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Sustainability studies for future linear colliders

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The environmental credential of future colliders are increasingly in the spotlight, because of their size and complexity, and will be under scrutiny for their impact on the climate. Therefore, sustainability has become a prioritized goal in the design, planning and implementation of future accelerators; approaches to improved sustainability range from overall system design, optimization of subsystems and key components, to operational concepts. A direct quantification of the ecological footprint, be it greenhouse gas emissions during construction and operation, or consumption of problematic materials, is currently performed only sporadically, mostly through translation of electricity consumption into equivalent CO2 emissions. Two large electron-positron linear colliders are currently being studied as potential future Higgs-factories, CLIC at CERN and ILC in Japan. These projects are the central elements of the recently approved EU / EAJADE (Europe-America-Japan Accelerator Development and Exchange) program. A direct societal impact is expected through EAJADE WP4 (Sustainable Technologies for Scientific Facilities), where methods to reduce the power consumption of accelerator technologies and systems will be studied, and smart integration of future accelerator infrastructure with the surrounding site and society (e.g. Green ILC concept). This contribution will highlight past achievements and address the EAJADE WP4 future program.

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