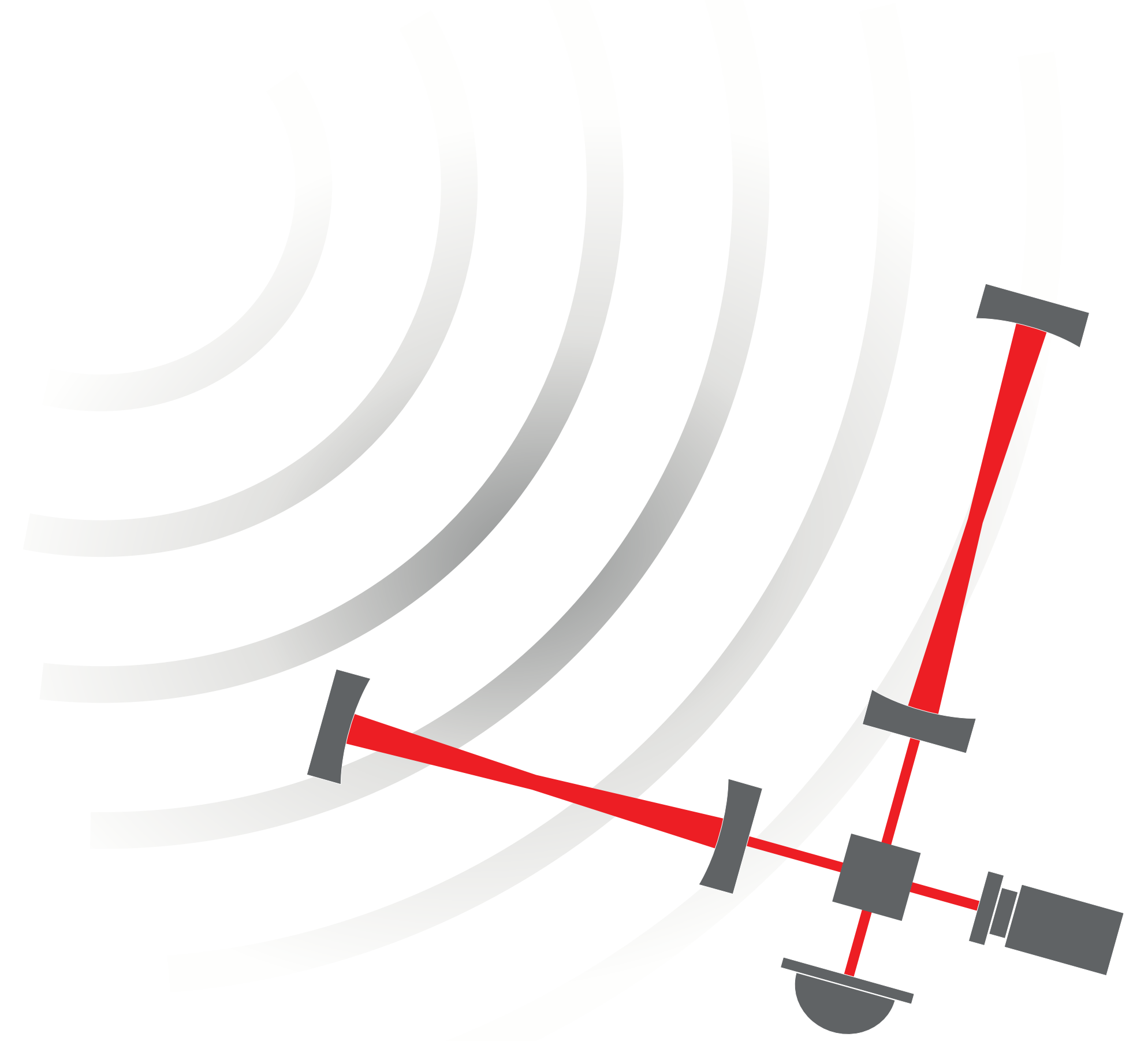


Report from the ET Directorate



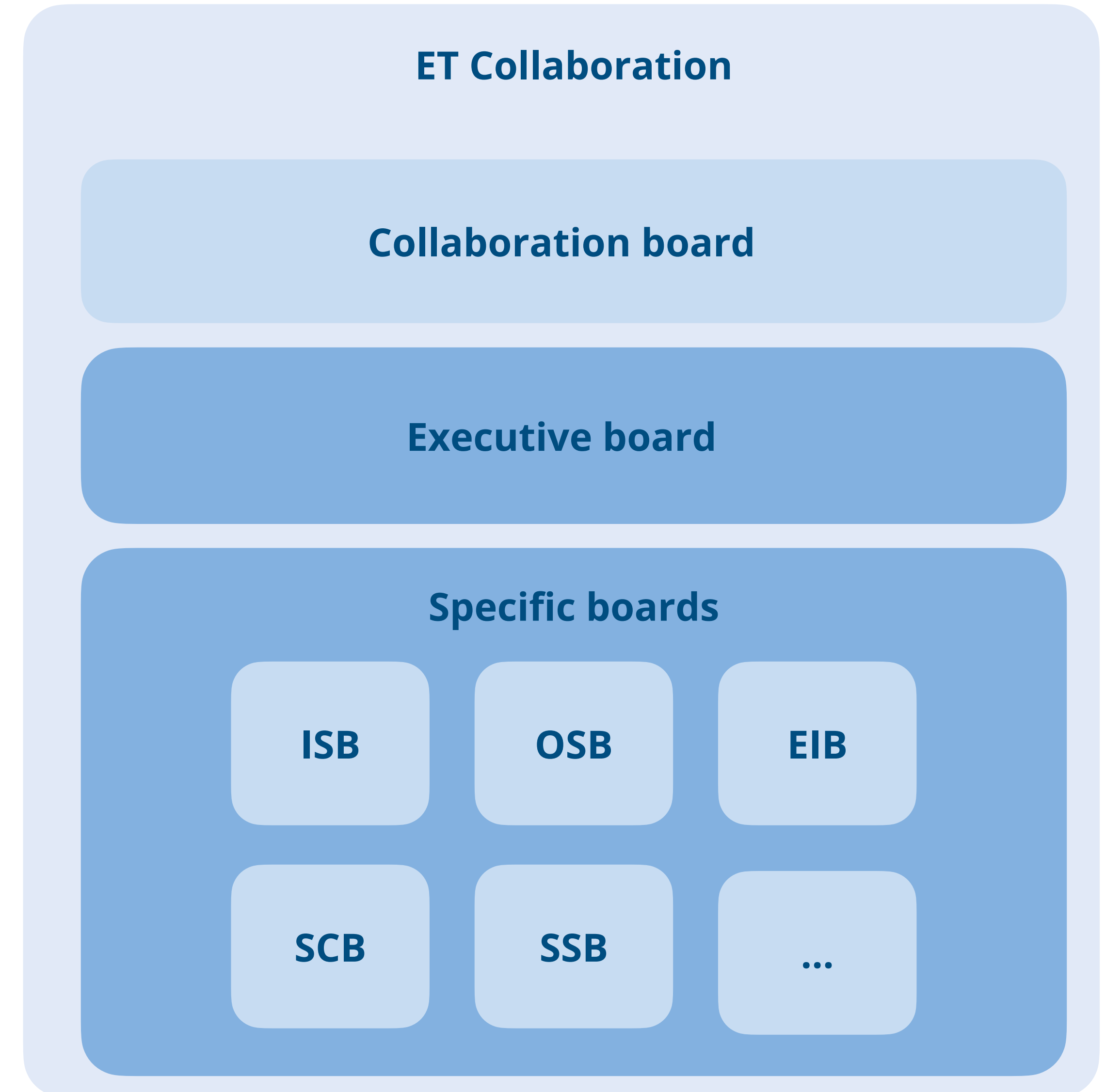
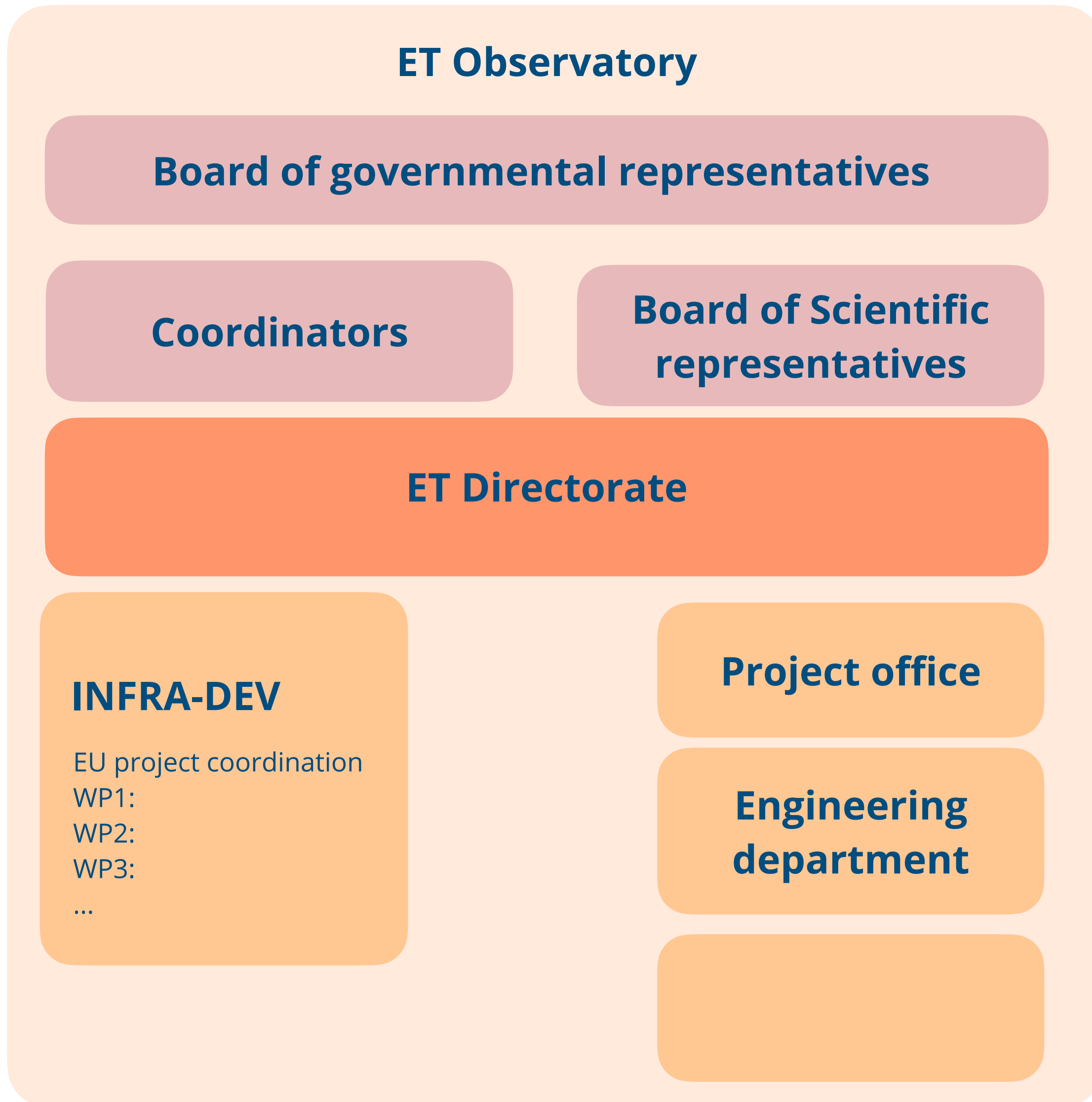
Freise, Ferroni, Martinez, 15.11.2022, ET-0276A-22

Reminder: objectives, roadmap, deliverables

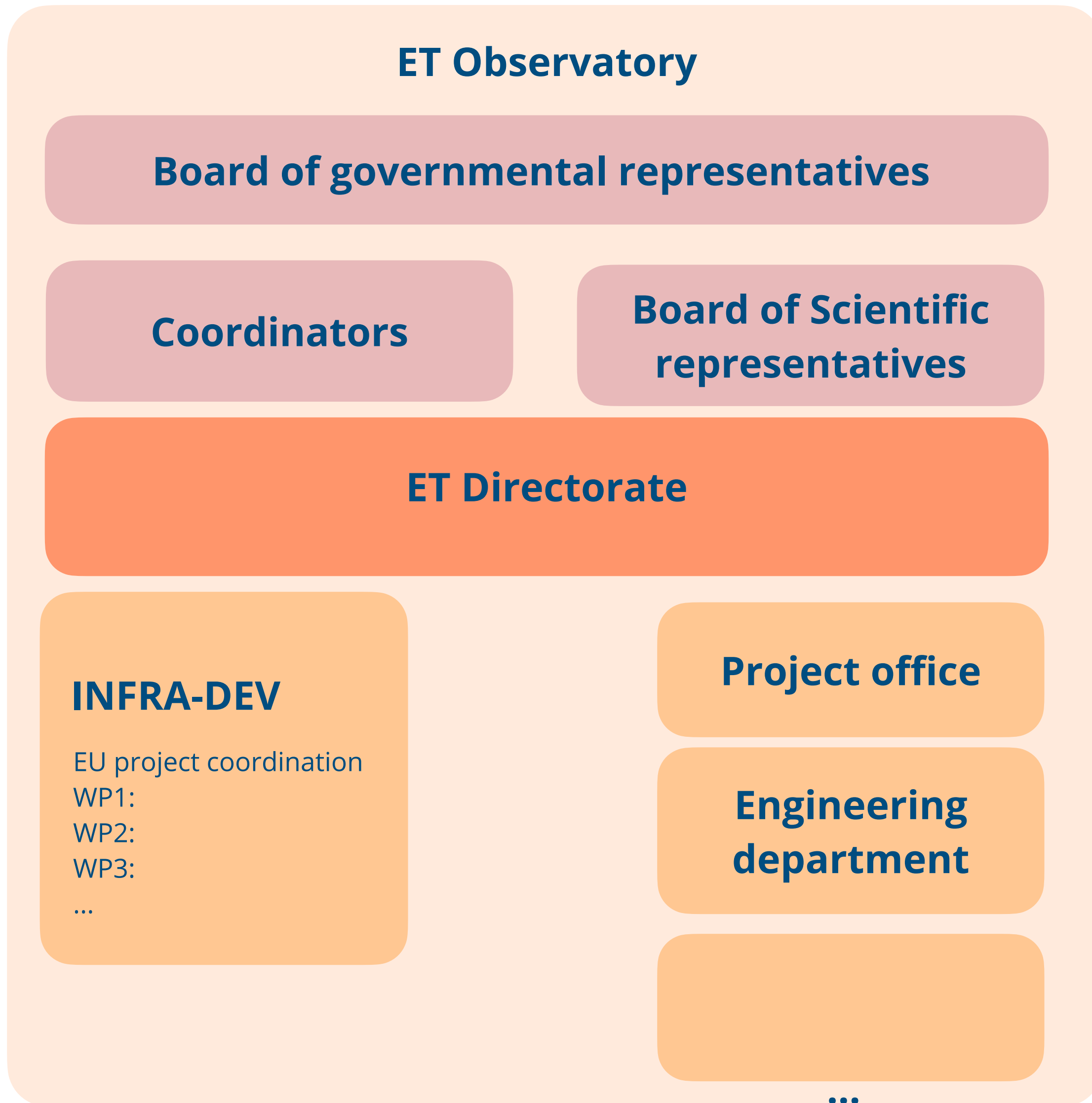
- Ongoing work is based on the framework of the ESFRI project.
- The first part of the **design and preparation phase** should end with a positive conclusion of the site identification, a first approval (by the BGR eg. ministries of partner countries) for the construction of ET.
- We need to provide the **necessary documents for such a decision to the BGR**, demonstrate **efficient and professional management** of the emerging project and demonstrate support for ET by a **large vibrant scientific community**.
- The necessary documents include:
 - preliminary technical design reports (TDRs) of the infrastructures and detectors
 - an updated costing
 - characterisations of possible sites
 - project execution plan, schedule and funding model

Current status: **a dual structure:**

1) project organisation (towards legal entity) and 2) scientific collaboration



Work in progress: organisation of project management structure

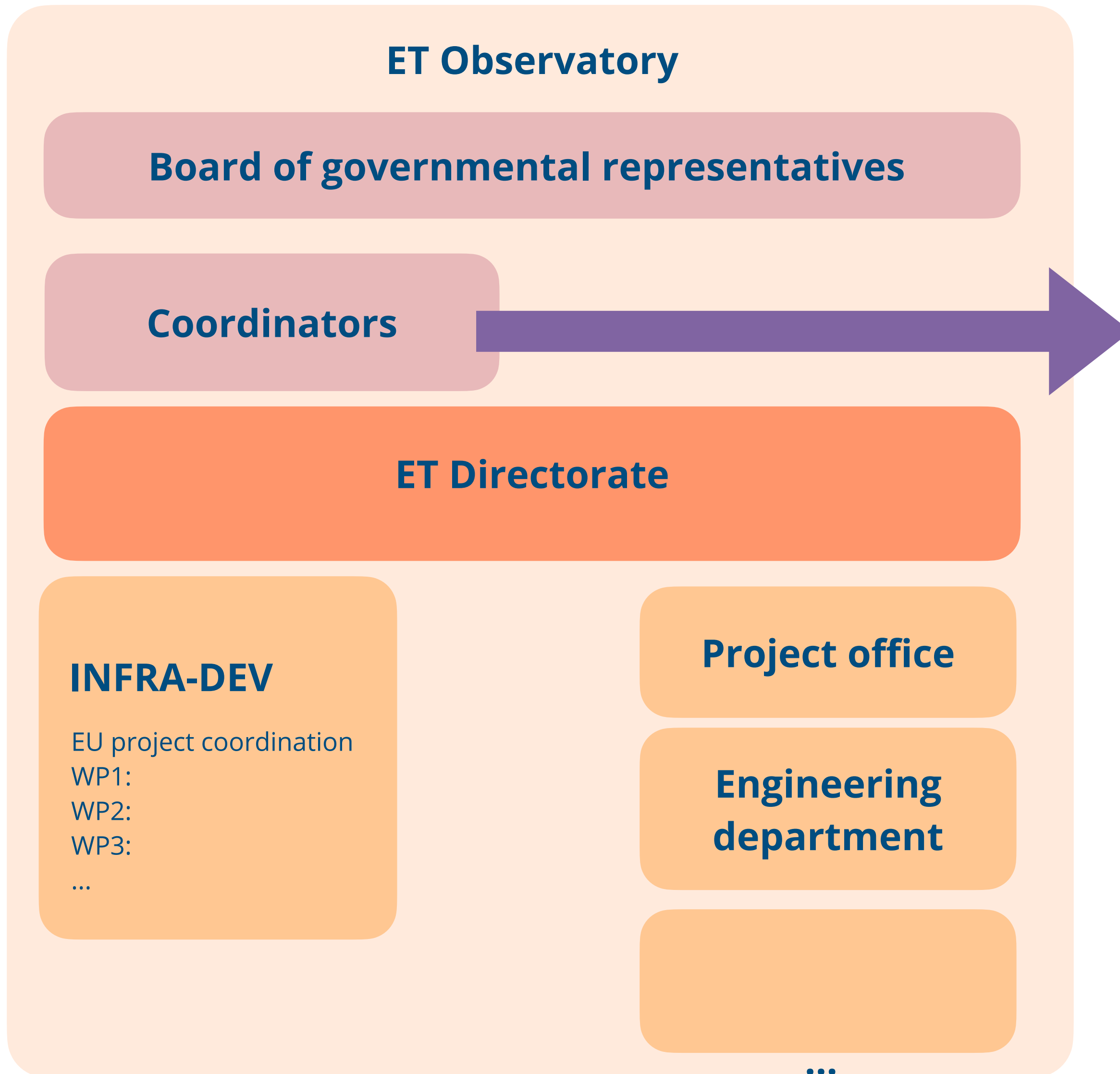


The 'Project' aims at constructing a legal entity to build and operate a research infrastructure, the ET Observatory.

This part of the organisation is new, **in addition to the ET Collaboration.**

Currently, during the preparation phase, we are setting up and operating an interim organisation. The final form of the ET Observatory is one of the outcomes of the preparation phase.

Work in progress: organisation of project management structure



Two coordinators of the ESFRI project:

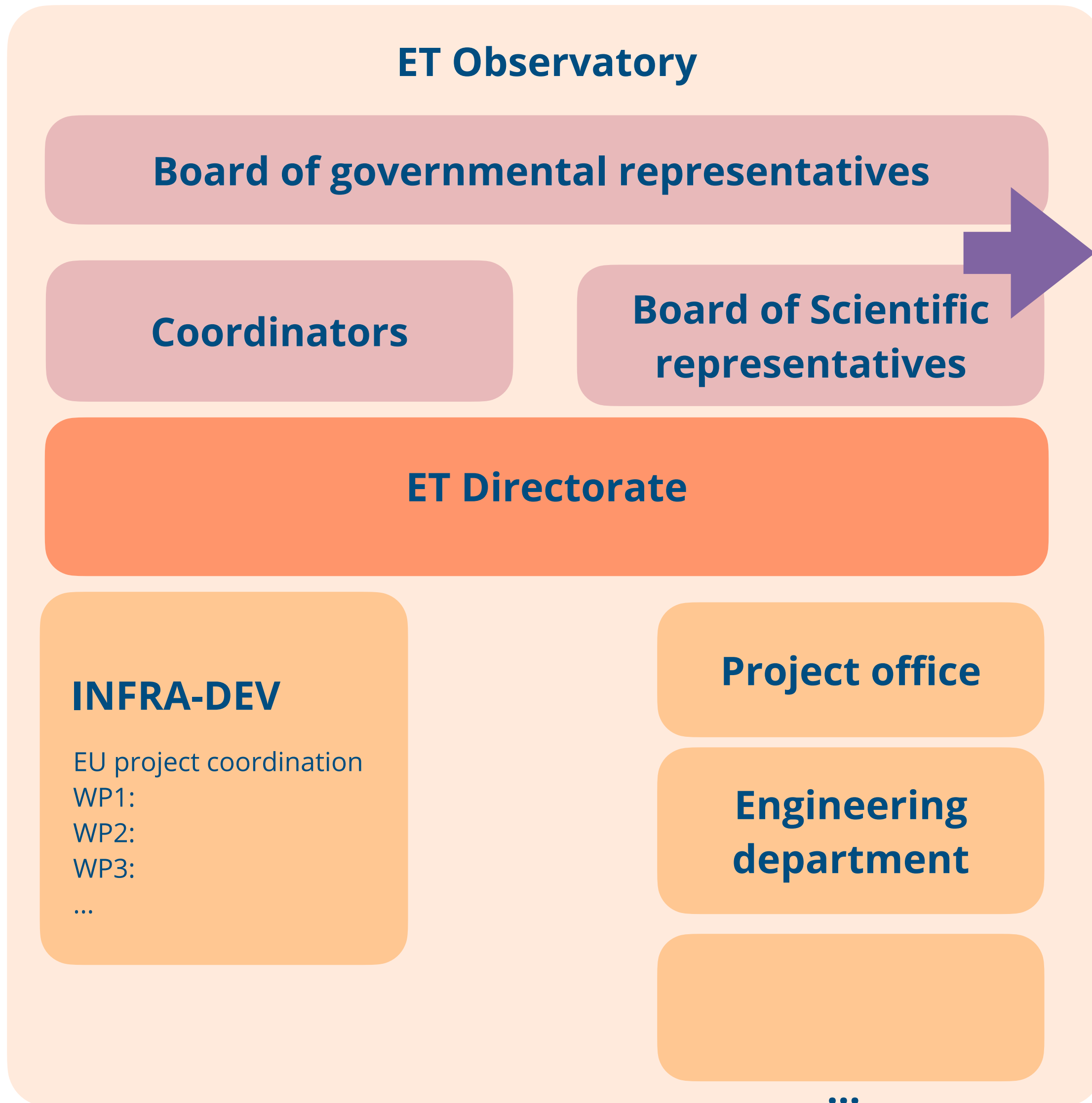


Antonio Zoccoli,
President of INFN,
Italy



Stan Bentvelsen,
Director of Nikhef,
Netherlands

Work in progress: organisation of project management structure



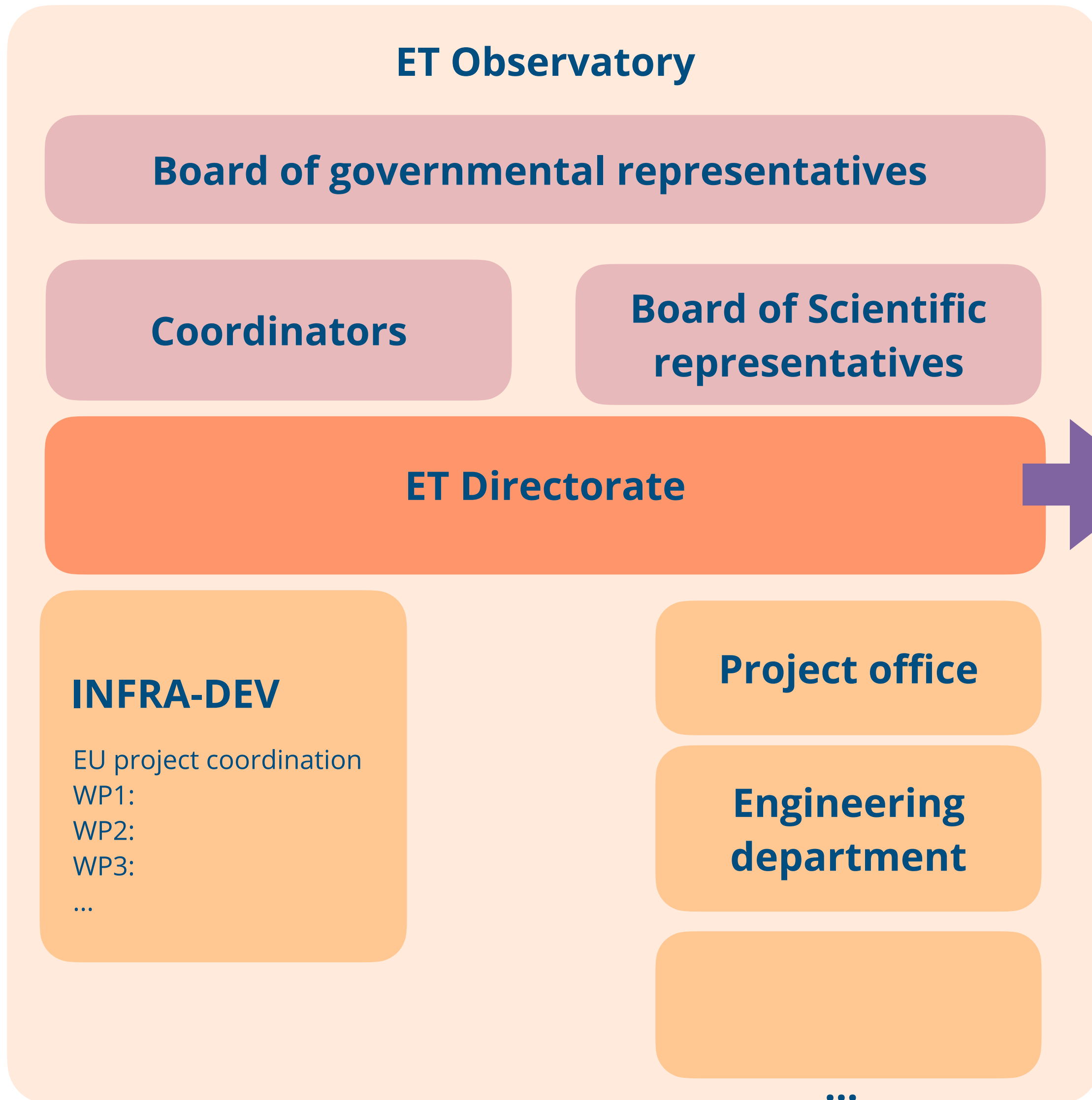
Board of Governmental Representatives (BGR) is following on from an informal **Ministerial Group**. The group is set up and agreed on Terms of Reference: 'The BGR is representing the countries potentially interested in joining the activities for setting up the Einstein Telescope . [...] The BGR shall among others prepare, discuss, negotiate, and **approve** the documents needed for the setting up of the ET legal entity'.

Board of Scientific Representatives (BSR) is being set up, draft Terms of Reference have been compiled: 'a **strategic scientific forum** to discuss and agree in consultation with the ET coordinators on the progress and process of realizing ET.'

Participating countries:

Belgium (both Flanders and Wallonia), Italy, the Netherlands, UK, Spain, Poland, Germany, Austria.

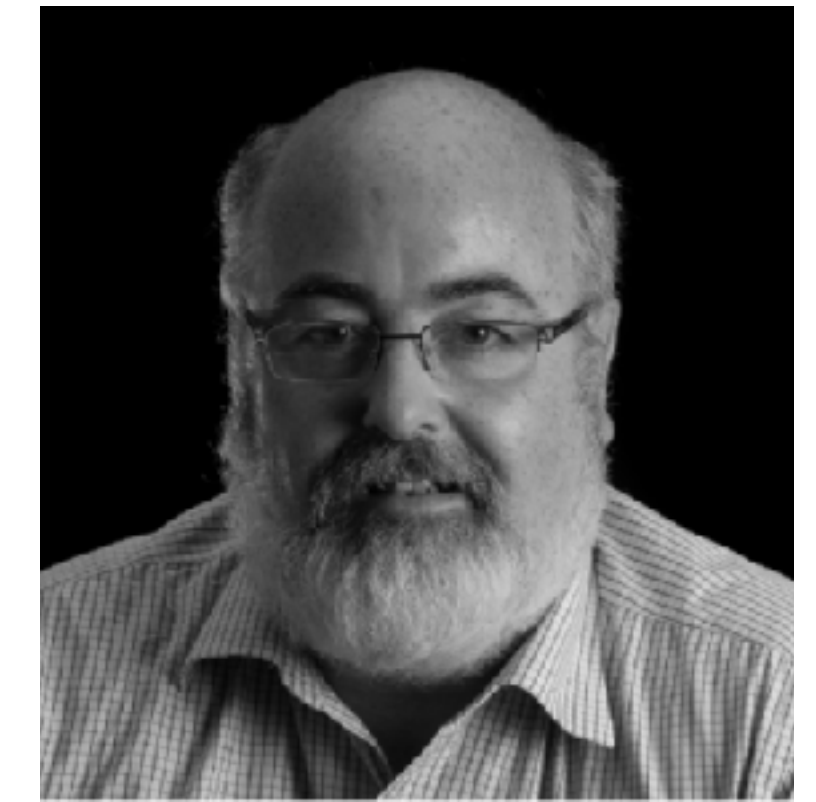
Work in progress: organisation of project management structure



Fernando Ferroni
(INFN, Italy)



Andreas Freise
(Nikhef, NL)



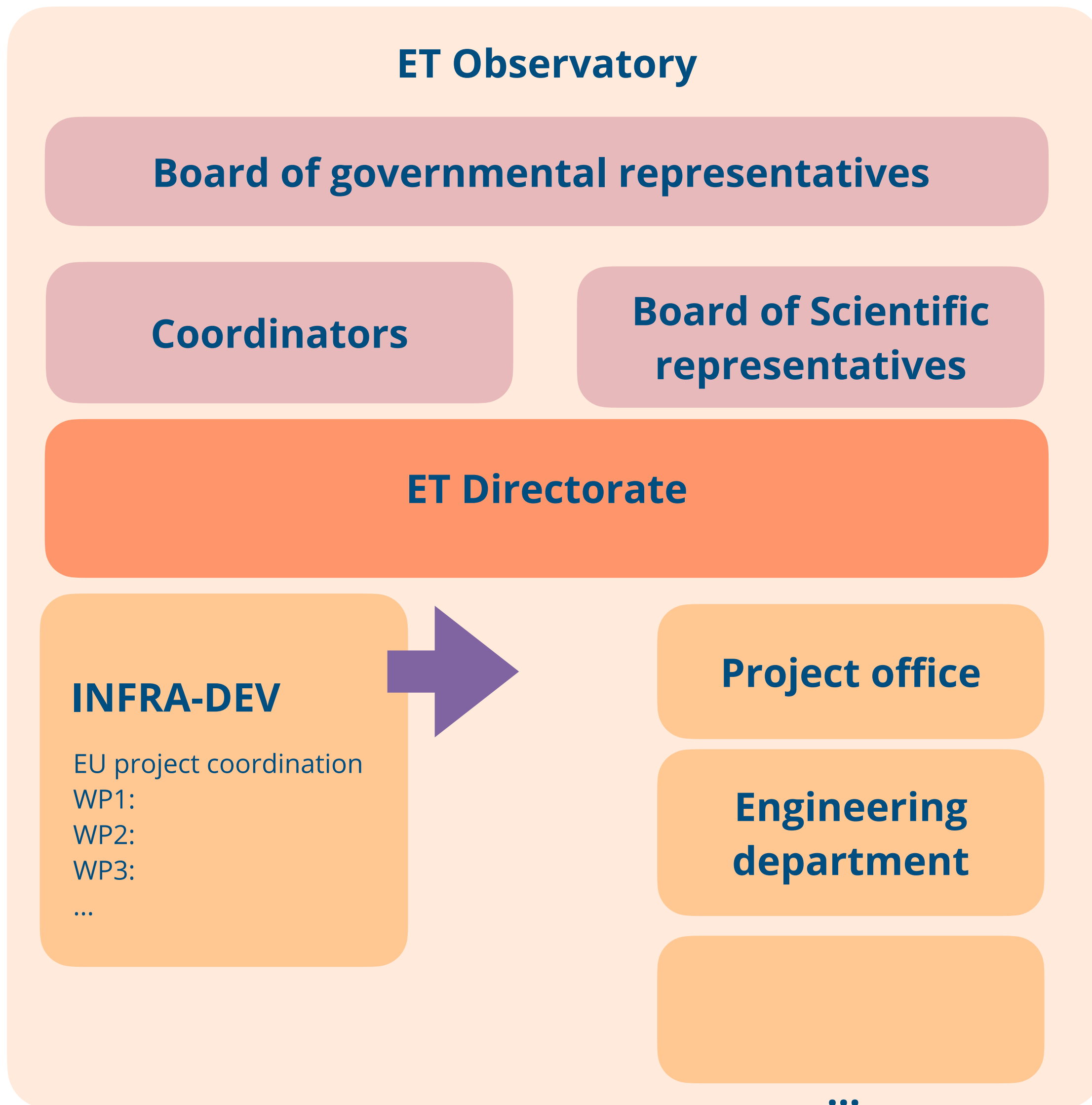
Mario Martinez
(IFAE, Spain)

Since August 2022:

- Andreas Freise takes over from Jo v.d. Brand.
- Mario Martinez as leader of the Infra-Dev project joins the directorate.

A mandate of the ET Directorate and its roles is being prepared.

Work in progress: organisation of project management structure

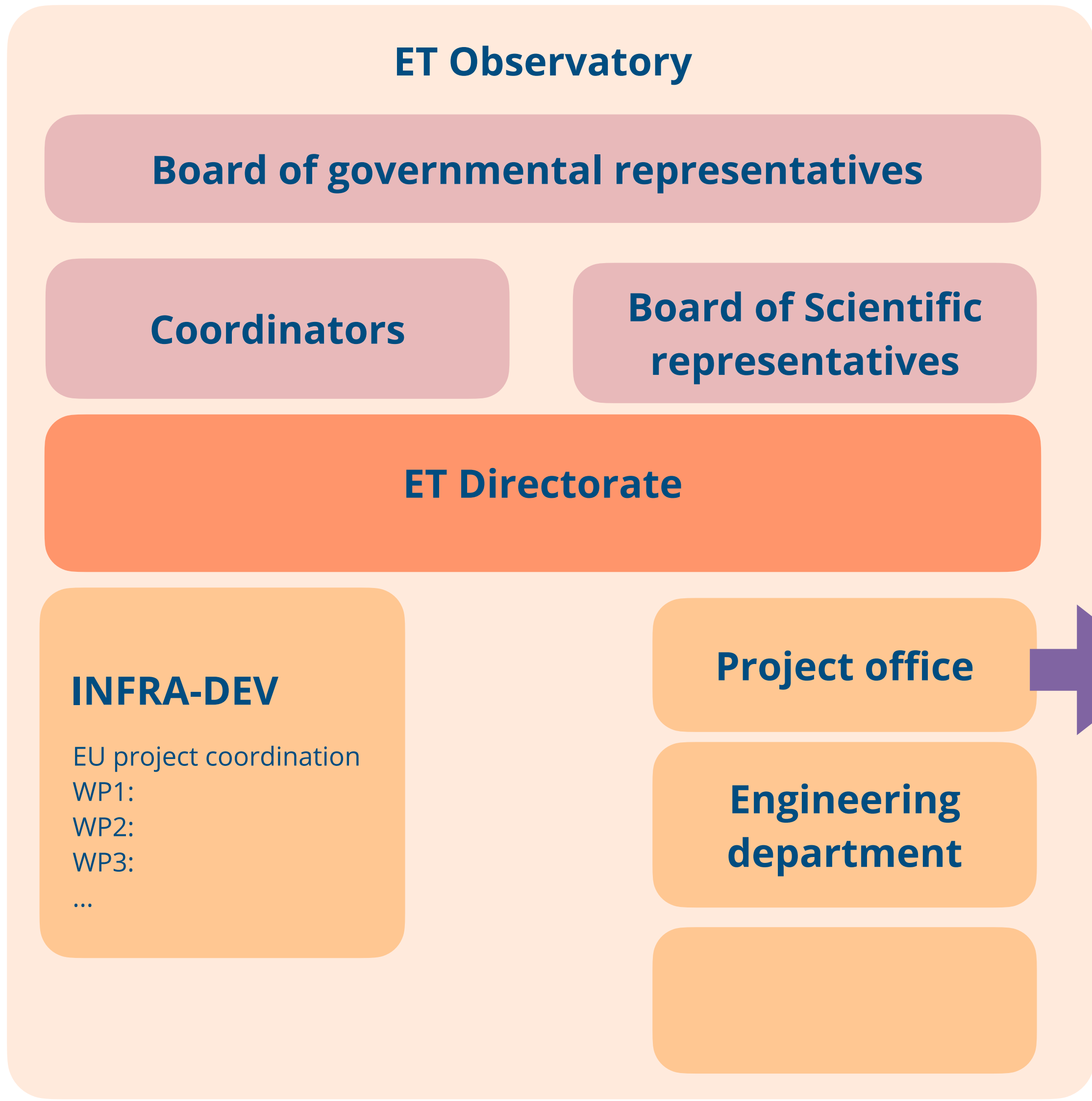


INFRA-DEV is a temporary project under the leadership of the ET Directorate. **Its internal structure will dissolve at the end.** However, it will create organisational bodies that will remain as structural parts of the ET organisation, such as, for example, the Project Office.

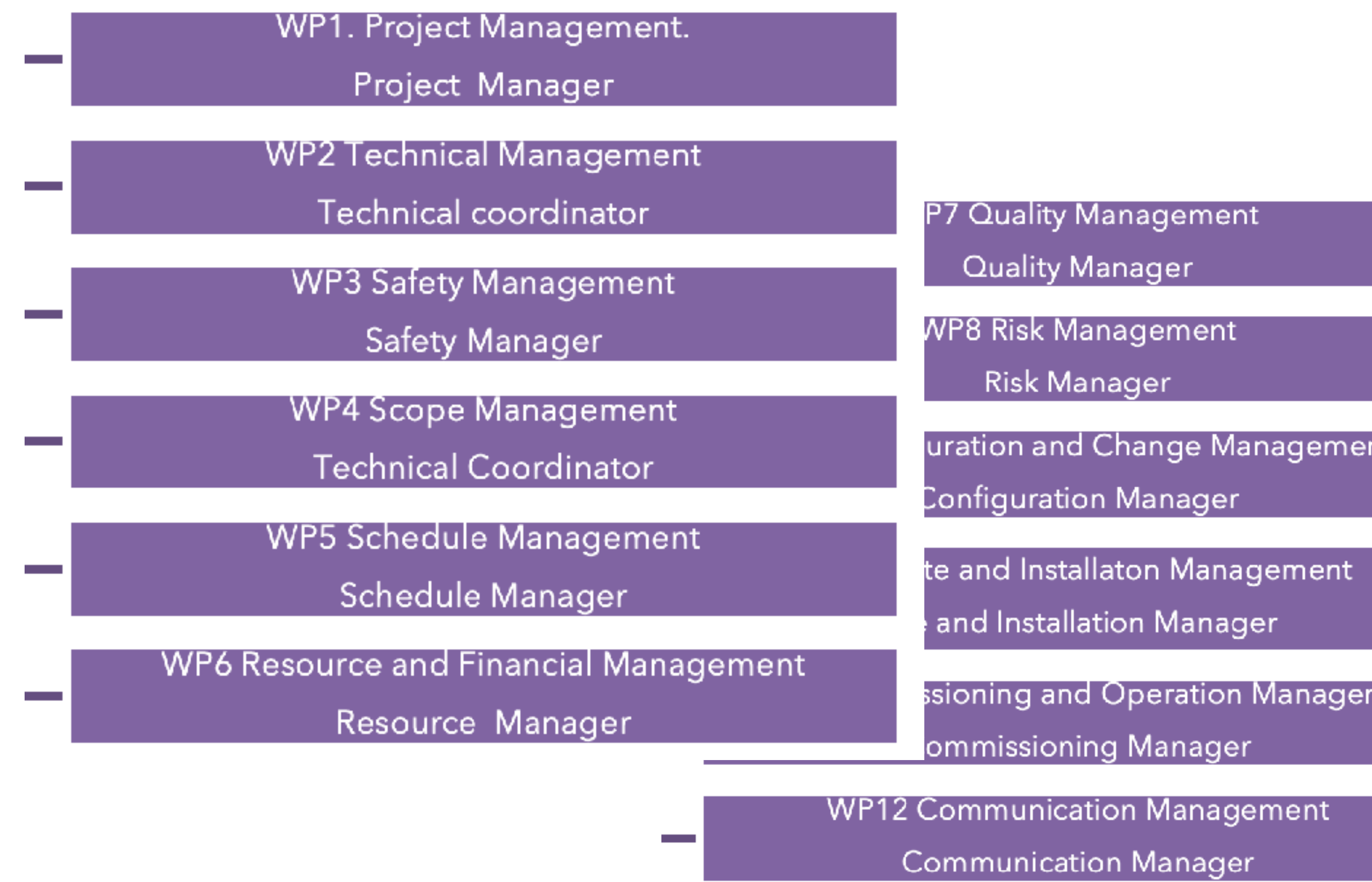
Careful bootstrapping beyond the core INFRA-DEV proposal: the deliverables of INFRA-DEV include 'operational Project Office' for month 28 (near the end of the EU grant). However, INFRA-DEV funding is only sufficient for a limited staffing of a project office. More importantly, we require input from the Project Office much earlier.

See separate talk by Mario Martinez.

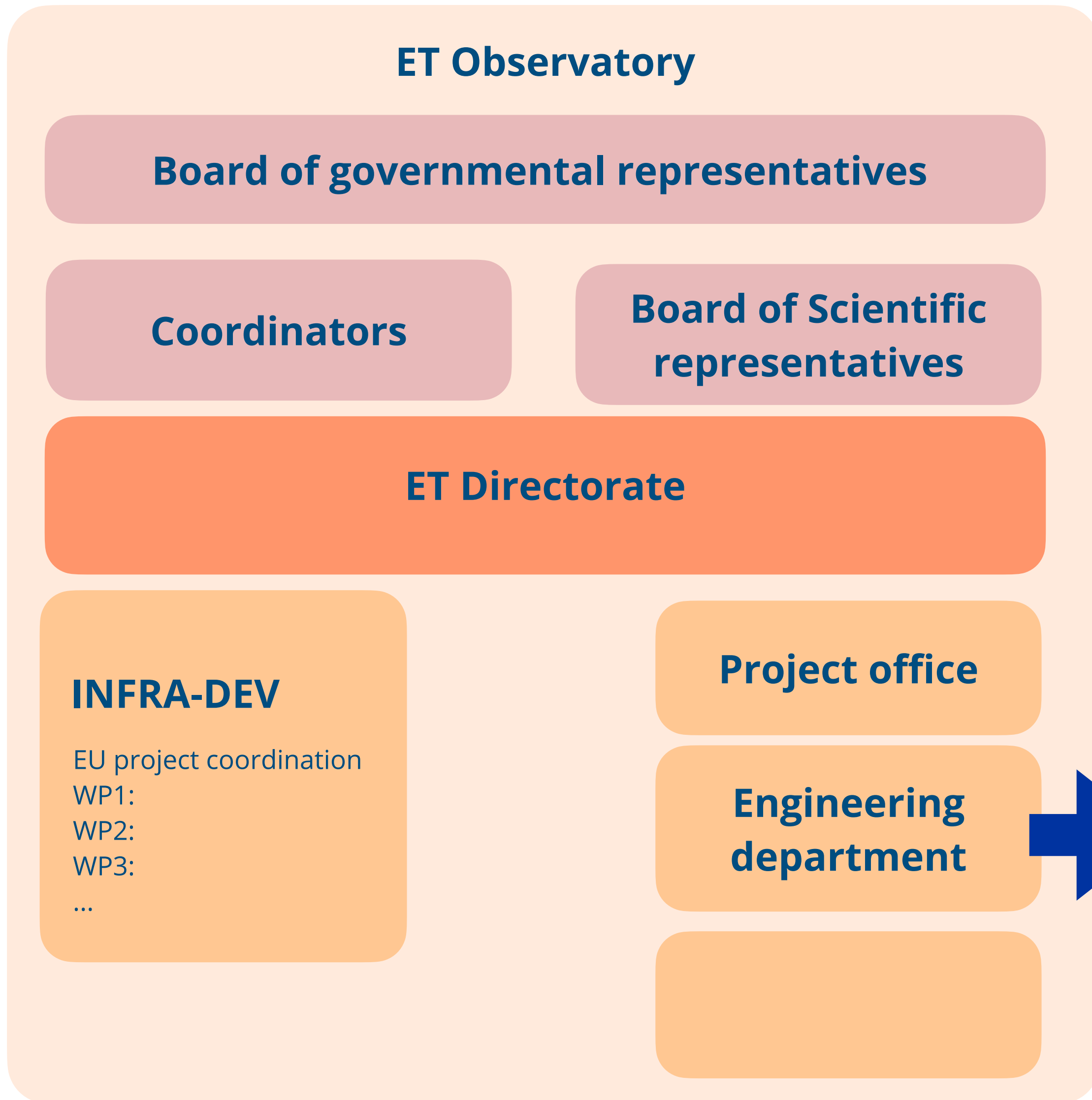
Work in progress: organisation of project management structure



Head of project office:
Alessandro Variola (INFN)



Work in progress: organisation of project management structure



Head of engineering department:
Patrick Werneke (Nikhef)

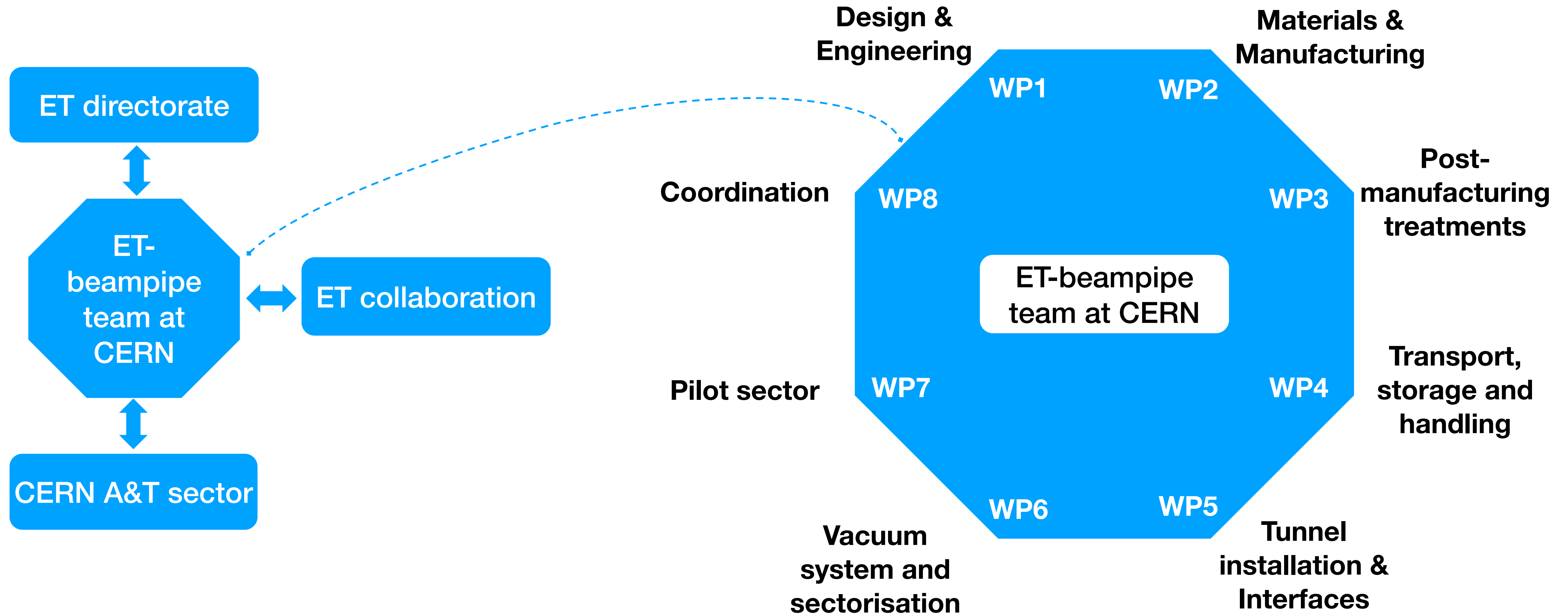


Vacuum pipe TDR
See next slides.

Infrastructure TDRs
TBD

...

INFN-Nikhef-CERN agreement



Objectives: re-evaluate baseline, propose less-expensive alternative, install pilot sector at CERN, TDR, and coordination effort with ET and CE vacuum community.

ET vacuum pipe: achievements and ongoing activities-1

WP1

- **Preliminary design of corrugated beampipe**, including stability analysis.
- **Construction drawings** of corrugated pre-prototypes (ID 40, L=400 mm).
- Preliminary design of **supports** for prototypes.

NEXT:

- **Detailed design** of corrugated beampipe.
- **Vibration modal analysis.**
- Design of the **supports** for the corrugated and baseline solutions.
- Integration of **baffles.**
- Design of **pumping modules** with integrates NEG pumps.

WP2

- Required **H₂ outgassing rates achieved in ferritic alloys** (mild steels and ferritic stainless steels)
 - **without air bakeout**
 - **after mild bakeout;** (80°C<T<150°C).
- Complete **metallographic characterisation** of the tested alloys.

NEXT:

- Study of additional ferritic stainless steels and mild steels, in **collaboration with European steelmakers** (Aperam, Arvedi, Bohler/ Voestalpine, and Tata steel).
- **Manufacturing at CERN** of corrugated pre-prototypes made of AISI304, AISI 430 and mild steel.

WP3

- Preliminary study of **surface cleaning** considering multiple options:
 - **Detergents vs. Solvents.**
 - **In situ vs. ex-situ**
 - **Batch by batch vs. continuous from coil**
- **Assessment matrix** for optimization of **sustainability**, performance, cost and reliability.

NEXT:

- Procedure for cleaning of the corrugated pre-prototype at CERN.
- **Industrial partners** for cleaning of the pilot sector.
- Design of the ET **cleaning machine.**

WP6

- **Control system and instrumentations** for ET beampipe vacuum system: first proposal and cost breakdown, including bakeout system.

NEXT:

- **Vacuum layout design** for the corrugated beampipes prototype.
- Simulation and measurement of **integrated NEG pumps.**

ET vacuum pipe: achievements and ongoing activities-2

WP7

- **Pilot sector:** Two **areas of installations are identified**, one is in a storage building and the other is in a old transfer-line tunnel.

NEXT:

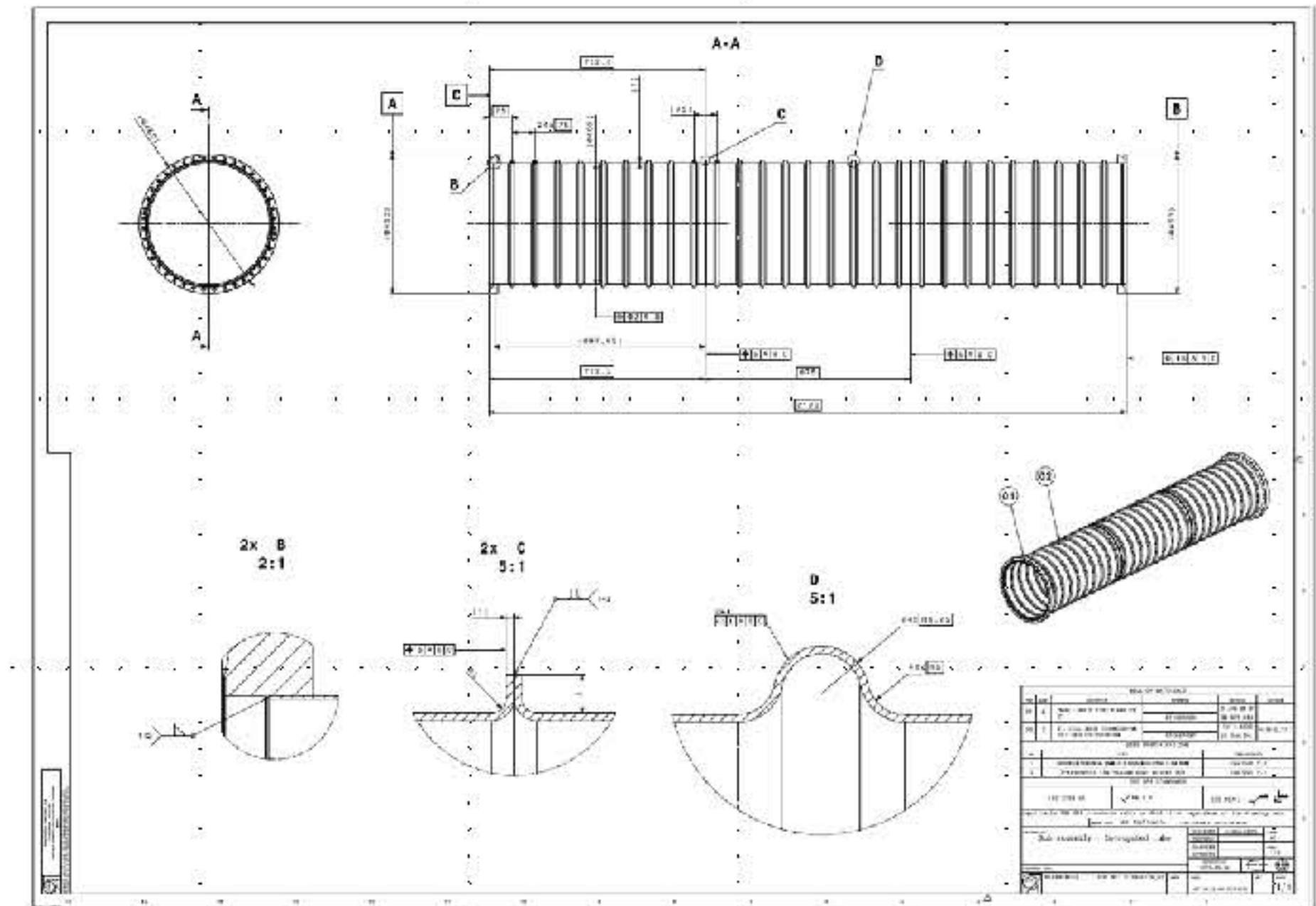
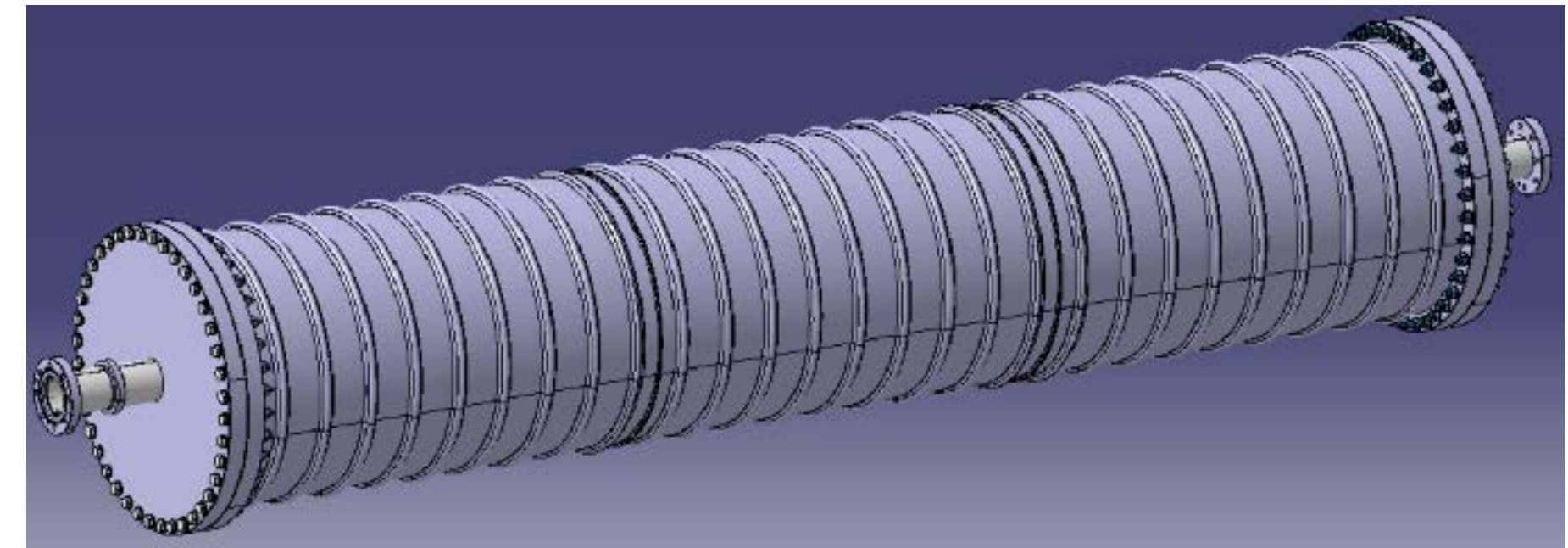
- Installation **feasibility** in the two areas in terms of logistic and measurement requirements.
- **Preparation** of the installation area.

WP8

- **Visits** at CNRS-LAPP, IFAE-UAB, ET-Pathfinder, RWTH Aachen, FZ Jülich, LNF-INFN, EGO-Virgo.
- **Informal agreement with LAPP and IFAE-UAB** (to be formalised soon).
- Preliminary programme of a **dedicated workshop at CERN** (27-29.03.2023).
- Regular meetings with **CE vacuum community**.

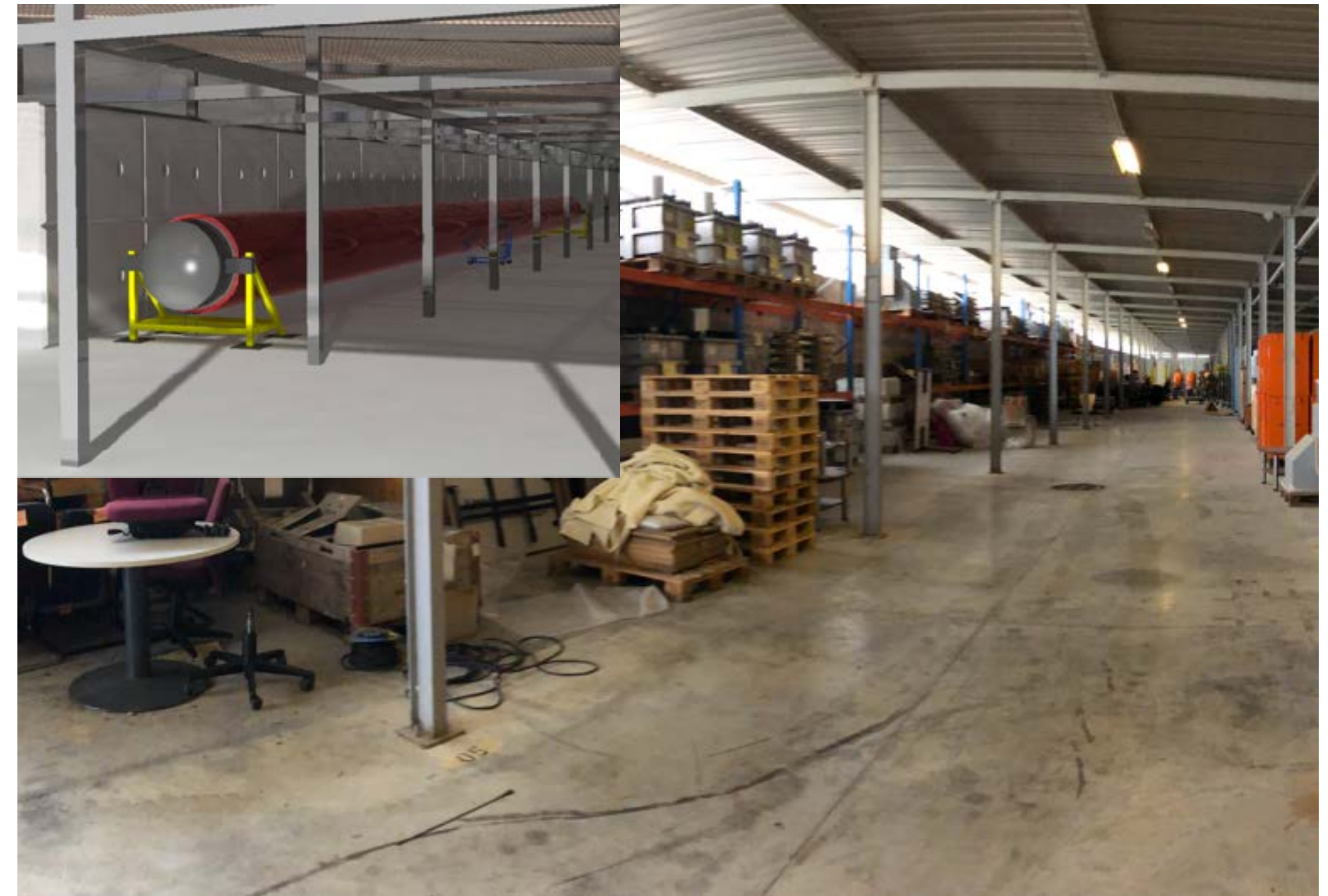
NEXT:

- Final programme of the workshop.
- MoU with IFAE and, possibly, with LAPP.
- Experimental programme with the pilot sector.



Pre-prototypes: corrugated walls, ID40, L=210mm, made of AISI 304, AISI 430, and mild steel

ET vacuum pipe: achievements and ongoing activities-3



TT1 tunnel and Building 973: possible candidate areas for the installation of the pilot sector

Activity has just started. Good and fast progress has been presented in a first internal meeting:
<https://indico.cern.ch/event/1214567/>

We are currently discussing how to organise **regular open meetings to present and discuss progress.**

(Some of the) next steps for the Directorate

- Establish a project for the Technical Design Reports for the ET infrastructure (lead institution, the team and required funding).
- Support the development of the organisational structure towards the legal entity and support effective team work with existing structures in the ET collaboration.
- Establish procedures and provide leadership for the emerging project office and engineering department.
- Deliver mandate for the ET Directorate during the preparation phase.
- Develop outline for the required resources of the project organisation during the preparatory phase.

... end