European Strategy for Particle Physics
Adopted by the CERN Council

https://europeanstrategygroup.web.cern.ch/EuropeanStrategyGroup/

5th Open Hyper-K Collaboration meeting

Vancouver, Canada, 20-22 July 2014

T. Nakada

EPFL-LPHE
Lausanne, Switzerland

Last Scientific Secretary for Strategy Session of CERN Council
Chairing Strategy Group and Preparatory Group

Timeline

- Preparation of the update started in 2011 by setting up Strategy Group and Preparatory Group by the Council
- September 2012: **Open Symposium**
  Organised by the Preparatory Group
  scientific input from the community
- December 2012: Scientific Briefing Book
  by the Preparatory Group based on the community input (Open Symposium + written submissions)
- January 2013: Strategy Group drafting session
  Draft of updated European Strategy made, submitted to the Council and made **available to the community**
- March 2013: Council discussion on the draft
  aiming for an agreement on the updated Strategy
- May 2013: The Council formally adopting the Strategy

Groups

- European Strategy Group: Members and invitees
  - Working Groups of ESG
    - Working Group 1:
      Organisational structure for the Council for the European Strategy and its implementation
    - Working Group 2:
      Organisational structure for European participation in global projects. Role and definition of the National Laboratories and the CERN Laboratory in the European Strategy
    - Working Group 3:
      Relations with external bodies, in particular EU-related
    - Working Group 4:
      Knowledge and technology transfer, and relations with industry
    - Working Group 5:
      Communication, outreach and education
- Preparatory Group: Scientific input to ESG

European Strategy Group (ESG)

Members

Member States Representatives

Austria	Prof. A. H. Hogang
Belgium	Prof. W. Van Doninck
Bulgaria	Prof. L. Litov
Czech Republic	Prof. J. Chyla
Denmark	Prof. J.J. Gaardhoje
Finland	Prof. P. Eerola
France	Prof. J. Martino
Germany	Prof. S. Bethke
Greece	Dr P. Rapidis
Hungary	Prof. P. Levai
Italy	Prof. F. Ferroni
Netherlands	Prof. S. De Jong
Norway	Prof. A. Read
Poland	Prof. J. Krolikowski
Portugal	Prof. G. Barreira
Slovakia	Dr L. Sandor
Spain	Prof. F. del Aguila
Sweden	Prof. B. Asman
Switzerland	Prof. K. Kirch
United-Kingdom	Prof. J. Butterworth

CERN - Director-General Prof. R. Heuer

Major European National Labs

CIEMAT	Dr C. Lopez
DESY	Prof. J. Mnich
IRFU	Dr Ph.Chomaz
LAL	Dr A. Stocchi
NIKHEF	Prof. F. Linde
LNF	Dr U. Dosselli
LNGS	Prof. S. Ragazzi
PSI	Dr L. Rivkin
STFC-RAL	Dr J. Womersley

Strategy Secretariat Members

Prof. T. Nakada	Scientific Secretary (Chair)
Prof. F. Zwirner	SPC Chair
Dr M. Krammer	ECFA Chair
Dr Ph. Chomaz	Repres. EU Lab. Directors
Prof. E. Tsesmelis	Scientific Assistant

Invited - President of Council Prof. A. Zalewska

Invitees

Candidate for Accession and Associate Member States

Israel	Prof. E. Rabinovici
Romania	Dr S. Dita
Serbia	H. E. Amb. U. Zvekic

Observer States

India	Prof. T. Aziz
Japan	Prof. Sh. Asai
Russian Federation	Prof. A. Bondar
Turkey	Prof. Dr M. Zeyrek
United-States	Prof. M. Shochet

EU	Dr R. Lecbychova
ApPEC	Dr S. Katsanevas
Chairman FALC	Prof. Y. Okaka
Chairman ESFRI	Dr B. Vierkorn-Rudolph
Chairman NuPECC	Prof. A. Bracco
JINR, Dubna	Prof. V. Matveev

Also invited to the Open Session, Preparatory Group Members

The European Strategy Preparatory Group (ESPG) Members

Strategy Secretariat Members

Prof. T. Nakada	Scientific Secretary (Chair)
Prof. F. Zwirner	SPC Chair
Dr M. Krammer	ECFA Chair
Dr Ph. Chomaz	Repres. EU Lab. Directors
Prof. E. Tsesmelis	Scientific Assistant

SPC
Prof. R. Aleksan (FR)
Prof. P. Braun-Munzinger (DE)
Prof. M. Diemoz (IT)
Prof. D. Wark (UK)

ECFA
Prof. K. Desch (DE)
Prof. K. Huitu (FI)
Prof. A. P. Zarnecki (PL)
Prof. C. De Clercq (BE)

CERN
Dr P. Jenni

ASIA/AMERICAS
Prof. Y. Kuno (Asia)
Prof. P. McBride (Americas)

Erice Meeting

- Monday
  - Briefing Book summaries and update
    - by Preparatory Group members and Research Director
  - SPC and ECFA inputs
    - by SPC and ECFA chairs
  - Brief statements
    - Member, Candidate for Accession to Membership, Associate Member States and two Observer States (US and Japan)
- Tuesday
  - Discussion on the scientific issues
- Wednesday
  - Reports by the Working Groups followed by the discussion
- Thursday morning (up to here the ESG + invitees can talk)
  - morning, Discussion on the scientific issues
- Followed by Thursday afternoon and Friday
  - Strategy drafting (invitees could talk with invitation by the chair)

Drafting process

- Draft was made by the Strategy Secretariat + editorial help
- First draft (produced over Wednesday-Thursday)

Composition

Prof. Tatsuya Nakada, Scientific Secretary

Prof. Fabio Zwirner, SPC Chair

Dr Manfred Krammer, ECFA Chair

Dr Ph. Chomaz, Representative of the European Laboratory Directors' meeting

+ Emmanuel Tsesmelis and John Pym

Drafting process

- Draft was made by the Strategy Secretariat + editorial help
- First draft (produced over Wednesday-Thursday)
- First discussion Thursday afternoon
- Second draft (Thursday-Friday night)
- Second discussion Friday morning
- Third draft (Friday lunch time)
- Third discussion Friday afternoon
- Fourth draft (Friday afternoon coffee break)
- Fourth discussion Friday evening
  line by line reading, real time editing and real time endorsement, item by item.
- Meeting concluded at 18:50 with fifth draft unanimously endorsed by the ESG members.

European Strategy

- Just three A4 pages, 1 preamble and 17 statements
  http://council.web.cern.ch/council/en/EuropeanStrategy/esc-e-106.pdf
  - General issues
  - High priority large scale scientific activities
    - LHC, accelerator R&D, e^+e^- (ILC), neutrinos
  - Other scientific activities essential to the particle physics programme
    - theory, small scale precision physics, detector R&D and engineering infrastructure, computing, relation with nuclear and astroparticle physics
  - Organisational issues
    - role of CERN and relation with EU
  - Wider impact of particle physics
    - Outreach, education and knowledge transfer

Deliberation Paper

- Deliberation Paper by the ESG is to provide
  - rationale behind the scientific issues
    ⇒ partly in this presentation
  - recommendations of the ESG Working Groups on the non-scientific issues
    ⇒ Council may consider taking up for future consideration

now finalised and available for public.
http://council.web.cern.ch/council/en/EuropeanStrategy/esc-e-S-103Rev.pdf

Strategy Background

- Reflecting the scientific status
  - Successful HLC operation and Higgs discovery
  - Measurement of θ_{13}, a larger end of the expected value range
  - Non observation of physics beyond the Standard Model
- European geopolitical environment
  - LHC expensive European flag machine, used also for flavour physics and heavy ion physics
  - While CERN is the European central place for particle physics, there are many national laboratories, with particle physics accelerator for some cases
  - Europe acknowledges that Europe cannot host all the important facilities and must be ready to support facilities outside of Europe
- European Strategy does not aim for a concrete programme for given budget scenario but describes strategy and policy

Four High Scientific Priority

- Exploitation of LHC as much as possible, i.e. including the High Luminosity Upgrade, for precision studies of Higgs and flavour physics, heavy ion physics, and direct search for physics beyond that Standard Model. This is the European top priority.
- Ensure ability to build the next high energy frontier machines: high field magnet, high gradient acceleration, conceptual design studies to estimate costs.
- Acknowledging complementarity between the hadron machines and e^+e^- machines for precision Higgs studies and New Physics search. If an ILC will be hosted in Japan, Europe will participate in the construction.
- CERN should provide infrastructure and technical support for the neutrino detector R&D for the future long baseline experiments in the US or Japan.

More on the last point

- Given the European top priority being LHC, there is no resources in Europe to construct a long baseline neutrino beam, an experimental cavern, and a detector
- Strong effort in Europe to develop technology for a large scale liquid Ar neutrino detector, with some success
- CERN medium term plan, which includes the construction of experimental area with secondary charged particle beam for testing large scale detector prototypes in CERN Prevessin (CERN Neutrino Platform) has been approved the CERN Council. It also includes refurbishing of ICALUS for shipping to the US for a short baseline experiment.

To conclude

- The current European Strategy does not envisage construction of a long baseline neutrino beam experimental facility
- It, however, foresees CERN to construct infrastructure for detector R&D
- Its implementation, CERN neutrino platform, is in place now
- Detector funding will primarily come from the national funding agencies
- CERN contribution could be possible for accelerator related items, in-kind.
- For detector contribution from CERN, participation of CERN research physicists in the project needed.