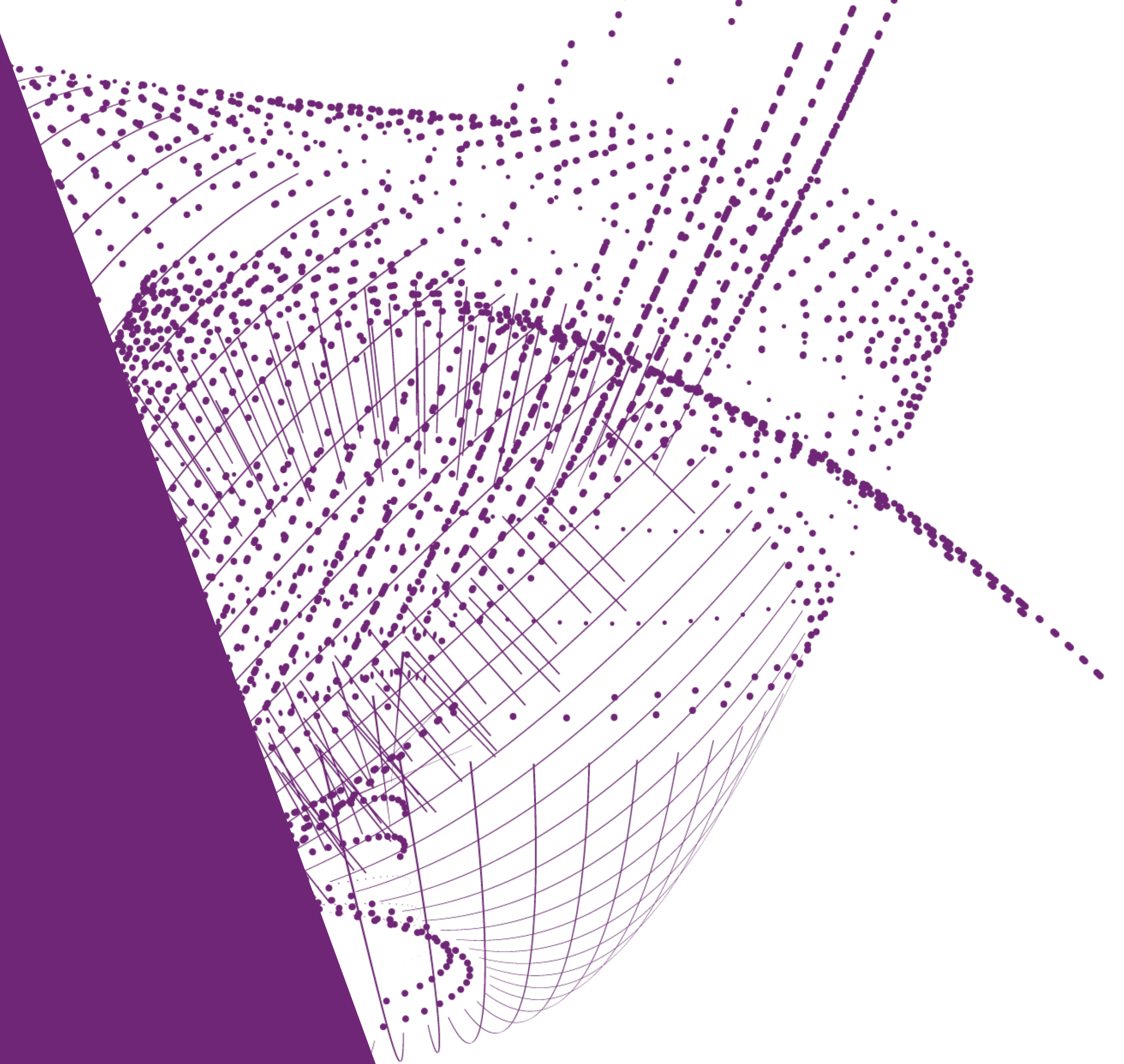




ESPP STRATEGY MEETING, 2-10-25

# Statements to repeat

Wouter Waalewijn



# PROCEDURE AND CRITERIA

- We are writing an addendum, our previous input is still valid.
- We can repeat statements for emphasis, and to refine them.
- Since the addendum is about future collider scenarios, statements should relate to that or be included to “balance” that.
- Input was received from Juan Rojo.

# Input to Nikhef's ESPPU26 addendum

- ☑ Recommend **integrated FCC program** as Plan A for CERN's future: strongest overall proposal in terms of physics case, technical feasibility, financial support, and pathway to the high energy frontier.
- ☑ Emphasise the **full exploitation of the HL-LHC, including ancillary detectors**, as top priority for CERN until 2041. Personal preference is to mention the **Forward Physics Facility** as an example of ancillary experiments which significantly extend and diversify the HL-LHC program
- ☑ Recommend not a unique Plan B but a **Program B of R&D and technical studies** to enable an eventual move to a Plan B should plan A not be feasible or competitive. This Program B includes energy recovery linacs, muon demonstrators, and magnet tech (cheaper, more powerful, faster to produce), perhaps also other acceleration technologies.
- ☑ This Program B should be accompanied with **dedicated physics studies** extending those presented in the BB and covering alternative collider scenarios. This crucial information for the decision making is now **missing** - in particular extending the global SMEFT fit to LHeC, (low-energy) FCC-hh, and different collider combinations (*e.g.* LEP3+LHeC).

# FLAGSHIP

- "Completing the full HL-LHC programme must be the main present priority for CERN"
- "It is essential that the next flagship collider is located at CERN"
- "The primary physics motivations for a future collider are to conduct a detailed study of the Higgs boson and to explore physics beyond the Standard Model."
- "It is important that the next flagship collider supports a broad physics programme"
- "In the pursuit of both precision and high energy, flexibility to integrate technological innovations and adapt to new discoveries is highly valued"
- "Feasibility studies of linear collider options at CERN should be seriously considered."
- "It is important to carefully scrutinise the physics motivations, when considering extensions of future colliders." → to study integrated scenarios rather than individual colliders



# FLAGSHIP

- "If a gap emerges between the HL-LHC and the next flagship collider at CERN which is too long, there should be impactful physics experiments in this gap."
- "An integral part of achieving future colliders is advancing accelerator technologies."
- "Long-term sustainability should be a guiding principle"
- "We value global collaboration in science and we should strive to retain it"

# SCIENTIFIC DIVERSITY

- "Non-collider (astro)particle experiments should be included in the European Strategy for Particle Physics."
- "A future accelerator should not happen at the expense of scientific diversity."
- "It is important for CERN to have a diverse physics programme."
- "Neutrino experiments probe fundamental properties of the lepton sector complementary to collider experiments."
- "Gravitational wave detection provides unique and paradigm-shifting opportunities for fundamental physics."
- "Underground facilities for dark matter searches have a unique sensitivity for a WIMP-nucleon scattering discovery."

# SCIENTIFIC DIVERSITY

- "Low-energy precision experiments, like those measuring electric dipole moments, are powerful probes of physics beyond the Standard Model complementary to high-energy experiments."
- "Next-generation facilities to study cosmic rays enable access to the highest (EeV) energies unreachable by earth-based colliders."
- "Strengthening the concept of 'recognized experiments'"
- "Establishing common technology platforms at CERN"
- "Supporting accelerator-based diversity. "
- "The ongoing physics exploitation at the (HL)LHC and other experiments, as well as preparation for future facilities, mandates the continuation of a strategic and vibrant research programme in theory."

# NEW TECHNOLOGIES

- "A coordinated and forward-looking technology strategy is essential to maintain Europe's leadership in particle physics."
- "The ESPP should prioritise long-term investment in key areas, including artificial intelligence (AI), quantum computing and quantum sensing, whilst also recognizing the need for sustained support and maintenance of existing technologies."
- "The European particle physics community should continue to actively define specific use cases for quantum computing in high-energy physics (HEP)"
- "The European particle physics community should take a leading role in developing AI initiatives for fundamental physics, by investing in research, fostering collaborations, and developing dedicated AI infrastructure and expertise."



# NEW TECHNOLOGIES

- "A concerted European programme on quantum sensing should be developed to remain competitive in the field, and to attract both physics students and technical staff."
- "CERN should take an active role in planning, coordinating, and even leading the efforts required for long-term maintenance of experiments hosted at the laboratory."
- "Fostering expertise in a broad portfolio of critical detector and electronics technologies must remain a core priority within the ESPP with a view to further these technologies."
- "The ESPP must actively ensure the field remains competitive and attractive for technologists."

# ECR & COMMUNICATION

- ECRs: especially job security & long-term career prospects (also w.r.t. long-term plans & gaps)
- "Ensure adequate support and funding for communications and outreach"
- "Adopt a common and coordinated European vision and strategy for communications, outreach and public engagement"
- "Engage directly with diverse and new audiences"
- "Demonstrate societal benefits arising from fundamental research"
- "Communicate transparently about efforts to reduce environmental impact"