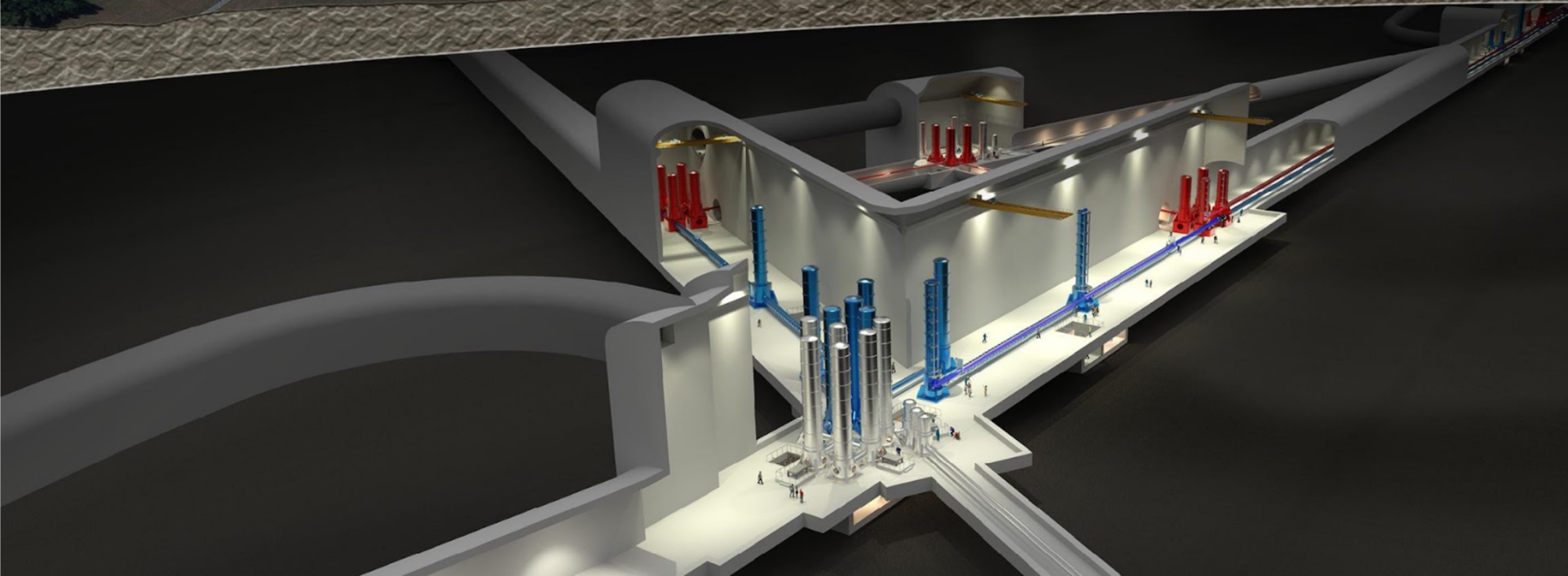


# WP4 Site Characterization



# WP4 Objectives



- WP4 is responsible for collecting and processing, from each potential site, all the required information necessary for site qualification. This includes **site specific characteristics** that might impact the ET scientific performance, **socio-economic impacts, legal implications, and civil engineering costs**. The information will be treated in a coherent and transparent manner, with the aim of facilitating a site selection process in a timescale consistent with ET anticipated schedule

**Participating institutions:** INFN, Nikhef, UW (Warsaw) & Wigner RCP (Budapest)(*and anyone else is of course more than welcome!*)

**Available funding:** 200 k€ for professional consulting expenses related to civil engineering costs and socio-economic impacts.

## Milestone name – Date (in months)/Lead Institution

- **M4.1 – M3/UW** : **Document detailing the site-specific characteristics that impact ET sensitivity and its duty cycle => REPORT**
- **M4.2 – M10/UW** : **Common methodology to estimate impact of site characteristics on ET sensitivity and operation and, if required, a scheme to compensate it => REPORT**

*Both Milestones should be formulated in close collaboration with the ISB and OSB and we should start the discussions with these boards soon.*

*(months from ET-PP start date, Sept. 1st)*

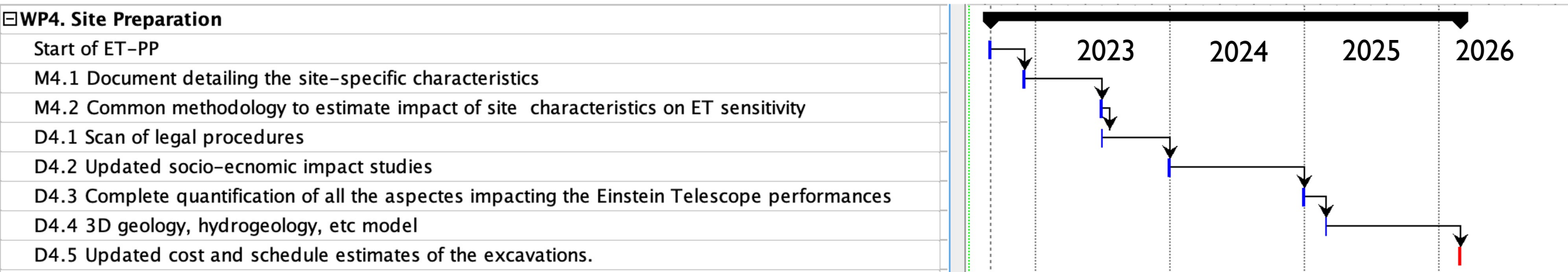
## Deliverable name – Date (in months)/Lead Institution

- **D4.1 - M10/Nikhef:** *Scan of legal procedures, permitting and land acquisitions, i.e. the steps to be taken prior to starting excavations*
- **D4.2 - M15/INFN:** *Updated socio-economic impact studies. Scan of accessibility, quality of life etc.*
- **D4.3 - M28/UW:** *Complete quantification of all the aspects impacting the ET performance for each site*
- **D4.4 - M30/INFN:** *Report on 3D geology, hydrology, etc. model with localisation of the ET infrastructure*
- **D4.5 - M42/Nikhef:** *Updated cost and schedule estimates of the excavations, including, if necessary: instrumentation for Newtonian Noise cancellation; costs of debris removal; costs of land acquisition, permitting, etc.*

(months from ET-PP start date, Sept. 1st)

# ET-PP – WP4 Timing

## **WP4 Gantt chart. Starting date assumed to be 1-Sept-2022.**

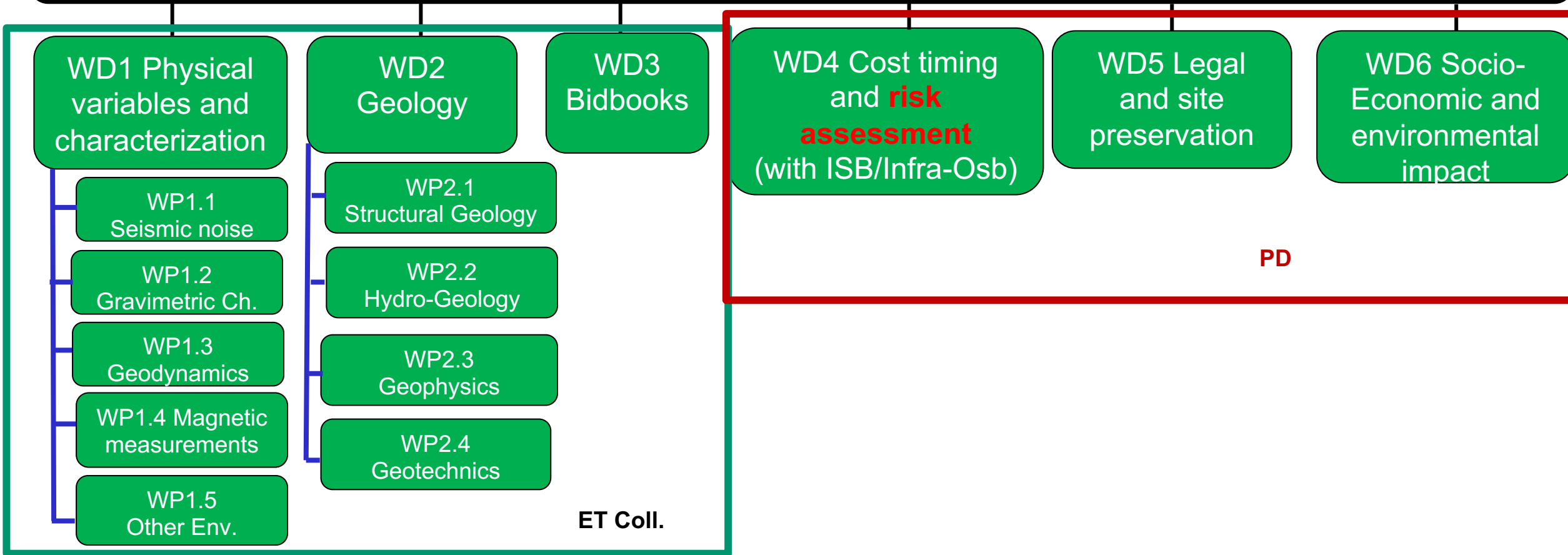


The SCB/SPB must lead the effort on the Einstein Telescope site related activities

- It must coordinate the activities to acquire the required characteristics for each site proposing to host the Einstein Telescope;
- Collect, organize and/or produce all the characterizations and documentation needed for a fair comparison of the sites;
- Propose a common framework and common basis for the evaluation of the candidate sites.

# SCB/SPB: Structure

## Site Characterization/Preparation Board



# Division Chairs



- **WD1** Luca Naticchioni (INFN/Rome, I),  
Shahar Kadmiel (KNMI, NL)
- **WD2** Leonardo Casini (UniSS, I),  
Frederic Nguyen (Liege, B),  
Wim Walk (Nikhef, NL)
- **WD3** ..., ... (*input/discussions with BGR, PD & ET Coll.*)
- **WD4** ..., ... (from ISB ?)
- **WD5** ..., ... (experts from institutes or industries)
- **WD6** ..., ... (experts from institutes or industries)



# Implementation of new SCB Structure

## Site Characterization Board

L. Naticchioni (INFN/Rome, I)  
S. Kadmiel (KNMI, NL)

L. Casini (UniSS, I)  
Frederic Nguyen (Liège, B) Wim Walk (Nikhef, NL)

WD1: Phys. Variables  
and characterization

WPI.1 Seismic noise

WPI.2 Gravimetric ch.

WPI.3 Geodynamics

WPI.4 Magnetic meas.

WPI.5 Other env. noise

WD2: Geology

WP2.1 Struct. Geology

WP2.2 Hydrogeology

WP2.3 Geophysics

WP2.4 Geotechnics

WD3: Bidbook

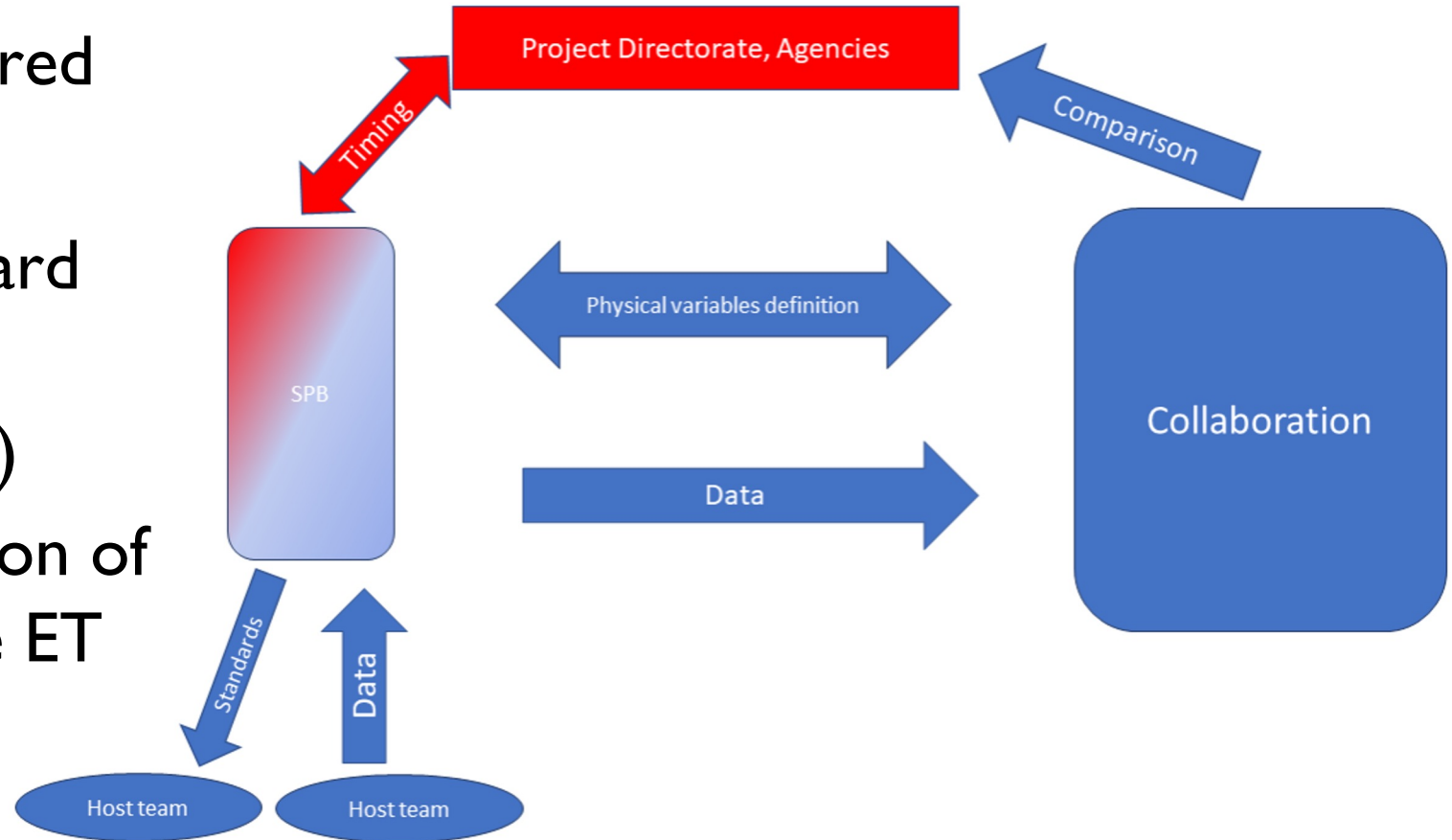
# Integration of new ET members



- Implementation of new board structure
- Ri-definition of activity plan after the new fundings from Netherlands and Italy
- Census of all interested people (from ET DB) **in parallel**
  - Different skills and availability
  - General Form with Division Structure to RU Coordinator

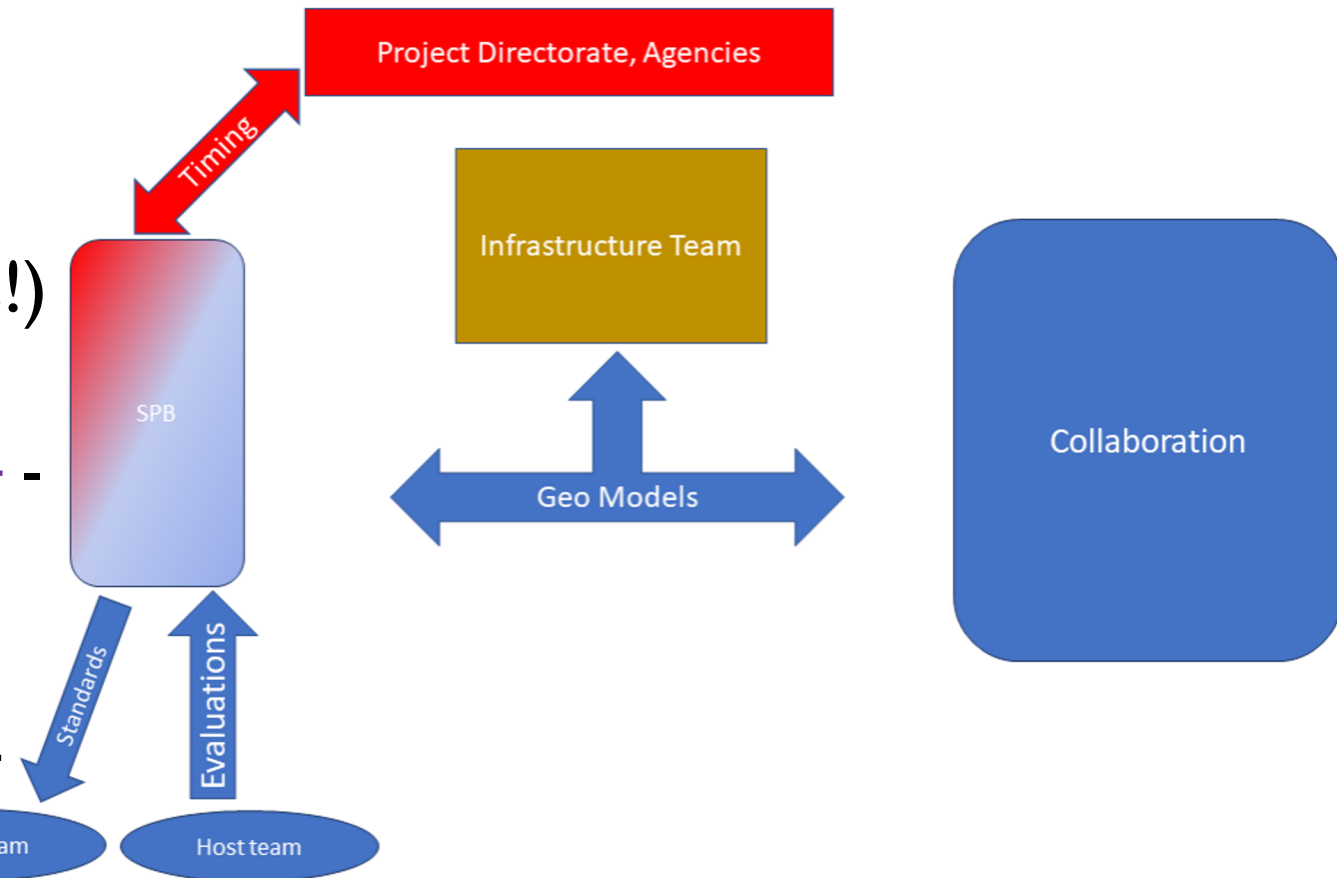
# Milestones and Deliverables: WDI

- **MI.1** Updated list a set of physical variable to be acquired (same as ET-PP/M4.1 - M3)
- **MI.2** Updated list of standard to collect data - M6 (instrumentations and so on)
- **DI.1** Complete quantification of all the aspects impacting the ET performance for each site (same as ET-PP/D4.3 - M28)



# Milestones and Deliverables: WD2

- **M2.1** Definition of a minimal set of geological, geophysical and geotechnical investigations - **M6**
- **D2.1** 3D map (with uncertainties!) of the sub-surface of the volume enclosed by ET (same as ET-PP/D4.4 - **M30**)
- **D2.2** Reports on hydrogeology and so on –using a common or at least comparable format– to be used for site comparison - **M40**



- **M3.1** Define Bidbook standard format and content, i.e. needed legal documentation, procedures to realize the infrastructure, timing, cost (according with the Infrastructure team, Collaboration, Host teams), financial plan, ... - **M?**
- **D3.1** Bidbook template - **M?**
- **D3.2** List of required documents - **M?**

*Note: this requires input/discussions with BGR, PD & ET Collaboration*

- **M4.1 - M24** NN compensation and all action needed to mitigate site “effects” on ET (to be discussed with ISB/OSB)
- **M4.2 - M36** Plan, cost and timing estimation for waste disposal, land-acquisition, logistics, surface infrastructures (buildings, services, ...)
- **D4.1** Updated cost and schedule estimates of the excavations. Including, if necessary: instrumentation for Newtonian Noise cancellation; costs of debris removal; costs of land acquisition, permitting, etc ... (same as ET-PP/D4.5 - M42)

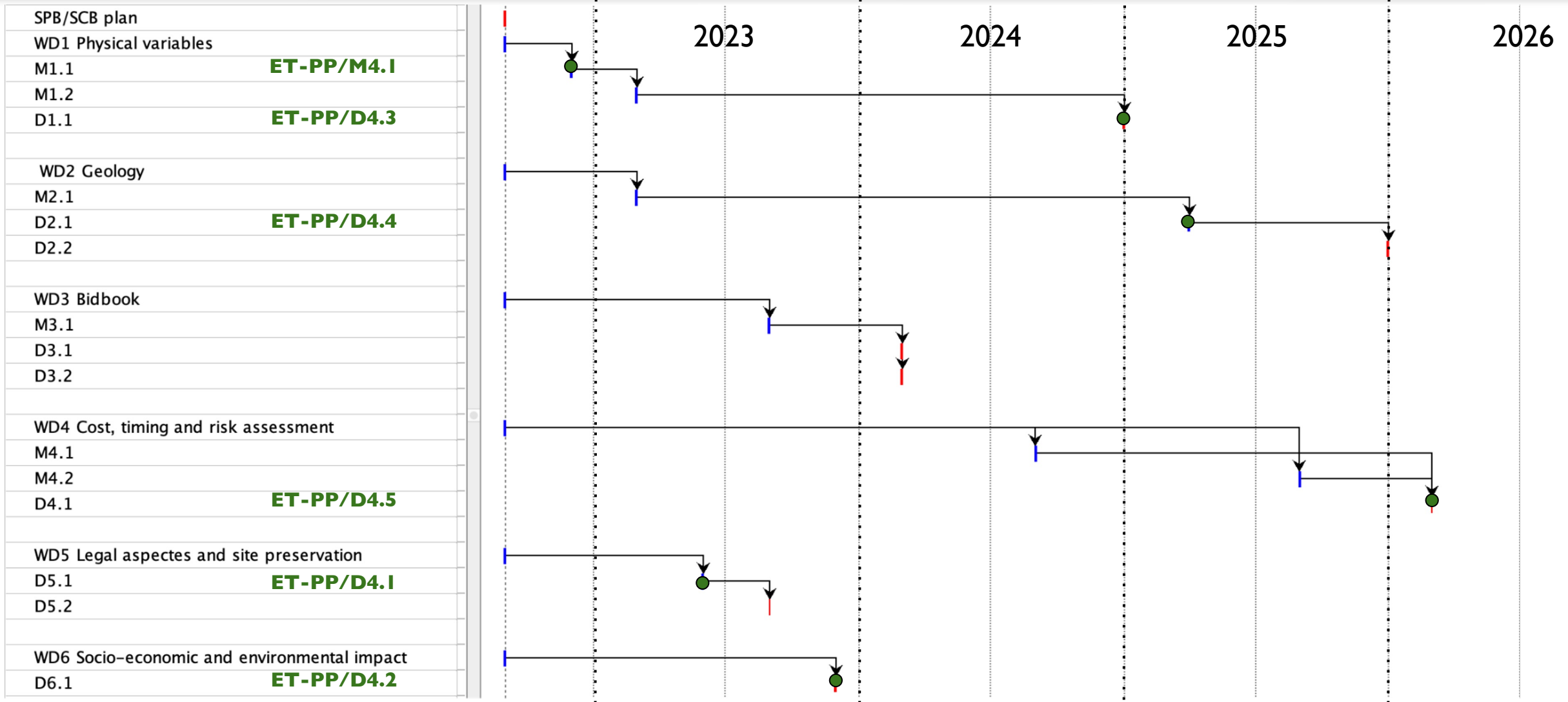
- **D5.1 - M10** A list of required legal documents, needed for the realization of the ET infrastructure  
(same as ET-PP/D4.1 - M10)
- **D5.2 - M12** Report describing the consolidated strategy to preserve the site quality.

- **D6.1 - MI5** Document containing a set of standards in the computation of the socio-economic-environmental impact
  - common multipliers in the computation of the economic impact, or multipliers based on shared criteria
  - definition of a set of common categories to define the social impact
  - definition of a set of common categories to define the environmental impact

(same as ET-PP/D4.2 - MI5)



# SPB/SCB Preliminary Timing (based on ET-PP)



# Issues to be addressed soon

- Timeline review (on going)
- Discussions with ISB/OSB on relevant parameters/requirements (Jan Harms workshop July 11<sup>th</sup> a very good start)
- ET basic geometry definition i.e.  $\Delta$  versus L (urgent, next ET Symposium will be devoted to that)
- Approach to update notably civil engineering costs: with or without the involvement of civil engineering parties
- Bidbook approach

# Next Steps

- Meeting with WD chairs to define WP's structure, milestones, deliverables and timeline
- Next SPB biweekly meetings dedicated to WD1 and WD2
- Appoint remaining WDx chairs
  - Meeting with WDx chairs to define WP's structure, milestones, deliverables timeline
  - SPB meeting dedicated to WDx

**End of Sept. – beginning of Oct.**

# Interaction with other WPs

- WP2: Organization, Governance and Legal Aspects
- WP3: Financial Architecture
- WP5: Project Office and Engineering Department
- WP6: Technical Design
- WP7: Innovation and Industrial engagement
- WP9: Sustainable Development Strategy
- WP10: Education, Outreach & Citizen Engagement

