



By using M. Vretenar, CERN, Project Coordinator slides

A.Ratkus RTU

# Preparation of the next accelerator R&D proposal

No more “**Innovation Pilot**” but “**Implementing research infrastructure technology roadmaps**” – but the new call incorporates many aspects and results of I.FAST.  
Name still to be defined, for the moment “I.FAST2”



# HORIZON-INFRA-2025-01-TECH-02

## Implementing research infrastructure technology roadmaps

From “confidential” WP25 draft document

Expected **EU contribution**: 10 – 15 MEUR (*funding will depend on decisions on e.g. the defense budget*)

**Total budget** for the call: 45 MEUR (to be confirmed, between 3 and 4 projects can be supported).

**Deadline** for submission: **18 September 2025** (to be confirmed).

For **infrastructure and technology communities** with already developed research infrastructure technology roadmaps: **accelerators, light sources, astronomy, etc.**

Projects should implement significant parts of, or entire research infrastructure **technology roadmaps** through **co-creation with industrial partners from the earliest possible stage**. The technology roadmaps should be the result of a community or cross-community effort already undertaken. The technological solutions developed should respond to the **needs of several research infrastructures**, and in some cases the needs of **different types of research infrastructures**.

**DIFFICULT TO ADVANCE PREPARATION IF THE RULES OF THE GAMES ARE NOT FINALISED!**

But we have to do it now.

# 6 requirements, from the call description

All R&D topics included in the portfolio must:

1. implement significant parts of a **research infrastructure technology roadmap** (ESPP, LEAPS, others) or develop new advanced **applications**.
2. address **prototyping** of high-performance systems needed to **upgrade** the involved research infrastructures or **construct** their next generation.
3. Include **co-creation with industrial partners** from the earliest possible stage (as beneficiaries, subcontractors, PCP partners, or with letters of engagement) .
4. respond to the **needs of several research infrastructures**, possibly of different types.
5. possibly **build on results** from previous projects and **avoid overlaps** with ongoing projects.
6. consider **resource efficiency** (e.g. raw material and energy consumption) and **environmental** (including climate-related) **impacts**.

# Additional conditions

- include at least **two** research infrastructures (ESFRI infrastructure, or ERIC infrastructure, or International European research organisation).
- **Cascade funding** admitted, support to third parties in the form of grants.
- when appropriate, make use of large-scale platforms combining R&D, integration and validation for technological developments (technology infrastructure).
- Different ways of **involving industry**: consortium members, commitment via engagement letters, identified at a later stage, Pre-Commercial Procurement subcontracting, ...
- Should **build on results** from previous INFRAINNOV projects (I.FAST) or INFRA-TECH projects **but avoid overlap** with them.

# General guidelines for the proposal

As defined in the October meeting

- Mixture of **top-down and bottom-up**: explore recognised critical R&D topics with appropriate funding, while keeping the **creativity and innovation** dimension of a bottom-up call.
- **Less partners** than in I.FAST, avoid beneficiaries with **less than 100k** EC funding. Ideal team one or 2 academic, one industry.
- **Rate of matching funds** (now 50% for academia, 30% for industry) reduced to **1/3 (33%)** for research institutions, **20%** for industry.
- Less space for **Networks**, possibly only in the frame of defining **Technology Roadmaps** – and more space to technology prototyping.

# Structure

Based on the experience of I.FAST and on our discussions with the EC

Project based on **4 pillars (groups of Work Packages)**:



	Pillar	Content	EC contribution per activity	Total EC contribution (with 15M)
1	<b>Instruments</b>	General WP's covering all activities		
2				
3				
4				

# The Instruments Pillar

4 Work Packages, supporting all other activities

WP	Task	Title	Content
1	1	Management, coordination	
	2	Dissemination	
	3	Risk Management	
2	1	Training	
	2	Communication, outreach	CBI, Acc. News, Social media
3	1	Industry	Support to AIPF
	2	Technology transfer	Support start-ups
	3	Societal applications	Medical industrial
4	1	Future accelerators	Exploratory work
	2	Sustainability	Methodologies (LCA)
	3	Roadmap follow-up	Contact with communities.

# Structure

Based on the experience of I.FAST and on our discussions with the EC

Project based on **4 pillars (groups of Work Packages)**:



	Pillar	Content	EC contribution per activity	Total EC contribution (with 15M)
1	<b>Instruments</b>	General WP's covering all activities		
2	<b>Enabling technologies</b>	6 key technologies, selected top-down, higher TRL		
3				
4				

# Enabling Technologies

**Top –Down approach:**

- **Technologies**

# Enabling Technologies

## 4 topics priority A:

- |   |
|---|
| 1. Superconducting thin films for RF cavities         |
| 2. Additive manufacturing of accelerator components   |
| 3. Superconducting magnets at High Temperature (HTS)  |
| 4. Surface treatments for Superconducting RF cavities |

*Proposals for these WP's must include production of high-level prototypes (TRL to be clearly specified) with some engagement of industry (as beneficiary, partner, user)*

After the meeting, and additional discussions, selected 2 topics from priority B, with lower budget:

- **Permanent magnets**
- **Laser driven accelerators.**

## 7 topics priority B:

- |  |
|--|
| Permanent magnet dipoles and quadrupoles                     |
| Laser driven accelerators                                    |
| High intensity proton and ion injectors (sources and linacs) |
| High-power targetry,   |
| Beam dynamics and stability                                  |
| High precision diagnostics                                   |
| Artificial intelligence/Machine learning                     |

Motivations for the choice:

- Both continuation of I.FAST
- Both in the roadmaps of PP/LEAPS
- Easy to find conveners
- Cannot be future large INFRA-TECH
- Can easily lead to prototyping

Additionally, one topic proposed as continuation of I.FAST and accepted to be considered today:

- **High-brightness electron injectors.**

Total: 4 + 2 + 1 = 7 topics

# Enabling Technologies

## Top –Down approach:

- Technologies
- **Convener**

# Enabling Technologies Pillar

WP		Convener	Inst.	Country	
1	SC thin films for RF cavities	O. Malyshev / C. Antoine	UKRI/CEA	UK/FR	
2	HTS magnets	Ernesto De Matteis	INFN	IT	
3	Additive manufacturing	Toms Torims	RTU	LV	
4	SC Surface treatments	David Longvergne	CNRS	FR	
5	Permanent magnets	Raffaella Geometrante	KYMA	IT/ind.	
6	Laser driven acceleration		DESY	D	
7	High brightness electrons		PSI	CH	

# Enabling Technologies

## Top –Down approach:

- Technologies
- **Convener**
  - Initial discussions with potential partners
  - Initial proposal preparation

# Submitted proposal – overall tasks

## Overall Goals

- Produce complex Cu structures by AM
- To advance understanding and application of AM technologies within the accelerator community through scientifically validated research and analysis



## Task 1. R&D and structuring of knowledge to make available for accelerator community (handbook)

To fill AM R&D gaps of knowledge (with TRL 2) to develop technological competencies and knowledge (till TRL3) to be used by the accelerator community



## Task 2. The Large prototype: Development and testing of RFQ prototype

Design, manufacturing and relevant environment and beam testing of full-size RFQ sector(TRL 5)



## Task 3. The Small prototype: Development of DTL prototype

Design, manufacturing and relevant environment testing of AM DTL(TRL 4)

# Submitted proposal – partners (balance)

## University



## Research institutes



## Industry



# Submitted proposal – tasks/ budget

- **Detailed tasks and budgets will be discussed and agreed upon later – after EC finalizes Call details/ budget (the overall budget is unknown yet)**

# Enabling technologies – summary of proposals received

WP		Beneficiaries	Industry	Partners	
1	SC thin films for RF cavities	CEA, INFN, HZB, STFC	Piccoli, Zanon, NovAccel (only Lol)	CNRS, DESY/HUH, HZDR, Siegen U., IEE, Lancaster U., Liverpool U., RTU, Victoria U.	
2	HTS magnets	INFN, CEA, CIEMAT, UNIMI	To come		
3	Additive manufacturing	RTU, PoliMI, GUF, CERN, INFN, ADIMME	EOS, Rosler		
4	SC Surface treatments	CNRS/IJCLab , CEA, DESY, INFN/Lasa	(to be confirmed)		
5	Permanent magnets	CERN, DESY,STFC CIEMAT, KYMA, KIT	Kyma		
6	Laser driven acceleration	DESY, CNRS, CNR	Optoman		
7	High brightness electrons	PSI, INFN	To come		

# Structure

Based on the experience of I.FAST and on our discussions with the EC

Project based on **4 pillars (groups of Work Packages)**:



	Pillar	Content		
1	<b>Instruments</b>	General WP's covering all activities		
2	<b>Enabling technologies</b>	6 key technologies, selected top-down, higher TRL		
3	<b>Emerging technologies</b>	About 10 selected technologies after bottom-up call, lower TRL		

# Emerging technologies

- Information and submission form to be downloaded from <https://ifast-project.eu/proposal-infra-tech-02> (page open, introductory text prepared).
- Applications to be sent by mail **until 30 April, 2025** to [accelerator.infratech02@cern.ch](mailto:accelerator.infratech02@cern.ch) .

# Proposal for Emerging technologies

Proposals for Emerging Technologies will consist of collaborations with a minimum of two partners from two different EU or associate countries, presenting a programme for increasing the Technology Readiness Level (TRL) of a specific particle-accelerator related technology, possibly with some industry involvement. The proposals may request a financial support (EC contribution) between 200 k€ and 400 k€ (up to 500 k€ in special justified cases). An additional contribution (financial, in-kind or personnel) from the partners ("matching funds") is required, at the level of 50% of the EC contribution for research partners and 25% for industrial partners.

The submission form contains an introductory part presenting the general guidelines for the call as defined by the EC, the additional conditions requested by TIARA, and some indications on how to build the budget for the emerging technologies proposals.

The descriptive part of the submission form (maximum 7 pages) will provide the information needed for the evaluation of proposals. Please respect the instructions on the maximum number of characters (including spaces) for each section.

# Proposal for Emerging technologies

**Duration** (*must be between 12 and 48 months*)

Emerging Technologies proposals must demonstrate that they increase **Technology Readiness Level<sup>3</sup>** (TRL). For emerging technologies, the most common cases will be from initial **TRL2** (technology formulation) to **TRL3** (proof-of-concept), or from initial **TRL3** (proof-of-concept) to **TRL4** (small scale prototype). In special cases, going up to **TRL5** (validation in relevant environment) or **TRL6** (demonstration in relevant environment) is possible.

# Proposal Emerging technologies- matching funds

200 k€	50 k€	125 k€	xxx k€
Eligible costs for the action, to be claimed to the EC and justified (personnel, travel, non-durable equipment)	25% overhead claimed to EC but not justified (for many partners, this amount is taken by the central administration)	Minimum level of matching funds provided by the partners for research institutions (=50% of total EC contribution, or 33% of total cost for the partner). For industry partners, minimum level is 25% of total EC contribution, or 20% of total cost for the partner.	Additional optional matching funds. A higher level of matching funds will lead to a higher score for the proposal.
Total EC contribution = 250 k€		Total cost of the activity ≥ 375 k€	

# Evaluation criteria

	Criterion	Points
1	<b>Scientific and technological excellence</b> , innovation content	10
2	<b>Coherence</b> with the <b>roadmaps</b> of accelerator communities and continuity with previous EC projects	5
3	<b>Impact on Research Infrastructures</b> , their users and/or society	5
4	Methodology	5
5	<b>Transnationality and integration of partners</b>	5
6	Capacity to attract additional matching funds	5
7	Correspondence between cost and objectives	5
8	Extent and quality of <b>industry involvement</b>	5
9	<b>Improve use of resources and reduce environmental impact</b>	5
	<b>TOTAL</b>	50

The criteria above correspond to the general requirements for activities to be part of this proposal, as defined in the EC call:

1. implement significant parts of a research infrastructure technology roadmap (ESPP, LEAPS, others) or develop new advanced applications.
2. address prototyping of high-performance systems needed to upgrade the involved research infrastructures or construct their next generation.
3. Include co-creation with industrial partners from the earliest possible stage (as beneficiaries, subcontractors, or with letters of engagement). Please, note that in this call Pre-Commercial Procurement (PCP) subcontracting is specially encouraged, since PCP can help sharing risks and promote co-creation.
4. respond to the needs of several research infrastructures, possibly of different types.
5. possibly build on results from previous projects and avoid overlaps with ongoing projects.
6. consider resource efficiency (e.g. raw material and energy consumption) and environmental (including climate-related) impacts.

# Structure of the proposal

Based on I.FAST experience and discussions with EC  
Project based on **4 pillars (groups of Work Packages)**:



	Pillar	Content	
1	<b>Instruments</b>	General WP's covering all activities	
2	<b>Enabling technologies</b>	6 key technologies, selected top-down, higher TRL	
3	<b>Emerging technologies</b>	About 10 selected technologies after bottom-up call, lower TRL	
4	<b>Innovation Fund</b>	Internal call after project start	

# Timeline for the new proposal

- 30 April 2025: deadline for internal submission of proposals to the Emerging technologies call.
- 30 May 2025: selection of Emerging Technologies completed.
- 1 June – 18 September 2025: Preparation of proposal document.

# iFAST



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.