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### Announcement of a Master Thesis

The future German energy concept envisions an energy mix for electricity generation, in which renewable energies account for a share of 80 % up to the year 2050. To date, the German power grids have not been designed to transport electricity from renewable energies across the country. Hence, large infrastructure measures are planned that are associated with considerable impacts on soils due to the laying of cables. In addition to changes in soil structure, underground cables also result in significant heat emission to the surrounding soil. The potential impacts on plant growth and yield through alternative construction measures and possible thermal losses have not been investigated into detail so far.

The aim of the project is to collect and evaluate field data for the impact of underground cable routes on agricultural soils and crops. The overall objectives fit into the scientific, economic, social and political goals for the expansion of renewable energies in Germany and provide a significant gain in knowledge, which can be transferred to other regions.

Within the framework of this research project "Field trial on the influence of High Voltage Direct Current (HVDC) underground cables on soils and agricultural crops (**CHARGE**)" the following thesis is advertised:

#### Thermal imaging for plant stress detection in cereals.

Due to soil heating it can be assumed that plants nearby the cable lines are exposed to heat stress. To detect plant stress reaction a thermal camera (VarioCAM HD 750) is available and can be used to investigate differences in the canopy temperature. In particular, leaf temperature is a valuable indicator of the physiological status of plants, responding to both biotic and abiotic stressors.

The goal of this thesis is to develop a generic method for the use of the camera by using the camera on different field trials and evaluate the images.

The aims are to be achieved by conducting the thermal images in a field trial in southern Baden-Württemberg during March and July 2023.

The thesis can be written in English or German. I am looking forward to hear from you.

With kind regards

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