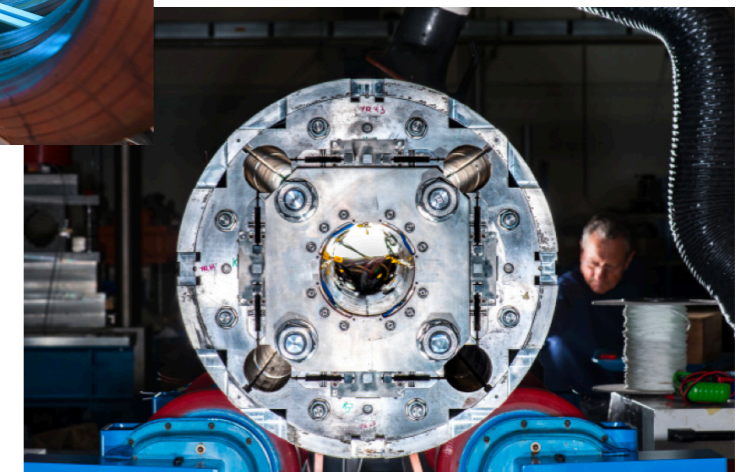
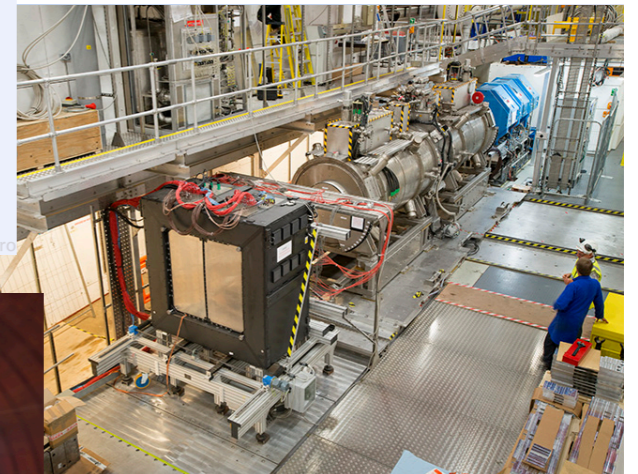
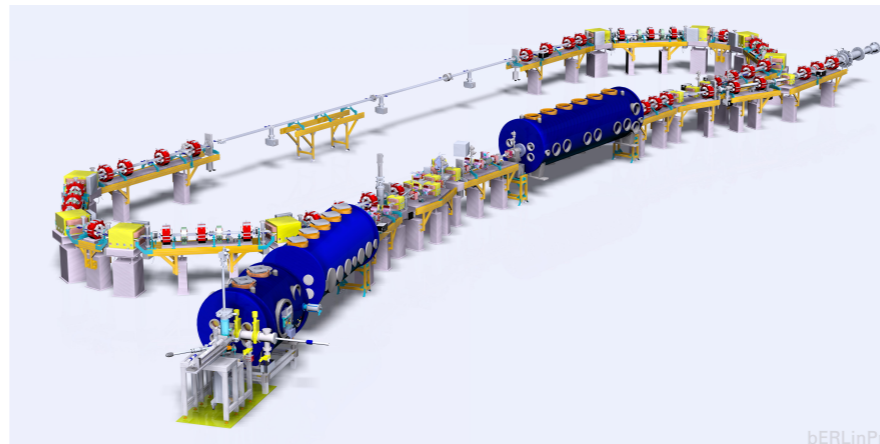
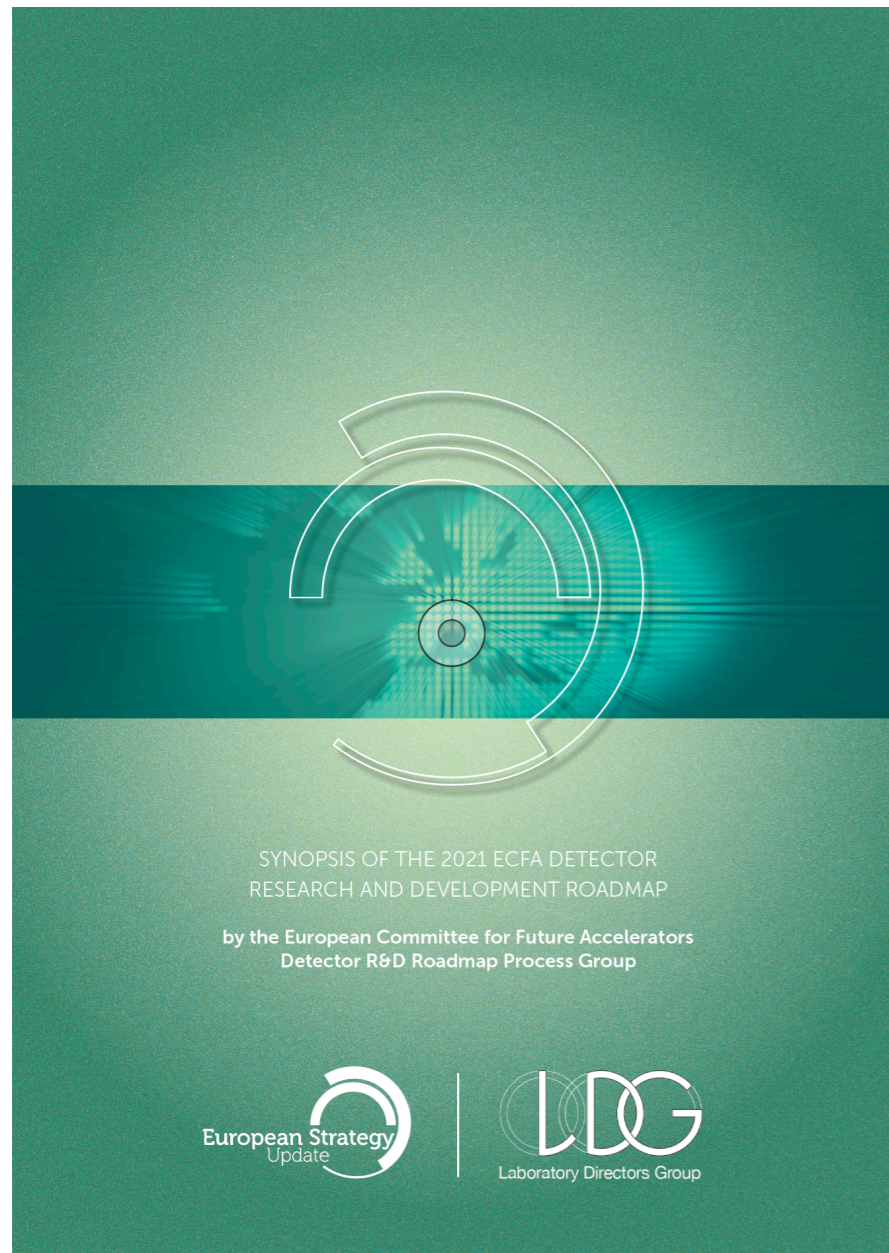


Accelerator R&D Workshop



Dave Newbold
Chair, European Laboratory Directors Group

▶ Welcome!

- ▶ Very first instance of what we hope will become a regular event
- ▶ Thanks to the Local Organising Committee
- ▶ Thanks to Fabio and his staff for hosting us in Frascati

▶ Purpose of the Workshop

- ▶ Bring together the R&D community with the eventual HEP users of new infrastructures
- ▶ Review the status and progress of the R&D roadmap implementation
- ▶ Confirm (and challenge) the connection of the R&D to the future HEP programme
- ▶ Examine the European R&D in its international context

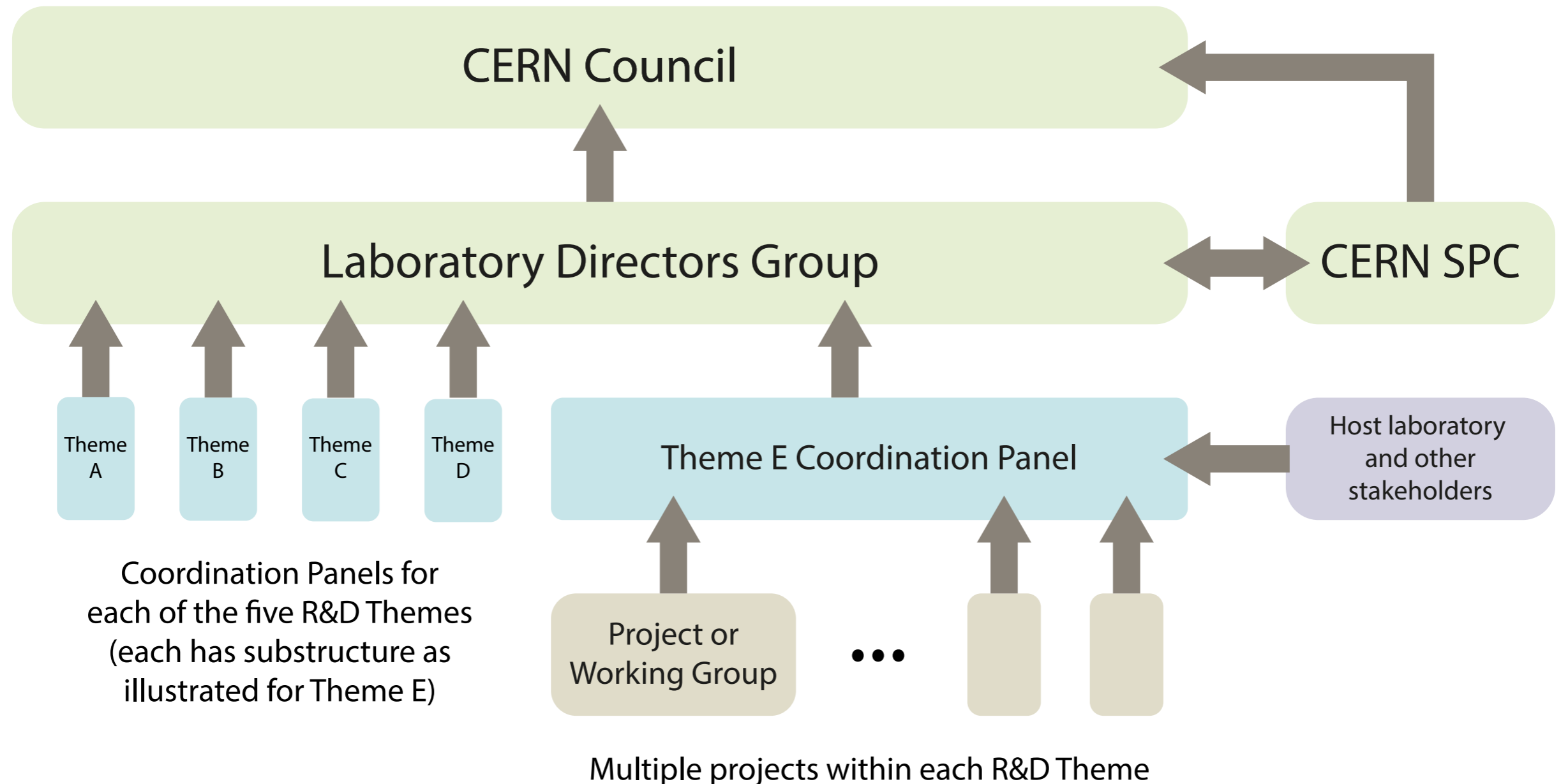
▶ Agenda

- ▶ Introductory talks on the Strategy and the Roadmap
- ▶ Presentations by selected current 'global infrastructure projects'
- ▶ Sessions dedicated to each of the five roadmap themes

- ▶ Key questions raised during the 2020 Strategy update process
 - ▶ What R&D is necessary for future facilities? What are the priorities?
 - ▶ How long might it take? How much will it cost?
 - ▶ What are the dependencies, conflicts or choices between activities?
 - ▶ What science can be done with demonstrators, or intermediate-scale facilities?
 - ▶ How can most efficiently deliver new infrastructures towards our common scientific goals
- ▶ Strategy Update mandated a large-scale programme of accelerator R&D to inform and support future decision-making by the field
- ▶ Accelerator R&D Roadmap adopted at end of 2021
 - ▶ Broad and deep survey of each technology area
 - ▶ Identification of key R&D objectives for short term and longer term
 - ▶ Definition of delivery plans for the next five to ten years
 - ▶ Outline estimates of resource needs and the necessary facilities
 - ▶ 'Reference' chapters on e+e- programme and sustainability
 - ▶ Overarching recommendations on the future R&D programme
- ▶ Roadmap provides information, motivation and priorities
 - ▶ Scale and balance of the programme subsequently addressed by expert coordination panels

- ▶ **Mandate conferred by CERN Council**
 - ▶ Facilitate informal dialogue among the Directors of the LNLs and CERN
 - ▶ Provide direct input to the European Strategy for Particle Physics
 - ▶ Liaise with the European Commission and national funding agencies, research institutes and universities, ensuring that LNLs speak with a single voice
 - ▶ Maximise the regional and national benefits of investment in fundamental research and in CERN
 - ▶ Keep abreast of the activities ... being undertaken in laboratories outside CERN's Member States, and of other coordinating groups in particle physics and related fields, and foster dialogue with them
 - ▶ Draw up and maintain a prioritised accelerator R&D roadmap towards future large-scale facilities for particle physics
 - ▶ Coordinate the accelerator R&D activities on the roadmap, with the aim of strengthening cooperation and ensuring effective use of complementary capabilities
- ▶ **The next few years will be a challenge and opportunity for LDG**
 - ▶ Both in its 'structural' role and as the discussion forum between national labs

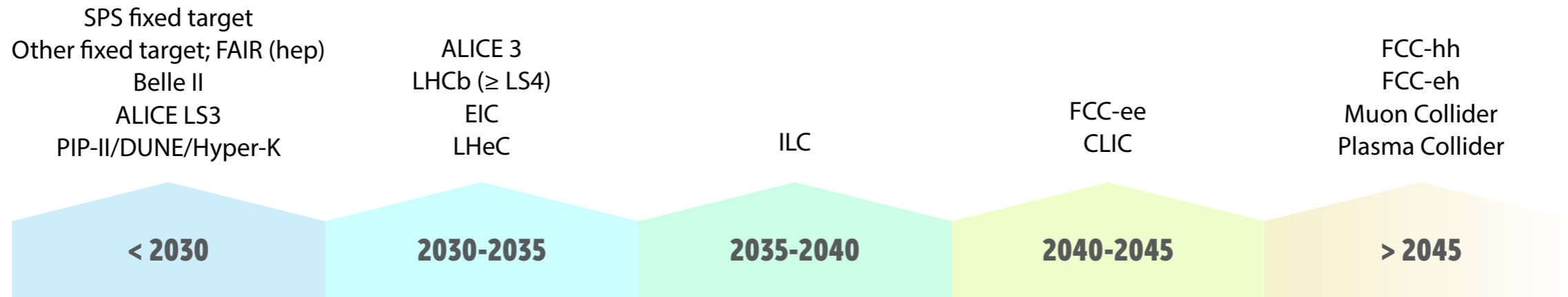
R&D Coordination Structure



- ▶ Clear recognition that R&D happens neither solely within Europe nor solely within labs
- ▶ Challenge is to bind a diverse and international set of activities into a structure allowing review and prioritisation

1. Roadmap should be accepted as the **collective view** of the communities
2. **Governance structures** should oversee the ongoing R&D ensuring:
 - ▶ Proper coordination and balance in their goals and execution
 - ▶ Continued focus on implementation of the goals of the European Strategy
 - ▶ Regular updates on progress to the community and to CERN Council
3. A **broad front** of R&D should be maintained, corresponding to at least the minimal resource scenario in each area
4. Provision must be left for 'blue skies' R&D and **novel developments**
5. Priority should be given to **continuity of funding** for facilities
6. **Environmental sustainability** should be a primary consideration
7. Emphasis on prompt **scientific exploitation** of R&D outputs
8. Practical considerations should factor into the design and parameters of future machines, with the close **engagement of industry**
9. **Close cooperation** between European and international labs is required
10. **Training and professional development** of accelerator physicists is a key factor in sustaining a vibrant and productive field

Future Facilities Timeline



- ▶ ‘Chicken-and-egg’ problem
 - ▶ Cannot define R&D timeline without approximate dates of future facilities
 - ▶ Cannot predict dates of future facilities without knowing R&D needs
- ▶ Detector / accelerator roadmaps have used a common timeline
 - ▶ Highly approximate, and not to be used out of context
 - ▶ Dates represent the ‘earliest feasible date’, driven by both technical considerations and the processes of approval
 - ▶ The goal in both cases is that R&D shall not be the rate-limiting step
- ▶ Informal ‘global infrastructure plan’ needs regular update and review
 - ▶ Discussion at yesterday’s LDG meeting on how and where that should happen

▶ Coordination panels

- ▶ Up and running since mid-2022, seem to be working well
 - ▶ In some cases, are mapped onto corresponding governance panels in large R&D collaborations
- ▶ Revised and re-prioritised plans in place - details in next sessions

▶ Resources

- ▶ FAs aware of roadmap and kept updated - new investments becoming possible
- ▶ Institutes now steering their internal R&D priorities around roadmap
- ▶ Significant success in attracting European funding in key areas
- ▶ Discussions with international partners are maturing

▶ Progress vs original roadmap plan

- ▶ The effects of COVID on the field have clearly been substantial
- ▶ Important progress being made (and momentum increasing), tracked via panels and LDG
- ▶ Clear that prioritisation decisions will be ongoing as R&D unfolds

▶ Goals for the Workshop:

- ▶ Learn what's going on and how the R&D is being addressed
- ▶ Remind ourselves of the eventual goal of the R&D, driven by our scientific Strategy
- ▶ Seek new ways to increase engagement and gain practical / intellectual contributions

Additional Information

▶ Laboratory representatives

- ▶ S. Bentvelsen (NIKHEF)
- ▶ F. Bossi (LNF)
- ▶ J. Clarke (DL)
- ▶ N. Colino (CIEMAT)
- ▶ F. Gianotti (CERN)
- ▶ B. Heinemann (DESY)
- ▶ D. Newbold (RAL)
- ▶ E. Previtali (LNGS)
- ▶ F. Sabatie (IRFU)
- ▶ M. Seidel (PSI)
- ▶ A. Stocchi (IJCLab)

▶ Standing observers

- ▶ K. Jakobs (ECFA Chair)
- ▶ M. Lamont (CERN Directorate)
- ▶ J. Mnich (CERN Directorate)
- ▶ H. Montgomery (SPC Chair)

▶ Secretary

- ▶ E. Tsemelis (CERN)

▶ Extended LDG members

- ▶ G. Bisoffi (RF) + P. Macintosh
- ▶ W. Leemans (LPA) + R. Patahill
- ▶ S. Stapnes (Muons) + D. Schulte
- ▶ J. D'Hondt (ERL) + M. Klein
- ▶ P. Vedrine (HFM)