

## CV – Maik Plenz

Maik Plenz is a Ph.D. candidate in Electrical Energy Systems at Helmut-Schmidt-Universität, specializing in multivariate and AI-based reference grids for analyzing the ramp-up of electrical loads and generators. He holds a Master and Bachelor of Engineering in Industrial Engineering (Energy Economics/Technology). He currently serves as the Team Leader for Electromobility and a Project Manager for AI-based load and charging management at Helmut-Schmidt-Universität. His past professional experience includes research at the University of Oxford on developing an algorithm for defining electrical network impedances. Plenz has an extensive publication record, with more than 50 first- and co-authorships in scientific publications, utilizing skills in modelling with Python and Matlab and AI-development.



Paper ID: 486

Title: Protecting Substations: Grounding System Performance Under Evolving Climatic Stress

Abstract:

Soil is being the largest reservoir of the terrestrial biosphere. This paper addresses the critical crisis and its effects by climate-induced soil changes on the performance of electrical grounding systems. As global temperatures rise and its impact on soils and their behavior, the critical properties of soil, particularly its electrical resistivity – based on the properties of water binding and the proportion of salts -, are subject to significant and non-linear variations. This variability directly compromises the safety and operational reliability of electrical grids, from power generation to end-user infrastructure. This paper investigates the relationship between environmental factors—specifically ambient temperature and rainfall—and the electrical conductivity of the soil. The authors explore how these variables, which influence soil temperature and moisture, affects the performance of electrical grounding systems. This is based on an experimental setup at a metropolitan substation, where sensors were installed at depths of 0.6 m and 1 m to measure these key parameters and get information about the climate impact.