

Please note ,the official RFI document is in Hebrew. This is an unofficial translation

**State of Israel – The Ministry of DefenseMAFAT/ R&D/
Telecomputing/ Artificial Intelligence branch**

**The Israel Innovation Authority
Technological Infrastructure Division**

**National Infrastructure for High Performance Computing (HPC)
Request for information (RFI)**

Invitation to express a position and receive information regarding the significance of setting up and operation of a National Infrastructure for High Performance Computing focused on research and development in artificial intelligence

The Ministry of Defense (hereinafter: "the Ministry") and the Israel Innovation Authority (hereinafter: "the Innovation Authority") invite the public to provide information and express a position regarding the need for setting up a national infrastructure for research and development in artificial intelligence in the State of Israel (hereinafter: "the infrastructure") that shall permit a variety of research and development programs that require considerable computing power, both for academic researchers and for industry, that will serve all sectors – civil, public, and defense.

Background

The Telem Forum (a voluntary committee for national infrastructures for science) has appointed an investigative committee to examine the need for government intervention in order to accelerate development in the field of artificial intelligence and data information (hereinafter: "**the committee**"). The committee, headed by Dr Orna Berry and with representatives from the Innovation Authority, the academy, MAFAT, and industry, have recommended a program for national initiative that will constitute a systemic solution that focuses on four fields: infrastructures, human capital, regulation, and accessibility to data.

Regarding the aforesaid infrastructures field, the need was examined for setting up an infrastructure, that, in accordance with the conclusions of the committee, must include the hardware and software required in order to permit the following major uses:

- An infrastructure for research and development in the world of artificial intelligence (for testing models, gaining insight, and optimization of complex calculation problems).
- An infrastructure for general research and development based on computing services and storage in a cloud (use of processing and storage power located near the users and that will provide low latency performance).
- An infrastructure permitting integration and feasibility studies for the products relevant to high performance computing infrastructures (such as accelerators, cooling infrastructures, scheduler programs, etc.).
- An infrastructure permitting holding the data within the borders of Israel in cases where this is the requirement of the regulator.

Consequently, the Ministry of Defense and the Innovation Authority, in cooperation with the planning and budgetary committee, the Ministry of Innovation and Science, and the Ministry of Finance (hereinafter together: "**the Partners**") are advancing the realization of the

committee's recommendation and are examining their position regarding the definition of characteristics of the infrastructure, the method of setting up the infrastructure, its operation, and the services provided over it.

The Partners hereby wish to receive information from Israeli and international bodies having suitable experience and know-how, in the fields of infrastructures and services for computing as set forth in Appendix A: National Infrastructure for High Performance Computing for research and development in the field of artificial intelligence – description of the infrastructure being examined (hereinafter: "**the appendix**").

The Partners invite the public, including companies, entrepreneurs, government bodies, and research and academic entities to present before them their positions and proposals in the subject of the infrastructure.

It is emphasized and clarified that the Partners have not yet decided whether and how to act in the subject, and this request does not constitute an RFP and does not form part of a tender or a benefit route or some other proceedings for the receipt of proposals, but is an RFI and a position only, and following it the Partners shall consider the continuation of their activities. Without limitation to that set forth in this document, the Partners reserves the right to address clarification questions or an RFI or additional data to any entity whatsoever, including the addressees, in whole or in part, but the said request shall not create any obligation whatsoever *vis-a-vis* any of the Partners or anyone acting on their behalf.

It is emphasized and clarified that this request does not constitute a proposal or an RFP or the creation of an agreement in accordance with the Regulations for the Obligation to Hold Tenders, 5753-1993, or in accordance with any other law or procedure.

The required information

The following are details of the information that the Partners wish to receive in the response. The following is not a closed list, and it may certainly be possible to extend it to subjects that are not included in this list, which in the view of the repliers is important to address.

In addition, it is emphasized that the questions as set forth below refer to those set forth in the infrastructure being examined in the appendix. It is recommended to read its contents carefully before answering the questions.

The repliers should have know-how and experience in providing a similar solution, operation, and the supply of services similar to those described in the appendix.

Apart from the response to the questions as set forth below, at the beginning of the document the following subjects should be addressed:

- Reference to the entity that the replier represents (such as a company, entrepreneur, investor, bank corporation, academy or any other entity), the name of the replier, function, company, and details for making contact.

- An executive summary that briefly describes the main features of the response.
 - Relevant previous experience (while referring to similar projects, with details similar to and different from that set forth in this response).
 - The possible organizational routes for setting up and operating the infrastructure being examined from the aspects of general architecture for the solution, physical infrastructure, hardware and software, operation and support (including SLA, etc.).
 - Models for set-up, maintenance, and operation (referring to the models proposed below or alternative models).
1. The physical infrastructure (in this section, please address separately stage A and stage B as set forth in the appendix).
 - a) What is the size of the physical place required for hosting such an infrastructure (minimum/ maximum size required) including the number of storage cabinets, electrical infrastructures required, and any other need?
 - b) What is the estimated power consumption for the solution?
 - c) What existing cooling technologies are relevant to the solution?
 - d) What is the suitable hosting infrastructure? (Does it exist? Is there a need to prepare a special area? Can it be shared with other infrastructures? Etc.).
 2. Processing and telecommunications resources
 - a) Which telecommunications technologies are relevant to the solution, and at what rates?
 - b) What is the proposed architecture that integrates the requirements of the processing, telecommunications and data storage in order to achieve maximum performance?
 - c) What kinds of virtual technologies for GPUs are available/ recommended for this solution? Please indicate the type of solution and the processing capability (relative to the description of the infrastructure being examined in the appendix).
 - d) Which types of virtual technologies of AI accelerators are available/ recommended for this solution? Please indicate the manufacturer, the type of solution, and the processing capability (relative to the requirements).
 3. Data storage
 - a) What is the data storage solution proposed that meets the description of the infrastructure being examined (storage that permits execution of data analysis, data mining, realization of data lakes, data warehouses, etc.). What storage volume is required? What kinds of technology are relevant to the solution?
 - b) What type of solution will be available for disaster recovery/ backup?

4. Resource management
 - a) What are the existing technologies for resource management?
 - b) Is there a minimum/ maximum number of virtual units that may be allocated to a specific task?
 - c) Is there a maximum number of tasks that can run on the system in parallel?
 - d) How can integration trials be conducted in an experimental system so as not to affect the infrastructure being examined and the other users?
 - e) How can a guaranteed level of service (processing consumption) be assured for selected users at the allocated level of processing power no less than the quantity defined below?
 - f) How can usage of the GPU be split in order to compute capabilities and optimize run times?
5. Integration of the infrastructure being examined with a cloud calculation infrastructure
 - a) Is it possible to carry out integration with public cloud platforms (such as AWS, Azure) so that in the event of exhaustion of the infrastructure resources (at a specific point) it shall be possible to transfer some of the tasks to a public platform?
 - b) How is it possible to withdraw configurations and users' management from existing cloud environments?
 - c) How is it possible to integrate existing cloud services from existing cloud platforms for withdrawal and use them? What will be the charging mechanism for use of these services in such cases?
 - d) How is it possible to withdraw services that have been built in this infrastructure as a cloud service in existing cloud platform?
6. Data transfer and data management
 - a) Which data management tools are available/ recommended for the infrastructure being examined?
 - b) Which software/ infrastructures for data transfer are available to aid in data transfer to the infrastructure being examined?
7. Information security
 - a) What kinds of information security will exist in order to protect the system and the life cycle for software development for upgrades, updates, hot fixes, etc.?
 - b) How will the solution handle separation between data of different users?
 - c) How will the solution handle separation between data at different levels of classification?

- d) How can transmitted data be scanned to ensure that viruses and the like do not enter the system?
 - e) How it is possible to verify that at specific, pre-defined times it shall be possible to process sensitive materials with absolute separation from external connections while ensuring the deletion of all the data so that they cannot be restored or duplicated?
8. Artificial intelligence software for machine learning models
 - a) Which software platforms for machine learning (ML) and deep learning (DL) will be available for the infrastructure being examined?
 9. Software for management and control of the infrastructure being examined (hardware, software, and users)
 - a) What tools for monitoring resources (user consumption, security, troubleshooting and reporting, etc.) are available for the infrastructure being examined?
 - b) What billing tools based on current resources are available for the infrastructure being examined?
 - c) Which additional programs/ tools/ infrastructures should be taken into account that can influence the costing for the infrastructure being examined (not necessarily for management and monitoring)?
 10. Integration of the infrastructure being examined with a quantum calculation infrastructure
 - a) If it should be necessary to connect the infrastructure being examined to a quantum calculation infrastructure, will this influence the components of hardware or software? Is there a need for special components (such as telecommunications, memory, resource management software)?
 - b) Is there an importance to the physical proximity between the infrastructure and the quantum computing infrastructure?
 11. The manpower element required for current operation of the infrastructure being examined and support of users
 - a) What is the estimated manpower required in order to support and maintain the infrastructure being examined, on a continuous 24/7 basis (technical support only)?
 - b) What is the estimated manpower needed to enable user ML/AI tool use and optimization?
 12. Estimated costs of setting up this request
 - a) What is the estimated setting up cost based on the specification defined as stage A in Appendix A? You may provide the breakdown according the following sections:

- Preparation/ renting of the physical location.
 - Physical infrastructures (cooling, electricity, storage cabinets, cables, telecommunications, etc.).
 - Equipment (processing units, memory, accelerators, etc.).
 - Management software (control, management).
 - Software and licenses for users.
- b) Are there any additional items relevant to the estimations of the setting up costs?
- c) What is the estimated additional cost in accordance with the specification defined as stage B in the appendix?
13. Estimated costs of maintenance of the infrastructure
- a) What is the estimated expected cost for a year of maintenance and providing service, based on the specification as set forth above?
Address the following sections:
- Costs of electricity and infrastructures.
 - Manpower costs (for maintenance and service providing).
 - Costs of maintenance and hardware upgrades.
 - Costs of software (licenses) and upgrades.
- b) Are there additional sections relevant to the estimations of the maintenance costs of being examined?
14. Services and capabilities of the infrastructure being examined
- a) What are the services for users and is it worthwhile to offer them on the infrastructure being examined?
- b) Please provide examples of relevant services the and estimated cost compared to such costs that exist in the market.
- c) What is the estimated manpower required to ensure development of common basic services that may be available to all the users in the infrastructure being examined?
- d) What are the services to be supplied, for example, for the work program of the first year of the services development team?
15. Timetables
- a) What are the major stages and timetables for realization of the project?
- b) What is the earliest date on which it shall be possible to begin providing services on the infrastructure being examined?

c) Is there a gradual setting up process that can be recommended?

16. Model for setting up and operation of the infrastructure

In order to answer this section, there shall be supplied an overall costing model for setting up the infrastructure being examined, its operation, and development of the required services, for five years - split into stage A and stage B.

It is required to propose an economic model that will permit continuation of maintenance, operation, development, economic renewal of the infrastructure and all the elements required as part of it - even after the period of five years.

The model is required to analyze the estimated cost required from the customer's budget, split into years, the level of income expected from use of this infrastructure for the various customers.

The economic model is required to take into account the need to ensure resources over the life time of the project.

In this response it shall be possible to propose different economic models while taking into account the requirements, and comparing the models.

The appendix describes options for the setting up and the operation model. Please refer to the models presented and present additional models, placing emphasis on the following subjects:

- a) The risks in setting up the infrastructure being examined and the guarantees required or other solutions for reduction of the risk.
- b) The risks in operation of the infrastructure being examined, and the guarantees required or other solutions for reduction of the risk.

It is desirable that the analysis and reference will be done from different aspects: economic-financial (costs of setting up, costs of operation, costs of services for different audiences, percentage profit expected, etc.); organizational (capability of setting up the solution or the capability of connecting with other companies in order to provide an overall solution, SLA, etc.), prior experience, potential customers, etc.

17. Any additional information that may contribute or influence the Partners when examining the possibility of advancing the infrastructure set-up program, including technological, economic, maintenance aspects and the uses and exploitation of the infrastructure, etc.

Submission of responses

Those wishing to contribute information and to present their positions in the subject of this RFI are requested to send their remarks in writing to: hpc@nationalplanil.ai no later than **October 31.2021**.

General information and reservation of rights

1. Without limitation to that set forth in this RFI, the Partners or anyone acting on their behalf reserve the right to send clarification questions or an RFI or any other data to the repliers to this request, in whole or in part, starting from the date of publication of this request. In addition, the Partners or anyone acting on their behalf reserve the right to hold a public meeting for the purpose of presentation of this request. Such a meeting will be held in September 2021 at a precise date to be published separately.
2. The Partners or anyone acting on their behalf shall be entitled to use the contents of the position papers and their appendices (including the information and data set forth therein) or any other document submitted for the purpose of formulation of recommendations for the future program, or for any other purpose. They reserve the right to reply or not reply to the responses received to this request, if received.
3. It is clarified that the Partners are entitled to use any information provided by the repliers to this request (including for the purpose of publication of an RFI by means of a tender and/or negotiations, specifications and/or characteristics based on the know-how and experience accumulated from the responses submitted), and consequently the repliers shall be barred from making against the Partners or anyone acting on their behalf any argument and/or demand and/or claim whatsoever regarding any rights whatsoever related to and/or resulting from their response to this request and/or from the material attached to this request (including copyright of the providers of the information).
4. This request shall not constitute a commitment *vis-a-vis* any of the repliers to this request and the Partners or anyone acting on their behalf shall be entitled to consider taking steps at their sole and absolute discretion. The Partners or anyone acting on their behalf shall be entitled to meet at any stage whatsoever with any entity or replier as they see fit, in accordance with the provisions of the law, and without any limitations of any nature or type whatsoever applying to them.
5. It is hereby expressly emphasized that no decision whatsoever has yet been taken regarding execution of an agreement from any aspect related to this request, and the publication of this RFI, or any action in respect of it, shall not be regarded as any commitment whatsoever of the Israeli government, the Partners or anyone acting on their behalf, *vis-a-vis* any person or entity whatsoever in the subject (including a commitment for any future action whatsoever).
6. All the costs involved in preparation and submission of the information in the response to this request are at the sole responsibility and financing of the addressees or the repliers to this request. The Partners shall bear no payment or cost in respect of the RFI or any aspect and matter resulting from and/or related to it. In all circumstances, this RFI shall not constitute negotiations and/or the creation of a commitment of any kind by the Partners.

7. A reply to this request does not replace the submission of an orderly request to obtain aid from any of the various benefit schemes of the Innovation Authority that exist at the date of publication of this request or that may be in effect in the future - in accordance with the provisions, rules, and procedures of these benefit schemes.
8. The submission of a response to this RFI is not a condition for participation in future , if there may be such.
9. To remove any doubts, it is hereby clarified that this request does not obligate the Partners in any way whatsoever, including regarding the possibility of continuation of this process, and it shall not create a commitment by the Partners *vis-a-vis* the addressees or the repliers to this request, and it constitutes a preliminary request for the purpose of receiving information only, following which the Partners will consider continuation of their activities.
10. The repliers to this request are forbidden to make use of the know-how as set forth in this document (including in the appendix) without approval from all the relevant entities in the Partners in advance and in writing.
11. The appendix attached to this request is subject to that set forth in it, and in no circumstances shall it be interpreted contrary to that set forth in it. In the event of conflict between the requirements in this request (including in the appendix), the replier shall bring them to the notice of the Partners before submission of the response and the Partners shall determine the applicable alternative.
12. Provisions regarding and/or connected with the Ministry of Defense (hereinafter in this section: "**the Ministry**") only:
 - 12.1 The Ministry reserves the right to contact some of the companies that reply to this request and/or to contact other companies for the continuation of activity in the subject (if made by it), all as it decides by itself.
 - 12.2 The Ministry reserves the right to interview the persons proposed by the repliers to the RFI, in whole or in part, as part of continuation of the activity in the subject (if made by it).
 - 12.3 The Ministry reserves the right to request from any of the repliers to this request the names and means of contacting at least two people who give a recommendation in government organizations, or in an organization employing more than 200 workers, for whom the replier has carried out activity in fields of the matter during the last four years.
 - 12.4 If it is subsequently decided by the Ministry to contact the repliers in an RFP for development and equipping, the Ministry shall be entitled to circulate an RFP to the repliers, at its sole and absolute discretion. Submission of a response to this request shall not obligate the replier to submit a response to the RFP.

- 12.5 The Ministry reserves the right to use any know-how forming the subject of this request in whole or in part, for its own purposes, including the issue of an RFP to industries, and/or the selection of a supplier for execution of the work, and/or the transfer of the know-how to a third party, provided that the final user is the Ministry.
- 12.6 No application to any of the sub-contractors of the repliers to this RFI regarding specific elements of the systems shall create contractual relations between the Ministry and the sub-contractors and/or limit the responsibility and commitment of the replier regarding the sub-contractors.
- 12.7 Without limitation to the generality of the aforesaid, the replier shall furnish the Ministry with information verbally and/or in writing as required by it for examination of the estimates of the cost, as set forth in the provisions of the Ministry of Defense 40.060-40.066.

Appendix A -

National Infrastructure for High Performance Computing for research and development in the fields of artificial intelligence – description of the infrastructure being examined

It is clarified that nothing in this appendix shall create a commitment and/or obligation and/or proposal and/or order and/or agreement on the part of any of the Partners regarding the subject being examined, as aforesaid.

In addition, it is clarified that that set forth in this appendix constitutes an initial description only of the high-performance computing infrastructure by the Partners. Consequently, if it should be decided to set up an infrastructure as aforesaid, changes are likely to the requirements for the infrastructure, including changes to the requirements as set forth below and/or the addition of requirements or conditions.

1. Definition of the infrastructure being examined and the major uses

In the light of the revolutionary influences of the field of artificial intelligence on research in industry and its ramifications in all fields of life, such as security, health, drugs, materials, etc., and the expected expansion of these influences and their acceleration, it has been decided to coordinate a special effort in the construction of infrastructures that will permit optimal exploitation of these capabilities and tools.

The national infrastructure requires significant processing power comprising infrastructures for processing, storage, rapid telecommunications and varied applications, with the capability of growth and adjustment over the life time of the system, under an operating model that will realize government subsidy against a solution of the existing market failures.

The infrastructure must also serve all the entities involved in research and development – academy, industry, and the military sector and it must include the hardware and software required to permit the following major uses:

- An infrastructure for research and development in the world of artificial intelligence (for testing models, gaining insight, and optimization of complex calculation problems).
- An infrastructure for general research and development is based on computing services and storage in a cloud (use of processing and storage power located near the users and that will provide low latency performance).
- An infrastructure permitting integration and feasibility studies for the products is relevant to high performance computing infrastructures (such as accelerators, cooling infrastructures, scheduler programs, etc.).
- An infrastructure permitting holding the data within the borders of Israel in cases where this is the requirement of the regulation.

2. The concept and management of the infrastructure being examined

In order to set up a research and development infrastructure for artificial intelligence (hereinafter: "**the high-performance computing infrastructure**" or "**infrastructure**"), that lies at the fore front of technology and that is renewed in order to maintain the relevance of the infrastructure and the equipment for research and development for at least five years, we regard the following points as being critical for the success of the infrastructure:

The architecture of the solution

- In order to set up a functional infrastructure rapidly and efficiently the best practice will be to use existing platforms and architectures as far as possible (telecommunications solutions, security solutions, processing solutions, etc.).
- In addition to the aforesaid, the possibility is being examined of designing a flexible architecture that permits integration of hardware and software from a variety of suppliers, and the possibility of later connection to various infrastructures such as external cloud infrastructures and quantum computing.
- Use of the infrastructure being examined
 - Use of the infrastructure being examined will give priority to projects of MAFAT, the planning and budgetary committee, the Ministry of Innovation and Science and/or requests approved by the Innovation Authority. In addition, use will be permitted to any Israeli company wishing to do so.
 - The utilization of infrastructure capabilities should be maximized. Consequently, the use should be attractive to customers, both in terms of convenience of use and services and in terms of cost to potential customers.
 - This should also be expressed in the proposal for an economic model that supports the setting up, operation and economic renewal and the creation of a worthwhile mechanism for use of the infrastructure being examined for various customers in Israel and abroad.
 - A response for the preservation of privacy and secrecy of information of companies that use the infrastructure.
- Creation of an echo system

If it should be decided to set up such an infrastructure in Israel, there shall be permitted the trial and specialization of manpower in the setting up and operation of a high-performance computer and in the provision of solutions for artificial intelligence projects. Consequently, we shall strive to make use of Israeli manpower as far as possible.

- Management of the infrastructure

- In order to benefit from the efficiency of the private (business) sector, if the infrastructure is set up, its setting up and management shall be done by a business entity orientated to marketing and the provision of service to customers, experienced in the field.
- In order to maintain the nature of artificial intelligence and the priorities, the option is being considered of management of the infrastructure being guided by an advisory committee comprising stakeholders (representatives of MAFAT, the Innovation Authority, the planning and budgetary committee, the Ministry of Innovation and Science, representatives of the public, etc.). Its sole function shall be to maintain the aims of the infrastructure as a national research and development infrastructure for subjects of artificial intelligence and to preserve the State's interest in support of the users – academy, industry, and the defense establishment.
- In management of the infrastructure being examined, it is required to take into account the economic feasibility and profitability in order to continue to maintain the infrastructure over a long period of time, because of costs of operation, development, economic renewal, etc.

3. Description of the infrastructure being examined

Structure of the solution being examined

The infrastructure being examined shall comprise physical infrastructures, hardware infrastructures, software infrastructures, services, operation of the infrastructure and the provision of service, support, and maintenance.

The physical infrastructure

The infrastructure shall be located in Israel and shall be set up and operated by a company registered in Israel. Furthermore, all the core services of the infrastructure must be set up and managed as part of the site. The permanent team of the infrastructure shall be resident in Israel but the support for specific services may be done by means of outsourcing.

The hardware infrastructure

This section wishes to examine the setting up of the infrastructure in two stages. In the first stage the infrastructure shall be set up, - with a variety of services, with part of the target processing and memory, and subsequently there shall be added components that will permit expansion to achieve capabilities of reaching a placing in the top 500.

<https://www.top500.org/project/>

In order to permit setting up in stages, during upgrading and growth, the number and power of the hardware components, the capabilities of integration of hardware of different manufacturers, etc. and the architecture must be constructed in a flexible and modular way.

In addition, as set forth above in the major uses, it is likely that there will be a number of types of users of the system (a system for military uses, an experimental system, and a system for current use). During design of the hardware architecture there shall be permitted a logical division between types of uses in the system.

Hardware infrastructure, stage A

In the following table processing power is proposed that constitutes the initial basis for the infrastructure being examined. That is called Stage A.

CPU cores	22,000+
Artificial Intelligence accelerators	400+ with at least one year in market
Accelerator type	1+ that are Nvidia A100 or equivalent
Accelerator capacity	1+ petaflop per
Total float 64 capacity	5+ petaflops
Total float 32 capacity	150+ petaflops
Total float 16 capacity	300+ petaflops
Networking capacity (CPU to storage)	200+ Gbps
DDR4 RAM	50+ terabytes
Premium SSD storage	1+ petabytes
Standard SSD storage	5+ petabytes

Hardware infrastructure, stage B

After establishment and operation of the infrastructure, and if exploitation of the infrastructure shall be maximal and there is budgetary approval, there shall be examined a significance expansion of the processing capabilities of the infrastructure and the accompanying memory.

The following table describes the possible processing and memory power infrastructure that is called Stage B:

CPU cores	88,000+
Artificial Intelligence accelerators	1000+ with at least one year in market
Accelerator type	3+ that are Nvidia A100 or equivalent
Accelerator capacity	1+ petaflop per
Total float 64 capacity	18+ petaflops
Total float 32 capacity	150+ petaflops
Total float 16 capacity	300+ petaflops
Networking capacity (CPU to storage)	200+ Gbps
DDR4 RAM	400+ terabytes
Premium SSD storage	1+ petabytes
Standard SSD storage	30 petabytes

Software infrastructures and services

The software infrastructures being examined must permit the activity of the system as set forth above, with optimal exploitation of the resources and the option of upgrading the software elements.

As set forth above, there are different kinds of users for the system who come from different bodies and who have different aims. Consequently, the solution is required to support different levels of types of data, and a different level of data classification. There shall be accessibility by the users, both online as a cloud service and physical accessibility for factories or with the accompaniment of the operators to the trial infrastructure.

In order to permit the maximum processing power for a single task and also permit a large number of users to use the system in parallel, a solution of spooling and division of resources will be required. The capability shall be required to temporarily allocate all or part of the processing power for processing sensitive material so that it will be impossible to restore the sensitive material, in whole or in part, after termination of the processing.

Examples of the functionality required from the software are:

- Monitoring, control, and warning of hardware malfunctions.
- Management of resources.
- Management of users and tasks.
- Applications that permit research and development for artificial intelligence.
- Backup solutions.
- Solutions for information security.

Operation of the infrastructure

After the initial setting up stage as examined above, and from the moment when it shall be possible to make use of the infrastructure being examined, the operating stage shall begin.

Operation of the infrastructure shall include activities of current operation, such as:

- Support and maintenance of the physical infrastructure, including treatment of malfunctions and upgrading, as planned and as necessary.
- Support of the software services – setting up the required service, treatment of malfunctions and upgrading, maximum exploitation of the infrastructure, etc.
- Support of users – starting from simple operation and up to accessibility and optimization of the specific functionality of high-performance computing and support for the creation of a program that will maximize the capabilities of the system.

In addition, the possibility is being examined of including activities that will maximize the exploitation of use of the system, such as:

- Training for relevant research and development teams.
- Marketing activities.
- Upgrading program.
- Addition of services.
- Costing services (competitive costing) – maintenance of great economic feasibility relative to other suppliers.

4. Models for setting up, maintenance, and operation

Since the setting up of the infrastructure being examined requires great investment, financing from the State and financing from the entity setting up the infrastructure, the option is being examined of selling the use and services of the infrastructure for additional purposes (apart from projects of the Innovation Authority, MAFAT, and the planning and budgetary committee), provided that the major users will not be harmed by this activity.

In addition, five years after the end of setting up the infrastructure, a model shall be examined for continuation of operation of the infrastructure or its privatization.

The following are possible examples for the setting up of the infrastructure being examined and its operation:

Setting up and operation model

There are a number of options for setting up and operation of the infrastructure. The following are a number of examples. These examples are not obligatory and the repliers are entitled to propose a model for setting up, development, and economic renewal as they see fit.

- **A single corporation (integrator)** sets up the infrastructure, maintains it and provides the service to the users. (Of course, sub-contractors may be used for purchasing equipment, setting up the physical infrastructure, etc.).
- **A consortium** (a number of corporations jointly submit the proposal) where every corporation can supply a different part of the elements of the infrastructure. The consortium is jointly responsible for setting up and operating the infrastructure.

Financing model

The option is being examined of the infrastructure being economically supported during the stage of setting up and operation, while placing emphasis on operation of the infrastructure with an industrial, marketing, and business orientation in order to lead the infrastructure being examined to economic independence.

The following are possible ideas for a financing model for setting up the infrastructure (similar to the previous section, we request the repliers to address a number of possible financing models, including analysis of the expected costs in each of the financing models proposed):

1) Government participation in financing the setting up of the infrastructure

In this model there is support in setting up the infrastructure. Operation of the infrastructure (supply of the services, maintenance, and upgrading) shall be done from the income from supply of services on the infrastructure, where some of the infrastructure services (use of the infrastructure, support hours) shall be allocated to users known in advance (who do not pay directly for the use of the infrastructure).

The priorities between these users shall be done by every entity separately (MAFAT, the Innovation Authority, the planning and budgetary committee, and the Ministry of Innovation and Science).

The consumption of the infrastructure shall be divided as follows:

X% for the needs of the Ministry of Defense.

Y% for subjects financed by the Innovation Authority.

Z% for the needs of the planning and budgetary committee.

The remaining % is open for the needs of industry and for the sale of the services to the Israeli industry.

2) Government participation to ensure minimum use for the first x years

In the PPP (public private partnership) model being examined, the infrastructure shall be set up privately and without government support, with a government committee for minimum use of the infrastructure for a period of five years.

As in the above example, the infrastructure is divided into different types of users, where there is an annual government undertaking for payment for the infrastructure, in return for the receipt of a percentage for the consumption of the infrastructure for projects of MAFAT, the Innovation Authority, and the planning and budgetary committee.

The operator may market and sell the remaining percentage of the infrastructure as services and use of the infrastructure to Israeli companies at competitive market prices.