ICFA Panel "Sustainable Accelerators and Colliders"

theme	topic
strategy & coordination	• quantification of accelerator efficiency, formulation of figures of merit, steps towards establishing a carbon footprint for complete facilities, e.g. assessment of fabrication of specific components • public communication and outreach, assessment of societal and political relevance in different regions • assessment of economy & reliability vs. sustainability aspects • involvement of industry partners, managing IP rights
energy efficient accelerator concepts	• energy recovery concepts, e.g. energy recovery linac • improving brightness in light sources, luminosity in colliders, brightness of desired secondary radiation (e.g. Muon cooling) using advanced concepts, i.e. "gaining output per kWh" • assessment of new/advanced acceleration techniques
energy efficient and sustainable accelerator technology	• efficient RF sources (klystron, magnetron, solid state, IOT) • s.c. cavity advancements relevant for efficiency (low cryo losses: high Q, HTC materials) • efficient beam transport (permanent magnets, optimized electromagnets and pulsed magnets, s.c. magnets) • optimization of large cryogenic systems • technology for energy recovery: heat recovery in accelerator facilities, high T cooling circuits, recovery of RF power, recovery of pulsed magnet field energy, recovery of spent beam energy (ILC) • efficient targets for neutron, neutrino, muon production • minimizing the consumption of cooling water • long term equipment and infrastructure sustainability, e.g. suitable selection of materials and re-usable modular components
energy management for large research facilities	• using excess energy in an era of fluctuating sustainable sources; best mix of conventional and renewable sources • dynamic operation avoiding periods of low supply, efficient standby modes and fast recovery • integration of energy recovery and energy storage techniques in the overall energy management concept

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