ARTES 4.0 Technologies and Products

Full Proposal

Part 5

Implementation Proposal for the … Phase

Proposal title

Proposal Reference: reference number

Notes for the use of this template (to be removed from Full Proposal)

***[N.B. Use this template to prepare your Full Proposal. Once the Full Proposal is complete and internally validated, please remove all captions in red colour (instructions for Tenderers), delete all ESA headers/footers, add your own logos, headers/footers prior to finalising your Full Proposal for submission to ESA. The Full Proposal shall be submitted in a searchable and indexed PDF file for easier viewing.]***

This document contains requirements gathered in annex. For convenience, they can be accessed via hyperlinks that are located at the beginning of the section they relate to. These requirements must be taken into account when completing the Proposal.

Material presented in this plain style must not be removed nor modified, unless stated otherwise by an explanatory note.

Parts highlighted in yellow may or may not need to be filled in, depending on the scope of the proposal (please refer to the related explanatory notes to determine if they apply or not).

Text in red font must be modified and/or completed by the Tenderer for the proposed activity (this supplementary information should be presented in plain typeface, i.e. not red, in the final version of the Full Proposal).

Text in blue italics is used for explanatory notes and guidance to help you to develop the Full Proposal content. They should be removed from the final document before submission.

A separate and self-contained Implementation Proposal shall be included **for each Development Phase** for which support is being requested under the ARTES 4.0 Technology & Product Developments Call for Proposals.

Use of this Full Proposal Template is **mandatory**. The Tenderer shall not change the structure of this Full Proposal Template (i.e. the table of contents must remain unchanged) and adhere to its guidelines and requirements. However, the format and lay-out can be modified, e.g. to be in-line with the Tenderer’s corporate identity.

Table of Contents

[1 Content of the Proposed Work 3](#_Toc201845462)

[1.1 Work Breakdown Structure (“WBS”) 3](#_Toc201845463)

[1.2 Work Package Description (“WPD”) 3](#_Toc201845464)

[2 Project Schedule 4](#_Toc201845465)

[3 Prior Work 6](#_Toc201845466)

[4 Review Meeting Plan 6](#_Toc201845467)

[4.1 Review Meetings 6](#_Toc201845468)

[4.2 Progress Meetings 7](#_Toc201845469)

[4.3 LIST OF DELIVERABLE ITEMS 7](#_Toc201845470)

[4.3.1 Deliverable Items 7](#_Toc201845471)

[4.4 LIST OF ITEMS REQUIRED FOR VALIDATION 8](#_Toc201845472)

[4.4.1 Items Required for Validation 8](#_Toc201845473)

[4.4.2 Other items (not deliverable): 9](#_Toc201845474)

[4.4.3 Non-conformances/limitations/additions regarding items for validation 9](#_Toc201845475)

[4.5 MANAGEMENT AND ADMINISTRATIVE COMPLIANCE MATRIX 9](#_Toc201845476)

[Annex 1: Generic Deliverable Documents 11](#_Toc201845477)

[Annex 2: Work Package Descriptions 13](#_Toc201845478)

[Annex 3: Work Package Descriptions (Prior Work) 14](#_Toc201845479)

[Annex 4: Requirements for Proposal Content 15](#_Toc201845480)

# Content of the Proposed Work

|  |  |
| --- | --- |
| **Content Requirements** | **Phase(s)** |
| [5-1](#R1), [5-2](#R2), [5-3](#R3), [5-4](#R4), 5-5 | All |

## Work Breakdown Structure (“WBS”)

The figure below presents the work breakdown structure, covering the entire scope of the proposed work.

The structure and number of Work Packages should be tailored depending on the size and complexity of the activity. In particular, the work breakdown structure may include only a few Work Packages for activities with an ESA price up to 500 k€.

Replace the following diagram with an equivalent showing the proposed work breakdown structure.

**Work breakdown structure**



## Work Package Description (“WPD”)

[For each WP already shown in the WBS: WP Title, Name of responsible company/institute, Name of the WP Manager, Input required to start the work under the WP, Output expected and a description of the tasks included in the WP. Please use the ESA PSS A20 form or an equivalent template, available at <https://esastar-publication.sso.esa.int/supportingDocumentation>.]

A work package description form (PSS-A20) is presented in Annex 2 and Annex 3 (for Prior Work) herewith for each of the work packages at the lowest level of the work breakdown structure.

In general, in case the WBS is based on two levels WPs, the WPDs will refer only to the second level WPs, and the first WPs will not be associated to any WPD.

The work package descriptions comply with the following requirements:

* There is a single work package manager for each work package, who is a member of the key personnel.
* Work packages **at first level** start and end on milestone events, technical "gates” and do not span the entire duration of the activity (except for the project management work package and the closely associated management functions).
* Inputs from other work packages are clearly identified.
* The work to be performed is described in sufficient detail for the Agency to be able to judge the value for money, including scope of work and man-hours.
* Each task is traceable with a corresponding work package output (reporting of results, documentation **deliverable to the Agency).**
* Work packages **at second level** (for the Agency's verification of the work progress) start and end on milestone events and do not span the entire duration of the activity.
* Each work package has at least one traceable work package output (hardware, software and/or documentation item, **to be made available to the Agency upon request and for validation purposes of the achievement of the results of WPDs at first level**).
* All hardware, software and documentation items required for validation are traceable to the identified work packages.

# Project Schedule

|  |  |
| --- | --- |
| **Content Requirements** | **Phase(s)** |
| [5-7](#R8), [5-8](#R9), [5-](#R10)9 | All |
| 5-10 | Demonstration (Ground Segment) |

The project schedule is illustrated in a bar chart in reference, attached to the proposal.

or (delete the inapplicable paragraph)

The project schedule is illustrated in the following bar chart.

Replace the example bar chart below with your own. Bar charts embedded in the proposal document should have sufficient resolution, both on screen and in print, for all elements of the bar chart to be easily read.



#  Prior Work

This proposal does not include Prior Work.

or

(delete the inapplicable paragraph)

This proposal includes Prior Work, which has its own dedicated set of work packages, work package descriptions and complete work package outputs. The Prior Work is presented separately in Annex 3.

We acknowledge and understand that the Prior Work is performed at our financial risk as clarified in the CfP Cover Letter, unless the Cooperative Agreement is awarded by the Agency.

# Review Meeting Plan

## Review Meetings

|  |  |
| --- | --- |
| **Content Requirements** | **Phase(s)** |
| [5-14](#R17), [5-15](#R18) | All |
| [5-17](#R22) | Demonstration (Ground Segment or End-to-End System) |

The proposed review meetings are summarised in the table below. Each review meeting will be attended by the Agency’s representative(s), the project manager, and other members of the project team as required.

Complete the following table as appropriate for the proposed Development Phase. For guidance, typical review objectives are provided in the following Excel® spreadsheet (Please note that “ security” is necessary only when applicable) :



A list of reviews is included in the Table below.

**Review meetings**

|  |  |  |
| --- | --- | --- |
| **Title** | **Date (months)** | **Objectives** |
| Kick-off Meeting | T0 | 1. Present the project and the company(ies)
2. Present the overall project planning
3. Review all planned deliverables
 |
| … | T0 + … | 1. …
2. …
 |
| … | T0 + … | 1. …
2. …
 |
| Phase Completion Review/Final Review | T0 + … | 1. Present a summary of the outcome of the development phase, including conclusions and recommendations.
2. Propose an outline of future product development strategies.
3. Present the test or operational data gathered during the phase.
4. Confirm that all outputs, deliverables and work have been successfully completed/delivered to the satisfaction of the Agency and as defined in theCooperative Agreement.

The following objective applies for a Product or a Demonstration Phase only.1. Estimate the socioeconomic impact of the product development and the subsequent commercialisation of the product.
 |

Include the paragraph below if this Part of the Proposal includes a Ground Segment or End-to-End System Demonstration Phase.

Representatives of the user organisations involved in the trial utilisation of the product shall participate in the on-site acceptance test (SAT).

## Progress Meetings

In addition to these review meetings, progress meetings will be held periodically, with no more than eight (8) weeks between consecutive meetings. The right for ESA to call for specific progress meetings is acknowledged.

The objective of each progress meeting will be to present a summary of the current status of the activity and to report on any problems and schedule slippages.

## LIST OF DELIVERABLE ITEMS

### Deliverable Items

[State your acceptance to deliver all required items as per the Activity Description (in the form of a Deliverable Items List (“DIL”)) and in the Draft Cooperative Agreement (Article 2) included in the CfP (as Appendices 1 and 2, respectively).]

#### Deliverable Items List Tables:

The documents that will be delivered during the project are summarised in the table below. Relevant details of these documents are provided in Annex 1.

| **Name** | **Deliverable Documents** | **Initial Submission** | **Updating** |
| --- | --- | --- | --- |
| *PBC* | *Project Bar Chart* | *within the proposal* | *as part of the MPR and at each Milestone review* |
| *MPR* | *Monthly Progress Report* | *TO + 1 month* | *every month, within first five working days* |
| *MOM* | *Minutes of Meetings* | *NM* | *every meeting* |
| *PWP* | *Project Web Page* | *1st Review Meeting* | *Update provided at FR* |
| *PMR* | *Report(s) as required for each Payment Milestone in line with the General Terms and Conditions Article 2.2* | *Each Payment Milestone Review* | *Each Payment Milestone Review* |
| *ES* | *Executive Summary (short text of half page)* | *FR* |  |
| *HRP* | *High Resolution Image(s)* | *FR* |  |
| *RSS* | *Report on Registration Status for IP* | *FR* |  |
| *PDS* | *Product Data Sheet – for Ground Segment Product Phase* | *FR* |  |
| *CFS* | *Certified Financial Statement* | *FR* |  |
| *PSS* | *Final PSS Forms (A2 + Exhibit A)* | *FR* |  |
| *FRP* | *Final Report (Public)*  | *FR* |  |
| *FRC* | *Final Report (Confidential) – If required* | *FR* |  |
| *SEIQ* | *Socio-Economic Impact Questionnaire* | *FR* |  |
| *JNC* | *Justification for Non- Continuation – If required for Definition or Technology Phase* | *FR* |  |
| *UP* | *Utilisation Plan* | *FR* |  |
| RRS | Report on the Registration Status of Intellectual Property Rights  | FR |  |

## LIST OF ITEMS REQUIRED FOR VALIDATION

### Items Required for Validation

[State your acceptance to submit for validation to ESA all required items as per the Activity Description (in the form of a Items for Validation List (“IVL”)) and in the Draft Cooperative Agreement (Article 2) included in the CfP (as Appendices 1 and 2, respectively).]

Items for Validation List Tables:

The documents that will be submitted during the project for validation are summarised in the table below.

(examples - supporting evidence as requested by the TO which will vary and which will be the items required for validation)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Documents for Validation** | **Initial Submission** | **Updating** |
|  | *Technical Requirements Specification* | *Within Part 3 - Technical Proposal Annex 2* | *RR, PDR, CDR* |
|  | *Requirements Traceability Matrix* | *RR, PDR* | *CDR* |
|  | *Design Justification File* | *PDR* | *CDR* |
|  | *Test Plan* | *PDR* | *TRR, CDR* |
|  | *Test Report* | *TRB* |  |
|  | *Report(s) as required for each Payment Milestone in line with the General Terms and Conditions Article 2.2* | *Each Payment Milestone* | *……………..* |
|  | *……………….* | *……………….* | *……………….* |

#### Documents:

Each document will include a title page reporting the project name, the cooperative agreement number, the title of the document, a reference identifier, the author(s) and related organisation(s), the date of issue and the revision number.

All documents will include a record of the document history, indicating in short for each document revision the corresponding date and the reason(s) for the revision. The relevant copyright marking in line with the Cooperative Agreement provisions shall be clearly identified.

All documentation will be submitted in electronic form, in MS Word or equivalent, with all pictures and tables embedded in the document. The documentation will be able to be printed and will allow the insertion of comments and track changes. Intermediate versions of the documents, before its final official release, shall be submitted in Track Changes.

All documents will be submitted using the Agency’s web-based project planning and collaboration tool. Documents will be submitted at least five working days prior to the associated review.

Example of / items to be validated are provided in the following Excel® spreadsheet (Please note that weather a document contains “ security” elements the related validation item(s) shall be labelled clearly as “security sensitive item” are necessary only when applicable) :



### Other items (not deliverable):

The following table describe the list of Hardware and Software and associated Documentation that will be made available to ESA for validation as part of the proposed Work:

Entries in the table are just examples to be amended as relevant

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Type** | **ID** | **Item description** | **Number of Items** | **Submission Point** | **Notes** |
| Hardware | HW.01 |  | 6 | According to ESA MR | ……… |
| HW.02 |  | 8 | According to ESA MR | Model…. |
| HW.03 |  | 1 | According to ESA MR | Model .... |
| HW.04 |  | 1 | According to ESA MR | ……… |
| ……… |  | ……… |  | ……… |
| Software(\*) | SW.01 |  | 1 | According to ESA MR | ……… |
| SW.02 |  | 8 |  | Embedded in HW.02 |
| ……… |  | ……… |  | ……… |
| Manuals | DOC.01 |  | 8 | According to ESA MR | ……… |
| DOC.02 |  | 1 | According to ESA MR | ……… |
| ……… | ……… | ……… |  | ……… |

(\*) Submission of the Software will be performed by storing the SW modules and versions developed under the project in a secure software repository (on-site or in the cloud). Up to two years after the Cooperative Agreement closure date, ESA will be provided access to the repository by contacting the Project Manager.

### Non-conformances/limitations/additions regarding items for validation

[In case you propose any limitation(s) or even any deletion(s) when compared with the CfP requirements on items for validation, specify it in this section by providing a complete and comprehensive list of such differences, by stating the reason(s) associated with the proposed limitation(s) or deletion(s). If you envisage addition(s), specify any additional items proposed.]

1. Generic Deliverable Documents

**Final Report**

The Final Report shall be prepared in the general form and quality of an item suitable for technical journal publication. It shall be written in a concise yet instructive manner and shall not exceed 20 pages (containing colour photographs, if applicable).

It shall describe the major technical, operational and commercial accomplishments of this Cooperative Agreement, especially:

- objective of the activity

- key issues

- results of the work incl. description of the new product/service developed

- main benefits

- perspective (further technical and commercial evolution).

The final report may be made available to all ESA Participating States and Persons and Bodies. Therefore if the Final Report includes commercially sensitive information, two versions of the final report shall be provided.

The version containing commercially sensitive information shall be marked “Proprietary Information”. The version not containing commercially sensitive information shall not be marked “Proprietary Information”.

**High resolution images**

High-Resolution (>2 MB) Photographs shall be delivered, shall be releasable to the public and shall be delivered in a format that can easily be processed electronically (e.g. not in PDF).

**Video (Optional)**

A video illustrating the results achieved may be delivered using common high-definition video format (e.g. mp4), and shall be releasable to the public.

**Product Data Sheet**

Include the following information if this Part of the Proposal addresses a Ground Segment Product Phase

A Product Data Sheet shall be issued:

For each hardware unit which has been developed and tested within the Cooperative Agreement, providing the functional performances, budgets and environmental specifications.

For each software item which has been developed and tested within the Cooperative Agreement, listing the main functions and the demonstrated performance parameters.

**Monthly Progress Reports**

A concise monthly progress report will be provided to the Agency within the first five working days of each month.

A template can be found at the following link: <https://artes.esa.int/documents><https://artes.esa.int/sites/default/files/MPR_ARTES_3-4_v3.1.doc>

**Minutes of Meetings**

Formal written minutes of meetings attended by the Agency will be agreed and, as far as possible, be signed and made available to the Agency at the end of the meeting. If this is not possible the minutes will be provided to the Agency no later than five working days from the date of the meeting. The minutes will, as a minimum, identify all agreements made and actions accepted during the meeting.

The action item list will be included in the minutes and will be updated in accordance with the meeting outcome. Each action item will be assigned a unique identifier in the format X.Y, where X is the meeting number in which it originated and Y is the action number, starting from 1 at each meeting.

**Project Web Page**

As part of the final data package, the Partner shall produce a Project Web Page which shall be suited for publication by ESA in the Telecommunications and Integrated Applications web site. The Project Web Page shall be produced using the template given under: <http://artes.esa.int/documents>. It shall include a paragraph summarising the most significant achievements of the project.

**Justification for Non-Continuation**

Include this deliverable if this Part of the Proposal addresses a Definition or Technology Phase

In the event that it is no longer proposed to continue with the development at the end of the Definition or Technology Phase, the Partner shall deliver a Justification Letter to the Agency. The Justification Letter shall set out the reasons (technical and/or commercial) for not continuing the development.

**Socio-Economic Impact Questionnaire**

Include this deliverable if this Part of the Proposal addresses a Technology, Product or Demonstration Phase

A Socio-Economic Impact Questionnaire (SEIQ) shall be delivered in one (1) set of documentation each, to the Agency’s authorised representatives not later than fourteen calendar days before the Final Review Meeting.

The Agency shall issue the questionnaire to the Partner not later than 30 calendar days before the Final Review Meeting.

The Agency reserves the right to request up to three updates of the SEIQ within a period of three years following the closure of the Cooperative Agreement.

**Utilisation Plan**

Include this deliverable if this Part of the Proposal addresses a Ground Segment or End-to-End System Demonstration Phase

The Utilisation Plan shall describe the activities to be carried out during the trial utilisation of the product and define the related evaluation framework. It shall consist of the following sections:

* Users: identifying the actors in terms of organisations and user groups that will be involved in the trial utilisation and describing their roles.
* Utilisation baseline: describing the utilisation of the product (e.g. number of utilisation sessions, volume of data exchanged, duration of interactive sessions) and the associated planning (e.g. duration of the trial utilisation stage, starting date of sites used in the trial utilisation).
* Utilisation assessment: intended approach to evaluate the trail utilisation of the product, including success goals, performance criteria (e.g. quality of the product/service, evolution of the number of users, utilisation time etc.).
* Utilisation preparation: describing the content elements that have to be developed or procured in the course of the project as a prerequisite to start the trail utilisation stage (e.g. products, training of people, statement of commitment from user/stakeholders involved in the trial utilisation of the product, planned approach to promote the commercial uptake of the product).
* Utilisation risks: a risk assessment associated with the trail utilisation of the product and your mitigation plan.

**Report on the Registration Status of Intellectual Property Rights**

The Report on the Registration Status of Intellectual Property Rights shall identify the Intellectual Property Rights suitable for registration arising from work performed under the Cooperative Agreement and specify their registration status.

1. Work Package Descriptions

Provide completed work package descriptions for each work package identified in the work breakdown structure

|  |  |
| --- | --- |
| PROJECT: … PHASE: … | WP: … |
| WP Title: …Company: …WP Manager: …Start Event: … Planned Date: …End Event: … Planned Date: … | Sheet … of …Issue Ref …Issue Date … |
| Inputs:…Tasks:…Outputs:…Each work package shall have one or more items as outputs |

1. Work Package Descriptions (Prior Work)

Include only if Prior Work is proposed under the Tenderer’s sole financial risk as clarified in the Cover Letter to the Call for Proposal.

Provide completed work package descriptions for each work package identified in Prior Work

|  |  |
| --- | --- |
| PROJECT: … PHASE: … | WP: … |
| WP Title: …Company: …WP Manager: …Start Event: … Planned Date: …End Event: … Planned Date: … | Sheet … of …Issue Ref …Issue Date … |
| Inputs:…Tasks:…Outputs:…Each work package shall have one or more items as outputs  |

1. Requirements for Proposal Content

| **Requirement** | **Template Section** |
| --- | --- |
| * 1. The Tenderer shall submit a Work Breakdown Structure (WBS) on at least two levels, which shall cover the entire scope of the proposed work. Depending on the size and complexity of the proposed activity, a breakdown to more levels may be necessary.
 | [Section 1](#_Work_Breakdown_Structure)Work Breakdown Structure |
| * 1. The work shall be broken down into work packages, that are task / outcome oriented rather than personnel function related. An exception will be made for the management and quality work packages.
 | [Section 1](#_Work_Breakdown_Structure)Work Breakdown Structure |
| * 1. Each work package at the lowest level of the WBS shall be described in a Work Package Description form. (PSS-A20).
 | [Section 1](#_Work_Breakdown_Structure)Work Breakdown Structure |
| * 1. The WBS/WPD shall be broken down into elements of a value not exceeding 500 KEURO or 2000 man hours, or higher amounts if the nature of the activity so justifies.
 | [Section 1](#_Work_Breakdown_Structure)Work Breakdown Structure |
| * 1. Work package descriptions shall comply with the following requirements:
1. There shall be a single work package manager for each work package.
2. Work packages shall start and end on review events and not span the entire duration of the activity. An exception may be made for the project management work package and any closely associated management function (e.g. Configuration Management, Contractual Management, Financial Control) and Product Assurance / Quality function.
3. Inputs expected from other work packages shall be clearly indicated (i.e. reference shall be made to the contributing work packages).
4. Task descriptions shall describe the work to be performed in sufficient detail for the Agency to be able to judge the value for money (scope of the proposed work versus the associated man-hours).
5. Each task shall be traceable with a corresponding work package output.
6. All hardware, software and documentation items for validation shall be traceable to the identified work packages.
 | [Section 1](#_Work_Breakdown_Structure)Work Breakdown Structure |
| * 1. Whenever a project/activity is considered sensitive, the work breakdown structure shall include a work package addressing Security Management and its integration into the project activities and resulting product. This shall include Security, Security Risk Management and related security certification/accreditation artefacts for the project team and its suppliers and the product during the full system lifecycle in line with the project scope[[1]](#footnote-2).

Whenever a project/activity is considered not sensitive, Risk analysis and security activities may be embedded as a task within the management WP. | [Section 1](#_Work_Breakdown_Structure)Work Breakdown Structure |
| * 1. The Tenderer shall submit a project schedule, which shall cover the entire duration of the proposed work.
 | [Section 2](#_Project_Schedule)Project Schedule |
| * 1. In establishing the project schedule, the Tenderer shall take account of the need of the Agency to review and/or approve intermediate deliverables and shall allow at least 10 working days for the Agency to do this.
 | [Section 2](#_Project_Schedule)Project Schedule |
| * 1. All review meetings and lowest-level work packages shall explicitly be indicated on the project schedule.
 | [Section 2](#_Project_Schedule)Project Schedule |
| * 1. The typical duration of the **Ground Segment Demonstration Phase** shall be between 1 and 2 years.
 | [Section 2](#_Project_Schedule)Project Schedule |
| * 1. The review meeting plan shall include a Phase Completion Review at the end of each Development Phase, unless the Development Phase is the last Development Phase in theCooperative Agreement , in which case the Phase Completion Review is not required and is replaced by the Final Review.
 | [Section 4.1](#_Milestones_and_Review)Review Meetings |
| * 1. The review meeting plan for a Development Phase shall include the mandatory reviews specified in the table for that development phase.
 | [Section 4.1](#_Milestones_and_Review)Review Meetings |
| * 1. If this Part of the Proposal addresses a **Ground Segment or End-to-End System Demonstration Phase,** and if the Tenderer is proposing a Product Phase in association with a Demonstration phase, the Baseline Development Review (BDR), Critical Design Review (CDR) and Factory Acceptance Test (FAT) are not required in the Demonstration Phase review meeting plan
 | [Section 4.1](#_Milestones_and_Review)Review Meetings |

**Mandatory Review Meetings**

[*Back to Requirement 5-12*](#R18)

|  |  |
| --- | --- |
| **Development Phase** | **Domain** |
| **Space Segment** | **Ground Segment** | **End-to-End System** |
| All | Kick-off Meeting,Phase Completion Review or Final Review | Kick-off Meeting,Phase Completion Review or Final Review | Kick-off Meeting,Phase Completion Review or Final Review |
| Definition | Mid Term Review (MTR) | MTR | MTR |
| Technology | Preliminary Design Review (PDR) | PDR | PDR |
| Product | Critical Design Review (CDR), Test Readiness Review (TRR),Test Review Board (TRB) | CDR,TRR,Factory Acceptance Test (FAT) | CDR,TRR,Factory Acceptance Test (FAT) |
|  |  |  |  |

**[END FULL PROPOSAL PART 5 TEMPLATE]**

1. The types of content to be expected for the security process includes:

	* 1. Security approach and Risk Analysis for:
		2. Controls and measures (procedural, technical, physical, personnel) that will be used to ensure the security of the technology being developed, deployed and maintained.
		3. Nature of the product, level of innovation, possible dual-use or governmental use and what measures will be undertaken to ensure the appropriate protection measures.
		4. Identification of potential regulatory constraints and compliance needs and constraints, taking into account the nature of development, the level of TRL and targeted future use (e.g. national regulations to protect CNI, export controls, Personal Data Protection) as well as potential future use in sensitive systems. [↑](#footnote-ref-2)