Statement of Work
ESA Express Procurement EXPRO

SpaceForMed

"Identification of Opportunities to Develop Space-based Services for Transport and Logistics in FEMIP Countries"
CHANGE LOG

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CHANGE RECORD

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1 INTRODUCTION

1.1 Scope of the Document

This document describes the activity to be executed and the deliverables required by the European Space Agency in relation to “Identification of Opportunities to Develop Space-based Services for Transport and Logistics in FEMIP Countries”. This activity is funded under the Space for Med framework sponsored by ESA and the European Investment Bank (EIB).

The study is expected to identify opportunities to develop commercially sustainable integrated services (services based on a combination of space and non-space technologies) that can support the planning, development, operation, maintenance or upgrade of transport and logistics infrastructure in the countries benefitting from EIB’s Facility for Euro-Mediterranean Investment and Partnership (FEMIP) fund.

The Contractor shall perform all tasks defined in this document. Tasks do not have to be limited to the ones specified herein but may also include tasks the Contractor may deem necessary to come up with realistic opportunities both ESA and EIB can leverage on to fulfil the objectives of the Space for Med initiative.

It will be part of the Contract and shall serve as an applicable document throughout the execution of the work.

1.2 Applicable and Reference Documents

1.2.1 Applicable Documents (ADs)

N/A

1.2.2 Reference Documents (RDs)

<table>
<thead>
<tr>
<th>ID</th>
<th>Subject</th>
<th>Source</th>
</tr>
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</table>

1.3 Acronyms and Abbreviations

| AIL | Action Item List |
1.4 Definition of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Asset</td>
<td>Anything tangible or intangible that is capable of being owned or controlled to produce value and that is held to have positive economic value is considered an asset. Simply stated, assets represent ownership of value that can be converted into cash (although cash itself is also considered an asset)</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>End User</td>
<td>See User</td>
</tr>
<tr>
<td>Integrated System / Service</td>
<td>A system / service reliant on the combination of space and non-space assets. In the case of the Integrated Application Promotion programme (ARTES 20), assets from at least two space domains are required.</td>
</tr>
<tr>
<td>Product</td>
<td>A sellable good such as equipment, subsystem, system or service offered by the supplier to the end users, and required by the end users in order to implement his/her application.</td>
</tr>
<tr>
<td>Proof of Concept</td>
<td>Evidence that an idea or concept is feasible or capable of solving a particular problem [meet requirements]</td>
</tr>
<tr>
<td>Scenario</td>
<td>A type of situation in which a service is required. A scenario is a synthetic description of an event or series of actions and events</td>
</tr>
<tr>
<td>Service</td>
<td>An intangible good provided to make available and support a specific application in the end user environment</td>
</tr>
<tr>
<td>Service Provider</td>
<td>The service provider is a group or person providing a product or service, from processing various input, to an (end) user or client organisation, who is using the product or service to support its operational (business) processes</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>A stakeholder is a person or group with an interest in a particular category of product or service, which is critical for the successful implementation of a sustainable service.</td>
</tr>
<tr>
<td>Subsystem</td>
<td>A major part of a system which itself has the characteristics of a system, usually consisting of several components. The subsystem represents the next level of detail in comparison to a system.</td>
</tr>
<tr>
<td>System</td>
<td>A functionally self-contained combination of hardware and/or software products, which represent the technological building blocks required to provide a service. The system, in its turn, can consist of a number of subsystems and equipment, representing a further breakdown of the technological platform.</td>
</tr>
<tr>
<td>User</td>
<td>A user is a person or group with an interest in a particular category of product or service with the aim to receive the benefits of this product or service. One of these benefits may be to support or improve their operational (business) processes. (also End User)</td>
</tr>
<tr>
<td>Use Case</td>
<td>Description of the situation, the set of actions and the involvement of stakeholders / users within a specific scenario for which the system / service will be used.</td>
</tr>
<tr>
<td>User Need</td>
<td>The statement which explains an actual desire of the stakeholders in roughly their own words. What they desire is never exactly what the integrated solution provides.</td>
</tr>
<tr>
<td>User Requirement</td>
<td>A requirement related to a task that the user must be able to accomplish using the system / service under study of an activity. They represent the user expectations which are critical to the success of the system / service and typically include key performance parameters and measures of effectiveness.</td>
</tr>
</tbody>
</table>
1.5 Background and Objective(s)

1.5.1 SpaceForMed Initiative

“Space for Mediterranean” or simply “Space for Med” is a joint undertaking between the European Space Agency (ESA) and the European Investment Bank (EIB). Space for Med will support economic growth in the Southern and Eastern Mediterranean areas by exploring the possibilities offered by space-based services in key economic sectors such as:

1. Energy and Renewable Energies
2. Transport and Logistics
3. Water Management

Space For Med builds upon two programmes: ESA’s Integrated Applications Programme (IAP), aiming to provide new and innovative sustainable services, and EIB’s Facility for Euro-Mediterranean Investment and Partnership (FEMIP), assisting the economic and social development of the Mediterranean countries.

Currently, ESA and EIB are working together in the first phase of the initiative, build around two areas:

- **Awareness Activities**: Direct interaction with potential users and stakeholders will be sought in order to identify needs, discuss the added-value of possible space-based solutions and raise awareness of project opportunities.
- **Project-related Activities**: Feasibility studies and projects, ideally linked to future EIB projects in the region and corresponding to EIB’s objectives. Any study or project will be evaluated jointly by ESA and EIB.

The study “Identification of Opportunities to Develop Space-based Services in the Sector of Transport and Logistics in FEMIP Countries” falls within the category of “Awareness Activities”.

**Integrated Applications Promotion Programme (IAP)**

The European Space Agency (ESA) is Europe’s gateway to space. Its mission is to shape the development of Europe’s space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world.

ESA’s Integrated Applications Promotion Programme (IAP or ARTES 20) is focused in creating new and innovative services to meet the demands of the user communities not familiar with the capabilities of space technologies.

To achieve this, the following objectives of ARTES 20 have been defined:

- Promotion of space applications to a wider range of users, especially those who are not aware of the benefits that space technologies can bring to them,
• Development of new operational and sustainable services for a wide range of users, involving a broader participation by actors on both the demand and supply sides.

• Utilisation of at least two existing and different space assets from two different space domains (such as Satellite Communications, Earth Observation, Satellite Navigation, Human Spaceflight technologies, and others), leading to a better exploitation of existing space capacity and know-how together with a better understanding of how they should evolve to meet user requirements.

• Cross-fertilisation across disciplines, together with the development of a consistent approach across Integrated Applications initiatives, to maximise their efficient and cost-effective implementation.

IAP emphasizes all business-related aspects of the proposed services, which developed in the frame of the programme, have the potential to become operational in the short term, and commercially sustainable shortly afterwards.

_Facility for Euro-Mediterranean Investment and Partnership (FEMIP)_

The European Investment Bank (EIB) is the long-term lending institution of the European Union (EU), owned by its Member States. It makes long-term finance available for sound investment in order to contribute towards EU policy goals.

Through its Facility for Euro-Mediterranean Investment and Partnership (FEMIP) EIB has undertaken since 2002 to support in very tangible terms its partners economic and social development, in order to improve the living conditions of their citizens – an undertaking that has constantly been reaffirmed over the years, resulting in an overall investment of more than €13 billion. This resulted in support for projects in the key sectors of industry, energy, transport and water, to which EIB added value provided through its advice and technical and financial expertise, has been allied to the stepping-up of its bilateral and multilateral cooperation.

FEMIP activities are currently targeting the following countries: Morocco, Algeria, Tunisia, Egypt, Gaza / West Bank, Israel, Jordan, Lebanon and soon Libya.
1.5.2 Background

Transport and Logistics Landscape in FEMIP Countries

The last decade has been marked by a significant economic growth in many African and Midde-East countries, including FEMIP, with some exceptions. May reports, including AfDB’s African Development Report 2012 recognises this; business opportunities are flourishing in these countries despite the existing boundaries. In particular, limited trade capacity, severe supply-side constraints and high transport costs endangers the competitiveness of the most promising FEMIP economies.

In general, transport systems in FEMIP countries are relatively well developed. Most countries have extensive road networks, a sizeable rail network as well as important facilities for air and sea transport. Nevertheless, the quality of the transport network is often deficient and cannot support growing economies. The connecting infrastructure networks in FEMIP or the ones connecting FEMIP with other regions (sub-Saharan Africa or Middle East mostly) are either dilapidated or under pressure of increased traffic, and this delays and hinders the movement of goods. Poor transport infrastructures, influencing transport costs considerably, represents a major bottleneck to sustainable growth.

To ensure the sustainable development of FEMIP countries, all the ingredients to build, maintain and expand infrastructure have to be in place; these include amongst others strong public-private partnerships, exploring future co-financing opportunities or putting in place adequate policy frameworks.

At a time when the World’s economy is showing tentative signs of recovery from the global financial and economic crisis, boosting competitiveness will be crucial to FEMIP economic growth. Improving logistics to reduce trade costs is thus essential for FEMIP countries to improve their competitiveness, and since the bulk of their trade is outside the region,
transits through ports, maritime costs are crucial. Improving efficiency in ports is one way to reduce these costs.

Some of the key issues of FEMIP countries regarding transport and logistics are the following ones:

1. Increase transport efficiency to facilitate trade and growth.
2. Expand capacity of transport networks and logistics centres to increase internal and international trade.
3. Upgrade urban transport services.
4. Expanding transport and logistics networks in rural areas, including the development of public transport networks connecting rural with urban areas.
5. Mitigate the contribution of the transport and logistics system to climate change.
6. Optimise infrastructure to facilitate inter-modal transport.

*The Added-Value of Space Applications*

Apart from capital to build the infrastructure, there is a whole framework to be placed around infrastructure to deploy, operate, maintain and upgrade it. This framework focuses mostly on:

- The “hard” infrastructure characteristics of specific transport infrastructure (seaports, warehouses, depots, factories, distribution points, etc.) which are built for a specific capacity and achieving certain efficiency.
- The “soft” infrastructure focuses on the need for a robust institutional and regulatory framework in order to improve the business enabling environment and attract private sector investment
- All the transport networks meaning roads, railroads and waterways linking centres of production and markets. Preforming trade corridors are important to improve regional integration, particularly for landlocked countries.
Space-based applications tend to add to the transport networks a satellite infrastructure delivering multiple services ranging from fall-back to distributed interactive logistic and transport solutions that might include:

- Regular weather information update.
- Fleet logistics and traffic assessment.
- Dynamic logistics and support to real-time management of trade goods.
- Real-time monitoring of goods while in transit.

The above and other innovative services can have a significant impact during the capital investment phase and also during the infrastructure exploitation phase. It is necessary to understand what can be the possible cost-savings, together with the additional benefits brought.

### 1.5.3 Objective(s) of the Activity

The objective of this study is to identify opportunities in the FEMIP countries where integrated services (combining space and non-space technologies) can improve the current development, operation and maintenance of infrastructure related to transport and logistics. These opportunities should be ideally linked (but not restricted) to related EIB’s infrastructure projects or lead to future EIB investments in the FEMIP countries.

The scope of activities to achieve this objective includes:

- To understand the needs of the user and stakeholder community in specific domain areas regarding transport and logistics and identify promising opportunities.
• To provide a first implementation roadmap for those opportunities addressing the technical as well as the business aspects.

• To explore tentatively the possibilities offered by space assets to meet the identified needs and requirement and define opportunities to implement integrated services (combining space and non-space assets).

The outcomes of the study will be considered by both ESA and EIB for further implementation through the appropriate mechanisms. Interested partners shall be aware that ESA and EIB are defining a specific framework to support the development and transition into operations of the opportunities identified during this study. A briefing about this mechanism will be provided upon signature of the contract.

Attention is driven to the fact that the final objective of the study is to identify opportunities in both the infrastructure and the services domain, but the services shall be always related to the infrastructure. An example of this in another economic sector will be a solar power plant as an infrastructure and improved power prediction as a service.

Services shall be based on existing or ready-to-market space assets and shall demonstrate a strong case for:

i) increase the revenues generated by the infrastructure and/or;

ii) minimise the risk of repaying capital invested upfront by financial entities / arms to develop the infrastructure.
2 WORK TO BE PERFORMED

2.1 Work Logic

The work logic is organised around three main tasks, representing the minimum of tasks to be covered within the study.

Section 2.2 describes the proposed tasks in detail.

2.2 Tasks

2.2.1 Task 1: Analysis of the Current Situation in FEMIP Countries and Stakeholder Federation

Input

- SoW
- Reference Documents.

Task description

The objectives of this task are the following:

- To understand the current situation in selected FEMIP countries regarding development, operations and maintenance transport networks and logistics.
- To identify and engage with the relevant user and stakeholder community of selected FEMIP countries.
• To understand the needs and requirements of the user and stakeholder community in terms of infrastructure and services related to transport networks and logistics.

The Contractor shall define the context within which Tasks 2 and 3 will be addressed. The aim is not to make a general or regional analysis but to focus on specific areas, sectors or cases within individual countries, where there is a need for transport and logistics infrastructure that is likely to require large-scale development effort and associated investment.

The contractor shall perform as a minimum the following sub-tasks, but not necessarily in the order listed:

1. Describe the situation regarding the existing transport infrastructure / logistics in selected FEMIP countries, in particular:
   • Describe the nature and status of existing related infrastructure and services, including the associated supply chains (construction, operation and maintenance).
   • Investigate the challenges faced by current existing infrastructure / services as well as existing plans / strategies / policies to improve them.

2. Identify relevant stakeholders dealing directly / indirectly in a number of areas requiring transport and logistics infrastructure and engage with them:
   • Identify the most important players per selected country and map them along the relevant supply chains related to transport and logistics areas upon which the study shall be focused (e.g. construction, operation, maintenance, regulation, finance).
   • Prepare dossiers regarding each identified stakeholder describing their nature, structure, organisation and business activities; identify key people inside each stakeholder organisation to be contacted.
   • Contact the relevant stakeholder organisations and introduce them the SpaceForMed initiative and its objectives.

3. Discuss with the engaged user / stakeholder community and identify relevant needs, in particular:
   • Define and discuss the relevant operational scenarios regarding planning, development, operation, maintenance and evolution of transport infrastructure and logistics; consider the implications of future plans / strategies / policies / constraints in the defined relevant operational scenarios.
Based on the discussions with the user communities, identify needs for infrastructure as well as related applications (services), and validate them with the engaged stakeholders; regarding applications, prioritise the identified applications and find out the most important and/or critical ones.

Define an initial set of requirements for the identified applications.

The format of the discussion will be up to the Contractor, but should be agreed in advance with ESA; these may include interviews, phone discussions, organisation of workshops, attending conferences, etc.

**Output / Approval conditions**

The contractor shall present the outcomes of this task in the following documents:

- Deliverable D1.1: “Understand the Current Situation in FEMIP Countries Regarding Transport Networks and Logistics”.
- Deliverable D1.2: Dossiers associated to each of the identified stakeholders, including names and contact addresses of the people contacted.

### 2.2.2 Task 2: Identification of Opportunities

**Input**

- SoW
- Reference Documents.
- Task 1 deliverables (in draft or final stage)

**Task description**

The objectives of this task are the following:

- To define opportunities to implement integrated space-based services in line with the outputs of Task 1.
- To identify the gap between the user needs/requirements and the currently available solutions and services;
- To tentatively explore the possibilities offered by space assets to meet in a cost/effective way the user needs and requirements defined.

This task shall focus only on opportunities that have the potential to involve large-scale infrastructure development projects, which are likely to be suitable for support through ESA or EIB mechanisms (loans, co-funding, etc).
The contractor shall perform as a minimum the following sub-tasks, but not necessarily in the order listed:

1. Based on the work done under Task 1, define concrete and realistic opportunities to develop infrastructure and integrated services (combining space and non-space technologies) related to transport and logistics infrastructure, including:
   - The purpose of the opportunity as well as the user needs to be satisfied.
   - The opportunity scenario, including the related infrastructure to leverage on (transport, logistics, telecommunications, etc.) and its status in the proposed scenarios (existing, under development, planned, etc.).
   - An high-level design of the solution / service to be developed.
   - An overview of the regulatory situation that might affect the infrastructure and / or the provision of the defined services.
   - A preliminary cost / benefit analysis for each opportunity, as well as the business perspective.
   - Consider the following timescales: short term (less than two years from now), medium term (between two and five years from now) and long terms (more than 5 years from now).

2. Investigate and compare solutions and services currently existing for each of the applications identified in Task 1 and propose the ones likely to be used. This shall include as minimum:
   - A trade-off analysis (technical, economical and regulatory).
   - A gap analysis vs. the user needs, including the nature of the gap (infrastructure readiness, technology, financial, regulatory, etc.).
   - A high-level list of the required developments, modifications or enhancements needed to satisfy user requirements which cannot be met by existing solutions and services, including the regulatory and financial frameworks if applicable.
   - A justified scoring of the different existing technologies, assets and services analysed.

The analysis shall consider the role of space technologies for each of the opportunities, but shall not be restricted to them.

**Output / Approval conditions**

The Contractor shall present the outcome of this task in the following documents:

- Deliverable D2.1: “Identification of Opportunities”.
• Deliverable D2.2: An executive summary presentation (e.g. a power point presentation) of the identified opportunities.

### 2.2.3 Task 3: Roadmap towards Opportunity Building

#### Input
- SoW
- Reference documents.
- Task 1 deliverables (in draft or final stage).
- Task 2 deliverables (in draft or final stage).

#### Task description

The objectives of this task are the following:
- To select the most promising opportunities to develop infrastructure and associated space-based services, both related to transport and logistics in FEMIP countries.
- To provide a tentative implementation roadmap for those opportunities.

This task shall focus only on those opportunities showing potential for large-scale development projects that are likely to be suitable for support through ESA or EIB mechanisms (loans, co-funding, etc), and have a high probability of being realisable.

The following are the minimum requirements of the Agency to meet the objectives of this task. ESA does not expect the Contractor to follow the requirements in the presented order:

1. Out of the opportunities identified during Task 2, identify and justify the most promising ones related to:
   - Development of infrastructure associated to transport and logistics infrastructure, in terms of new developments, upgrading or maintenance; the contractor shall identify the 1-2 most promising opportunities in the medium-to-long term.
   - Development of (space-based) services associated to infrastructure to improve development, operation or maintenance of transport and logistics infrastructure; the contractor shall identify 1-2 opportunities in the short-to-medium term.
The selection methodology shall be discussed with ESA, and may be based on both qualitative and quantitative aspects; the methodology shall include, but not limited to, business considerations.

2. Provide a tentative implementation roadmap for both the infrastructure and the service development opportunities, including:
   - A descriptive overview of the necessary activities to achieve an operational infrastructure and/or sustainable service; these activities should include, amongst others, stakeholders to be engaged, milestones to achieve, systems to be developed or capital to be raised.
   - An overview of the challenges to address and critical success factors to meet, inserting them in a time planning towards the successful implementation of a sustainable service; consider also a preliminary identification of risks and mitigation strategies.
   - For each opportunity, identify and describe the critical path as well as the resources required.
   - Define the scope and tasks of possible feasibility studies / demonstration projects, and consider them as part of the roadmap.

Output / Approval conditions
The Contractor shall present the outcome of this task in the following documents:
   - Deliverable D3.1: “Roadmap towards Opportunity Building”.
   - Deliverable D3.2: An executive presentation (e.g. in Power Point) explaining each of the opportunities, the designed roadmap and the main benefits expected.
3 REQUIREMENTS FOR MANAGEMENT, REPORTING, MEETINGS AND DELIVERABLES

The following are the requirements for Management, Reporting, Meetings and Deliverables applicable to the present activity.

3.1 Management

3.1.1 General
The Contractor shall implement effective and economical management for the project.
His nominated Project Manager shall be responsible for the management and execution of the work to be performed and, in the case of a consortium, for the coordination and control of the consortium’s work.

3.1.2 Communications
All communications to the Agency shall be addressed to the Agency’s representatives nominated in the Contract.

3.2 Access
During the course of the contract the Agency shall be afforded free access to any plan, procedure, specification or other documentation relevant to the programme of work.

3.3 Reporting

3.3.1 Minutes of Meeting
The Contractor is responsible for the preparation and distribution of minutes of meetings held in connection with the Contract. Electronic versions shall be issued and distributed to all participants, to the Agency’s Technical Officer and to the ESA Contracts Officer, not later than 10 days after the meeting concerned.

The minutes shall clearly identify all agreements made and actions accepted at the meeting.

3.3.2 Bar-chart Schedule
The Contractor shall be responsible for maintaining the bar-chart for work carried out under the Contract, as agreed at the kick-off meeting.

The Contractor shall present an up-to-date chart for review at all subsequent meetings, indicating the current status of the contract activity (WP’s completed, documents delivered, etc.).
3.3.3 Progress Reports
Every month, the Contractor shall provide a Progress Report in electronic format to the Agency’s representatives, covering the activities carried out under the Contract. This report shall refer to the current activities shown on the latest issued bar-chart and shall give:

- Action items completed during the reporting period;
- Description of progress: actual vs schedule, milestones and events accomplished;
- Reasons for slippages and/or problem areas, if any, and corrective actions planned and/or taken, with revised completion date per activity;
- Events anticipated during the next reporting period (e.g. milestones reached);
- Milestone payment status.

3.3.4 Problem Notification
The Contractor shall notify the Agency’s representatives (Technical Officer and Contracts Officer) of any problem likely to have a major effect on the time schedule of the work or to significantly impact the scope of the work to be performed.

3.3.5 Technical Documentation
As they become available and not later than the dates in the delivery plan, the Contractor shall submit for the Agency’s approval Technical Notes, Task/WP Reports, etc.

Technical documentation to be discussed at a meeting with the Agency shall be submitted electronically two weeks prior to the meeting.

Technical documents from Subcontractors shall be submitted to the Agency only after review and acceptance by the Contractor and shall be passed to the Agency via the Contractor’s formal interface to the Agency.

During the execution of the contract the web based project planning and collaboration tool accessible under http://telecom.esa.int/collaboration_tool, shall be used. This collaborative environment is made available free of charge by ESA for the duration of the contract, and it is intended to replace the usual electronic communication tools (e.g. e-mail with attached document and/or FTP) within the project team and in the communication with ESA, as well as for recording and tracking Action Items.

Unless otherwise agreed with ESA and formalised in the minutes of the negotiation/kick-off meeting, the Contractor shall provide at the Kick-Off Meeting the name of the person to be appointed as administrator of the account. The Agency will activate within one week from the negotiation/kick-off meeting an account dedicated to the project team.
“The distributed project collaboration tool applicable to this study will be Daptiv [www.daptiv.com]. Information and tutorials on Daptiv can be found under http://telecom.esa.int/telecom/www/object/index.cfm?fobjectid=30279.

### 3.4 Meetings

The following meetings shall take place:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiation Meeting (NM)</td>
<td>To</td>
<td>ECSAT (Harwell, UK)</td>
</tr>
<tr>
<td>Mid Term Review (MTR)</td>
<td>To + 2.5 months</td>
<td>Teleconference</td>
</tr>
<tr>
<td>Final Review (FR) and Final Presentation (FP)</td>
<td>To + 5 months</td>
<td>Luxembourg (TBC)</td>
</tr>
</tbody>
</table>

Table 1: Meeting list

The kick-off meeting shall take place by video- or tele-conference. Progress Meetings shall be held at approximately 2- to 3-monthly intervals, by video- or teleconference. The final presentation, co-located with the Final Review, shall take place at the premises indicated above. Additional meetings may be requested either by the Agency or the Contractor to be conducted by teleconference / videoconference. EIB will be invited to any meetings. With due notice to the Contractor the Agency reserves the right to invite Third Parties to meetings to facilitate information exchange. For each meeting the Contractor shall propose an agenda in electronic form and shall compile and distribute hand-outs of any presentation given at the meeting.

### 3.5 Deliverable Items

In addition to the documents to be delivered according to section 3.3 here above, the following documentation and additional items shall also be deliverable.

All documentation deliverables mentioned hereunder (including all their constituent parts) shall also be delivered in electronic form in a format agreed by the Agency (PDF format, the native format and in other exchange formats where relevant).
All the documentation shall be delivered on computer readable media (e.g. CD-ROM, DVD-ROM) as agreed by the Agency with in addition 2 paper copies.

The draft version of the documentation shall be sent to the Technical Officer in electronic format not later than two weeks before the documentation is to be presented. The final version shall be provided in a number of copies specified in the Statement of Work.
<table>
<thead>
<tr>
<th>Doc ID</th>
<th>Title</th>
<th>Milestone</th>
<th>No. of copies / Format</th>
<th>Deliver to</th>
<th>e-copy to DMS (*)</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>D1.1</td>
<td>Technical note on “Understand the Current Situation in FEMIP Countries Regarding Transport and Logistics”</td>
<td>MTR, FR</td>
<td>Electronic</td>
<td></td>
<td></td>
<td>Agency’s Technical Officer</td>
</tr>
<tr>
<td>D1.2</td>
<td>Dossiers associated to each of the identified stakeholders, including names and contact addresses of the people contacted.</td>
<td>MTR, FR</td>
<td>Electronic</td>
<td></td>
<td></td>
<td>Agency’s Technical Officer</td>
</tr>
<tr>
<td>D2.1</td>
<td>Technical note on “Identification of Opportunities”</td>
<td>MTR, FR</td>
<td>Electronic</td>
<td></td>
<td></td>
<td>Agency’s Technical Officer</td>
</tr>
<tr>
<td>D2.2</td>
<td>Executive presentation of the identified opportunities</td>
<td>MTR, FR</td>
<td>Electronic</td>
<td></td>
<td></td>
<td>Agency’s Technical Officer</td>
</tr>
<tr>
<td>D3.1</td>
<td>Technical note on “Roadmap towards Opportunity Building”</td>
<td>FR</td>
<td>Electronic</td>
<td></td>
<td></td>
<td>Agency’s Technical Officer</td>
</tr>
<tr>
<td>D3.2</td>
<td>Presentations on promising opportunities and development</td>
<td>FR</td>
<td>Electronic</td>
<td></td>
<td></td>
<td>Agency’s Technical Officer</td>
</tr>
</tbody>
</table>

Documents shall be submitted electronically during the course of the activity. Hardcopies and CD-ROMs (as per contract) shall be submitted after the FR meeting and only after the Agency has fully accept them.
<table>
<thead>
<tr>
<th>Deliverables</th>
<th>Format</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Report</td>
<td>FR, Contract Closure</td>
<td>Electronic</td>
</tr>
<tr>
<td>Contract Closure Summary**</td>
<td>Contract Closure</td>
<td>Electronic (PDF)</td>
</tr>
</tbody>
</table>

**Table 2: Deliverables list**
Definitions of Deliverable Documents

- **D1.1** Technical note on “Understand the Current Situation in FEMIP Countries Regarding Transport and Logistics”
  Definition of deliverable D1.1 is found in section 2.2.1.

- **D1.2** Dossiers associated to each of the identified stakeholders, including names and contact addresses of the people contacted
  Definition of deliverable D1.2 is found in section 2.2.1. This deliverable is intended to summarise relevant contacts made during the course of Task 1.

- **D2.1** Technical note on “Identification of Opportunities”
  Definition of deliverable D1.1 is found in section 2.2.2.

- **D2.2** Executive presentation of the identified opportunities
  Definition of deliverable D2.2 is found in section 2.2.2. This deliverable is intended to summarise the opportunities identified in a format suitable for presentation and promotion purposes.

- **D3.1** Technical note on “Roadmap towards Opportunity Building”
  Definition of deliverable D3.1 is found in section 2.2.3.

- **D3.2** Presentations on promising opportunities and development roadmaps
  Definition of deliverable D3.2 is found in section 2.2.3. This deliverable is intended to summarise the roadmaps defined in a format suitable for presentation and promotion purposes.

- **Final Report**
  The Final Report shall provide a complete description of all the work done during the activity and shall be self-standing, not requiring to be read in conjunction with reports previously issued. It shall cover the whole scope of the activity, i.e. a comprehensive introduction of the context, a description of the programme of work and report on the activities performed and the main results achieved. It shall consist of 50-200 pages and shall not contain Proprietary Information.

  The front cover of the Final Report shall carry the following text within a delineated box of at least 10 cm x 4 cm, preferably located in the top or bottom left-hand corner of the cover:

  **CONTRACT FINAL REPORT**

  The work described in this report was done under ESA contract.
  Responsibility for the contents resides in the author or organisation that prepared it.

  This document was produced with the financial assistance of the FEMIP Trust Fund. This fund was established in 2004 and has been financed – to date – by 16 EU Member States and the European Commission, and is managed by the European Investment Bank. It is
intended to support the development of the private sector via the financing of studies and technical assistance measures and the provision of private equity.

The authors take full responsibility for the contents of the document. The opinions expressed do not necessarily reflect the views of the European Union or the European Investment Bank.

- **CONTRACT CLOSURE SUMMARY**
  The Contract Closure Summary is a mandatory deliverable, due at the end of the contract. For the avoidance of doubt, “end of the contract” shall mean the finalisation of a series of tasks as defined in a self-contained Statement of Work. The contents of the Contract Closure Summary shall conform to the layout provided in Annex A hereto.

### 4 SCHEDULE AND MILESTONES

#### 4.1 Duration
The duration of the work shall not exceed 5 months from kick-off to end of the activity (delivery of the Draft Final Report or hardware or software).

#### 4.2 Milestones
The following milestones shall apply:

- **Kick-off meeting (T0):** Start of the activity.
- **MTR (T0+ 2.5 months):** Conclusion of Task 2.
- **FR: (T0+5 months):** Conclusion of all study Tasks.
APPENDIX A. LAYOUT FOR CONTRACT CLOSURE SUMMARY

Contract Closeout Summary
for
ESA/ESTEC Contract Nr. [Contract Number]
[Title of Activity],
hereinafter referred as the “Contract”

A1. Parties, contract duration and financial information

| Contractor |  |
| Subcontractor(s) (state if not applicable) |  |
| Contract Duration (insert the dates; see Article 7.1 of the Contract; also per phase, if applicable) | From: |
| | To: |
| Total Contract Price and total contract value (in case of co-funding; state if not applicable) | EUR |
| | EUR |
A2. Recapitulation of deliverable items

Items deliverable under the Contract

If any of the columns do not apply to the item in question, please indicate “n/a”.

Items deliverable according to the Statement of Work

<table>
<thead>
<tr>
<th>Type</th>
<th>Ref. No.</th>
<th>Name/Title</th>
<th>Description</th>
<th>Property of</th>
<th>Rights granted / Specific IPR conditions¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹e.g. IPR constraints, deliverable containing proprietary background information (see also 2.1.2 below)
Background information used and delivered under the Contract (see Article 6.3 of the Contract)

The following background information has been incorporated in the deliverable(s):

<table>
<thead>
<tr>
<th>Proprietary Information (title, description)</th>
<th>Owner (Contractor, Sub-Contractor(s), third party/ies)</th>
<th>Affected deliverable (which documents, hardware, software, etc.)</th>
<th>Description impact on ESA’s rights to the deliverable(^1)</th>
<th>Other/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) if not explicitly stated otherwise, the contractual stipulations shall prevail in case of conflict with the description provided in this table
A3. Output from / achievements under the Contract

3.1 Technology Readiness Level (TRL)

Indicate the TRL of the technology developed under the Contract using the classification given below:

<table>
<thead>
<tr>
<th>Initial TRL</th>
<th>Planned TRL as activity outcome</th>
<th>Actual TRL at end of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic principles observed and reported</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Technology concept and/or application formulated</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Analytical and experimental critical function and/or characteristic proof of concept</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Component and/or breadboard validation in laboratory environment</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Component and/or breadboard validation in relevant environment</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>System/subsystem model or prototype demonstration in a relevant environment</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>System prototype demonstration in an operational environment</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Actual system prototype completed and ‘flight qualified’ through test and demonstration</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Actual system ‘flight proven’ through successful mission operations</td>
<td></td>
</tr>
</tbody>
</table>

Note: The TRL shall be assessed by ESA. The Agency’s responsible Technical Officer shall verify TRLs 1-4 while TRLs 5-9 shall be assessed through an ESA-internal formal procedure.

3.2 Achievements and Technology Domain

Provide a concise description (max 200 words) of the achievements of the contract and its explicit outcome (including main performances achieved): please refer to the final documentation (e.g. Final Report)

Please indicate the Technology Domain (TD 1 to 25) of the development (please tick off):

| 1 | On-Board Data Systems |
| 2 | Space System Software |
| 3 | Spacecraft Electrical Power |
| 4 | Spacecraft Environment & Effects |
| 5 | Space System Control |
| 6 | RF Payload and Systems |
| 7 | Electromagnetic Technologies and Techniques |
| 8 | System Design & Verification |
| 9 | Mission Operations and Ground Data Systems |
| 10 | Flight Dynamics and GNSS |
| 11 | Space Debris |
| 12 | Ground Station System & Networking |
| 13 | Automation, Telepresence & Robotics |
| 14 | Life & Physical Sciences |
| 15 | Mechanisms & Tribology |
| 16 | Optics |
| 17 | Optoelectronics |
| 18 | Aerothermodynamics |
| 19 | Propulsion |
| 20 | Structures & Pyrotechnics |
| 21 | Thermal |
| 22 | Environmental Control Life Support |
| 23 | EEE Components and Quality |
| 24 | Materials and Processes |
| 25 | Quality, Dependability and Safety |
3.3 Application of the output / achievements

Please tick off as appropriate:

☐ Possible use in programme:

..........................................................................................

Please indicate the service domain (see table) relevant to a possible application

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earth Observation</td>
</tr>
<tr>
<td>2</td>
<td>Science</td>
</tr>
<tr>
<td>3</td>
<td>Human Spaceflight and Exploration</td>
</tr>
<tr>
<td>4</td>
<td>Space Transportation</td>
</tr>
<tr>
<td>5</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>6</td>
<td>Navigation</td>
</tr>
<tr>
<td>7</td>
<td>Generic Technologies and Techniques</td>
</tr>
<tr>
<td>8</td>
<td>Security</td>
</tr>
<tr>
<td>9</td>
<td>Robotic Exploration</td>
</tr>
</tbody>
</table>

☐ Actual use in programme:

..........................................................................................

Please describe the specific programme and application or mission for which the output of this contract is or will be used.

3.4 Further steps / expected duration

Please tick off as appropriate:

☐ No further development envisaged.

☐ Further development needed:

..........................................................................................

Please describe further development activities needed, if any, to reach TRL 5/6 including an estimate of the expected duration.

3.5 Potential non-space applications

..........................................................................................

Describe any potential non-space applications or products that may benefit from the technology that has been developed. Emphasize potential markets and costumers where known.

..........................................................................................

Describe the principle features of technology that would be required in a technology demonstrator for any identified non-space application. Include an estimate of the resources in time and money that would be required.
A4. Statement of Invention

[OPTION 1: NO INVENTION]
In accordance with the provisions of the above Contract, ..........[Company] hereby certifies both on its own behalf and that of its consortium/Sub-Contractor(s), that no Intellectual Property Right(s) has(ve) been registered in the course of or resulting from work undertaken for the purpose of this Contract.

[END OPTION 1]

[OPTION 2: INVENTION]
In accordance with the provisions of the above Contract, ..........[Company] hereby certifies both on its own behalf and that of its consortium/Sub-Contractor(s) that the following Intellectual Property Right(s) has(ve) been registered in the course of or resulting from work undertaken for the purpose of this Contract:

..........................

The Agency’s rights on such Registered Intellectual Property Rights shall be in accordance with Article 6 of the above Contract.

[END OPTION 2]