Creating connections for better energy use

In 2023, the energy management manufacturer Solar-Log GmbH and Viessmann Climate Solutions SE, one of the world's leading providers of sustainable climate and energy solutions, announced their strategic partnership in the field of monitoring photovoltaic systems. PES wanted to ask Holger Schroth, Chief Product Officer Solar-Log GmbH, and Dr. Markus Klausner, CTO Viessmann Climate Solutions SE, what this strategic partnership means for the two companies, what technical solutions can be expected and, above all, what added value the customer can derive from it.

PES: At first glance, it is not immediately obvious to outsiders what Viessmann and Solar-Log have in common. Can you tell us the answer?

Holger Schroth: Certainly, an outsider may not immediately realise that there are a lot of similarities between Viessmann and Solar-Log. With Viessmann you would certainly think of heating systems and with Solar-Log of monitoring photovoltaic systems. However, both companies have two essential things in common: firstly, active support in the expansion of renewable energies and secondly, a focus on digital system solutions.

Viessmann is continuously expanding its portfolio of sustainable heating and energy solutions and relies heavily on photovoltaics as a source. Solar-Log combines a wide variety of PV systems in its platform and enables users to monitor them in an efficient manner. For this, both companies rely on digital and networked solutions. That is the core that connects us both.

Markus Klausner: Our solutions focus on sustainable energy concepts, which we can only fully exploit if we can integrate the various PV systems available on the market,

in addition to our own Viessmann PV systems. With the Solar-Log partnership, we are combining the strengths of both companies and transferring them into meaningful customer benefits.

PES: How did Solar-Log and Viessmann come together?

HS: Admittedly, we were somewhat surprised when Viessmann contacted us a little over a year ago and shared the idea of the system solution for the first time. However, we quickly realized that we had a common goal here and so, after an initial technical evaluation phase, we were able to start building the system solution.

MK: After a market evaluation, it quickly became clear to us what Solar-Log's strength was in its business regarding connectivity of different PV systems. This was why we explicitly approached the company with our idea. Fortunately, we recognised comparable approaches, so we were able to move together into the evaluation and subsequent concept development.

PES: Is there a unifying vision for the energy market of the future? And if so, what might it look like?

HS: Yes, both companies see the benefits of photovoltaics and are working hard to make optimal use of it locally. Thus, we both see ourselves as 'partners' for the property owner who wants to heat and cool his property sustainably, or needs energy for mobility.

PES: You talk about a holistic energy solution in sector coupling What exactly does this mean?

HS: With this solution, Viessmann is certainly in the lead as far as the application to the customer is concerned. Solar-Log is pleased

Holger Schroth

Markus Klausner

that we can help Viessmann as a 'bridge builder to expand its system solution to include devices from third-party suppliers. Here we benefit from the high level of compatibility that the company has achieved over many years.

MK: Sector coupling is the linking of locally and sustainably generated electricity with heat generation and even mobility. Our Viessmann Energy Management System is the central intelligence for controlling these activities. It ensures that the self-generated electricity is used to operate the heat pump, for household consumption and for charging the e-vehicle. For us, the Solar-Log Gateway is the central module that enables the Viessmann system to communicate with the PV system of a third-party supplier, to be able to implement monitoring, self-consumption optimisation and other applications in the future.

PES: What are the advantages of coupling different sectors?

HS: By coupling electricity generation, such as energy storage, heating, cooling and mobility, the decentrally generated sustainable energy from photovoltaics can be optimized for use locally. Energy storage is certainly a key component here. While battery storage has become increasingly important in recent years, we see that in the future the storage options in the heating, cooling and mobility sectors will also provide significant added value.

If a system is so well coordinated that the PV energy generated is sufficient to cover the heating/cooling demand and the share for mobility, then certainly less battery storage will be needed, and the overall profitability of the systems will be optimized. Today, this is still hardly done in a coordinated manner, as the individual devices do not communicate with each other, and each system has its own 'logic'.

MK: In terms of the entire energy system, sector coupling is a key element for the energy transition, as locally generated electricity can be used optimally and the dependence on fossil-generated electricity, as well as on fluctuating renewable electricity generation can be drastically reduced. Locally, sector coupling ensures the best possible use of the available energy, intelligently split between stationary storage, heat generation, vehicle charging and household consumption. This type of intelligent self-consumption optimisation saves the customer energy costs and increases his autarky.

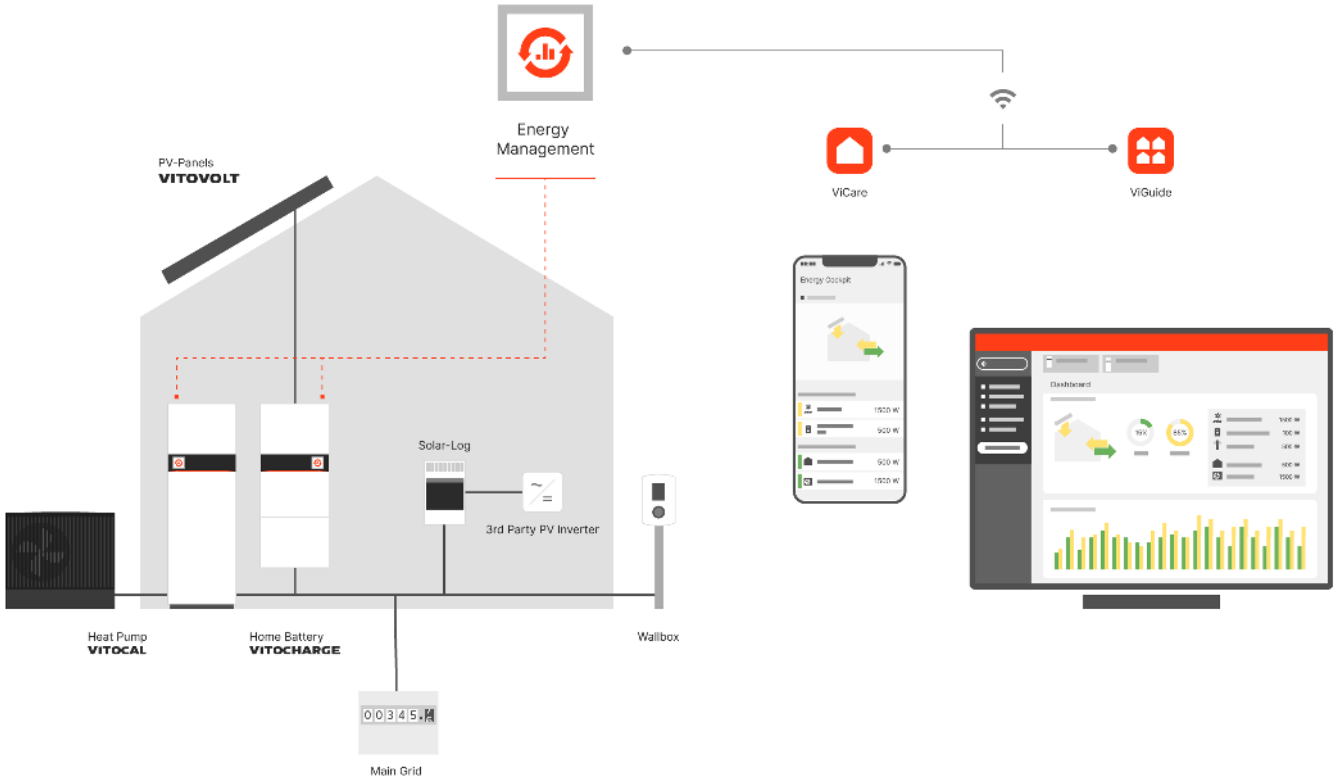
PES: What does this look like in practice? How are electricity, heat and mobility connected?

HS: This is done by means of two essential building blocks: communication and a higher-level logic. By enabling the devices to communicate with each other, you enable a higher-level 'logic' to optimize the subsystems.

MK: In practice, we achieve this with intelligent Viessmann Energy Management. Taking into account generation and consumption forecasts, we maximize the self-use of the electricity generated by the PV system. This is only possible if the Viessmann system can communicate with the PV system. Interconnected between the Viessmann system and the PV inverter, the Solar-Log Gateway serves as the central link.

PES: What influence does sector coupling have on grid stability?

HS: A not entirely insignificant one. First of all, the optimized operation of the sectors reduces the high load peaks from the grid. Just imagine when, for example, heat pumps and e-charging stations need the most energy from the grid. This is usually not when the sun is at its strongest, but at times when the sun is not available. By using optimization logic, we shift these times to when enough



energy is available from the PV system. This provides active relief in the grids.

Conversely, high feed-in quantities are avoided, which also contributes to grid stability. This can even be transported further to a grid level. If there is too much energy in the grid, one uses the heat generators or cooling units to take it from the grid, if energy is needed, battery storage and e-cars release energy into the grid, since a lot of systems can be addressed at the same time here, these quantities have a considerable effect on the grid.

This will certainly not prevent the expansion of the grid, but at least it can take place to a moderate extent, which in the end remains affordable for everyone.

MK: With regard to grid stability, Viessmann has already implemented a pilot project, in which we offer the flexibility of our heat pumps bundled to the German transmission grid operators. Flexibility can be expanded and improved by integrating PV systems via the Solar-Log Gateway, as generation and consumption can be optimally orchestrated and preemptively controlled based on demand in the grid. We can therefore jointly expand the contribution to grid stability at both transmission and distribution grid level in the future.

PES: What role does digitalization play in this?

HS: Digitization enables the devices to 'talk' to each other and the logics that have been built up can actively influence the devices. Without networking, this would not be possible without major effort.

MK: The energy system consists of various individual components including electricity storage, PV inverters, etc. Digital bi-directional communication is the basis for intelligent control and orchestration. In addition, we naturally also use it to implement energy monitoring for the consumer, as well as for the partner in the specialized trade.

PES: What future developments in the area of systems integration of energy would be conceivable?

HS: This is an exciting question. From our point of view, the quality of the optimization logics used will certainly play an essential role. The topic of AI will not stop here either and thus predict user behavior even better and adapt the systems to it. Another exciting field will be the linking of several residential units or entire building areas in order to optimize these 'energy cells'.

MK: Our focus with regard to future developments is primarily in the area of grid stabilization and system efficiency. In the future, we are planning the bundled use of all flexibilities around the single-family home, including generation, storage and consumption, in order to proactively support the electricity grid. The prerequisite, of course, is that the customer does not suffer any loss of comfort.

PES: How can Viessmann and Solar-Log continue to add value here in the future?

HS: For Solar-Log, the focus is clearly on expanding compatibility. We want to broaden the basis so that more subsystems can be networked with each other. We are counting on our colleagues at Viessmann to further improve the optimization logic. But we will also work separately on further interfaces to the energy market in order to bring generation, consumption and marketing closer together and to further increase the value of renewable energy.

MK: In addition to PV systems, the Solar-Log Gateway opens up a wealth of possibilities for integrating other components, such as heating rods or wallboxes. This ultimately increases the flexibility potential, which can be used to optimize self-consumption and to support the grid.

PES: What will the future bring? What else can customers of both companies look forward to?

HS: We don't want to give too much away yet, but there are various topics we are discussing to maximize the benefits for the user.
A major focus in the future will certainly be the activation of loads and energy reserves in order to contribute even more to grid stability in addition to maximizing self-consumption locally.

https://www.solar-log.com/en/

https://www.viessmann.co.uk/