

## TECHNICAL SPECIFICATIONS

### 1. Section A

The subject of the public procurement is the preparation of an analytical study on the condition of leased lines<sup>1</sup> and accompanying services in Slovenia.

The study must include the following analyses:

- a) An overview of technical solutions and services conducted over leased lines
  - The types and technologies of leased lines are present on the Slovenian market
  - Which services and or products are available based on the identified types of leased lines:
    - at the fiber-optics level (dark fiber lease)
    - at the physical (L1) level of the OSI model (wavelength lease)
    - at the L2 level of the OSI model (Carrier Grade Ethernet, IP/MPLS L2VPN, PWE3..),
    - at the L3 level of the OSI model (npr. IP/MPLS L3 VPN,...),
  - What are the technical characteristics of individual products and what are the interfaces (classification into meaningful classes)
  - in which parts of the network (access line, backhaul connections, backbone connections) and for what purposes are leased lines primarily used (providing backhaul connections to access nodes, base stations, connecting remote business locations, connecting data centers, ensuring high-quality managed services, transit, network interconnection, backup redundant connections, etc.)
- b) A review of the price policies of leased lines providers:
  - What do products cost per month, and are they tied to a contract with a long indefeasible right of use?
  - Based on which parameters (contract duration, capacity, SLA, etc.) is the price of the service formed for the main products of identified types of leased lines?
- c) A more detailed analysis of the supply and demand on the leased lines market:
  - Who are the providers of individual products or services, on which segments of the network, and in which geographic areas of Slovenia?
  - Where does the demand come from i.e. who are the users of individual products/services (operators, service providers, business customers, state or public institutes, etc.) and in which network segment?
  - Which products are most in demand by users (description of main products)?
  - Which types of leased lines or products are missing from the market, in which area of Slovenia (by municipality), and in which network segment (access/aggregation/core)?
  - Types of architecture or configuration (point-to-point or point-to-multipoint) for each individual service.
  - What is the typical service level agreement (SLA) like, and in what are the specifications of the service level (SLS) for providing a particular product, fixing errors, and compensations in the event of non-fulfilment of obligations?
  - Are available leased line services/products suitable in the context of capacity, quality and provision of SLA (fixing errors)?
  - Exact locations of points of entry/exit (address, town, post number) of the connection for logical connections, and the connecting segments for physical connections (fiber optics/wavelength) per individual product/service.
  - What is the share of the use of leased lines at the optical fiber level (user has their own active equipment), and what is the share at the level of managed products?
  - The assessment of trends for future demand by type of user compared to the existing demand.

The study should be written in Slovenian or English, and must along with the analyses listed above also include the explanation of terms used, an abstract with the main conclusions of the document presented in a condensed format, along with the identification of main products, and their technical and service characteristics.

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<sup>1</sup> Leased lines are dedicated mainly symmetrical telecommunications lines between two or more locations which are characterised as guaranteed and uncontended bandwidth and agreed level (SLA) and quality of service (QoS). Leased lines can be passive (dark fibers) or active (managed – e.g. IP/MPLS) solutions with traditional circuit (e.g. E1) or modern (packet switching) interfaces (e.g. Fast and Gigabit Ethernet).

The Contractor is expected to obtain the required data directly from:

- all the providers of public infrastructure who lease parts of their networks (fibers or capacities)
- main customers who are a representative sample of representatives of individual typical leased line products

For this purpose the Agency shall in the scope of its authorization give the selected Contractor the authority to conduct the required analysis on its behalf.

The analysis shall be conducted separately for:

- the access part of the network and aggregation (the termination part of the network)
- connecting segments between individual cities where operators have the main nodes (transit – backbone part of the network)

The analysis must provide an assessment of the market's competitiveness for individual types of leased lines and whether the existing leased lines market meets (and fails to meet) the demands of business users and the public administration on one hand, and of the operators/ISPs on the other. The document must include all the references of used sources and documents the Contractor obtained during the analysis. Alongside the written part the Contractor must also submit the requested analysis in an MS Excel spreadsheet with all the required explanation of the structure and the used attributes that make it possible for the Client to conduct additional analyses, including importing the data into the Client's geographical information system.

The subject of this public procurement includes:

- the preparation of an analytical study of the condition leased lines and accompanying services in Slovenia
- the presentation of said study with a detailed explanation of the findings and the conclusions at the Client's location
- support for the implementation of the study's findings in regulations

Deadlines for implementation:

- agree on the activities from the included project Gantt chart with the Client (within 10 days of signing the contract at the latest)
- submitting the draft study (within 30 days of signing the contract at the latest)
- submitting the final version of the study (75 days from signing the contract at the latest)
- presentation of the study's findings on Client's location (90 days from signing the contract at the latest)

## 2. Section B

The subject of the public procurement is **the preparation of an independent and expert study of an analytical overview of market regulation of leased lines<sup>2</sup> and accompanying services in at least 10 technologically and economically leading European Union member countries.**

The Contractor is expected to obtain the required data directly from regulators in each individual analysed country.

The basic analysis must include at least the following data on each individual selected country:

- The definition of the wholesale market for leased lines and accompanying services that are subject to regulation.
- Which active or passive products with traditional or modern interfaces on the leased lines market are regulated and in which network segments (access/aggregation/core)?
- Which provider was recognized as the provider with significant market power (SMP), and what were the reasons for this?

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- Considering national specifics and the network topology, at which network point does the backbone part begin, i.e. the access/aggregation network part end (separation point between terminating and trunk segment)?
- At which network level are individual points of interface (POI) available for each individual product/service (locally, regionally, nationally)?
- What is the status of the national research and education networks (NREN) in each individual country, and under what conditions can they lease lines or accompanying services?
- What type (dark fiber/lambda/capacity/interface) of lines do NRENs generally lease?

After the analysis is completed in accordance with the previous point in the scope of the analysed countries the Client shall select 5 reference countries for which the Contractor shall have to conduct an even more detailed analysis in accordance with the following guidelines:

- What is the substitutability of services in the retail and the wholesale market of leased lines on the demand side?
- What are the technical characteristics of individual regulated products?
- What are the imposed obligations (general and technical) for individual products in the retail market for leased lines?
- Are there any accompanying obligations that are a precondition for providing leased line services, and if so, what are they (e.g. network interconnection, providing space and technical facilities in collocations, etc.)?
- Definition of key customers of individual products in individual network segments.
- Is the quality of service regulated, and what obligations are imposed in relation to this?
- What is the typical service level agreement (SLA) like, and in what are the typical specifications of the service level (SLS) for providing a particular product, fixing errors, and compensations in the event of non-fulfilment of obligations?
- What are the obligations for ensuring the service level agreement (SLA), and what are the contractual penalties/service level guarantees (SLG) for regulated services?

The Contractor shall prepare the final report, which also includes the study's findings and the recommendations to the Client regarding leased lines regulation. The document, which must be written in Slovenian or English, must include all the references of used sources and documents the Contractor obtained during the analysis. Alongside the written document the Contractor must also submit the requested analysis in an MS Excel spreadsheet with all the required explanation of the structure and the used attributes which makes it possible for the Client to conduct additional analyses.

The subject of this public procurement includes:

- the preparation and the presentation of the independent and expert study
- the presentation of the said study with a detailed explanation of the findings and the conclusions at the Client's location
- support for the implementation of the study's findings in regulations

Deadlines for implementation:

- agree on the activities from the included project Gantt chart with the Client (within 10 days of signing the contract at the latest)
- submitting the draft analysis (within 30 days of signing the contract at the latest)
- submitting the final version of the basic analysis (within 45 days of signing the contract at the latest)
- submitting the draft of the detailed analysis of the 5 member countries the Client selected (within 60 days of signing the contract at the latest)
- submitting the final version of the analytical study (within 75 days of signing the contract at the latest)
- presentation of the study's findings on Client's location (90 days from signing the contract at the latest)