

Supply of optimal route planner software and services at ELES, Slovenia

Tender Technical Requirements

6 Purpose of the document

The document contains the specification of requirements for the procurement of a tool (hereafter SOFTWARE) and the associated licenses for constructing the optimal route of new transmission lines, using modern algorithms, such as machine learning and artificial intelligence, by which the overall process of finding/defining optimal route is upgraded and simplified.

7 General information about the company ELES

7.1 Contact data

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7.2 About the company

Founder and exclusive owner of the combined transmission and distribution system operator ELES is the Republic of Slovenia (RS). ELES performs commercial public service of electric power transmission and distribution on the territory of the RS and is responsible for its operation, maintenance and development, system services as well as coordination with neighbouring networks.

The main tasks of ELES are:

- power transmission services,
- power system operation,
- ancillary services,
- enabling access to cross zonal capacities for market participants taking into account secure and safe transmission system operations and
- construction and maintenance of the transmission network.

The system has total transmission line length of 3.160,4 km, more than 50 substations, peak demand of 2.100 MW, energy demand of 13.816 GWh and comprises 110 kV, 220 kV and 400 kV networks, 33 power transformers, two phase shifting transformers, FACTS devices and several battery energy storage systems. The grid interconnects with the power systems of Austria, Italy, Croatia and Hungary. There are 2x 400 kV and 1x 220 kV transmission lines to Austria, 1x 400 kV and 1x 220 kV transmission lines to Italy, 2x 400 kV, 2x 220 kV, and 3x 110 kV transmission lines to Croatia, and 2x 400 kV Transmission lines to Hungary.

Revenue is mostly generated from the regulated activities of power transmission through the electric energy transmission tariffs (network charge/tariff). The methodology for setting the network charge and criteria for establishing eligible costs are determined by the Energy Agency of Slovenia and respective Acts issued by Energy Agency of Slovenia.

8 Definitions

For the purpose of this tender documentation, the following terms shall have the meanings set out below:

- **Contracting Authority:** refers to ELES, d.o.o., acting as the purchaser and contracting body under this public procurement procedure.
- **Tenderer:** any economic operator (company, consortium, or authorized representative) that submits a tender in response to this public procurement.
- **Contractor:** the successful Tenderer with whom the Contracting Authority will conclude the contract following the award procedure.
- **SOFTWARE Provider:** the original developer and owner of the offered software solution. In cases where the Tenderer is not the manufacturer, the Tenderer must act as the authorized representative of the SOFTWARE Provider.
- **SOFTWARE:** the SOFTWARE solution that is the subject of this public procurement, including all its components, modules, and functionalities offered by the Tenderer.

9 Description of the current situation

Transmission system operators play a key role in ensuring that the power system reliably meets the demand for electricity and power under all operating conditions. In recent years, they have been facing increasing challenges arising from spatial constraints, technological progress, and the growing use of renewable energy sources (RES).

Projections indicate that, due to the green transition, it will be necessary to build additional transmission lines, which under the current circumstances - where spatial planning is extremely demanding - represents a major challenge.

Currently, ELES cooperates with external contractors in the process of identifying optimal routes for new overhead lines. This process typically involves various expert profiles covering different areas of project planning and implementation, while adequately considering technical, spatial, environmental, and social factors. Due to the large number of stakeholders involved, processes are often lengthy and require the reconciliation of different interests.

10 Description of the desired state

Selection of the optimal transmission route is crucial in the investment process for a new line, as it can significantly reduce construction costs, minimize environmental impact, and increase the social acceptability of the project. The acquisition of an advanced SOFTWARE, which employs modern algorithms, such as machine learning and artificial intelligence, enables the acceleration of the spatial planning process by upgrading and simplifying the search for the optimal route.

As part of this public procurement, Contracting Authority will conclude a contract with the most advantageous Tenderer for the purchase of the SOFTWARE and the associated licenses for the next three (3) year period, with the possibility of extension.

The introduction of this technology in the company will significantly contribute to sustainable and cost-effective planning of energy infrastructure in the future.

11 Technical requirements for the new SOFTWARE

The aim of this section is to define the Contracting authority's requirements for the introduction of a SOFTWARE for selecting the optimal route of new transmission lines. The section highlights the specific requirements that must be available in the selected tool either in the basic configuration or as additional customizations provided by the supplier within the implementation project to meet the Contracting authority's needs.

The requirements are divided into two categories: mandatory and additional. Mandatory requirements define the essential conditions for the introduction of the SOFTWARE, while additional requirements refer to extra functionalities offered by the supplier within the scope of the procurement, which are evaluated as part of the award criteria.

Each requirement in the document is specified with the following details:

- ID: Unique identification number of the requirement.
- Description: Explanation of the requirement and its purpose.
- Acceptance Criteria: Criteria that must be met for the requirement to be accepted as fulfilled.
- Mandatory/Optional: Field included when the requirement is defined as mandatory or additional.

Table 1: Technical requirements

ID	Description	Acceptance Criteria	Mandatory / Optional
1	The solution is deployed in the cloud (SaaS) in Europe	<ul style="list-style-type: none"> • The solution (all data) is deployed and processed in the cloud (SaaS) located in European Union or in countries recognized by the European Commission as providing an adequate level of data protection (e.g. Norway, Iceland, Liechtenstein, Switzerland, and the United Kingdom). The same applies to backups or redundant data centers. • The Tenderer shall provide clear evidence of the physical hosting location(s). 	Mandatory
	System configuration documentation and manuals	<ul style="list-style-type: none"> • Necessary documentation prepared for effective SOFTWARE handover • Administration and user manuals delivered. • Access provided to key users 	Mandatory
2	Establishment of the Contracting authority's environment	<ul style="list-style-type: none"> • The Contractor shall set up and provide the production environment in the cloud. • Environment accessible to the Contracting authority via secure connections 	Mandatory
3	User licenses	<ul style="list-style-type: none"> • The Contractor shall provide at least one (1) license with full functionality, enabling concurrent access for at least one (1) user with full administrative rights. 	Mandatory

		<ul style="list-style-type: none"> The SOFTWARE shall allow managing user accounts with different levels of access rights. 	
	User training	After establishing production environment of the SOFTWARE, training of the contracting authority's staff is provided as explained in chapter 12.1.	Mandatory
4	System requirements for setup	<ul style="list-style-type: none"> The SOFTWARE must operate responsively The Contractor must ensure regular data backups (at least once per day) are made. The web interface must operate exclusively over secure connections (TLS 1.2 or TLS 1.3). For data exchange, the application must use standard API interfaces and encrypted traffic (minimum TLS 1.2). Secure key management and rotation must be supported: The offered SOFTWARE shall support secure management and regular rotation of all authentication keys used for access to system components or services (e.g. user API keys, internal service keys, or equivalent credentials). Rotation may be performed automatically or according to a defined key rotation policy (e.g. every 30–90 days). For the entire maintenance period, the SOFTWARE must remain compliant with the latest security patches of the platform on which it is installed. The maximum recovery time must be defined. A responsible person for service operation must be designated. 	Mandatory
5	Technical requirements for cloud deployment (service subscription)	<ul style="list-style-type: none"> Data flows should primarily be established from the contracting authority to the service provider. If flows are bidirectional or from the provider to the contracting authority, "Site-to-Site IPSec VPN" or application-level encryption must be used. In case of a cloud service, the contractor must process personal data in compliance with the EU General Data Protection Regulation (GDPR). The service provider must notify the contracting authority immediately (no later than 1 hour after detection) about any security incidents that may compromise the contracting authority's data or its users' data. The service must allow at least 90 days of access to data after termination of the contract between ELES and the service provider. Upon termination of service, the contractor must ensure that ELES can retrieve its data easily in a format allowing further use or conversion into another suitable format. The contract must specify the maximum period within which the service provider irreversibly deletes data (after a deletion request or service termination), including backups and redundant data centers. 	Mandatory

	General security requirements	<ul style="list-style-type: none"> The user interface must be implemented as a web application; it must only be published via secure connection (https). The user interface must function on standard web browsers without plugins (at least MS Edge). All connections used for data exchange within the ELES network must be encrypted. Data and communication encryption must use modern strong algorithms and methods. Weak encryption algorithms or methods must not be possible. Password changes for all privileged accounts must be enabled and documented. 	Mandatory
		<ul style="list-style-type: none"> ISO 27001 certified 	Mandatory
		<ul style="list-style-type: none"> The cloud service provider must be SSAE 18 SOC Type I compliant. 	Mandatory
	User authentication	<ul style="list-style-type: none"> Login (authentication) must prevent unauthorized disclosure or use of authentication data. Authentication data must not be transmitted or stored in unencrypted form. 	Mandatory
	Visualization	<ul style="list-style-type: none"> Display of terrain in 2D/3D view. Display of included optimization parameters. 	Mandatory
		Includes tower models, cables, LiDAR data.	Optional (2 pt)
	Transmission route optimization	<p>The SOFTWARE must support fully parameterizable optimization of transmission line routes by integrating imported geospatial layers and user-defined boundary conditions. The system shall include, but not be limited to, the following capabilities:</p> <ul style="list-style-type: none"> Custom Offsets, Buffers, and Weights per Layer For each imported layer (e.g., seismic zones, protected areas, legal restrictions, terrain features, existing infrastructure, vegetation, cadastral boundaries), the user must be able to define custom offsets or buffers (minimum exclusion zones) and assign weightings or penalty scores for traversing or proximity. Multi-criteria Decision-making & Flexible Parameter Adjustment The optimization engine must support multi-criteria methods that allow users to balance environmental, technical, and socio-economic parameters dynamically, by adjusting weights, priority settings, and trade-offs between competing objectives. Hard vs Soft Constraints Users must be able to distinguish between “hard constraints” (absolute exclusion; route segments may not cross) and “soft constraints” (areas to be avoided where possible but allowed with penalty). The system should be able to manage trade-offs accordingly. 	Mandatory

		<ul style="list-style-type: none"> • Obstacle Avoidance & Use of Existing Infrastructure The algorithms must allow for avoidance of obstacles (e.g., steep slopes, protected zones, buildings) and promote reuse of existing infrastructure (e.g., follow existing corridors, use existing right-of-way) where advantageous, subject to weights and constraints. • Re-optimization The system must permit recalculation of routes when additional layers, constraints or parameters are added or modified — without requiring full reimport or rebuild of the dataset. 	
	Transparency & Visualization of optimization constraints	The system must provide transparent, visual feedback on how each constraint or layer influences the routing result (for example via heatmaps, influence overlays, “cost surfaces”, scoring maps) so that users can understand which constraints “pushed” the route where it went.	Mandatory
	Investment optimization of transmission route (financial aspect)	Software can calculate expected CAPEX and OPEX of the project.	Mandatory
		Route optimization must allow the option of hybrid line in a sense of mixed overhead or underground cable	Mandatory
	Accuracy of transmission route optimization configuration	<ul style="list-style-type: none"> • Ability to add multiple layers of data one above the other, limited to basic types of criterion functions. • Ability to add raster and vector data and configure layers (e.g., seismic maps, legal restrictions, etc.). 	Mandatory
	GIS data availability	<ul style="list-style-type: none"> • The SOFTWARE must provide a geographic base map layer (from OpenStreetMap, Google Maps, or similar reliable sources) as the foundation for visualization. 	Mandatory
	Creation of technical reports	<ul style="list-style-type: none"> • The SOFTWARE must enable the automatic generation of technical project reports, including clear presentation of results supported by graphs, tables, and analytical summaries. Reports must be produced in a structured format suitable for review, archiving, and further processing. • The SOFTWARE allows to export these reports in PDF or DOCX. 	Optional (3 pt)
	Project data import	<ul style="list-style-type: none"> • Supports at least one of the following standard formats: Shapefile, .tif, .tiff, GeoTIFF, GeoJSON, GPKG. 	Mandatory
	Project data export	<ul style="list-style-type: none"> • Export of spatial data in at least one of the following formats: GeoJSON, Shapefile or geopackage (gpkg). • Export of tabular data in at least one of following formats: XLSX ,CSV or TXT. 	Mandatory
	Connection to ArcGIS	<ul style="list-style-type: none"> • Possibility of using the application, its functions, or data within the ESRI ArcGIS environment in the form of tools (toolbox) or add-ins. 	Optional (2 pt)

	Coordinate systems	<ul style="list-style-type: none"> Support for the use of the Slovenian coordinate system (EPSG 3794 and EPSG 8690) or online transformation between the Slovenian and the applied system (for upload and download of the data). 	Optional (2 pt)
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12 Nonfunctional requirements

12.1 Trainings

Training for the SOFTWARE shall be provided to the Contractor authority's officials by the SOFTWARE provider. The training program shall consist of three sessions with a total duration of 5 days:

- The first session shall be an on-board, hands-on course covering both basic and advanced handling of the SOFTWARE, with a duration of 5 days (35 hours).
- The second session shall be held approximately two months later, with a duration of 1 day (7 hours).
- The third session shall be held approximately two months after the second one, or as otherwise agreed, with a duration of 1 day (7 hours).

This phased approach ensures effective knowledge transfer and gradual reinforcement of skills during practical use of the SOFTWARE.

The scope of trainings shall be suggested by the SOFTWARE provider and mutually agreed upon. The parties shall also agree on the training schedule, number of participants, session durations, proceedings and other details.

12.2 Customer support

Customer support shall include support through customer portal or any other ticketing system in place (e.g. within the SOFTWARE itself) and telephone with access to updates and software extensions, as well as information about technical references, tutorials, and FAQs.

- During the 3-year license period, the provider of SOFTWARE shall provide at least 100 hours of professional support for the use of the SOFTWARE.
- The provider of SOFTWARE shall provide a dedicated e-mail address that can be used for error reporting in cases when the ticketing portal is not operational.
- The provider of SOFTWARE shall respond to an error report submitted through the reporting system or by e-mail within one (1) working day.
- The SOFTWARE provider shall commence resolution of the reported error within a maximum of three (3) working days.
- Live chat support shall be considered an equivalent alternative to telephone or e-mail support.

For the duration of the customer support period (three years), all maintenance services described herein — including updates, extensions, and up to 100 man-hours of professional support per year — shall be provided by the SOFTWARE provider at no additional cost to the contracting authority.

13 Conditions for participation

Eligible Applicants include legal entities and other suppliers established and having their registered office in a Member State of the European Union (EU), the European Economic Area (EEA), the Swiss Confederation, the United Kingdom, or in any other country with which the Republic of Slovenia or the

European Union has concluded an appropriate international agreement, subject to the condition of reciprocity.

Applicants may submit a tender individually or as part of a group of jointly and severally liable entities, including consortia, joint ventures, or other forms of temporary associations (hereinafter also referred to as “Consortium Members”).

Each Applicant, or in the case of a consortium, each Consortium Member, must be duly registered to perform the business activity corresponding to the subject of this public procurement.

If, for the performance of its professional activity, the Applicant is required by law to hold a specific license, approval, professional certification, or membership in a professional body or register, such requirements must be fulfilled at the time of submission of the tender.

13.1 References

Tenderer must submit a reference list indicating successfully implemented or operational uses (including cloud-based or SaaS solutions) of the SOFTWARE by clients, confirming that the solution has been successfully deployed and is in active use, where the end customer is a European transmission system operator (TSO) or distribution system operator (DSO), performing its activities in accordance with EU electricity market legislation or being a member of ENTSO-E or a recognized European DSO association (such as E.DSO or CEDEC). In the case of DSOs, the operator must also manage and operate networks including voltage levels of 110 kV.

The installation or provision of the SOFTWARE must have been carried out within the last five (5) years, counted from the date of publication of this public procurement.

The reference list must include at least one (1) successful implementation of the SOFTWARE, accompanied by a letter of satisfaction issued by the end user. The end user shall comply with the definition of a European TSO or DSO as specified in the previous paragraph.

The references shall be evaluated and awarded points as described in Table 2.

14 Evaluation Criteria and Scoring Matrix

The Contracting authority will evaluate all compliant tenders in accordance with the criteria set out below. The purpose of the evaluation is to ensure that the selected Tenderer provides the best overall value, balancing economic efficiency with technical quality, security, proven reliability, and adequate support for the contracting authority’s operational needs.

Table 2: Scoring Matrix

Criterion	Max points	Scoring Method
1. Price	73 points	The tender with the lowest offered price will receive the maximum score of 60 points. Other tenders will be scored proportionally according to the following formula: $Points = \left(\frac{Lowest\ Offered\ Price}{Tenderer's\ Price} \right) \times 73$

2. Licenses	10 points	<p>At least one (1) concurrent license with full functionality are mandatory, as described in Table 1 paragraph 3 (User licenses). Additional points may be awarded in the following cases:</p> <ul style="list-style-type: none"> • External User Flexibility: 5 points may be awarded if the system supports the creation of user accounts (with full functionalities) that are not bound to the Contracting Authority's organization (e.g., external contractors/consultants, design engineers). • Read-only / Viewer Licenses: 5 points may be awarded if the Contractor provides a minimum of five (5) read-only (viewer) licenses, enabling wider access to the tool for stakeholders (e.g., management, project designers, external partners, local communities, civil initiatives) without consuming full user licenses.
3. Visualization	2 points	<p>The Tenderer shall be awarded 2 points if the following conditions are met:</p> <ul style="list-style-type: none"> • Visualization includes tower models, cables, LiDAR data.
4. Creation of technical reports	3 points	<p>The Tenderer shall be awarded 3 points if the following conditions are met:</p> <ul style="list-style-type: none"> • The SOFTWARE enables the automatic generation of technical project reports, including clear presentation of results supported by graphs, tables, and analytical summaries. Reports must be produced in a structured format suitable for review, archiving, and further processing. • The SOFTWARE allows to export these reports in PDF or DOCX.
5. Connection to ArcGIS	2 points	<p>The Tenderer shall be awarded 2 points if the following conditions are met:</p> <ul style="list-style-type: none"> • Possibility of using the application, its functions, or data within the ESRI ArcGIS environment in the form of tools (toolbox) or add-ins.
6. Coordinate systems	2 points	<p>The Tenderer shall be awarded 2 points if the following conditions are met:</p> <ul style="list-style-type: none"> • Support for the use of the Slovenian coordinate system (EPSG 3794 and EPSG 8690) or online transformation between the Slovenian and the applied system.
4. References and Reliability	6 points	<p>Evaluation shall be based on valid references indicating successfully implemented or operationally deployed (including cloud-based or SaaS solutions) uses of the offered SOFTWARE with electrical Transmission System Operators (TSOs) only.</p> <p>A maximum of three (3) references shall be considered under this criterion.</p> <p>Scoring:</p> <ul style="list-style-type: none"> • Each confirmed reference with an ENTSO-E member TSO, accompanied by a letter of satisfaction issued by the end user = 2 points.

		<p>The maximum achievable score under this criterion is 6 points (e.g., three (3) ENTSO-E TSOs = 6 points).</p> <p>Only references from TSOs that are members of ENTSO-E shall be considered valid for scoring.</p> <p>References consisting solely of European DSOs are accepted only to meet the minimum eligibility requirement for participation in the Tender but shall not contribute to the score. The end users shall comply with the definition of a European TSO or DSO as specified in the first paragraph of Section 13.1.</p>
Software's language	2 points	The Tenderer shall be awarded 2 points if the SOFTWARE provides the entire graphical user interface (GUI) in Slovenian language, with a seamless option to switch between Slovenian and English language.

Price will constitute the main criterion, reflecting the importance of cost-efficiency for the contracting authority. However, in order to guarantee that the procured solution also meets high professional and technical standards, additional evaluation criteria are included. These criteria cover quality and functionality of the offered software, compliance with security requirements and relevant references in the energy transmission sector.

Each tender will be evaluated based on a points system. The maximum achievable score is 100 points. The tender with the highest total score will be ranked first.

The contract will be awarded to the tenderer that achieves the highest total score in accordance with the above evaluation criteria.

In the event that two or more tenders achieve the same final score, the tender offering the lower total price shall be ranked higher. If both the final scores and the prices are identical, the contracting authority reserves the right to request additional clarifications or to conduct negotiations with the concerned tenderers, provided that such actions are in accordance with the applicable public procurement legislation.

Tenders that do not meet the mandatory requirements of the technical specifications or fail to provide the required documentation (e.g., reference confirmations, proof of compliance) will be considered non-compliant and excluded from further evaluation.

15 Implementation deadline of the SOFTWARE

Access to the web interface must be established and granted to the user within 2 months from the signing of the contract.

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