EE11 Mission Information Day (MID) for Industry

Overview of the Earth Explorer 11 Process & Lessons Learned about scientific preparation

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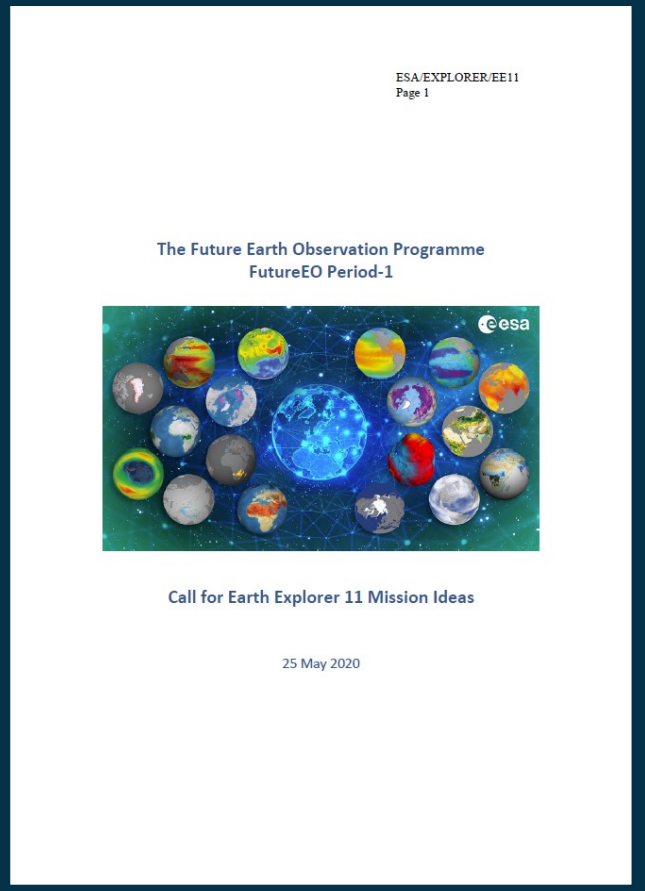
EE11 Call: Objectives, Scope and Boundary Conditions


ESA/EXPLORER/EE11
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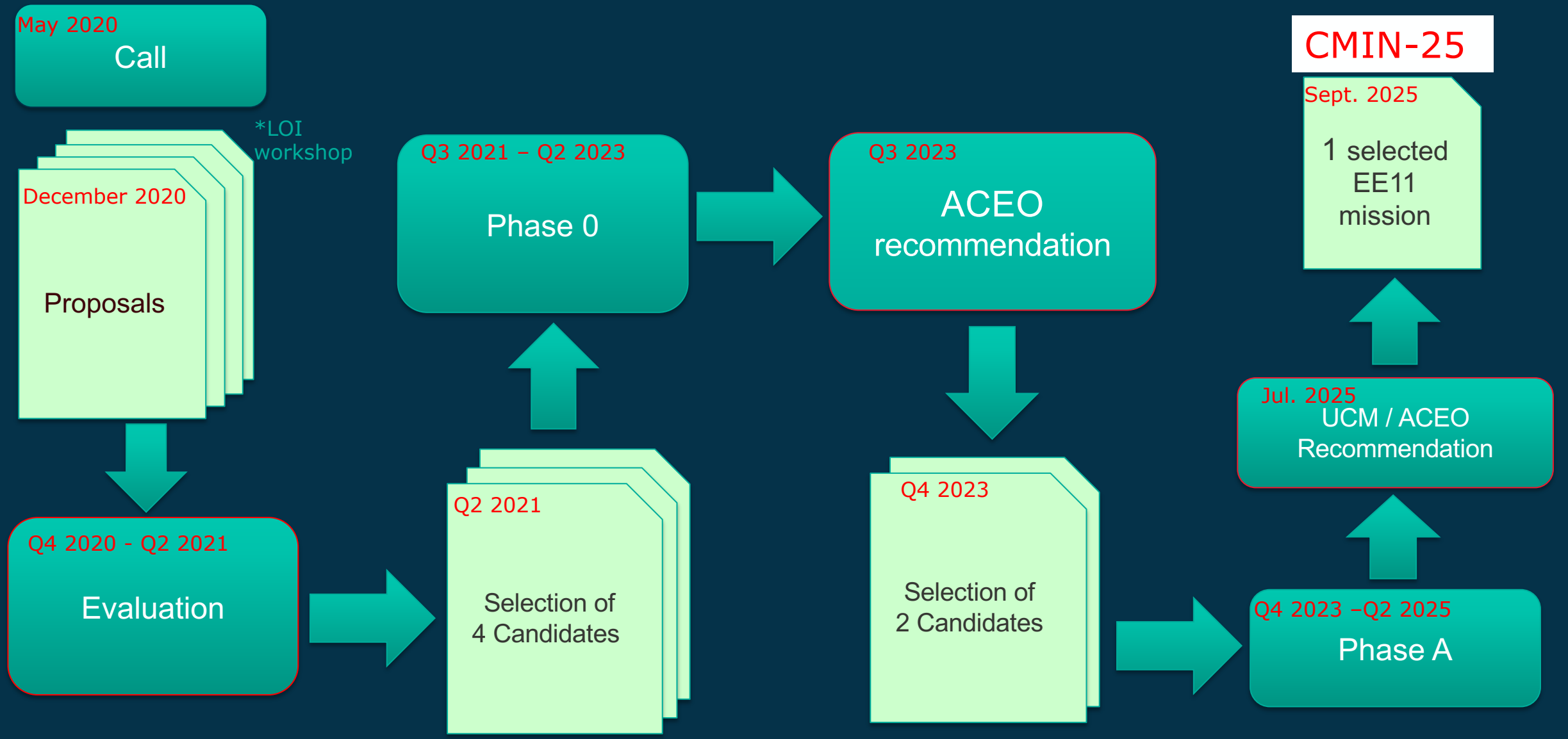
The Future Earth Observation Programme
FutureEO Period-1

Call for Earth Explorer 11 Mission Ideas

25 May 2020

- FutureEO-1 Programme Proposal foresaw a Call for Ideas for a Large Research Mission (Earth Explorer 11) in May 2020
- Responses to the Call could cover potentially any Earth Science topic relevant to the FutureEO Programme, in accordance with the Earth Observation Science Strategy for ESA: A New Era for Scientific Advances and Societal Benefits
- Evidence was requested in the Proposals that a Science Readiness Level (SRL) of 5 can be achieved at the end of Phase A and Technology Readiness Level (TRL) of 5 at the end of phase B1
- Target of a CaC at ~450 M€
- Launcher selection shall follow the ESA launcher policy
- Decision on implementation of EE11 Large Research mission is scheduled to be taken in 2025, prior to the CM-25
- Implementation of the EE11 flagship to be financed by Segment 3 of the FutureEO-1 Programme
- EE11 flagship mission launch target in approximately 2031/2032.

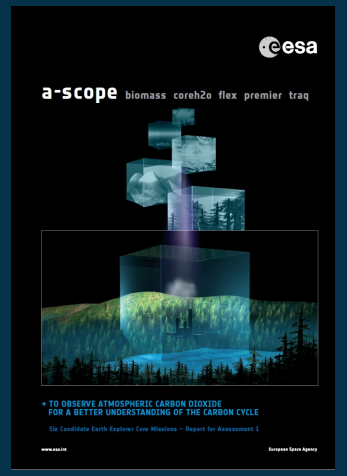
Roadmap to EE11 Mission Selection

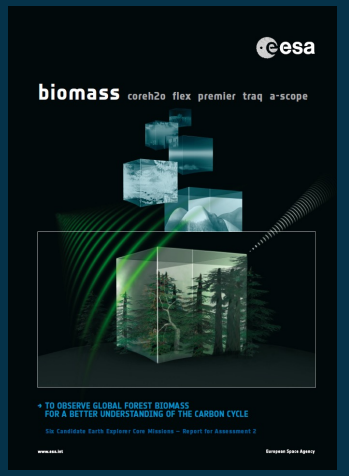


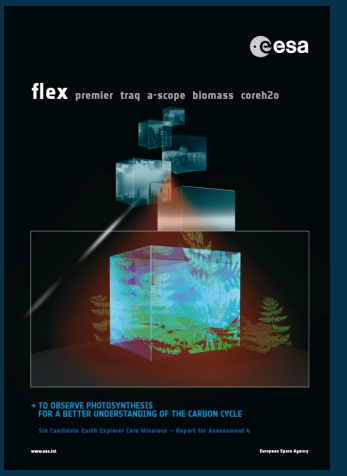
EE11 – Upcoming Key Dates

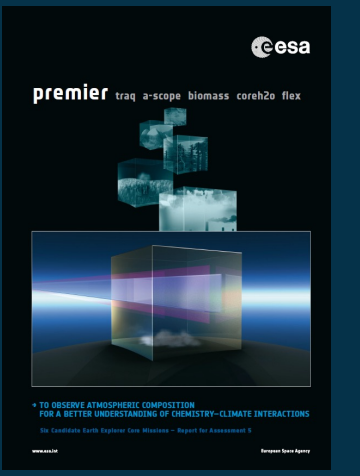
PB-EO 187 Decision to select 4 candidates	10 June 2021
EE11 Mission Advisory Group (MAG) Call	11 June 2021
Science Requirements Consolidation Studies (SciReC) RfQ	7 September – 14 October 2021
1st EE11 MAG Meetings	Mid September 2021
Release of EE11 Phase 0/A/B1 System Studies ITT:	Q4 2021
Kick Off SciReC Studies	Q4 2021
Report for Assessment	Q3 2023

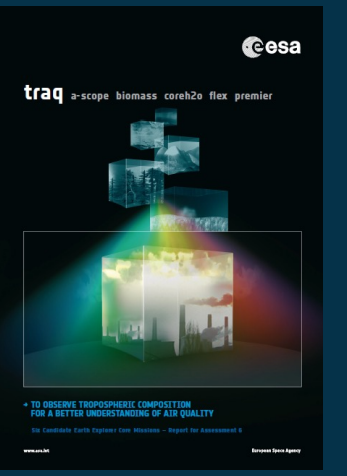
Reports for Assessment



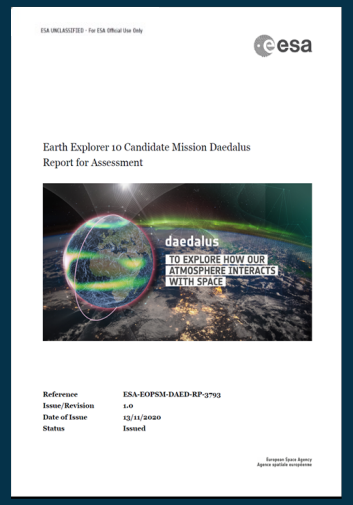


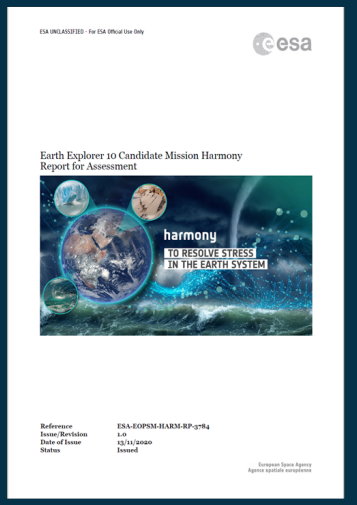


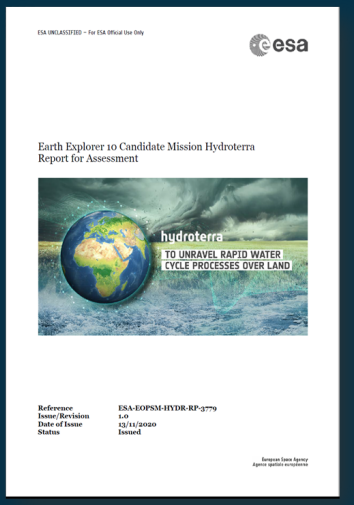




Earth Explorer 7 - SP1313(1-6)







Earth Explorer 10 – RP-3779, RP-3793, RP-3784

https://www.esa.int/Applications/Observing_the_Earth/Future_EO/Preparing_for_tomorrow/Documents_and_publications

Lessons Learned on Scientific Preparation

At selection of EE10 candidates to proceed to Phase A only one candidate was selected due to strict adherence to the industrial cost envelope (225MEuro).

An ACEO-ESA Tiger team was established in Q4 2020 to **analyse and identify lessons learned from the EE10 Phase 0 process**, including the following:

- The approach to mature mission concepts within the cost target established in the Call, whilst preserving the proposed scientific goals and mission objectives;
- The information flow and interactions between the ESA teams and MAG teams throughout Phase 0;
- **Lessons learned** that could be useful for EE11 and future EE Calls.

Key Lessons Learned

The Tiger Team (TT) Recommends:

TT2 - An increase from 3 to 4 Phase 0 studies would significantly lower the risk of only one mission advancing to Phase A.

→ At PB-EO 185 in February 2021, Member States regretted the lack of mission competition, selecting only one EE10 Ph A mission candidate. Based on the Tiger Team recommendation PB-EO noted a preference for "up to four candidate EE11 missions to enter Phase 0" (i.e. modification of original EE11 Call text)

TT5 - The Tiger Team recommends clarifying the governance rules for the Phase 0 in the MAG terms of reference and in the Call, and in particular the expected interactions between MAG members and industrial consortia.

→ Clear MAG Terms of Reference established in EE11 MAG Membership Call - delimiting industry engagement (discussed in MAG #01), to ensure impartial advice and to avoid conflicts of interest

→ On-boarding Mission Information Day planned - ensuring Industry have access to the relevant mission specific information – prior to Consortium Ph 0 Bids

→ Hereafter – No direct MAG – Industry dialogue.

ESA Mission Scientist is the MAG PoC
ESA System Study Lead is the Industry PoC

Lessons Learned – MAGs, ESA and Industry – part I

TT4 - The Tiger Team recommends **a thorough 'onboarding' process**:
At the beginning of Phase 0, ESA should systematically report to the MAGs any scientific, technical and programmatic issue identified in the original Phase 0 mission proposal evaluation. The ACEO/ESA evaluations of the proposed mission idea should be made available to the MAGs as part of the detailed debriefing at the beginning of Phase 0. The debriefing meeting should identify a clear set of activities and key points to manage during the Phase 0 study.

→ EE11 proposal Evaluations relayed to the Proposing teams; critical points identified in MAG#01; and identification of issues to be addressed by the respective MAGs throughout Phase 0

TT7 - It is proposed to **start scientific support activities in advance** of the kick-off of parallel industrial system level study activities in order to better consolidate scientific and technical requirements before passing them on to industry.

→ EE11 Science Requirements Consolidation (SCIReC) Studies - Request for Quotations 7 Sept. (closed 14 Oct. '22): Goal Q4 Kick Off of Requirements Consolidation activities – with opportunity to consolidate requirements prior to Spring 2022 KO of Ph 0 System Studies.

Lessons Learned – MAGs, ESA and Industry – part II

TT6 - It is proposed to **invite nominated MAG representatives to key milestones** of both industrial parallel studies (e.g. mid-term meeting, mission definition review) in order to facilitate information flow between industry and the MAG. An alternative would be to organise a joint workshop or industry day at the beginning of the Phase 0 industrial studies open to both industrial consortia and the MAGs to address and clarify specific topics from the outset.

→ This Mission Information Day has been organised specifically to address TT6

→ MAG scientific/technical representation to be considered for key Industry collocation meetings or milestone reviews

Summary

Phase 0 for an Earth Explorer mission candidate grants a unique opportunity to develop a mission concept delivering ground-breaking new scientific insights into previously unknown and under-researched topics, with broad scientific and societal impact

- Today's Mission Information Day (MID) is a new element of preparation recognising the importance of establishing an on-boarding process for Industry and Scientific teams involved in the four EE11 Candidates
- Phase 0 is a critical phase of mission definition that produces valuable knowledge and experience, both for ESA, the proposers, and the Industry and scientific teams involved
- Critically Phase 0 is an extremely busy interval of time requiring:
  - Clearly defined, robust and traceable mission requirements and technical requirements
  - Effective communication and timely feedback between the Teams
  - A well choreographed suite of synchronised Scientific and Industry study activities must be completed to define the mission concept (and establish SRL 4 - "proof of concept")
- The output of Ph 0 activities shall be summarised in a *Report for Assessment* – as primary input to the Mission Definition Review and ACEO recommendation for Ph A candidate selection in Q3 2023
- We count on Industry and Scientific teams to execute Ph 0 study contracts and to provide timely inputs according to the identified milestones, as governed by the FutureEO Programme timeline.