats in the housing sector. Maybe more. You have to realise that we want to receive and keep half of it from heating networks, which will also provide renewable heat. And we will certainly add more networks.

Where will all the green electricity for the heat pumps need come from?

Ingrid Vogler: That is an exciting question. We would like to generate a lot of it locally on the buildings and in the neighbourhoods. There are still a lot of obstacles there. But it is indeed true that we will have times when photovoltaics (PV) do not deliver. And then we get to the question: How to produce this base load? We will need natural gas for a very, very long time and we will need the possibility to also use hydrogen in cogeneration. In the case of electricity generation, it's all about clusters in local areas so that as little as possible has to be sent via the large transmission grids. No one has yet come up with a solution for how this is supposed to work together. We in the housing industry are still not in a position to use locally generated electricity in an uncomplicated way. We hope that the federal government

will change this. After all, the federal government has announced a plan to generate as much PV and as much wind energy as possible.

Same question to Mr Böhm: Is there even as much green electricity as we would need?

Michel Böhm: Ideally, it definitely exists. And, of course the areas for it also exist. Especially if you look at urban areas and cities and all the roof areas that have not yet had PV installed on them. What is lacking is the possibility to use this and to ensure that these plants, whether PV or wind turbines, do not have to be shut down. That still happens far too often. The generation of electricity must become simpler and the entire system more flexible. For which, of course, transmission grids are also necessary.

A new topic: natural gas and hydrogen. Mr Böhm, how would a switch from gas to hydrogen be conceivable? And in what time frames?

Michel Böhm: It's a great idea to replace the gas grid with a hydrogen grid, and we've been working on it for a while now and are coming up against questions that have yet to be answered. Let's start with the building. We don't know which appliances can use how much hydrogen. 20 per cent, 30 per cent or 40 per cent hydrogen admixture? And how does that affect the comfort of the flats? These are all questions that have to be answered individually for each combination of building, heating and system technology.

The devil is in the detail.

Michel Böhm: And these questions have to be rolled out to the millions of residential buildings in Germany. And then, however, hydrogen has not yet reached the users. Because for that one would need the gas distribution networks, which are on site, and the transmission networks for gas.

And they would also have to be hydrogencapable.

Michel Böhm: Exactly. And that's what it comes down to: What material are these pipes made of? And what about the compressors and fittings along these lines? The operators of these grids will have to make a huge effort and the corresponding investments for the conversion. Of course, these investments would then also reach the consumers. And then we first have to figure out: Where will the hydrogen actually come from; can we produce it in Germany alone? The problem is that we don't have the amount of hours of sunshine or wind that we do in Spain, Portugal, Norway, or Sweden, for example. Then we get to the next question: can we import the hydrogen, and can we import it at prices that are competitive locally in Germany?

What would green hydrogen have to cost for it to be interesting for the housing industry?

Michel Böhm: Ideally, of course, green hydrogen should be able to compete with natural gas. The question is: When will parity with natural gas be achieved? It won't be today. It won't be in 2025. It probably won't be 2030 either. Because in 2030 the supply will be much smaller than the projected demand.

So it will be well after 2030.

Michel Böhm: At least that is our interpretation.

Do people actually want to have hydrogen in their homes? Gas is not harmless, but neither is hydrogen.

Ingrid Vogler: I don't think it's any more dangerous than natural gas. We have the technologies. We're not going to bring a "Hindenburg" into our house that suddenly explodes. Because the ability to ignite is not as simple as people sometimes think. Of course, like natural gas, hydrogen has to be provided with olfactory substances so that people notice if there is a leak somewhere.

What is your perspective on this, Mr. Böhm?

Michel Böhm: If you look at the state of the art and the safety measures that are already in place for natural gas alone, then you won't have to worry about that.

What are your expectations of Global Energy Solutions?

Ingrid Vogler: We are driven by the questions that we do not yet have a good idea of how an international hydrogen market will develop, how transport routes and prices will evolve. You can never really look into the future. But our hope is that more information will be made available through Global Energy Solutions and that we will also better understand how hydrogen is used in Germany. That means in which sectors how much hydrogen is needed, so that we also have a certain quantity structure. We want to understand that better. In concrete terms: if a provider presents a contracting project to a housing company, for instance: I'll build you a heat pump for the base load and a condensing boiler for hydrogen for the peak load. Then we would have a super solution. But that presupposes that the hydrogen reaches the house. That doesn't necessarily always have to be via the grid. A container solution would also work. But then it must also be clear how the hydrogen was produced, if possible green, and that it has a price that won't knock us over. And then, of course, it is also crucial that the hydrogen was not previously used for industry purposes. All of this are of interest us in the project cooperation.

Earlier Mrs Vogler spoke about a building block system. Are there other building blocks for climate neutrality in 2045? What about CO2 compensation, for example?

Ingrid Vogler: First, our favourite building block is the neighbourhood grid, where different components are interconnected individually by neighbourhood and between electricity and heating. Compensation is an important story that we are tackling in parallel. However, the task that politicians have set us is to ensure that the sector becomes climate-neutral even without compensation. But compensation has proven to make faster progress in a global context. It is not for nothing that the GdW is a part of the Alliance for Development and Climate Protection of the Ministry of Development. We think this is sensible, we also promote it, but we still have the task of no longer burning fossil fuels locally.

What are the toughest nuts to crack on the road to climate neutrality from your point of view?

Ingrid Vogler: The way politics wants to solve the problem. We have wasted years and are still wasting time in trench warfare over efficiency standards. As a housing industry, we know very well that with the highest efficiency standards we are spending too much money on too little efficiency gains. Because the last metre simply costs too much. We advocate low-temperature capability, i.e., improving buildings so they can be heated at lower temperatures. Then you are free in terms of energy supply, meaning there also is no lock-in effect. You can then use, for example, a heat pump, a connection to a grid with renewable energies and also a condensing boiler. Whatever you use as fuel then. This helps everyone and the money is invested very well because it allows more buildings to be renovated.

What does that mean in concrete terms?

Ingrid Vogler: We have about 20 million flats in Germany that need to be retrofitted. And we won't be able to do that if we build ventilation systems with heat recovery, throw out the windows and re-install them in the insulation layer in front of them, cut off the balconies and rebuild them, in other words go to great lengths to save another 10 percent more energy. We sometimes act as if we have a poor energy standard in new buildings or renovations today. That is not the case. These are buildings that are comfortable, that need little energy, in the existing buildings around 80 kilowatt hours per square metre and year for heating and hot water. This is what we have in mind as the optimum for apartment buildings. The efficiency standards above that are bought with too much investment - which we would be better off investing in renewable heat and in PV systems on the roof. By the way, this also applies to neighbourhood networks. In the housing industry, we have analysed that it makes more sense to spend a little less money on the efficiency standard of the buildings and to invest this money in energy generation in the neighbourhood. This will also be cheaper for the tenants.

What are your greatest hopes?

Ingrid Vogler: That this concept which we are proposing is met with open ears. That the federal government also provides long-term and reliable investments for energy-efficient renovation of buildings, that the whole thing becomes plannable again, that the heat and electricity sectors in the neighbourhoods and buildings are combined. That you don't become an energy supplier if you have a PV system and use electricity in the building for tenants. And that such neighbourhood solutions, perhaps by producing hydrogen locally with electrolysis, become easy to regulate. And in best case, that we will also have sub-grids where there will be green hydrogen later on, which will secure the base load via combined heat and power (CHP) in order to stabilise the electricity grid and the heat supply. If sun and wind are not available, a hydrogen CHP unit must be used to cover a peak heat load, perhaps even a natural gas CHP unit.

Technology is not the problem. It's actually more policy, the framework conditions?

Ingrid Vogler: Technology is a problem insofar as we don't yet know exactly how to get heat pumps into the stock on a larger scale than before. But right now it's more politics than technology that is holding us back. We could do more.