

Symbizon

Publieke samenvatting / Public summary

Aanleiding

A potential threat to the further development of solar parks is a decrease of societal enthusiasm. It is therefore essential to develop concepts for solar energy in rural areas that take into account potential reasons and viewpoints for resistance and that help to increase societal enthusiasm for solar parks. Besides that, the agricultural sector has to contribute to a more renewable society as well, by improving biodiversity and reducing the use of chemical crop protection, e.g. by transition to biological farming. Moreover, the Netherlands is a densely populated country, and one of the objections to solar parks presently is already that it takes farmland out of use for farming. For this reason it is important to use the available land as efficiently as possible by creative solutions like multiple land use where the combination of agriculture and energy production is combined on a single field.

Doelstelling

Goal of the project is to show how to achieve a combination of photovoltaic (PV) energy generation and strip farming that provides a positive business case for the farmer, maintains the use of the land for food production and improves ecological characteristics. The combined use of PV and agriculture will have a low density of solar panels per hectare, and thus a high kWh yield per hectare is needed. For this reason, the combination of bifacial solar panels and solar tracking will be the PV technology investigated in this project. Solar tracking is relatively new in the Netherlands. In this project the combination of solar tracking with strip

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Algemene informatie / General information

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farming will be investigated and optimized with respect to finance, ecology and food production. We expect that in this way an optimal combination between agricultural and energy landscape will be formed, that can contribute to large scale CO₂ reduction, a good business case, and more sustainable farming.

Korte omschrijving

In the project, a test site with bifacial panels in a solar tracking system, will be developed and installed in combination with resilient, regenerative and automated strip farming for biological farming. The strip farming will make use of tractors and robots for the cultivation. A sun track algorithm will be developed that optimizes for several different parameters, e.g. crop yield, energy yield, effect of herb strips, weather forecast, energy price and soil conditions. This algorithm will be tested and further developed in the field test system. Besides that, the effect of the solar tracking system with a standard as well as the optimized algorithm from this project will be evaluated on aspects such as crop yield and diseases, including the functionality of the herb strips as well as the ease of use for the farmer. In the first year the algorithm will be developed based on hypothetical effects of irradiance and water management on the crop growths and biodiversity and in the three remaining years the actual effect is monitored. Furthermore, the exact energy yields and the added value of using the bifacial panels in the solar tracking system will be investigated.

Resultaat

The result will be a feasibility report for a new concept that combines a bifacial solar tracking system with strip farming. The feasibility study will be based on both economic analysis, i.e. containing business case elements as energy and crop yield, as well as on analysis of agricultural operations like ease of use.

samenwerking met de Topsector Energie ontsloten.

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