



## Naturesave Trust: Grant application proposal

### Southill Community Energy



Southill Community Energy is a community owned 4.5MW solar farm in Charlbury, Oxfordshire. Other than producing clean solar power, Southill Community Energy is also engaged in restoring the 22-acre site to a natural wildflower meadow. Previously used for intensive wheat production, the site was something of a desert in terms of biodiversity when the project first began. The ongoing work by Southill Community Energy is to restore the landscape to an abundant wildflower meadow, which will in turn will provide the necessary habitat for critically endangered species of insects, flora and fauna to thrive. The work so far has included the following:

- Field margin drilled and seeded with wildflower mix.
- South end of the site has been drilled & seeded with wild Quinoa, for wild birds.
- Orchard trees planted along the eastern margin.
- Existing northern wildflower meadow has been harvested for green hay, and spread onto the remaining areas of the site.
- Hedge improvements, ragwort pulling, drystone walling restoration, and countless other tasks are regularly performed by our dedicated team of volunteers.

Honeybees at Southill Community Energy:

Right from the start it was recognised that having a resident population of pollinators would be key to the success of the rewilding of the wildflower grassland, as well as benefiting the orchard planting.

Our first hive installed at Southill in 2017, was an experimental design originating from the Czech Republic. This unique Thermosolar hive design uses passive solar gain to elevate the internal hive temperatures, as a means of killing off the endemic varroa mite that currently plagues all bee populations. Varroa die at temperatures over 42°C, while Honeybees can tolerate temperatures as high as 50°C. The design of the hive is a clever balance between thermal insulation, internal heat sinks, and passive thermal solar panels. This ensures that the heat is spread evenly throughout the hive, ensuring there are no hot-spots, or areas that remain cold.

Beekeepers conventionally need to treat their bee colonies with a variety of chemicals to control the varroa mites, none of these chemical treatments provide 100% efficacy, and all of which have detrimental side effects, ranging from reduced fertility in the bee populations, aborted brood, and tainted honey. Furthermore, several of these chemical treatments have recently had to be withdrawn from the market as varroa mites have developed resistance to them.

For the first time, the Thermosolar hive design offers Beekeepers the opportunity to treat Honeybee colonies for varroa infestation, with 100% efficacy, without resorting to chemical means. This is a potential game-changer, and Southill Community Energy are on the forefront of this technology as early-adopters. Southill Community Energy received the first Thermosolar hive to be installed in the UK in 2017.

**Grant objectives:**

1. To improve Apicultural husbandry methods.

Our intention is to make the Southhill Community Energy solar farm a centre of excellence for Thermosolar beekeeping, to provide a long-term field study demonstrating the effectiveness of this new beehive design, and to share our results with the beekeeping communities around the world.

To achieve this, we need more Thermosolar beehives. The Naturesave Trust grant will fund an additional two Thermosolar hives, which we are matching with another two of our own. With a total of five Thermosolar hives installed over the 2018 / 2019 beekeeping season, we shall be able to demonstrate that this new type of beehive can benefit honeybee populations by providing a means to control the spread of varroa mites without resorting to chemical means, and to encourage more beekeepers to follow our lead.

2. Community outreach.

Our honeybee colonies make excellent ambassadors for Southhill Community Energy, as well as solar farm development in general. By demonstrating the natural synergy between solar farms, wildflower meadows, and beekeeping – we can show local communities that the solar rewilding project can still yield a valuable agricultural crop of honey, and the final product will find itself on the shelves of local shops, and eventually into the diets of local communities.

With a single hive and a bare field over the 2017 / 2018 season, our honey yield was too low to provide a viable harvest. However, as the meadow matures and the flowers blossom over the coming years, our expanding Thermosolar apiary of five hives will potentially yield up to 100kg of honey per year.

We have also put on bee-shows, lectures, and hands-on activities such as hive building, and honey tasting for the local community. These activities have been very popular, and are in growing demand.

**About Thermosolar Beehives:**

Thermosolar beehives are manufactured in the Czech Republic by Apis Innovations Spa. This company is run by the two inventors of the Thermosolar beehive design. The origin of the design lies in their academic research into the concept of using solar gain to control varroa infestation in bee populations. They have published several peer-reviewed papers on the subject, which are available online. However, as a commercial entity the company is still very small, with low production volumes, and until recently, a somewhat limited outreach. Over the past five years they have produced over 1000 Thermosolar beehives, but this installed user-base is still largely limited to beekeepers within the Czech Republic.

A crowd-funding campaign launched in 2016 brought their ideas to the attention of Southill Community Energy shareholder and Beekeeper, Tom Worsley, who invested in the campaign, and obtained the first Thermosolar beehive for Southill Community Energy.

This has in turn lead to a great deal of media exposure for the Thermosolar beehives. Southill Community Energy reached over 1.5 million people through the publicity generated by the arrival of their first Thermosolar beehive. With public interest in beekeeping on the up, it is anticipated that the Thermosolar beehive project will continue to expand, and reach even more people over the coming years.

**About Tom Worsley:**

When he is not beekeeping, Tom is a Mechanical Engineer, developing imaging technologies for use in life-sciences and nanotechnology research. One of Tom's designs was recently used by researchers Joachim Frank, Richard Henderson, Jacques Dubochet to win the Nobel Prize in Chemistry 2017.