The new Innovation Pilot project

Shaping our Future

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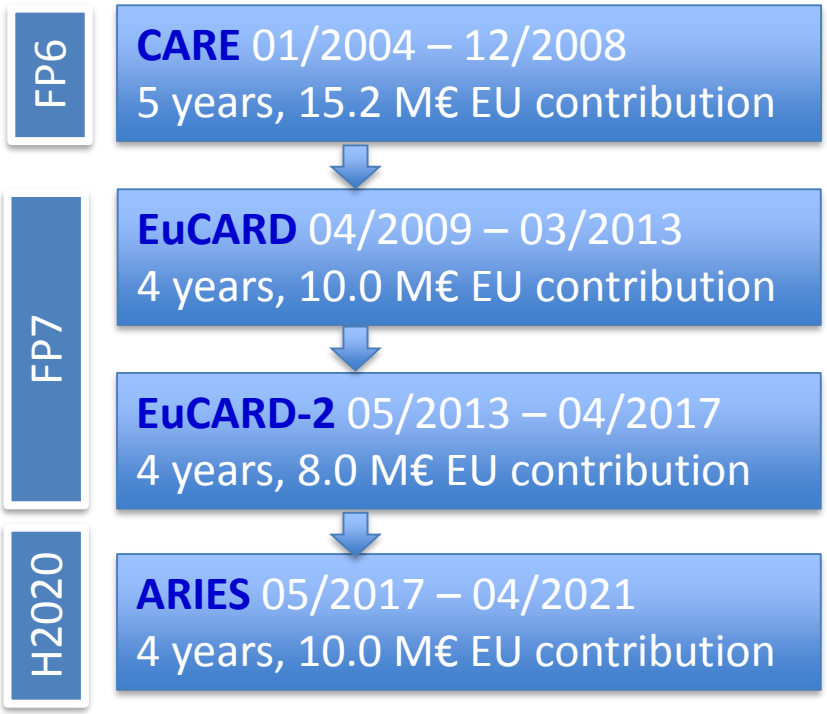
Integrating Activities

ARIES is the 4th of a successful series of Integrating Activities for R&D on particle accelerators that have raised 43 M€ EC funding over 16 years (2.7 M€/yr).



Integrating Activities are originally intended to «integrate», i.e. to force scientific communities to collaborate across borders and to achieve a synergetic sharing of resources across Europe.

The structure of Integrating Activities (Networks, Transnational Access, Joint Research Activities) is functional to this goal.

"The aim of this action is to bring together, integrate on European scale, and open up key national and regional research infrastructures to all European researchers, from both academia and industry, ensuring their optimal use and joint development."

We have to acknowledge that after 16 years working together:

a. we are definitely a well integrated community, by all standards;
b. The rigid structure of Integrating Activities is increasingly less functional to our goals.

What after 4 Integrating Activities?

The Research Infrastructure Unit of DG/RTD is discussing since 2 years what should be the future of their 4 «super-advanced communities», having reached 3 or 4 successful IAs: accelerators, lasers, synchrotron light, detectors.

The first idea was to stop all support and leave them alone (they should become «sustainable»). We have a Task in ARIES on sustainability of accelerator research.

Luckily, another direction emerged from many discussions where we took part (ARIES and TIARA toghether with other communities), based on the creation of:

a. A separate new tools for communities centred on TNA (e.g. lasers);
b. A new tool centred on innovation that would boost the innovation potential (development of new technologies in partnership with industry) of other communities.

→ Birth of the **Innovation Pilot**

Pilot because this is an experimental programme, to test what the communities can invent and what they can produce inside such programmes.

If successful, the pilot could pave the way for a multi-million long term programme (flagship project) within the new Horizon Europe Framework Programme.

The Innovation Pilot in the RI Workprogramme

The Workprogramme for the last calls of H2020 – Research Infrastructures is in preparation since last September.
A final draft has been approved in January, and after some possible «minor technical modifications» the final version should be approved at the committee meeting of 7 May.

The programme contains the call:
«**INFRAINNOV-04-2020: Innovation pilots**» for 3 projects of **10 M€** each addressing innovation in 3 domains: light source technologies, detector technologies, accelerator technologies.
Non-competitive call, each community is expected to submit one project that will be approved if evaluated beyond an acceptance threshold.

TIMELINE:

- Open call 28 November 2019
- Deadline for submission **17 March 2020**
- Result of evaluation end of 2020
- Possible project start **May 2021**
  (end of ARIES on 30 April 2021!)

Unique opportunity of a flexible non-competitive project for the future of particle accelerators

ARIES

Contents of the new project (from workprogramme)

INFRAINNOV-04-2020: Innovation pilots

Specific Challenge: Pan-European Research Infrastructures use more and more sophisticated technologies not available on the market, which require ad-hoc developments and often the use of large-scale platforms combining R&D (Research and Development), integration and validation. These platforms can also provide longer-term visibility and involvement of European industry in scientific and technological advancements and therefore ensure greater socio-economic impact.

Scope: Funding will be provided to research infrastructure networks to kick-start the implementation of a common strategy/roadmap for technological developments required for improving their services through partnership with industry. Proposals should then involve research infrastructures, industry and SMEs to promote innovation and knowledge sharing through co-creation of needed technical solutions and make use, when appropriate, of large-scale platforms combining R&D (Research and Development), integration and validation for the technological developments.

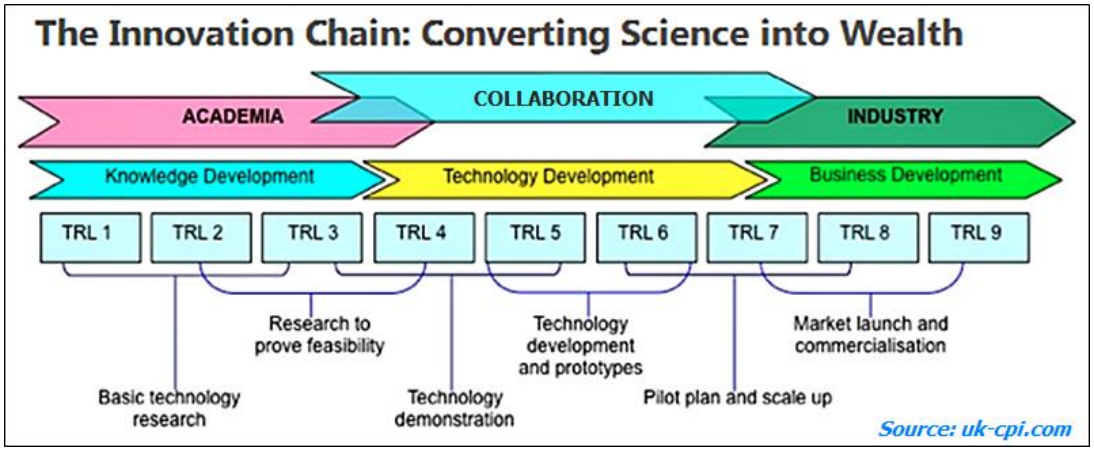
Key points:
- RI Networks
- Technological developments in partnership with industry
- Use of large scale platforms

3 components:
1. Technological roadmaps in partnership with industry
2. «Development» of technologies.
3. «Prototyping» of technologies.

- if not already done,the identification of key techniques and trends which are crucial for future construction and upgrade of the involved Research Infrastructures and the definition of roadmaps and/or strategic agendas for their development, in close partnership with the industrial partners, especially with innovative SMEs;
- the development of the identified fundamental technologies or techniques underpinning the efficient and joint use of the involved research infrastructures, taking into due account resource efficiency and environmental (including climate-related) impacts.
- the prototyping of higher performance methodologies, protocols, and instrumentation, including the testing of components, subsystems, materials, and dedicated software, needed to upgrade the involved research infrastructures or construct their next generation.

What does innovation mean in this context?

The Oslo Manual (OECD/Eurostat, 2005), defines innovation as "the implementation of a new or significantly improved product or process …"



- **Improving the accelerator-based Research Infrastructures**

- **Bringing accelerator-based technologies to society**

2. Feasibility Study

3. Demonstration, prototyping

1. Strategic roadmaps

The problem of societal applications

All good, but…

Reading the draft workprogramme, the innovations developed in the Innovation Pilot should aim exclusively at the RI's themselves, to improve the delivery of services or to upgrade their infrastructure.

Innovations with a market outside of RI's are in principle excluded. This includes all our medical, industrial and environmental applications of accelerators.

The reason is that the EC people wanted to clearly define a boundary between ATTRACT phase 2 (disruptive innovation in detectors with applications outside RI's) and AIDA2 that shares the same Innovation Pilot text with ARIES2.

We **lobbied against** this serious blow to our traditions and to the potential of our technologies, and the Deputy Head of Unit promised to make some «minor technical modifications» to the final version of the text, to leave the door open to our societal applications.

We will know more in the next weeks. The situation in Brussels is difficult because of the ongoing restructuring of DG/RTD – there is no clear counterpart or people feeling responsible!

Dimensions to retain from the present IA's

In theory, we are free to do what we want with our Innovation Pilot if we respect the general rules. It might become an unstructured collection of mini-projects, originated in one single institute, with some additional industrial partners («à la ATTRACT»).

This is NOT what we want!

We must keep some important dimensions of our strategy for the development of accelerator that have emerged from our experience with Integrating Activities:

1. A project structured in well-identified and coordinated «themes».
2. European integration, in particular for smaller countries.
3. Connections and cross-fertilisation between laboratories, universities, industry.
4. Long-term time span of the R&D, beyond the needs of specific ongoing projects.
5. Co-funding, projects integrated in the work programme of our laboratories.
6. Partial two-stage submission as experienced with the ARIES proof-of-concept.

Proposed structure of the new Pilot

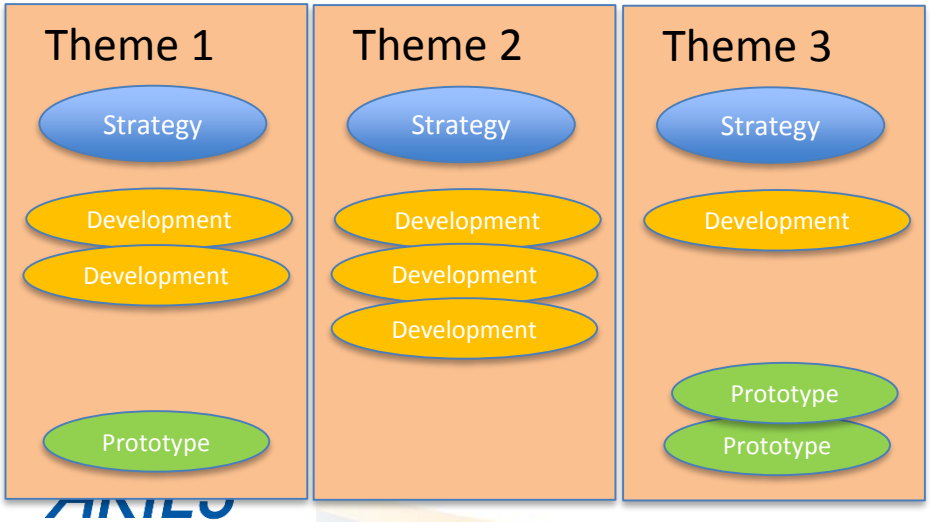
The Innovation Pilot contains «projects» of three types: strategies, developments, prototypes

Activity	TRL	Initial proposal (4 yrs.)			Second stage (3 yrs.)		
		Individual EC contribution	N. of projects	Total budget	Individual EC contribution	N. of projects	Total budget
Strategies		200 k€	6	1.2 M€			
Developments	2 – 3 - 4	100 k€	15	1.5 M€	100 k€	15	1.5 M€
Prototypes	4 – 5 - 6	500 k€	6	3.0 M€	500 k€	4	2.0 M€
TOTALS				5.7 M€			3.5 M€

Example of possible distribution

Will be finalized depending on the proposals

The projects are organised in themes, with a theme (workpackage) coordinator. The ideal configuration would be having for each theme a strategy/roadmap and a number of projects at different TRL level.



What are we looking for

We are starting a **bottom-up call for actions** to become part of the new Innovation Pilot.

These actions may be:

1. **Strategies** (roadmaps), involving 5-10 partners including industry representatives, to identify a roadmap or a strategy to develop designs, technologies or applications. Possible examples: Frontier accelerators, Compact photon sources, Novel high-gradient accelerators, Low-emittance rings, Accelerators for medicine, Accelerators for industry and environment, Sustainability of technology infrastructure, Applications of superconducting magnets, High-gradient conventional RF, Future SC magnets, etc. Total budget about 200 k EC contribution, 50% co-funding for about 400 k total budget to be used for meetings, workshops, and to subcontract studies on perspectives and on possible markets.

2. **Developments** (feasibility studies) (100k) and **prototypes** (500k), involving minimum of 2-3 partners with possibly one from industry (mandatory for high TRL, optional for low TRL), to develop an idea, or a component, or a prototype for a new component, instrument, or application with wider long-term use beyond the needs of an individual project or laboratory. Examples: SC magnet, photocathode, electron lenses, advanced materials, components for new accelerators, etc.

Evaluation of projects – proposed selection criteria

The submitted projects will be evaluated with respect to some criteria. The selection committe will define, before the selection, the weight to attribute to each criterion.

A first proposal for the evaluation could follow the criteria below:

1. Scientific and technological excellence
2. Impact on Research Infrastructures and/or on society
3. Methodology
4. Innovation content
5. Transnationality and integration
6. Co-funding rate
7. Risk
8. Cost vs. benefit
9. Industry involvement
10. Coherence with the priorities of the community

Proposed selection timeline and procedure

The members of the **Innovation Evaluation Committee (IEC)** should be nominated by the Directors of the 11 laboratories or consortia that signed the TIARA MoU [CEA, CERN, CNRS, CIEMAT, DESY, GSI, INFN, PSI, STFC, Uppsala University for the Nordic consortium, HN Institute of Nuclear Physics for the Polish consortium].

Each project will be submitted based on a standard form, and evaluated by the committee.

The requested EC contribution should correspond to the guidelines given for the three components, but different amounts can be asked in exceptional cases (to be evaluated by the committee).

Tentative Timeline:

- **1 May** send letter and submission form to all institutes having participated in previous programmes
- **31 August** submission deadline
- **30 September** pre-analysis and classification of submissions completed.
- **31 October** selection of projects completed.
- **30 November** after a negotiation phase, structure of project complete and start editing.

The IEC will be nominated at the July TIARA meeting

Proposal form

The submission form could be structured as follows:

1. Title and summary (0.5 p.)
2. Participants (0.5 p.)
3. Description (excellence) (1 p.)
4. Impact (0.5 p.)
5. Methodology and Organisation (0.5 p.)
6. Budget and indicative budget share with co-funding (0.5 p.)
7. Schedule, Deliverables and Milestones (0.5 p.)
8. Potential risks and mitigations (0.5 p.)

Proposed length about 5 pages


Innovation Pilot
Proposal Form

Name of proposed action

Type of action (Strategy / Development / Prototype)

Name of main proposer

Institution of main proposer

Please send the proposal form to
Innovation.Pilot@cern.ch

1 | Innovation Pilot
Proposal Form

Ready for discussion…