

# Sonnenpark: The Flower Power Plant

## Initial Situation

The photovoltaic solar power plant called *Sonnenpark* was built in 2011 in Untermühlbach / St. Veit in Carinthia, Austria. This power plant produces 1,2 megawatt (peak) clean, silent, CO<sub>2</sub>-free renewable energy. In doing so, it saves every year 440 tons of CO<sub>2</sub>.<sup>1</sup> Together with the already existing district heating system and several decentralized solar power plants, St. Veit will cover nearly 50% of its energy requirements with clean renewable forms of energy. This is a great accomplishment - not just in Austria - but worldwide.



Fig. 1: Conventional solar power plants in Germany and the US.

The *Sonnenpark* is unique in the way it is treating nature with special care and it is a unique and exemplary symbiosis of nature and engineering:

- The field of solar cells is surrounded by and dissected by a huge field of seldom flowers<sup>2</sup>. Honey bees, located on the property as well as being near by, distribute the seldom seeds, creating a new biological initial area.

<sup>1</sup> In comparison with the average emission of the current European energy mix.

<sup>2</sup> As Austria has a highly industrialised agriculture, most land is being heavily used and nutritioned, resulting in the unfortunate situation, that some flowers are about to be extinct. The seeds of these flowers, were used at the property.



- In the southern part of the premises, there is an area 2.500 square meters featuring a rose garden with some 600 rosebushes.



Fig. 2. Sonnenpark – finished 2011 – a symbiosis of nature and technology.

- To the south of the rose garden will be a rock garden with suntraps and rock formations. This field of solar cells will become narrower toward the horizon, as viewed from the lookout platforms, and turn into a *blue river* surrounded by fields of flowers.
- South of the solar cell field is a wetland biotope and on the lookout platform is a sundial reaching into the sky like a sculpture and displaying the sunlight hours.
- The field of solar cells has two solar giants to the north. They are designed to resemble huge sculptures and follow the course of the sun.
- The whole ensemble is an open installation, not using a fence<sup>3</sup>.

This power plant concept was meanwhile awarded five times by national as well as international organisations.

In the construction and operation of *Sonnenpark*, care was taken to treat the soil gently. No herbicides or fertilizers were used and no tree was harmed. Attempts were made to attract various kinds of animals and have them settle there. Honey

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<sup>3</sup> This is an experiment: The insurance accepted the open setup. So far no disadvantages resulted from this open concept in the power plant operations.

bees pollinate about 80 % of the colorful flowering plants in our part of the world. They derive their nutrition from nectar and pollen and never destroy plants. Just the opposite in fact: They pollinate the plant in the course of their search for food, thereby ensuring the continued existence of these plants. The attempt to settle more bees in Untermühlbach is happening at a time when the whole world is facing widespread disappearance of honey bees<sup>4</sup> (Colony Collapse Disorder) whose cause is not fully understood. For instance, this disorder has affected as many as 80% of the bee colonies in the US.

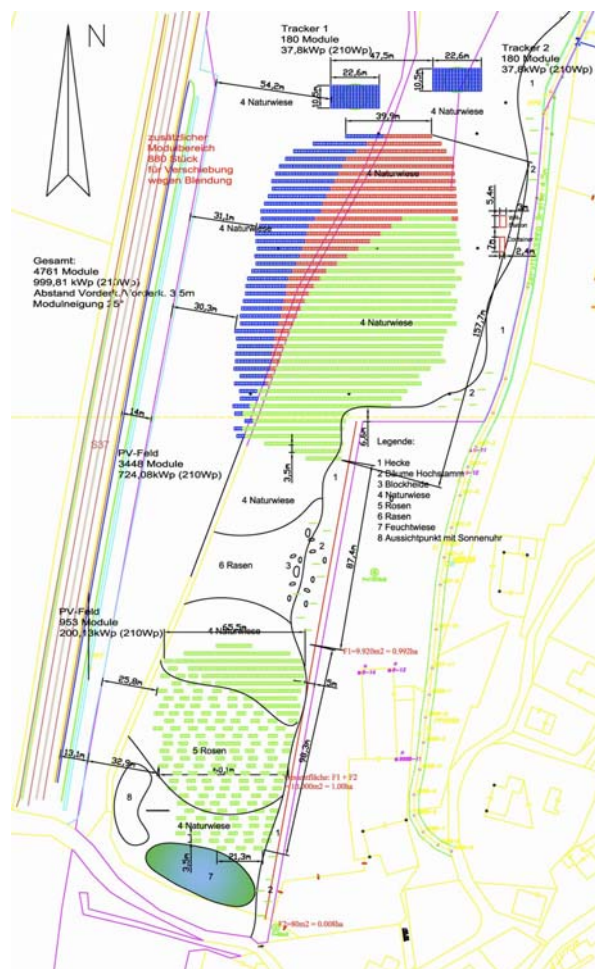


Fig. 3. Master plan for Sonnenpark with solar field, frog pond (left), lookout platform (lower left) and the solar giants (in the north).

Wild flowers on the endangered list will be planted along the sides and between the solar cells. This resettlement creates a small paradise for bees and what is known as

<sup>4</sup> Honey bees play a crucial part in the pollination of numerous useful plants such as apples, pears, many types of berries such as raspberries, strawberries, currants and gooseberries, cucumbers, cherries, squash and melons, almonds, peaches, soja beans and about 90 other varieties of fruits and vegetables. Consequently, this disorder could be highly disadvantageous for the future food supply. Refer also to [http://en.wikipedia.org/wiki/Colony\\_collapse\\_disorder](http://en.wikipedia.org/wiki/Colony_collapse_disorder), among other sources.



an initial space, in other words an area from which the bees will distribute the seeds of these rare flowers. Various forage crops such as stinging nettles, woodbine, common honeysuckle, and wild carrots will be placed here and light fixtures to bathe the plants in light. These features will attract butterflies. A collection of rocks, a stone garden called “The Rock Quest<sup>5</sup>” is like some *Land Art* installation and along the sides of the field of solar cells will provide a habitat for some lizards, ground beetles, toads, frogs and shrew mice. These animals will help fight pests and help maintain the biological balance of the area. Gentle landscaping will bring about a renaturation of the *meadow* as a habitat, supplemented by stone and frequent rocks plus the conscious creation of a forest perimeter and hedges. A frog pond (wet area) will be laid out on the southern side of the property.



Fig. 4. A giant 6 meter large sundial on the viewing platform.

These careful procedures will make *Sonnenpark*:

- An encounter with nature.
- A tourist attraction.
- A successful example for the symbiosis of nature and engineering that shows a new understanding of self that is based on gentle and sustainable handling of resources.

<sup>5</sup> From a line of 7 seats, the visitor can watch and meditate on a set of 7 rocks, of which there are only 6 rocks visible.

The resettlement and creation of an initial space for rare varieties of flowers are especially valuable ecologically. The creation of habitats as functional ecosystems using natural looking landscape architecture has another advantage: it requires minimal care. That means an economically functional system is created at the same time.

## Outlook - The Future of Solar Technology

Prices for photovoltaic modules (solar cells) are plunging, new production methods are emerging such as thin film technologies (applying photovoltaics directly onto substrates like glass or fabrics) and new and more efficient materials are being researched. All such factors make the photovoltaic industry highly dynamic, on one side with economic growth of up to 70% and the other side turbulent economic aspects, creating further innovations in the future.

In 1976, one watt of output installed with a photovoltaic cell cost 60 US dollars. In 2012, that figure had fallen far below 1 US dollar. That means costs have been cut dramatically in this 35 years of development. This achievement is reminiscent of the computer industry. Within a similar time span, it too has revolutionized our lives with the invention of personal computers, the Internet, Google, social networks, cell phones, smart phones, etc.. Solar energy production originally could only be used profitably in space travel and satellite technology. With this rapid decline in prices, solar power is becoming a consumer product, too. The renowned *Worldwatch Institute* predicts that *grid parity* will be achieved in many industrialized countries as early as 2015, i.e. the point will be reached at which solar power will be cheaper than electricity we currently draw from the grid.



Fig. 5. Sonnenpark.



For normal consumers, the payback period today might be 7-12 years if being supported by sponsorship programmes. Soon that payback will also work without national support programmes. That means a solar power installation with a possible life duration of perhaps 40 years requires ten years to cover its own costs and then delivers power free for 30 years thereafter or if the power is fed into the grid, the beneficiary earns money without incurring any substantial operating costs. What a wonderful business model! This means: We are approaching a point at which every household must (!) invest in solar power systems, because not investing, would be untenable economically and ecologically.

### **The Future: Buying a Stake in the Power Plant**

*SKW Sonnenpark GmbH* as construction and operating company still has sufficient real estate and has received a constant stream of inquiries from private individuals regarding participation and partnerships. Consequently, the plan is to build facilities for more output in a second project phase. It is directed especially at anyone without their own roof or without a yard or garden large enough to accommodate an installation but who still wish to participate in the solar boom. This will take place in the form of share certificates. Any natural person or legal entity can become a partner. More details on this power plant investment plan will be available from 2013/2014 on.

### **Summary**

The *Sonnenpark* is more than just a photovoltaic solar power plant that follows the strict narrow economical directives - it is a

- natural paradise and an example of the symbiosis of nature and technology
- a meeting point and gathering place for cyclists and hikers
- a tourist attraction for the region
- the perfect promotion of solar energy creation
- and – finally – a silent, emission free, sustainable power plant.

Location in Google Maps: <http://goo.gl/maps/sFn2a><sup>6</sup>

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<sup>6</sup> As of April 2013, Google has unfortunately not yet updated the aerial pictures since the completion of the power plant in August 2011.

