Proposal Evaluation Form

EUROPEAN COMMISSION

Horizon 2020 - Research and Innovation Framework Programme

Evaluation Summary Report - Research and innovation actions

Call: H2020-INFRADEV-2019-3
Type of action: RIA
Proposal number: 951754
Proposal acronym: FCCIS
Duration (months): 48
Proposal title: Future Circular Collider Innovation Study
Activity: INFRADEV-01-2019-2020

N.	Proposer name	Country	Total Cost	%	Grant Requested	%
1	EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH	CH	0	0.00%	0	0.00%
2	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	FR	188,910	6.30%	188,910	6.30%
3	CENTRE D ETUDES ET D EXPERTISE SUR LES RISQUES L ENVIRONNEMENT LA MOBILITE ET L AMENAGEMENT	FR	314,660	10.49%	314,660	10.49%
4	Centre d'études des tunnels	FR	108,005	3.60%	108,005	3.60%
5	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	FR	302,265	10.08%	302,265	10.08%
6	CSIL - CENTRO STUDI INDUSTRIA LEGGERA SOCIETA' COOPERATIVA	IT	197,695	6.59%	197,695	6.59%
7	STIFTUNG DEUTSCHES ELEKTRONEN-SYNCHROTRON DESY	DE	474,695	15.82%	474,695	15.82%
8	THE HENRYK NIEWODNICZANSKI INSTITUTE OF NUCLEAR PHYSICS, POLISH ACADEMY OF SCIENCES	PL	139,375	4.65%	139,375	4.65%
9	ISTITUTO NAZIONALE DI FISICA NUCLEARE	IT	285,780	9.53%	285,780	9.53%
10	KARLSRUHER INSTITUT FUER TECHNOLOGIE	DE	178,850	5.96%	178,850	5.96%
11	Latitude Durable Sàrl	CH	176,225	5.87%	176,225	5.87%
12	MONTANUNIVERSITAET LEOBEN	AT	101,185	3.37%	101,185	3.37%
13	Springer Nature B.V.	NL	189,660	6.32%	189,660	6.32%
14	Terra Mater Factual Studios GmbH	AT	204,035	6.80%	204,035	6.80%
15	THE UNIVERSITY OF LIVERPOOL	UK	85,910	2.86%	85,910	2.86%
16	UNIVERSIDAD DE SANTIAGO DE COMPOSTELA	ES	52,600	1.75%	52,600	1.75%
	Total:		2,999,850		2,999,850	

Abstract:
What is the Origin of Everything? The Standard Model of Particle Physics explains everything except for the parts that it does not cover. This limitation calls for a science mission to gain a deeper understanding of matter, energy and the fundamental laws of nature. The first step is to elucidate the mysteries that revolve around the Higgs boson. Is it point like? Does it interact with itself? The best way to answer these such questions is to create a clean experimental environment with a highest luminosity particle collider. The Future Circular Collider Innovation Study (FCCIS) will deliver a conceptual design and an implementation plan for a new research infrastructure, consisting of a 100 km long, circular tunnel and a dozen surface sites. It will initially host an electron-positron particle collider. With an energy frontier hadron collider as a second step, it can serve a world-wide community through the end of the 21st century.
This project will validate the key performance enablers at particle accelerators. Extreme luminosities, a factory producing a million Higgs bosons, luminosities up to 100 times the present world record with parts-per-million energy precision will strengthen Europe's leadership in excellent science for many decades. This project will attract academic and industrial leaders to develop a feasible and affordable project that incorporates ecodesign and resource efficiency from an early stage onwards. The project includes work with the host states France and Switzerland to ensure that the infrastructure blends in with the territorial boundary conditions. A socio-economic impact analysis will reveal the added value that this infrastructure will generate during its first phase and serve as the basis for developing a funding and implementation plan. This project emphasizes the user capacity building process with theoretical and experimental physicists at an international scale to ensure an exploitation of the facility from the start.

Evaluation Summary Report

Evaluation Result

Total score: 15.00 (Threshold: 10)

Form information

SCORING

Scores must be in the range 0-5.

Interpretation of the score:

0 *The* ***proposal fails to address the criterion*** *or cannot be assessed due to missing or incomplete information.*

1 Poor. *The criterion is inadequately addressed, or there are serious inherent weaknesses.*

2 Fair. *The proposal broadly addresses the criterion, but there are significant weaknesses.*

3 Good. *The proposal addresses the criterion well, but a number of shortcomings are present.*

4 Very good. *The proposal addresses the criterion very well, but a small number of shortcomings are present.*

5 Excellent. *The proposal successfully addresses all relevant aspects of the criterion.Any shortcomings are minor.*

Criterion 1 - Excellence

Score: **5.00** (Threshold: 3/5.00 , Weight: -)

The following aspects will be taken into account, to the extent that the proposed work corresponds to the topic description in the work programme:
Clarity and pertinence of the objectives
Soundness of the concept, and credibility of the proposed methodology
Extent that proposed work is beyond the state of the art, and demonstrates innovation potential (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)
Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge and gender dimension in research and innovation content

The FCCIS project builds on a concept for a 100 TeV energy hadron collider in a 100 km long circular tunnel and a dozen surface sites, whose feasibility was in principle demonstrated within the framework of the EuroCirCol H2020 project. The herein considered task of further design and optimization, addressed also in the European Strategy for Particle Physics update (approval expected in May 2020), is assigned to leading research institutions in the high energy physics such as CEA, CERN, CNRS, DESY, KIT, INFN, ULIN etc.
It is a very well planned, written, and structured project with clear scientific objectives covering a very large part of the particle physics discipline, with clear innovation potential, ambitions and well described methodology.
The scientific outreach beyond the current state-of-the-art, aimed at developing the detailed conceptual design and long-term implementation plan of a new leading-edge electron-positron circular collider (FCC) with the goal of studying with high precision and luminosity the Z, W, Higgs and top particles, that will pave the way for a wide area of new research and opportunities for major discoveries in the field of electroweak interactions, is well elaborated. This will allow attaining considerable improvement in experimental and theoretical precision and enhance radically our knowledge about the subatomic world. Exceeding the current energy frontiers provides the foundation for future fundamental physics research. What is more, the proposed RI would be more sustainable and more energy efficient than previous accelerators, as well as embedded in the local natural and political landscape.
The positioning of the proposal with respect to the relevant TRLs, as well as to national and international projects (CHART, EASITrain, CLIC, DAΦNE etc.) and activities in the areas of high field magnets, advanced accelerator methods, superconductivity, cryogenic refrigeration technologies, novel collision schemes etc., is clear.
Gender dimension activities are clearly stated.

Criterion 2 - Impact

Score: **5.00** (Threshold: 3/5.00 , Weight: -)

The following aspects will be taken into account:
The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic
Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society
Quality of the proposed measures to:
- exploit and disseminate the project results (including management of IPR), and to manage research data where relevant
- communicate the project activities to different target audiences

The relation to the work package is clearly stated and explained.
The project adopts a unifying approach integrating scientific goals with technology advancements, environmental compatibility, socio-economical impact analysis and stakeholder engagement.
The impacts and their structuring through the 3 O's (Open Innovation, Open Science and Open to the world) is excellently elaborated, as are the socio-economic impacts. All of this should validate and strengthen the European leadership in science, as well as strengthen the European innovation and industrial capacities, resulting in its increased competitiveness.
The planned dissemination activities with the involvement of the key stakeholders (SN & Terra Matter Factual Studios) are exemplary. The target groups in this framework are carefully chosen.
Innovation management is very well considered.
The planned activities towards potential users are well described, as is the strategy for the exploitation of the results. Especially relevant in this context are also the activities aimed at engaging EC DG RTD, EIROforum, ESFRI, and other funding and policy bodies. The outreach towards the next generation of researchers is clear and sound.
There is a clear focus on the mitigation of the environmental impact of the excavated material. In fact, the 'Mining the Future' activity for excavation materials management and materials re-use will enable to produce a business development plan for the use of the molasse materials.

Criterion 3 - Quality and efficiency of the implementation

Score: **5.00** (Threshold: 3/5.00 , Weight: -)

The following aspects will be taken into account:
Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables
Appropriateness of the management structures and procedures, including risk and innovation management
Complementarity of the participants and extent to which the consortium as a whole brings together the necessary expertise

Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role

The work plan is well structured, with clear assignments and involvement of all project partners. All critical tasks are well allocated.
A lot of attention has been dedicated to details in putting the consortium together, with consortium institutions characterised by high levels of excellence and competence.The resulting structure and geographical distribution of the project consortium (including partner organisations) is very good, with an excellent availability and complementarity of all the needed expertise and material resources. The direct inclusion of non-particle-physics expertise (e.g. the Montanuniversitaet Leoben for mining and CSIL for socio-economic impact studies) is excellent.
The structure and time distribution of deliverables is very well addressed.
The management structure is very good. The state-of -art methodology of "agile project management" has been chosen as its basis. The project will hence evolve in iterative cycles of Plan-Do-Check-Act processes that will allow for continuously developing and optimizing all its integral parts.
The risks and the respective mitigation measures and contingency plans are well defined.

Scope of the proposal

Status: **Yes**

Comments (in case the proposal is out of scope)

Not provided

Operational Capacity

Status: **Operational Capacity: Yes**

If No, please list the concerned partner(s), the reasons for the rejection, and the requested amount.

Not provided

Exceptional funding of third country participants/international organisations

A third country participant/international organisation not listed in General Annex A to the Main Work Programme may exceptionally receive funding if their participation is essential for carrying out the project (for instance due to outstanding expertise, access to unique know-how, access to research infrastructure, access to particular geographical environments, possibility to involve key partners in emerging markets, access to data, etc.). (For more information, see the Online Manual)

Based on the information provided in the proposal, we consider that the following participant(s)/international organisation(s) that requested funding should exceptionally be funded:
(Please list the Name and acronym of the applicant, Reasons for exceptional funding and the Requested grant amount.)

Not provided

Based on the information provided in the proposal, we consider that the following participant(s)/international organisation(s) that requested funding should NOT be funded:
(Please list the Name and acronym of the applicant, Reasons for exceptional funding and the Requested grant amount.)

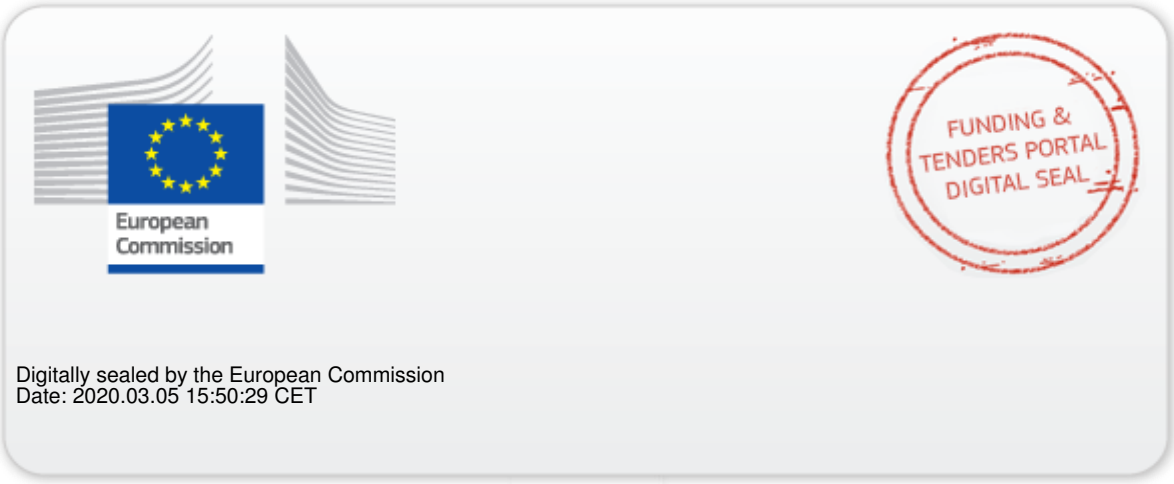
Not provided

Use of human embryonic stem cells (hESC)

Status: **No**

If yes, please state whether the use of hESC is, or is not, in your opinion, necessary to achieve the scientific objectives of the proposal and the reasons why. Alternatively, please state if it cannot be assessed whether the use of hESC is necessary or not because of a lack of information.

Not provided



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