

ORGANIZATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
CERN **EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH**

Action to be taken

Voting Procedure

For Recommendation	SCIENTIFIC POLICY COMMITTEE 264 th Meeting 15 and 16 March 2010	-
For Approval	RESTRICTED COUNCIL 154th Session 18 March 2010	Consensus

Council Working Group
on the
Scientific and Geographical Enlargement of CERN

Global Accelerator Projects and their Governance

The Council is invited to approve the proposals set out in section III of this document concerning implementation of future Global Accelerator Projects.

I. Introduction

The endeavour of science brings nations together towards a common goal. CERN's openness, which enables scientists from anywhere in the world to participate in its scientific programmes, is in line with the mandate laid down in the CERN Convention aimed at fostering international collaboration. CERN's relations with non-Member States have grown substantially over the past years, reflecting the uniqueness of the LHC, CERN's flagship accelerator-based research programme at the high-energy frontier for the next decade. In the 1990s, several non-Member States that made significant contributions to the construction of the LHC were granted Observer status with special rights.

In the future it may be anticipated that particle physics projects and programmes at CERN and elsewhere will become more and more global. It will be even more necessary than in the past to pool resources from all over the world to achieve the ambitious strategy and scientific goals of the worldwide particle physics community. Resources may be pooled for future projects at CERN; likewise, and as stated in the Council document *"The European Strategy for Particle Physics"*, CERN may also be a contributor to future global accelerator projects that are located elsewhere.

In December 2008, the Council set up a dedicated Working Group on the Scientific and Geographical Enlargement of CERN, with the mandate *"To work out scenarios for the strategic development of the Organization and its Geneva laboratory in terms of scientific fields as well as geographical enlargement. The geographical enlargement will include considerations about new Member States and relationships with countries that are not Members...."*

As part of its consultations on this subject, on the morning of 3 September 2009 the Working Group exchanged views with representatives of eight non-Member States that each have a major activity in particle physics, namely Brazil, Canada, China, India, Japan, Korea, the Russian Federation and the United States of America.

The increasingly global nature of accelerator projects will necessitate correspondingly global governance structures. This was one of the three key topics identified by the Working Group, and forms the subject of this paper.

In this context, and in view of the mandate of the Working Group and the need to enable the wide international scientific community interested in contributing to research in fundamental physics to contribute to such global accelerator projects, the following specific topics are addressed in this document:

- discussions with global partners about new governance structures for future projects;
- frameworks that would enable CERN to host a global accelerator project under its own authority or under the authority of a separate global organizational structure;
- the possible participation of the Organization in a global accelerator project not sited at CERN.

II. Global accelerator projects and considerations on their possible governance

There is an increasing tendency for particle physics experiments to be concentrated at unique yet complementary facilities located in different regions of the world, and possible structures for their governance are being considered by many inter-regional bodies. Given this context, it is anticipated that any major future CERN accelerator would need to be organized from the outset as a global accelerator project in partnership with States that are not members of the Organization. Equally, in the case of a global facility constructed at a site other than CERN, a coherent large-scale European participation would be organized through CERN, as allowed for by the CERN Convention and more recently foreseen by the European Strategy for Particle Physics. It is expected that a global project constructed at CERN would be treated as part of the “Basic Programme” of CERN, and hence with Member State contributions proportional to their subscriptions to the Organization, possibly supplemented by additional contributions, whereas a global project elsewhere would be treated as a “Special Programme” to which the Member States would contribute on an ad hoc basis.

Whether at CERN or elsewhere, it is envisaged that such a global accelerator project would require a specific well identified governance structure. In the case of a project hosted by CERN, the CERN Council could provide an institutional framework within which a Project Governing Board could direct a global accelerator project. The CERN Member and Associate States could be represented collectively in the Project Governing Board, in partnership with representatives of the other major participating States, the “external partners”. Individual CERN Member and Associate States that provide significant additional contributions may be granted additional representation in the Project Governing Board. The weights of the external partners in the Project Governing Board should be proportional to the values of their contributions to the project. The execution of the project could be assigned to a Collaboration, similar in principle to those for the LHC experiments, under the leadership of the host laboratory and operating within rules defined by the CERN Council.

The Working Group is of the opinion that a specific global accelerator project structure based on the above-mentioned principles should be put in place for future upgrades of the LHC. Such a structure would build upon the experience gained with the LHC experimental collaborations and has similarities with that already adopted for the CTF3 collaboration and the CLIC study. However, it may apply to any other global accelerator project under discussion, such as a future linear collider or a future large neutrino project. It should be understood, however, that the choice of governance model for a given global accelerator project can only be made jointly by CERN and the external partners.

There are several ways of implementing a global accelerator project at CERN, which would all involve discussions with non-Member States in planning, preparation, management, construction and operation.

During the initial phase, a consensus on whether CERN should offer to host the global accelerator project or participate in a project based elsewhere should form part of the updated European Strategy and be enshrined in a subsequent Council decision. For a project hosted by

CERN, the Organization should take a leading role in the preparatory phase during which a detailed technical design and adequate global governance structures are established; CERN's rich experience and facilities and its open working environment for the international scientific community would place Europe in a good position to offer to initiate and host a future global accelerator project.

As mentioned above, in many implementation models a Project Governing Board could be created and mandated to monitor the project. As for the actual management of the project, the most suitable model would seem to be that of the Scientific Collaboration. This is the model proposed below for implementing future upgrades of the LHC, though recognizing that the governance model needs to be carefully elaborated in partnership with the external partners.

Some prospective non-Member-State partners might prefer a closer institutional relationship with CERN over participation in individual projects. Hence, the issue of reconciling the respective roles of the Project Governing Board and the CERN Council in the context of a future global accelerator project cannot be decoupled from the ongoing discussions about new institutional participation models at CERN. For example, in establishing a suitable framework for the future upgrades of the LHC as proposed below, it might be felt necessary or desirable for official representatives of the major external partners in the LHC upgrade to be invited to restricted Council sessions dealing with this project. However, the finalization of such new participation models need not be a prerequisite for the conclusion of the specific agreements between the Council and the Project Governing Board that define their respective responsibilities in a project such as future upgrades of the LHC.

III. Proposal

In light of the above Council is invited to approve the following:

1. CERN is prepared to join partners in discussions about new governance structures for future global accelerator projects.
2. In particular, CERN is prepared to provide an institutional framework within which a "Project Governing Board" could direct a global accelerator project.
3. As a **prototype** implementation of such an institutional framework for a global accelerator project, CERN should **explore** a governance structure for future upgrades of the LHC.
4. CERN is willing to consider hosting a future global accelerator project, if it is deemed to be in the interest of the Organization and the global particle physics community.
5. In the case of a future global accelerator project hosted elsewhere, CERN is willing to coordinate broad European participation.