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Communications Strategy for the 2020 Update of the European Strategy for Particle Physics

2021 – 2025

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Introduction

This document outlines the five-year communications strategy for the 2020 European Strategy for Particle Physics Update (ESPPU). The overarching goal of this communications strategy is to ensure sustained support for the recommendations of the ESPPU and their implementation, by establishing a framework that may be used by the relevant partners, namely CERN, laboratories, institutes and universities in CERN Member and Associate Member States, as well as the high energy physics community across the globe. It is a tool for all those who communicate on the future of particle physics in Europe with different target audiences.

This communications strategy is a collaboration between CERN's Education, Communications and Outreach (ECO) group and the European Particle Physics Communication Network (EPPCN), where CERN Member States are represented. It was developed in parallel with CERN's communications strategy for 2021-2025, which is underpinned by the Organization's strategic goals. These encompass the Lab's scientific objectives, which are determined by the ESPPU and will be pursued in strong collaboration with national laboratories, institutes and universities, and industry in the Member States and beyond. The two communications strategies cross-feed into each other and are aligned in all aspects that concern supporting the successful implementation of the recommendations of the ESPPU.

The ESPPU communications strategy sets the framework for the development of the specific activities and programmes that will be implemented over the next five years, through continued joint actions between CERN's ECO group and EPPCN.

The European Strategy for Particle Physics

The European Strategy for Particle Physics provides a clear prioritisation of European ambitions in advancing particle physics, taking into account the worldwide landscape and developments in this and related fields. The latest process for the update of the European Strategy was launched by the CERN Council in September 2018 and carried out through a broad consultation of the international particle physics community. It was concluded in June 2020 when the CERN Council unanimously adopted the resolution to update the European Strategy for Particle Physics.

The ESPPU places priority on the successful completion of the High-Luminosity upgrade of the LHC for full exploitation of the LHC physics potential, and begins to map out the landscape for research in Europe in the post-LHC era. It presents a vision for both the near- and long-term future of the field, and aims to maintain Europe's leading role in particle physics and in the innovative technologies developed within the field. The main recommendations may be summarised as:

- Successful completion of the HL-LHC upgrade of the LHC machine and detectors
- An electron-positron Higgs factory as highest priority next collider
- Ramping up R&D on advanced accelerator technologies, as well as detector and computing technologies
- A technical and financial feasibility study for a future 100 TeV hadron collider at CERN, with an electron-positron Higgs factory as a possible first stage
- Support long-baseline neutrino projects in Japan and the USA, and a high-impact scientific programme complementary to high-energy colliders.

The ESPPU also recommends continued support for a broad programme of theoretical research covering the full spectrum of particle physics, continued and stronger synergies with neighbouring fields (namely nuclear and astroparticle physics) and the expansion of collaborative programmes between CERN and research institutes in its Member States, Associate Member States and beyond, building on the existing European organisational model.

The Strategy additionally addresses environmental and societal impacts of the field:

- The environmental impact of particle physics activities should continue to be carefully studied and minimized;
- The principles of equality, diversity and inclusion should be placed at the heart of all activities;
- Knowledge and technology transfer should be supported, as well as engagement with industry to facilitate knowledge transfer and technological development;
- Public engagement, education and communication in particle physics should continue to be recognised as important components of the scientific activity and receive adequate support.

Thematic areas of the ESPPU communications strategy

The recommendations of the ESPPU span a range of areas, from research priorities and projects to environmental and societal impacts. These different thematic areas pose different communication challenges.

For many ongoing research projects (such as the LHC and HL-LHC, neutrino facilities and other non-LHC research), communication efforts are well-established and will be continued and extended. By contrast, communicating the case for a post-LHC collider as the next large-scale project in European particle physics requires new, targeted approaches and efforts. This communications strategy therefore focuses for the large part on the case for a future collider. This is – from a communication's perspective – the most challenging recommendation of the ESPPU.

Societal and environmental impacts, which are of growing importance in today's world, are also relevant areas for all the projects included in the ESPPU. They therefore form a crucial part of this communications strategy.

The following thematic areas were thus selected as the working basis for the development of the communications strategy:

- Physics case for a future collider
- Benefits to society
- Minimising environmental impact
- International collaboration
- Diversity and Inclusion

Goals of the Communications Strategy

The overall goal of the ESPPU communications strategy is **to ensure sustained support for the recommendations of the ESPPU and their implementation.**

This overall goal can be broken down into objectives, addressing the themes identified above.

Objectives of the communications strategy

Our stakeholders will support the recommendations of the ESPPU because:

- They are surprised and excited to learn that ~95% of the universe is unknown and that this and other profound mysteries about our origins linked to the Higgs boson can be addressed by a future collider.

- They acknowledge or have been reassured, inspired or surprised by the ways that particle physics research has impacted all our lives.

- They are aware that there is a strong and growing culture of environmental responsibility and engagement within CERN and the particle physics community concerning current and future large-scale projects.

Promoting diversity and inclusion, and raising awareness of the value of global collaboration in pushing the frontiers of knowledge are cross-cutting objectives to the above.

Target audiences

Target audiences have been identified and grouped according to their **power** to influence the ESPPU recommendations and their implementation, and their **interest** in the process. Several of these audiences are also stakeholders, that is, they are impacted by and directly contribute to the current and future states of the field.

Priority target audiences

Priority target audiences are those audiences with **high interest** and **high power**.

- Governments/Decision makers (at local, regional and national level; of CERN Member States, CERN Associate Member States, CERN Host States, CERN Observer States and potential CERN Member States)
- the particle physics community (including the CERN community)
- Local communities away from the LHC[1]
- Environmental associations, interest groups and activists
- Industry
- Media and influencers (as vectors to reach different audiences)[2]

Second priority target audiences

Second priority target audiences are those with **lower interest**, but with **high power**.

- General public in CERN Member States, Associate Member States, Host States and Observer States
- Local communities near the LHC[3]
- Scientific communities from other fields
- Donors

Other target audiences

These target audiences have lower power than priority and second priority target audiences within the timeframe of this communications strategy[4]

- Teachers and students
- General public in potential CERN Member States and non-Member States
- International Organisations (namely United Nations, NGOs)

[1] Communities within the area of a potential future collider that are not already in the vicinity of the LHC, and therefore not yet familiar with having a collider in their neighbourhood.
[2] "Influencers" encompasses social media influencers and personalities in the cultural, business and social spheres with a connection to or demonstrated interest in science/particle physics.
[3] Communities in the vicinity of the LHC, and therefore already familiar with having a collider in their neighbourhood.
[4] These audiences are key target audiences for the field in the long-term, but with less power to influence the ESPPU within the 5-year timeframe that this communications strategy refers to.

Key messages (top-level)

The following overarching key messages are applicable to all audience groups. Each key message falls within an associated narrative around the ESPPU recommendations, their implementation and their impact on the field and on society.

1. Many fundamental mysteries about the universe remain to be solved, including those linked to the Higgs boson. A future collider is a unique tool to unlock these outstanding mysteries in a controlled way. [Associated narrative: Increase understanding of the universe]

2. Innovation for a future collider and other large-scale projects will create technologies that can change the way we live and work, and address societal challenges, ranging from health to the environment. [Associated narrative: Benefits to society/knowledge & technology transfer]

3. A future collider will bring industrial, economic and social benefits to local, regional, national and global partners. [Associated narrative: Return on investment]

4. The particle physics community constantly strives to develop sustainable research facilities and is transparent in communicating their environmental impact [Associated narrative: Environmentally responsible research]

5. Collider-based research is one of the most compelling examples of countries coming together for a common good. It is a proven source of inspiration for future generations. [Associated narrative: Inspire and strengthen relationships between nations and cultures]

Messages per target audience

The following specific messages for the priority audience groups were developed, based on the identification of their drivers (what motivates their interest in the ESPPU) and our desired outcomes for these groups (in terms of changes in knowledge, attitude or behaviour).

Governments/Decision makers (at local, regional and national level; in CERN Member States, CERN Associate Member States, CERN Host States, CERN Observer States and potential CERN Member States)

Drivers	Desired Outcomes	Messages
Be part of scientific excellence Economic and social impact[5] Return on investment (industrial, etc.) Job creation Inspiration for STEM Environmental responsibility and sustainability	Political and financial support for a future collider Advocate for continued collider-based exploration in multilateral debates	Your region/country will have a stake in answering some of the outstanding fundamental questions about the universe. The unique know-how and expertise needed to develop a future collider will bring industrial, economic, human capital and social benefits to your region/country[6]. Clear, decisive political and financial support for a future collider is required to ensure Europe's leadership role in research and innovation. The particle physics community constantly strives for environmentally-responsible research, such as reduction of the carbon footprint.

[5] Through innovation and knowledge transfer
[6] Including unique learning and training opportunities for highly-skilled professionals in a diversity of roles

Particle physics community (including the CERN community)

Drivers	Desired Outcomes	Messages
Scientific excellence Future of the field, dependent on a future large-scale project[7] Access to large-scale research infrastructure Funding[8] Be part of a global collaboration project	Community-wide consensus and support for the choice of a post-LHC collider in Europe Interest to join the research programmes built around a future collider Well-prepared ambassadors for a post-LHC collider Commitment to environmentally responsible research and transparency in communicating about it Interest in developing societal applications of future collider R&D	A future collider in Europe will push progress in particle physics as a whole. Designing, building and operating a future collider will benefit the whole particle physics community for decades. Minimising environmental impact is crucial for the approval of a future collider project. The community pursuing the next future collider must be diverse and inclusive. Your passion and enthusiasm make you the best ambassadors to secure the future of the field, and can contribute to your scientific impact.

[7] including influx of new researchers
[8] access to large amounts of funding

Local communities away from the LHC

Drivers	Desired Outcomes	Messages
Economic and social benefits[9] Potential impact on the environment Impact on people's daily lives	General political and public support for a future collider project Specific support of those communities directly affected by the construction of a future collider (e.g. neighbours of surface infrastructures) Feeling of prestige on being associated to an ambitious scientific project	A future collider at CERN will create jobs and other economic developments in your local area. CERN is world famous and brings a positive cultural spotlight to your region. CERN adheres to the highest standards of health, safety and security, and consistently strives to deliver environmentally responsible research. CERN takes its place in the community seriously. We work closely with local institutions and authorities for the CERN of tomorrow.

[9] Including tourism

Environmental associations, interest groups, activists

Drivers	Desired Outcomes	Messages
Protection of the environment Stop climate change Ensure healthy living and working conditions Use the attention generated by big projects to create momentum for environmental change	Active and public acknowledgement that the particle physics community communicates transparently about its environmental impact Active and public acknowledgement that the particle physics community strives to minimise environmental impact and become 'part of the solution' by developing technologies that could help address the issues at a wider level Voice the acknowledgement towards decisions makers/political actors Partnerships with the particle physics community to address environmental issues	The particle physics community constantly strives to minimise environmental impact (both globally and locally). CERN is transparent about all environmental aspects of its research, and openly publishes all information on a regular basis. Technological developments in the context of a future collider may be transferred to society with a potentially wider impact on environmental sustainability. The particle physics community wishes to be a partner in forums striving for environmental sustainability and mitigating climate change (be represented, engage in dialogue, and actively seek for solutions).

Industry

Drivers	Desired Outcomes	Messages
Generate business: revenue, job creation, return on investment	Collaborations on the technological innovation needed for a future collider	A future collider is a key driver for your innovation, and will bring new and more business opportunities for your company.
Be seen to be at the forefront of technological innovation	Industry proactive reaching out to the particle physics community for joint innovation and development projects[11]	Partnerships between particle physics and industry are essential for the successful development of cutting-edge accelerators, detector and computing technologies with reduced environmental impact.
Give own companies a boost for the future through knowledge transfer[10]	Industry have a feeling of prestige in being associated with an ambitious scientific project	Join us in developing applications of particle physics technology that can change the way we live and work, and address societal challenges ranging from health to environment.
Contribute to the common good	Environmental considerations taken into account when developing and delivering products for particle physics/CERN	Through knowledge transfer, particle physics research fosters innovation across industry, from start-ups and SMEs to big businesses[12].
		Industry profits from highly skilled professionals in particle physics.

[10] includes human capital
[11] Examples: computing, AI
[12] e.g. Business Incubation Centres

Media and influencers (as vectors to reach different audiences)

Drivers	Desired Outcomes	Messages
Audience numbers (readership, viewers) One of the most ambitious projects in the world (wow factor) News values: Relevance (benefits to society), novelties and exclusives (be the first), big discoveries, conflict and competition, quirkiness, superlatives Trusted sources	Media and influencers channel our messages with maximum reach and engagement. Accurate coverage of the field Coverage that is representative of the diversity of the field[13] Awareness of the existence of CERN (as each MS' national lab), the wonder of fundamental exploration, and the plans to build a collider even bigger than the LHC	The discovery of the Higgs was only the beginning of a new frontier of exploration, one that will connect the smallest and the largest scales in the Universe. Understanding these links requires a collider that gives you a bigger bang than the LHC. The journey of fundamental exploration has transformed the world (microelectronics, WWW, GPS, 50000 accelerators in hospitals)[14] Particle physics is less costly than other areas of public investment[15] Did you know that one euro invested in CERN's research brings 1.8 euros back to society? The next collider will be the most ambitious scientific project ever mounted

[13] Includes younger researchers being used as sources

[14] As a sub-message: Physicists, engineers, technicians working in particle physics are also developing next-generation cancer treatment technology

[15] CERN's annual budget corresponds, on average, to 2 EUR per year per European citizen)

Communication hooks and moments

This document presents a framework for regular and continuous communication on the ESPPU and its implementation. However, key dates, milestones and events present stand-out “hooks” for the messages outlined above. These include:

1. Organised by particle physics/CERN community
    - Scientific conferences (e.g. Moriond, ICHEP,…)
    - Collaboration/Project weeks (e.g. FCC week, CMS week, HL LHC week,…)
    - Anniversaries (e.g. 50 years hadron colliders, 10 years Higgs discovery, …)
    - Publications (e.g. of CERN Environment Report, FCC Feasibility Study report, …)
    - Accelerator/Experiment/Project Milestones (e.g. related to start LHC Run3, HiLumi LHC, FCC feasibility study, …)
2. Organised by other organizations
    - Thematic ‘weeks’, ‘days’, ‘hours’ (e.g. World Intellectual Property Day, Earth Hour,)
    - Forums, conferences and other events (e.g. World Economic Forum, EU Research and Innovation Days, UN Climate Change Conference of the Parties, Big Science Business Forum, European Researchers’ Night,...)

EPPCN members will identify country-specific communication “hooks” relevant for the ESPPU. Specific channels and products for each communication hook will be defined, often linked with those implemented by CERN, for greater reach and impact.

Ambassadors and partners

This section lists the main partners and ambassadors with which CERN and EPPCN will work for the full implementation of the communications strategy.

Ambassadors are considered to be individuals who could be invited to advocate for the recommendations of the ESPPU, within specific campaigns. The goal of using ambassadors is to have many voices speaking for the ESPPU: within CERN, within the particle physics community and beyond. The latter will come from both the wider scientific community and other areas of society (politicians, actors, musicians, cultural leaders, philanthropists, etc.)

Beyond those mentioned in this section, EPPCN members will identify ambassadors and partners in their countries, tailored to specific communication hooks.

Categories/types of ambassadors and partners

1. Partners
    a. Within CERN
        i. CERN Council
        ii. LHC collaborations’ communication teams
        iii. CERN departments
        iv. CERN and Society Foundation
        v. CERN Alumni
    b. In Member States and Associate Member States
        i. Universities and research institutes
        ii. Funding agencies
        iii. Business Incubation Centres
    c. Other Big Science projects (e.g. ITER, SKA, XFEL, ESS, SESAME, …)

d. Physics Societies (e.g. APS, EPS, country-specific societies)
e. UN organisations/programmes (e.g. UNESCO, UNFCCC, UNEP)
f. Organisations at EU level (e.g. European Commission, EIROforum,…)
g. Communication and outreach networks in the particle physics field (IPPOG, Interactions,…)
h. National, federal and local authorities, especially with host states
i. Specific for the minimizing environmental impact strand:
    i. '2050 today' initiative (CERN joined UN and other international institutions based in Geneva in this initiative)

2. Ambassadors from the particle physics/CERN community (and closely related to this community)
    a. Prominent scientists
    b. Nobel prize winners
    c. CERN/Particle Physics community members who are active on Twitter (in terms of followers and engagement)
    d. CERN alumni
    e. Specific for the benefits for society strand:
        i. Founders of start-ups related to CERN
        ii. Leaders of CERN Business Incubation Centres
    f. Specific for the minimizing environmental impact strand
        i. Organisers and participants of the HEP Sustainability Workshop in 2021 (and of future similar workshops)
        ii. Members of the ESPPU working group 6 'Sustainability and Environmental Impact'
        iii. Members of the ECFA Early-Career Researchers Panel (who published a report in 2020)

3. Potential ambassadors external to the particle physics field
    a. Personalities in culture, finance, high-tech, non-governmental organisations, humanitarian field
    b. Leading scientists in other fields (biomedical research, climate research, neuroscience, artificial intelligence…)
    c. Specific for the minimizing environmental impact strand:
        i. Members of Environmental Associations, interest groups and prominent activists

Appendix 1 – SWOT analyses of the ESPPU

A SWOT analysis of the ESPPU was carried out, from a communications perspective, in order to establish baseline of the current landscape of the field (strengths and weaknesses) and the main threats and opportunities for the future encapsulated in the recommendations of the ESPPU.