

## From field to socket

# Energy park & Donau-Silphie: a symbiosis that benefits nature

**Biogas plants that produce non-fossil fuels are very much in vogue at the moment. In the Swabian hamlet of Hahnennest, four family farms have joined forces to form an energy park and operate a local biogas plant, covering everything from substrate production to the sale of energy. The usual disadvantages of biogas no longer apply because the farmers themselves are growing the energy crop *Silphium perfoliatum* as well as producing and selling *S. perfoliatum* seeds.**

Ralf Brodmann is one of the partners of Metzler & Brodmann Saaten GmbH in Ostrach, a small town close to Lake Constance in the south of Germany. Having made a career change to join the field of agriculture and originally being new to the seed trade, Brodmann's business now focuses on supplying the local biogas plant in the Hahnennest Energy Park (Energiepark Hahnennest; EPH) with an ecologically valuable substrate, namely, *Silphium perfoliatum* plants.

And this is not all the resourceful entrepreneur does: since 2015, his company has also been breeding and propagating *Silphium perfoliatum* plants and selling the seeds under the brand name Donau-Silphie. The company also markets and sells a cultivation concept under the same brand name. Brodmann is thus making the crop, which is valuable both ecologically and energetically, available to others. And he is doing so very successfully: in 2020, a total of 6,000 hectares of silphium were cultivated throughout Germany and in the neighbouring countries of Hungary, France, Italy and Slovakia. But how did it all come about?

## It all started with four farms and their own biogas plant

In 2010, four large family farms in Hahnennest, a village of around 40 inhabitants near Lake Constance, came up with the idea of supplying energy to their farms from their own on-site biogas plant: "The idea arose at the farmers' monthly get-together," reports Brodmann. "The initial plan was to build only a very simple plant for their own use, but from the very start the farmers were extremely keen to ensure the sustainability of the project."



However, the once small plant is no longer so small: back in 2011, the four plant managers Georg Rauch, Thomas Metzler, Edwin König and Egon Kaltenbach were able to put two combined heat and power plants into operation, and just a year later, the biogas treatment plant was completed. Today, the EPH plant produces 1,000 m<sup>3</sup> of raw gas per hour - equivalent to about 5,500 kW of energy – which is more than enough for the company's own operations; surpluses are fed into the district heating network in the form of natural gas, or sold as electrical power. The business model of the original Biomethangas GmbH, now Silphienenergie GmbH, is so popular that power, i. e. 'green power', has to be bought on the stock exchange. "We also benefited from being located close to a large gas pipeline," says Brodmann, who not only runs Metzler & Brodmann Saaten but, as Thomas Metzler's brother-in-law, is also involved in the Hahnnest Energy Park.

From the outset, the EPH founders wanted to have control of the entire workflow themselves, starting with substrate production in the fields and ending with the sale of gas, power and heat to the end user in private households. This is unique in Baden-Württemberg. In addition, another major goal of the project was the search for new substrates that are as environmentally friendly as possible.

## Silphium cultivation as a family project

Due to its high energy yield, maize is still the leading crop for biogas production throughout Europe. And as positive as the boom in renewable energies may be, the focus on maize cultivation is also associated with side effects that can have a negative impact on the environment.

For this reason, the Hahnnest Energy Park farmers started looking for alternatives to maize when they built their biogas plant. As is so often the case, a chance discovery helped them on their way: years earlier, Brodmann had already heard about a plant called cup plant (*Silphium perfoliatum* L.) from a card game called quartets that he played with his daughters. "On the card depicting *S. perfoliatum*, the plant was described as an 'energy crop of the future', but at that time it was cultivated on a total of only about five hectares of arable land in Germany. In other words, it was still a real exotic. However, the idea stuck with me. I looked for seeds and got to grips with the subject, and even carried out the first trials in my own garden. I was soon convinced that this plant would be something for our biogas plant. So in 2012, we cultivated it for the first time on a larger scale of about one hectare. All families helped. It was all still very unprofessional. We had great fun planting the seedlings, but it took us a long time."

## Silphium fields throughout Germany and in other European countries

However, the effort was worth it: the first trial plantation of the plant was so successful that the decision was made the following year to further pursue the cup-plant project. However, the plant does not produce a harvest in the first year of sowing or planting. It only forms ground-cover leaves, and then, from the second year onwards, it grows to an impressive height of up to four metres and produces golden-yellow flowers. "The yield was overwhelming - and so was the quality of the gas," says the expert. "And from that point on we also realised that this energy plant has an enormously positive effect on the ecosystem and biodiversity."

The fact that cup plants do not produce a yield in the first year is seen by many farmers as a disadvantage. To compensate for this, the Hahnnest farmers sowed maize over the silphium plants in the first year. "The symbiosis between maize and our cup plant worked out well, and so our costs for the first, yield-free year were covered right from the start," says Brodmann.

Since then, Brodmann and his partners have expanded the silphium cultivation area year on year: the support and confidence of their colleagues was such that the energy crop became a business model and they now sell silphium seeds along with a cultivation concept through Metzler & Brodmann Saaten GmbH. To this end, Brodmann and his colleagues set out from Hahnnest every spring with four tractors equipped with the latest technology to plant silphium plants throughout Germany and neighbouring countries. The price tag of around 2,000 euros per hectare includes not only seeds and sowing, but also comes with a guarantee that the silphium cultivation will work. "You can also do the sowing yourself, but then of course we don't give a guarantee," says Brodmann.

## Not just for energy production: *Silphium perfoliatum* has a future





The alternative energy plant, *Silphium perfoliatum* L., is sometimes also called sunflower. It is obvious why from the picture.  
© Energiepark Hahnnest

The fact that *Silphium perfoliatum* is an (energy) plant with a future is due, on the one hand, to its contribution to maintaining a healthy ecosystem: its golden-yellow flowers attract bees and other insects, creating high quality human and animal habitats, helped by the fact that it is a visually more attractive alternative to maize. It also forms a lot of biomass below the soil surface. The plant does not have any major pests or diseases, so that comparatively few plant protection measures are required when the plant is kept in permanent cultivation. With its deep roots, it provides a well-aerated, humus-rich and fertile soil that can store a lot of water.

Furthermore, the plant is suitable for other innovative concepts besides protecting the environment and producing energy. Silphie Paper GmbH from the city of Lenningen produces ecopaper from silphium fibres grown in the Hahnnest area that can be used as packaging material in the retail sector.

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## Article

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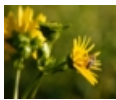
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## Further information

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