Universität Kassel
Fachbereich Ökologische Agrarwissenschaften

UNIKASSEL
VERSITÄT

Comparison of solar technologies for thermal uses
(Vergleich solarer Technologien für thermische Anwendungen)

Bachelorarbeit im FG Agrartechnik

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abstract

For thermal uses of solar energy there are principle different technologies available. Each technology has its characteristic advantages and disadvantages and is therefore suitable for a specific use. How far a technology is suitable for a specific use depends on the temperature needed, the location (weather, clima) and other factors. The aim of this work is to quantify the differences of the technologies and to identify preference technologies depending on purpose and location. In addition an outlook is given to possible uses of solar thermal technologies in agriculture and neighboring industries.
To sum up: Non concentrating technologies are sensible und long-term economical capable for the use in low temperature ranges in Germany. If the needed temperature range is above low temperature concentrating technologies are necessary. Only with this technologies high temperatures (>250°C) can be reached. Because of low irradiation and high shares of diffuse irradiation in Germany, concentrating technologies are only limited useable. The selection of a technology is depending on the purpose, the temperature range needed, the irradiation, energy requirement and the distribution of energy requirement throughout the year. Besides this the profitability is also a factor. The profitability can be given by the comparison to energy prices of conventional energy sources like oil and gas. Today solar technologies can not always compete with the prices of gas and oil. But besides negative effects of this energy sources, like the climate change, gas and oil are finite resources and will not be available any more in reasonable periods of time.