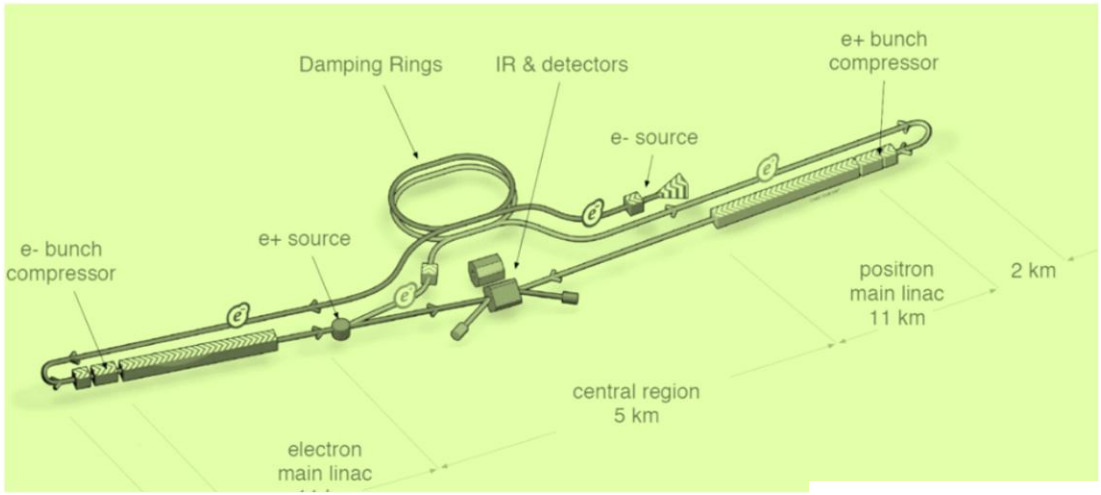

THE GREEN ILC

Sustainable Colliders with ICFA

Energy for Innovation, Innovation in Energy

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ICFA

International Committee for Future Accelerators

http://www.fnal.gov/directorate/icfa/

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ICFA

To facilitate international collaboration in the construction and use of accelerators for high energy physics.

- Created in 1976 by the International Union of Pure and Applied Physics.
- To promote international collaboration in all phases of the construction and exploitation of very high energy accelerators.
- To organize regularly world-inclusive meetings for the exchange of information on future plans for regional facilities and for the formulation of advice on joint studies and uses.
- To organize workshops for the study of problems related to super high-energy accelerator complexes and their international exploitation and to foster research and development of necessary technology.
- The Committee has sixteen members, selected primarily from the regions most deeply involved in high energy physics.

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ICFA Panels

- *Address topics of a technical nature where international discussion is valuable, and where expertise beyond that of the ICFA members is needed. ~ 16 members*
- ICFA Instrumentation Innovation and Development Panel
- ICFA Beam Dynamics Panel
- ICFA Panel on Advanced and Novel Accelerators
- ICFA Standing Committee on Interregional Connectivity
- ICFA Study Group on Data Preservation in High Energy Physics
- Linear Collider Board
- ICFA Neutrino Panel

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ICFA: Proposal for a new panel: "Sustainable accelerators and colliders"

Context

Energy consumption and related running costs are major issues for many on-going and future accelerator/collider projects ranging from the highest energy or most intense fundamental research machines to medical and industrial equipment.

The feasibility of HEP future infrastructures is strongly depending on the efficient implementation, both at the design and operation level, of energy saving/recovery/recycling schemes as well as on the injection of sustainable energies in the energy mix.

Any progress done in the framework of flagship projects whose electrical consumption come close to large cities not only will impact the accelerator/collider economy but may also contribute to solving the most prominent societal issue of energy.

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ICFA : Proposal for a new panel on: Sustainable accelerators and colliders

Existing Initiatives

The ICFA panel would coordinate at the world level and expand the scope and visibility of the following regional initiatives:

- ESS: the European Spallation Source project is committed to become "the world's first sustainable research facility".
- Workshop "Energy for sustainable Science": CERN, the European Organization for Nuclear Research, ERF, the European Association of National Research Facilities, and ESS, the European Spallation Source, organized in 2011 the first Joint Workshop on Energy Management for Large-Scale Research Infrastructures. The event took place on 2011 in Lund, Sweden. After CERN in 2013, the next venue will be DESY (Oct 2015).
- Green-ILC is dedicated to ILC studies on energy saving, recovery and recycling as well as to the implementation of sustainable energies at the ILC site.
- AAA Green-ILC: the AAA organization of Japanese industry and research centers has a dedicated working group on the Green-ILC.
- EuCARD-2: Enhanced European Coordination for Accelerator R&D, WP-3: EnEfficient

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ICFA: Proposal for a new panel: Sustainable accelerators and colliders

Addressing Topics

- Methodology and guide lines to assess quantitatively the AC wall-plug power, the yearly energy consumption and the related cost for various design options and operational modes. Motivations for and feasibility estimates of a generic and global energy consumption computing package or expert system will be addressed.
- Evaluation, for each accelerator component, of the most promising R&D to increase efficiency keeping stability and longevity at the highest level.
- Evaluation of the best energy recovery and recycling technologies from heat wastes and beam dumps and recommendations for future machine design and operations.
- Elaboration of strategies to implement renewable energies in accelerator design and operations including schemes for a global energy management system including production, use and storage.
- Proposal for a collaborative framework involving energy, accelerator, experimental and industry researchers at the world level to proceed toward reaching sustainability for large accelerator/collider infrastructures. It will include an organization framework and a global coordination scheme, an estimate of the needed appropriation and the identification of possible supporting organizations, a discussion on intellectual property policies as well as a detailed scientific scoping.

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ICFA: Proposal for a new panel: Sustainable accelerators and colliders

Current Status

- Initiated by A. Suzuki (when KEK DG) will be presented/promoted by M. Yamauchi (KEK DG)
- Discussions have started with the EU and US representatives for a common proposal.
- ICFA will discuss the proposal at its next meeting: August 19, 2015 during the Lepton-Photon Symposium in Ljubljana, Slovenia
- Your comments and suggestions are welcome, please contact Saeki san, Hayano san.

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ICFA: Proposal for a new panel: Sustainable accelerators and colliders

Challenging and exciting

The ICFA panel "Sustainable colliders/accelerators" would boost the Green-ILC project by promoting it to the international level. It is needed because:

Achieving full or even partial sustainability for large scale colliders is both:

- challenging:
  - Some/many equipment, construction strategies and running procedures need to be redesigned
  - New expertise in energy saving/recovering/storage/production/management needed
  - Increase the overall complexity of the infrastructure

- Exciting:
  - Building the future of High-Energy Physics: Energy consumption is a roadblock for Future Colliders beyond ILC
  - Solving energy issues similar to a medium sized city. More attractive to decision makers
  - More and better connections with the local people
  - More energy independence and flexibility
  - Bring in a larger community

A Green-ILC is much better than the ILC

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Sustainability beyond energy consumption

Sustainability on a wider scope

- Future upgrade/evolution should be made easy: higher energies or other usage like synchrotron radiation, XFEL, medical applications
- The infrastructure should allow for future acceleration technologies (CLIC, plasma wake field, …)
- Accelerator components and equipment should be made reusable as much as possible.
- Sustainable local acceptance: Environment friendliness for the users and the local people: minimal pollution, good countryside embedding, relationship with the local people (free energy, heat)
- Sustainable budget !! Should become a reference and an asset for decision makers and politician (see CERN treaty)

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Thank you

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