



Public

ESA IAP activity proposals – Guidelines for obtaining NL delegation support

Version NSO-ESA/IAP/2018/01

Date	28 Februari 2018
Status	Final

Colophon



Netherlands Space Office is a cooperation of the Ministry of Economic Affairs and Climate Policy, the Ministry of Education, Culture and Science, the Ministry of Infrastructure and Water Management and the Netherlands Organisation for Scientific Research.

Version	NSO-ESA/IAP/2018/01
Contact	Bert Meijvogel Sr. Advisor Technology transfer & Telecom NL Delegate ESA JCB T +31 88 602 45 29 M +31 6 515 300 33 b.meijvogel@spaceoffice.nl Netherlands Space Office Prinses Beatrixlaan 2 2595 AL Den Haag Postbus 93144 2509 AC Den Haag www.spaceoffice.nl
Annex	1
Authors	Bert Meijvogel — T +31 88 602 45 29

Contents

	Colophon—2
	Introduction—4
1	NSO objectives within the framework of the National Space Policy—4
2	Objectives of the ESA ARTES IAP element—5
3	Implementation of ARTES IAP—5
4	NSO specific framework—5
4.1	Feasibility study—6
4.2	Demonstration activity—6
5	NSO considerations and criteria for support request evaluation—6
6	NSO financial support—7
7	Support request procedure—8
	Annex 1 Background information on space assets—9

Introduction

For execution and implementation of the space policy the Netherlands uses various programmatic frameworks of ESA. Each of these frameworks have their specific focus in implementing rules. For the promotion of the use of space assets the ESA IAP (Integrated Applications Promotion) programme is key in commercialisation of space based services.

ESA IAP is one of the elements of the ARTES programmatic framework under the management and responsibility of the JCB (Joint Board on Communication). Within this board all ESA Member states are represented and together decide on the objectives, content, budget and specific rules of implementation of the ARTES elements. Each element is set-up on the basis of consensus among the member states. As a consequence the scope or implementation of an element could be broader than what National policy of a member state calls for.

In line with a number of other ESA programmes, IAP rules require Member States delegation to explicitly authorise ESA to use the funds for specific contract activities. Each activity proposal submitted to ESA therefore has to be accompanied by a "Letter of Support" from the National delegate.

Within this document NSO sets out the guidelines based on National policy that apply to acquire support for the ESA IAP activity proposals.

Note: Within the scope of promoting IAP, ESA is using the term "Business Applications" in all its communication.

1 NSO objectives within the framework of the National Space Policy

Two of the objectives of the space policy of the Netherlands are strongly related to applications and services;

1. To contribute to the development of a healthy space sector, including marketable products and services related to space.
2. To promote the use of satellite data for new applications and services that is useful to society, and contribute to developments elsewhere, particularly in developing countries and emerging markets.

The National Space Policy is centred on the *use of space* and thus it is essential that user needs are a co-driver for future developments. In this way, the Space Policy objectives should lead to an increase in the use of satellite data through the development of applications and implementation of commercial exploitation of services for which a (potential) societal and market demand actually exists. This increase is foreseen for governmental, institutional and commercial end-users. NSO actively supports the promotion of applications and services specifically based on the use of Earth Observation (EO) data. Compared to the navigation and satellite communication sectors the Dutch EO-sector has a relative lag in maturity and therefore requires special support and attention in the coming years. For this reason a number of key topics have been defined based on specific earth observation

applications. These key topics focus on the value chain from data source to value adder to service provider up to the (potential) end-user.

2 Objectives of the ESA ARTES IAP element

The declaration of the ESA ARTES IAP element to which the Netherlands has subscribed states;

"The main objectives of the Integrated Application Promotion (IAP) Element of the ARTES Programme are to promote the services provided by space technologies beyond the areas explored up to now and, as a result, to attract new, wider user communities. To reach this goal, efforts are to be granted to give a higher visibility to the applications of space technologies at large and to combine existing space and terrestrial assets, in order to provide users with the best solution available to meet their particular needs.

*The IAP Element focuses on the use of existing space assets and technologies, leading to a better **commercial** exploitation of the already developed space systems and know-how, while requesting only limited technology adaptations. It also aims at providing inputs to the future space developments based on the acquired knowledge of user needs."*

Within these objectives key elements for NSO are "commercial exploitation", "existing space assets" and "limited technological adaptations".

3 Implementation of ARTES IAP

IAP defines a number of activities to support the overall objectives of the programme. Of these activities the feasibility and demonstration studies form the larger part and are the most relevant for getting to a viable commercial service. Initiation of feasibility studies is through an ESA competitive tender procedure focusing on a specific topic or end-user community. There is also a specific procedure for kick-start studies, which address a specific theme and have a limited extent.

A second option is the open call for proposals where the initiative lies with the proposing consortium. For demonstration activities this open call is the only way to start even when they follow a feasibility study.

In each case a support letter from the national delegation to ESA is requested to authorize ESA to pay to cost of the activities within the relevant member states. For activities bearing costs within the Netherlands NSO is responsible for providing this letter of support.

4 NSO specific framework

One of the tools at hand for NSO to fulfil the space policy objectives of the Netherlands is IAP. This is considered to be the last step with support (from the space budget) before reaching a mature commercial service. As such the main focus points of the IAP activities should be the implementation of the business case and the potential end-users/markets.

The potential to become a commercial service also determines the starting point of the IAP activity. Services can be composed of different assets or building blocks, being H/W, S/W, data, system or application oriented, with a very high level of maturity in relation to the commercial service foreseen. As a consequence no technical development will be supported other than limited adaptations necessary to cover end-user specific requirements. An IAP activity should only be proposed when it is confirmed that all building blocks are available and ready for use. At the same time, the real user demands/needs should have been identified on the basis of a market assessment and these should lead to clearly defined requirements for the service.

IAP is organized in 2 steps, feasibility and demonstration, each with its own specific purposes.

4.1 Feasibility study

A feasibility study should focus on the evaluation of the technical feasibility and commercial viability.

1. Technical feasibility: The goal is to determine how to set up a sustainable, integrated solution in terms of hardware (assets) and software (data & systems) and also to understand the needs and specifications, both functional and non-functional, of a typical user. The technical feasibility can be evaluated in a proof of concept in collaboration with stakeholders.

2. Commercial viability: The costs of the proposed system, both Capex and Opex, need to be assessed, including Return on Investment and Break-even, leading to a viable business case for the service provider. The commercial viability based on an economic analysis of the customer's business case, e.g. how much additional margin can be earned with the proposed solution, needs to be investigated together with the customer.

4.2 Demonstration activity

The demonstration activity should focus on the validation of the service within the operational environment of the customer/end-user and provide confidence in the financial sustainability of the service.

1. Service validation: Demonstrate that the service can be integrated in the operational processes of the user, and that the added value for the customer is achieved. For services dependant on seasonal effects at least one full production cycle must be included in the demonstration.

2. Financial sustainability: The business model selected for the service is sustainable and the minimal number of customers required is within reach. The selected price point of the service is validated within the market and (potential) customers are willing to pay. Predicted cost and income are realistic and break even is achievable within 3 to 4 years.

Following the demonstration phase a full commercial service should be possible without any interruption of service from either an operational or a business perspective.

5 NSO considerations and criteria for support request evaluation

Although any company can apply for support the following restrictions apply.

- Start-ups must at least have a MVP (Minimal Viable Product) and business maturity before support will be granted.
- Only companies without prior ESA IAP contracts can apply for support in the frame of the Kick-start activities.

When evaluating a request for support for IAP activities, NSO checks against a number of criteria. None of these are determinative but an assessment on the outcome of the combined requirements will lead to a final conclusion and decision. One non-negotiable criterion is end-user commitment in the IAP activity and willingness to implement and pay for the service.

- **Market:** What are the market needs in terms of geo-spatial and/or environmental information? How are these needs articulated? In what way will a service based on satellite data contribute to the fulfilment of these needs? What is the extent of the market for this application or service? What competition is already in place? Is the focus on a regional, national or international market?
 - The market should be identified in terms of type and number of users
 - The market should be clearly defined in terms of added value of space assets
 - The market should be quantified
- **Business model:** How is the value chain organised and what value is added by each of the actors therein? How will turnover be achieved?
 - There should be a positive cash-flow after the IAP activity is finished
 - The break-even of the service should be within 3 – 4 years of IAP
- **Customers/End-users:** Who are the key customers for the commercial service? Are these customers directly involved in the IAP activity? Do they contribute to the activity and in what manner? Are there already solid intentions/promises to procure the service?
 - At least one customer should contribute in-kind or cash to the IAP activity
 - The customer must show its willingness to pay a commercial rate for the service after IAP
- **User requirements:** Has there been end-user involvement in the drafting of the user requirements? Does the service cover these requirements to the full extent?
 - The commercial customer should define the end-user requirements
- **Space asset integration:** Which space assets are integral parts of the service? How do they contribute? Which non-space assets contribute to the service?
 - The space assets should be a crucial element of the service
 - Request which use a single commodity space asset will not be supported
 - A service promoting the use of EO will be preferred
- **Technology maturity:** Is the service a combination or composition of proven technologies or are further developments still foreseen and if so, to what extent?
 - No technical development below TRL 7 is allowed
- **Involvement of Dutch actors:** Which companies from the Netherlands are directly involved in the service? Are there specific end-users/customers from the Netherlands?
 - The commercial service should lead to economic and/or societal benefit within the Netherlands
- **Use of ESA resources:** Is IAP the only funding source available? Has it been made reasonably plausible that other NL supporting policy instruments are not accessible?
 - Are there parallel funding sources foreseen?
 - Is the non-ESA part of the funding secured?

6 NSO financial support

Within IAP rules have been set concerning the amount of support to be granted. Feasibility studies in open competition are funded at 100% except for kick-start activities. The latter are funded at 75% up to a maximum of 60k€.

Feasibility studies initiated by a consortium are funded at 50%. In this case universities and research institutes without commercial interest in the product may be funded at 100% when involved as (sub-) contractor. Demonstration activities are always funded at 50%. SMEs are eligible for funding up to 75% in any consortium-initiated activity.

NSO uses a more stringent approach to the funding levels possible within IAP. The Dutch budget available for IAP activities is limited. Therefore a maximum amount has been set for any granted support. These figures are to cover the total ESA cost of all Dutch participation within a consortium. The general rule of thumb is that feasibility activities are supported up to a maximum of 250 k€ ESA price. As for the 100% funding of universities and research organizations, there is limitation of their participation to a maximum of 15% of the total cost. For demonstration activities the maximum amount supported is up to 500 k€ ESA price. Due to the commercial and market driven nature of the IAP activities NSO will not support SMEs to the maximum allowed within IAP, but will in principle only support 50% of the cost when a consortium-initiated activity is proposed.

7 Support request procedure

In order to obtain a letter of support authorizing ESA to use part of the Dutch budget for a specific activity, a formal request for such a letter needs to be made to NSO. For this a support request form needs to be filled in and an attachment outlining the reasons for the activity, with a focus on the business case and opportunities, needs to be provided.

Part of the application process is a meeting at NSO with a first presentation of the proposed activity. It is advised to have this meeting as early as possible in the proposal phase, preferably even before drafting the outline proposal or issuing the support request form in case of a competitive tender (ITT).

The formal internal procedure at NSO will take between 2 – 3 weeks, depending on the availability of key persons. This procedure will start after the applicant provides all relevant information.

Annex 1 Background information on space assets

Of the three types of space assets; Earth Observation, Navigation and Satellite Communication (SatCom), only the latter has a sound and mature commercial ecosystem. Although military SatCom is highly institutionalized, commercial SatCom supply and demand operates within a purely commercial market. For Earth Observation, and to a lesser extent Navigation, the situation is completely different. Up till now PNT signals from GPS have been used as a commodity; use of these signals is free of cost and has led to a large commercial market for navigation and location based applications, services and products. With the introduction of the European Galileo system additional signals will be available at no cost, and regulated and authenticated services will also become available.

Earth Observation is a slightly unique case. At the beginning of the 1960s satellites were already being launched to observe the earth's cloud cover for weather prediction purposes. In 1972 Landsat-1 was launched, the first satellite dedicated to observing the surface of the earth. Over the course of the last decades, different satellites carrying a variety of sensors were launched. Making use of the data obtained from these sensors and transforming it into useful information required substantial effort and was time-consuming. Earth Observation satellites have mostly been designed and built for scientific and institutional purposes, have been financed by governments, and their data was not made freely available. Over the last decade only a small number of commercially operated satellites have been launched, mostly optical and radar. The cost of the data was high and the temporal resolution was limited.

With the launch of the Sentinels revisit times will be more frequent and the data will be free of charge. This should enhance the development and availability of services and applications, and increase the market in terms of size and economic value.

In relation to IAP the consequence is that only a certain amount of development will be financially supported. As SatCom is available from a large number of suppliers in different service types and levels, no development is supported within IAP. The same is true for the PNT signals although in very specific cases, e.g. with PRS, support can be considered.

Earth observation requires dedicated development in order to extract correct information from the data. Algorithm adaptation or new algorithms could be necessary for specific novel services. These kinds of development may be supported within IAP when they form an explicit part of the new service and take place in conjunction with other data sources.

For specific technical developments within SatCom, Navigation and Earth Observation support frameworks exist within ESA. Only after these developments are finalized and employable should an IAP submission be considered.