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Design considerations for the FCC electrical network architecture

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This paper discusses various design aspects of a large scale electrical network infrastructure for the Future Linear Collider (FCC), a 100 km long circular accelerator, under feasibility evaluation. The key requirements are very reliable, redundant and operable electrical networks granting the highest accelerator availability. Firstly, the required types of electrical networks are identified and characterised. Then, a first estimate of the power requirements in each geographical location along the accelerator is presented per type of network. Based on the available point of interconnection to the European high voltage transport grid, different network architectures and power line routing layouts are presented. Finally, the feasibility of the proposed architectures are examined in the aim of identifying at the conceptual design phase any specific requirements on the civil engineering infrastructure and defining the prerequisites for the underground integration of the network components.

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