

ET-PP WP9 – Support for developing a Sustainability Strategy for ET

Introduction

Background

The Einstein Telescope (ET) is a proposed underground facility to host a gravitational-wave observatory. ET will make it possible, for the first time, to explore the Universe through gravitational waves along its cosmic history up to the cosmological dark ages, shedding light on open questions of fundamental physics and cosmology.

As part of the ET Preliminary Phase (ET-PP) framework, Work Package 9 (WP9) – “Sustainability” is a fully integrated technical WP of the project, with connections across all other WPs. Sustainability considerations will be included at all steps of the ET design process and will be constantly adapted to match the progress of these developments. Sustainability will not be an abstract concept; it will always be applied to match the needs and the requirements of the ET.

WP9 has delivered a preliminary sustainability plan (PSP). This plan describes the sustainability goals and how identified issues will be addressed as part of the ET project, focussing on its importance, methodology for study of the topic, and the different phases of the ET project for which sustainability will be relevant.

Scope

Arup’s role through this commission will be to conclude the technical advisory services to ET-PP WP9 in support of the refinement and development of the sustainability plan into a more advanced strategic document that needs to be completed by July 2026.

The tasks identified are the n. 4 and n.6 (described as optional in the previous contract) expanded in more detail in the following section that account for the modified and delayed timeline agreed with the ET-PP coordinator.

Tasks

Task 4a
ET CO2 footprint ET assessment and mitigation strategy (D9.3) – Report Authorship
Context: This task will take forward the structure and framework and produce authorship of the strategy document itself, for draft and final review and approval from EGO and INFN.
Activity: It is expected that the strategy shall be in line with current good practice of documents of similar nature for a major infrastructure project at the preliminary phase and is expected to align as a minimum with what is understood to be ET-PP’s overall objectives.

Reference to relevant guidelines to inform the granularity of detail shall be made, which is expected may include:

- PAS2080 Carbon management
- EU Environmental Impact Assessment (EIA) Directive (2011/92/EU)
- Environmental Considerations checklist for European Strategy Forum on Research Infrastructures (ESFRI)

Programme:

ET-PP is required to deliver D9.3 in April 2026 so the timeline below is requested:

- a) Review final draft report: Start 1th April 2026 - 15 days development period. Completion 15th April 2026.
- b) Deliver final report: Start 15th April 2026 - 15 days development period. Completion 30th April 2026.

Assumptions:

A single iteration of comment review and feedback per stage between Arup and the WP9 representative(s)

An online meeting to discuss the comments with the WP9 representatives through each round of report draft to provide clarity or further recommendation.

Deliverable:

Word document report

Task 4b

ET high-level whole life carbon assessment (D9.3) – Report

Context: High-level whole life carbon assessment of the major civil engineering components of the two ET configurations (triangle and L-shape). The carbon footprints will be used as a baseline before more granular and site-specific carbon assessments are undertaken by the design teams.

Activity:

The assessment includes the construction, maintenance, end of life of the major civil engineering components of the triangle and L-shape. Operational energy and water will also be included. The assessment excludes construction, maintenance and end of life of science and M&E componentry.

Programme:

As per Task 4a

Assumptions:

A single iteration of comment review and feedback per stage between Arup and the WP9 representative(s)

An online meeting to discuss the comments with the WP9 representatives through each round of report draft to provide clarity or further recommendation.

Deliverable:

Word document report

Task 6:

ET Sustainable Development Implementation Strategy (D9.1) – Report Authorship

Context: This task will provide the structure and framework and produce authorship of a high level concise strategy document, for draft and final review and approval from INFN (reference for this report) and EGO. It is understood that WP9 will use this as the basis for their overall implementation strategy report.

Activity:

It is expected that the strategy shall be in line with current good practice of documents of similar nature for a major infrastructure project at the preliminary phase and is expected to comprise as a minimum a comprehensive summary of Task 1 to 4 deliverables and final considerations derived from D9.2 and D9.3.

Reference to relevant guidelines to inform the granularity of detail shall be made, which is expected may include:

- PAS2080 Carbon management
- EU Environmental Impact Assessment (EIA) Directive (2011/92/EU)
- Environmental Considerations checklist for European Strategy Forum on Research Infrastructures (ESFRI)

Programme:

ET-PP is required to deliver D9.1 in July 2026 so the timeline below is proposed:

- c) Review final draft report: Start 1th May 2026 – 1 months development period. Completion 30th May 2026.
- d) Deliver final report: Start 1th June 2026 - 15 days development period. Completion 15th June 2026.

Assumptions:

A single iteration of comment review and feedback per stage between Arup and the WP9 representative(s)

An online meeting to discuss the comments with the WP9 representatives through each round of report draft to provide clarity or further recommendation.

Deliverable:

Word document report

Task 7:**Workshops and Meetings Participation**

Context: Various collaborator meetings and workshops are expected to occur until November 2026. Tentative dates are set out below, to be confirmed with the project's teams at least 2 weeks in advance of the event:

Task relationship	Date	Location	Theme
W4, W6	May 5-7 2026	Hybrid Barcelona	ETPP annual meeting
all	November 2026 (TBC)	Hybrid CERN	Sustainability of large infrastructure - Meeting

Activity:

Preparation of material for meeting and presentations

In addition, for each Task an online meeting with ET-PP stakeholders is accounted for if required at the start, end and approximate mid-point of each task to review and discuss inputs and updates on each task.

Programme:

As above

Assumptions:

Remote/hybrid attendance for all meetings.

Deliverable:

Workshop material and contributions to discussions and meetings

In addition to these task specific deliverables, throughout the course of this project we have accounted for:

- A monthly progress meeting with M. Marsella, INFN representative, and WP9 participant, reasonable ad-hoc advice and opinion through email correspondence relating to progress and support around the tasks, direction of the commission, and project management and administration of this contract.
- A task briefing meeting to kick-off and report at each sub-task stage has been assumed.
- Unless otherwise indicated, all workshops and meetings are assumed to take place remotely online, or in-person at Arup London's office, where access to INFN or their collaborators will be made available.
- Deliverables shall be submitted at the end of each programme stage.
- It is understood that the D9.1 and D9.3 final strategy reports will be reviewed by an independent European Commission officer. Arup is not responsible or liable for their acceptance or otherwise of these documents. EC's decision is unlinked to Arup's

scope of works and INFN's payment to Arup on development of any work towards these documents. However, early engagement with the EC on their expectations and assessment criteria, can help mitigate against this.

- The project manager identified by Arup is Yung Loo, who will be the main point of contact for the study. The project director for this commission is Matt Sykes.

Remuneration and Payment

The allocated budget for this order is EUR 60,00, including expenses. The allocation of the budget to the different Tasks follows:

Task	Topic	Fee (Euros)
4a	ET CO2 footprint ET assessment and mitigation strategy (D9.3) – Report Authorship	27,000
4b	ET high-level whole life carbon assessment	17,000
6	ET Sustainable Development Implementation Strategy (D9.1) – Report Authorship	10,000
7	Workshops and meetings participation	6,000
Total		60,000

(Note the full fee for Task 4b is EUR 29,000. Remuneration of the remainder has been accounted for within the Part 1 works)

The ad-hoc support shall include ad-hoc support either through attendance into additional meetings or personnel, or other tasks that may be required, which are not defined within this current scope. If in-person attendance is required on site these will need to be agreed on cost basis.

I accept the above terms and conditions

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For and on behalf of []

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