Horizon Europe:
Coordination and Support Actions

ET-PP WP9
2nd review meeting (RP2)

15/05/2025
Grant agreement: № 101079696

WP9- Sustainable Development Strategy: Introduction and objectives

WP9 participants

EGO — Lead beneficiary and Co-Coordinator - Responsible for: M17, M18, M19, D9.3 (ET CO2 footprint)

INFN — Co-coordinator Responsible for: D9.1 (ET SD strategy), D9.2 (ET env. Impact)

MUL — Participant (expertise: excavated material treatments)- Contributor to D9.2

***CNRS** has withdrawn its direct involvement in WP9 after reaching M18 and will now serve as reviewer for WP9 milestones & deliverables*
***DESY** will join after 2RP review meeting*

Co-Coordinators


Francesca Spagnuolo (EGO)


Maria Marsella (INFN)

WP9 Team


Robert Galler (MUL)


Monica Marzario (INFN)


Gabriel Loucky (MUL)


Disha Sawant (EGO)

Objectives

Develop a strategy for the realization of **a sustainable RI**, including:

- Study and minimize the carbon footprint of ET, including computing and travel
- Evaluate and minimize the landscape and environmental impact
- Evaluate the contribution of the infrastructure to the UN sustainable goals

WP9: Tasks

M1-M48

Task 9.1 ET carbon footprint assessment and mitigation

Subtasks:
9.1.1 *ET carbon budget*
9.1.2 *ET energy consumption optimization*

Task 9.2 Landscape, environmental and societal impact

Subtasks:
9.2.1 *Assessing and minimizing the ET impact on its environment*
9.2.2 *Environmental management approach*
9.2.3 *Analyse and define an overall strategy for reclamation, reuse and recycling of the excavated materials*

WP9: Task 1

RP2: M13-M30

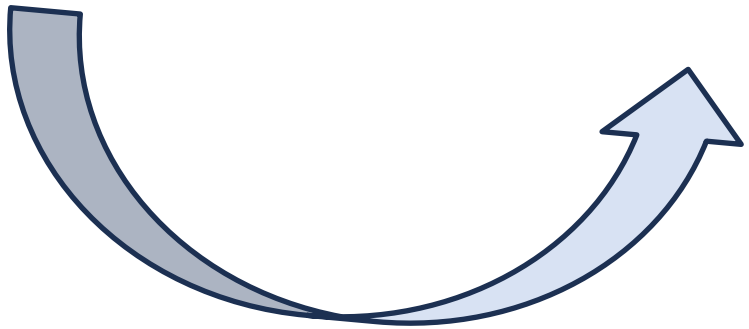
ET carbon fooprint assessment and mitigation

Subtasks:

9.1.1 *ET carbon budget*
9.1.2 *ET energy consumption optimization*

Identified the categories that will contribute more to the ET footprint (*e.g.* energy use; transport/travel; computing, etc.) in the different phases (e. g., construction, operation, etc.)

Elaborated a plan to develop an accurate ET CO2 footprint assessment & related mitigation strategy (D9.3 > to be delivered by October 31st, 2025)



ET CO2 footprint assessment and mitigation strategy

CO2 Emissions Scenario Analysis

- **Baseline Emissions Analysis:** Use LCA principles to calculate current CO2 emissions associated with materials, energy, and transportation.
- **Develop Emissions Scenarios:** Model emissions under various scenarios, including:
  - *Business-as-usual (BAU):* No significant interventions.
  - *Moderate Mitigation:* Partial adoption of sustainable practices.
  - *Aggressive Mitigation:* Full integration of best practices, including renewable energy and circular economy principles.
- **Evaluate Scenarios:** Assess scenarios for feasibility, cost, and environmental impact.

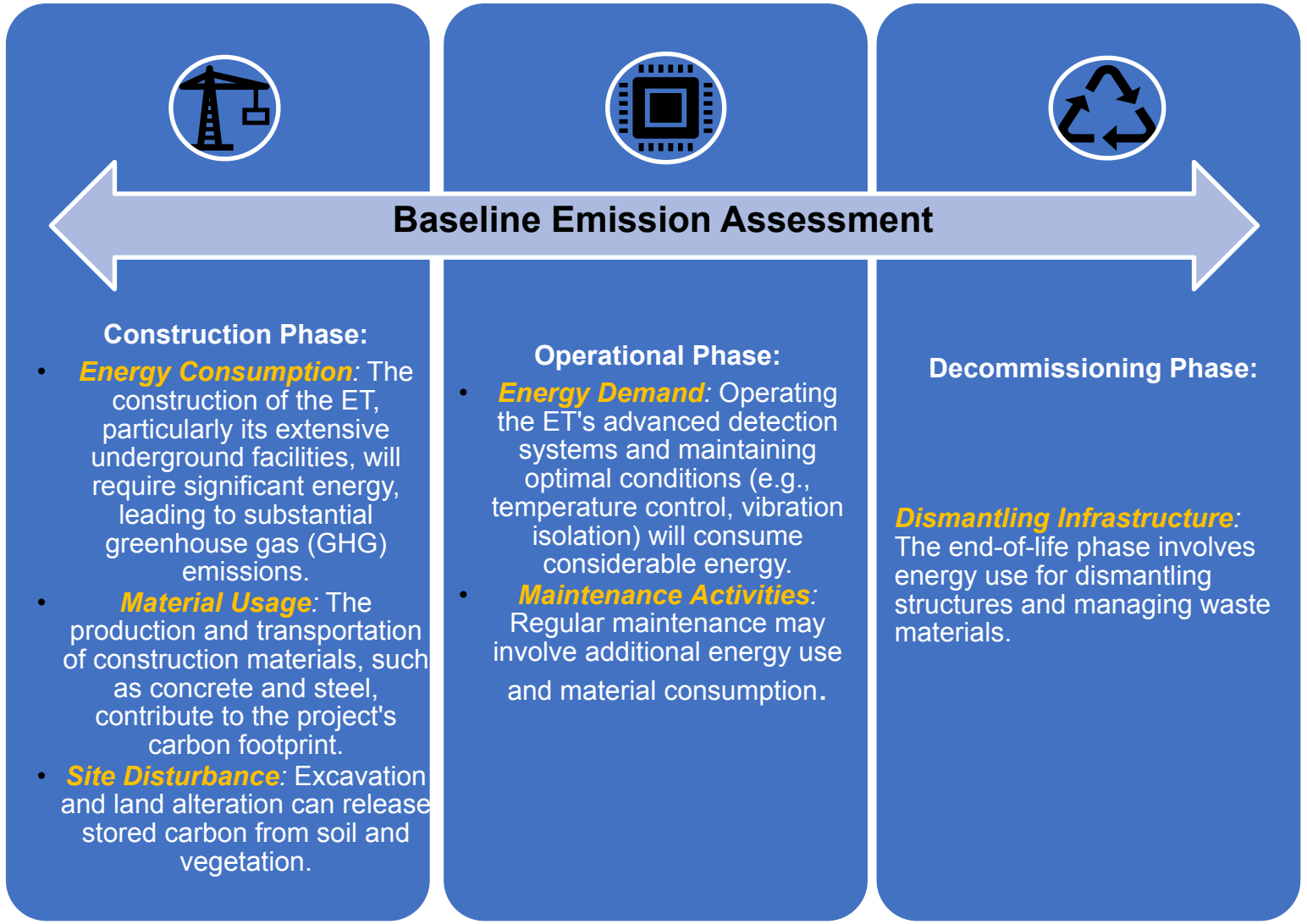
- **Deliverables (included in D9.3):**
  - CO2 Baseline Report.
  - Scenario Analysis Report

Definition of CO2 Emissions Scenarios

Establish baseline emissions% and project future trends under different operational strategies

Develop detailed emissions scenarios to evaluate potential environmental impacts during the lifecycle of (LCA#) the ET

References:
% Estimate of the carbon footprint of astronomical research infrastructures
# LCA by Uni Lieden



WP9: Tasks

RP2: M13-M30

Task 9.2 Landscape, environmental and societal impact

Subtasks:
9.2.1 *Assessing and minimizing the ET impact on its environment*
9.2.2 *Environmental management approach*
9.2.3 *Analyse and define an overall strategy for reclamation, reuse and recycling of the excavated materials*

Offered an overview of the main expected impacts of ET in terms of landscape/environment and social sustainability

Envisaged the adoption of policies and rules to limit ET possible negative impacts on the environment (e.g. green responsible procurement practices)

Explained our strategy for the re-use of the excavated material and waste, in line with EU Law and strategies (e.g. the EU Soil Strategy 2030 > reuse excavation material in the same or another appropriate location whenever is possible)

WP9: Tasks

M1-M48

Task 9.1 ET carbon footprint assessment and mitigation
Subtasks:
9.1.1 ET carbon budget
9.1.2 ET energy consumption optimization

Task 9.2 Landscape, environmental and societal impact
Subtasks:
9.2.1 Assessing and minimizing the ET impact on its environment
9.2.2 Environmental management approach
9.2.3 Analyse and define an overall strategy for reclamation, reuse and recycling of the excavated materials

Fixed some preliminary sustainability goals (15 PSGs), targets, timing and responsibilities > M17 Preliminary Sustainability Plan

ET preliminary sustainability plan's objectives and targets

Objectives	Sustainability Target	Responsibility	Timing
1. **Implement sustainable practices in excavation**	Reduce contamination and enhance material reuse	Engineering Department	By the end of the design phase
2. **Enhance sustainable Construction techniques**	Prioritize sustainable site design and sustainable practices (e.g. reduce energy usage; minimize waste, etc.)	Project Office and Engineering Department	Preparatory phase (end of 2026)
3. **Obtain ISO 50001 Certification**	• Reduce energy consumption at the ET site. • Increase the share of renewable energy in the energy mix. • Improve energy efficiency.	Engineering Department > Technical Systems Service > Energy Manager	1 year after ET reaches full operativity (operation phase)

ET preliminary sustainability plan's objectives and targets

Objectives	Sustainability Target	Responsibility	Timing
4. Adopt effective environmental management systems (in line with guidelines provided by the ISO 14000 series or similar)	• Achieve efficient use of natural resources at the ET site. • Reduce waste • Soundly manage chemicals and all wastes in accordance with existing guidelines	ET Management Engineering Department	When ET starts operating and until the dismantling phase (operation and termination phases) Since the construction phase and until the dismantling phase (implementation, operation and termination phases)
5. Adopt sustainable practices for data management	• Develop stable and robust repositories while ensuring that data are stored in an environmentally friendly manner • Adopt digital technologies that offer green solutions (e.g. green cloud)	Engineering Department Information Technology Department > Computing Facilities and Data Storage Division	Since Preparatory phase 2 When ET starts operating and until the dismantling phase

ET preliminary sustainability plan's objectives and targets

Objectives	Sustainability Target	Responsibility	Timing
6. **Adopt a Gender Equality Plan**	Ensure a gender-equal working environment	Direction > Gender Equality Plan Manager	6 months after ET reaches full operativity
7. **Conduct annual audits to assess and monitor the implementation of the gender equality plan**	Ensure a gender-equal working environment	Direction > Gender Equality Plan Manager	Annually
8. **Adopt smart working agreements**	Ensure a better work-life balance and improve the well-being of the employees	Administration > Human Resources Office	When ET starts operating
9. **Promote safe and secure working environment in accordance with relevant national and international Standards (including ISO 45001)**	Ensure productive employment and decent work for all, including people with disabilities	Health, Safety and Security Office/Department > Safety Manager	When ET starts operating and for all phases of the RI lifecycle

ET preliminary sustainability plan's objectives and targets

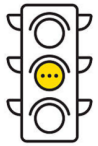
Objectives	Sustainability Target	Responsibility	Timing
10. Implement company carpooling and shuttle service from the nearest public transport facility to/from the ET site	Reduce emissions and promote sustainable mobility	Administration Department	When ET starts operating, and for all phases of the RI lifecycle
11. Adopt internal rules to ban or limit short-haul flights on routes where fast trains are available	Reduce emissions and promote sustainable mobility	Administration Department	Since the construction phase and until the dismantling phase (implementation, operation and termination phases)
12. Adopt sustainable procurement practices (in accordance with the ISO 20400 standard) and deliver periodic training courses on sustainable procurement to employees who interact directly with suppliers	• Reduce waste and carbon emissions and manage efficiently available resources • Enable compliance with social legislations (e.g. by buying ethical products and services whenever it is possible)	Administration > Procurement Office	When ET starts operating and during its lifecycle

ET preliminary sustainability plan's objectives and targets

Objectives	Sustainability Target	Responsibility	Timing
13. Enter into agreements with research centers and universities from all countries of the ET collaboration	• Support educational programs for the development of specialized skills • Co-design master courses and training programs	Direction	When ET starts operating and during its lifecycle
14. Engage the ET community	Develop capacity building and monitoring tools	Project Office and Engineering Department	Preparatory phase (end of 2026)
15. Commit to outreach activities	Promote citizen science and the understanding of science and technology in society at large	Communication office	Since the preparation phase and for all the lifecycle of the RI

WP 9: Deliverables and milestones

Delivered (anticipated)
M18 ET Sustainability Workshop (**EGO**, workshop+report, M18)



Completed
M17 Preliminary sustainability plan (**EGO**, report, due M11> submitted> sent back for revisions > ready for re-submission after passing internal and exernal review)

Delayed to October, 2025
D9.1- ET Sustainable Development Implementation Strategy (**INFN,** document/report, M18)
D9.2- ET Environmental Impact assessment and mitigation strategy (**INFN**, document/report, M24)
D9.3-ET CO2 footprint assessment and mitigation strategy (**EGO**, document/report, M36)

To be delivered in the next RP
M19 Final Sustainability Plan (**EGO**, reports, M47)

WP 9: Critical risks, deviations from Annex I, contingency plans

Critical risks encountered in RP2

1. Difficulties to find full time personnel adequately in time, with the skills needed for the project
2. Delays in technical designs

- To cope with these risks

1. increased time dedicated to cover the needs of the ET-PP project with in-kind contributions (person/ months) and support from a consultancy service
2. adoption of reference scenario such as preliminary documents (ESFRI proposal) and baseline detector layouts designed by ETO (in progress)

- **Deviations** from Annex I > partners efforts > withdrawal of a partner (CNRS)
- **Contingency plans >** additional in-kind resources from other ET-PP partners

WP 9: Contribution from each partner

INSTITUTION		PM as per Annex I	PM in the period
CNRS	CONTRIBUTIVES	13,00	4,73
	REQUESTED EC	0	0
EGO	CONTRIBUTIVES	12,60	2,68
	REQUESTED EC	18,00	0
INFN	CONTRIBUTIVES	39,20	3
	REQUESTED EC	18,00	0
MUL	CONTRIBUTIVES	4,00	3,12
	REQUESTED EC	12,00	4,68
Total Person Months	CONTRIBUTIVES	68,80	9,36
Total Person Months	REQUESTED EC	48	5,85
		116,80	**33,42**

Total PMs worked during **RP1**: **2,83 PMs**

WP 9: Outlook and perspectives

RP1
1 Sept 2022-31 Aug 2023

- first version of the Preliminary Sustainability Plan (**M17**)
- design and organization of the sustainability workshop (**M18**)

RP2
1 Sept 2023-28 Feb 2025

- sustainability workshop (Paris Nov 17, 2023
- revised version of the Preliminary Sustainability Plan prepared and submitted for internal/external review
- recruitment of additional resources completed > sustainability expert (full time EGO); ARUP consultant (INFN)

RP3
1 March 2025-31 Aug 2026

- Reinforce WP9 team by the end of May 2025 (additional resources recruited during RP2 + DESY staff to join after May,15)
- Deliver **D9.1**, **D9.2** and **D9.3** – by October 31st, 2025 > provide input and quantitative data for **M19**-Final Sustainability Plan
- Workshop (coll.WP7) - Nov 13-14 2025 - Environmental Sustainability for large underground research infrastructures: challenges and innovative solutions for the ET project.