# D2.5 Guidelines for tender process of IT-services

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## 1.1    REGATRACE in a Nutshell

REGATRACE (REnewable GAs TRAde Centre in Europe) aims to create an efficient trade system based on issuing and trading biomethane/renewable gases certificates/Guarantees of Origin (GO) with exclusion of double sale.

This objective will be achieved through the following founding pillars:
- European biomethane/renewable gases GO system
- Set-up of national GO issuing bodies
- Integration of GO from different renewable gas technologies with electric and hydrogen GO systems
- Integrated assessment and sustainable feedstock mobilisation strategies and technology synergies
- Support for biomethane market uptake
- Transferability of results beyond the project's countries
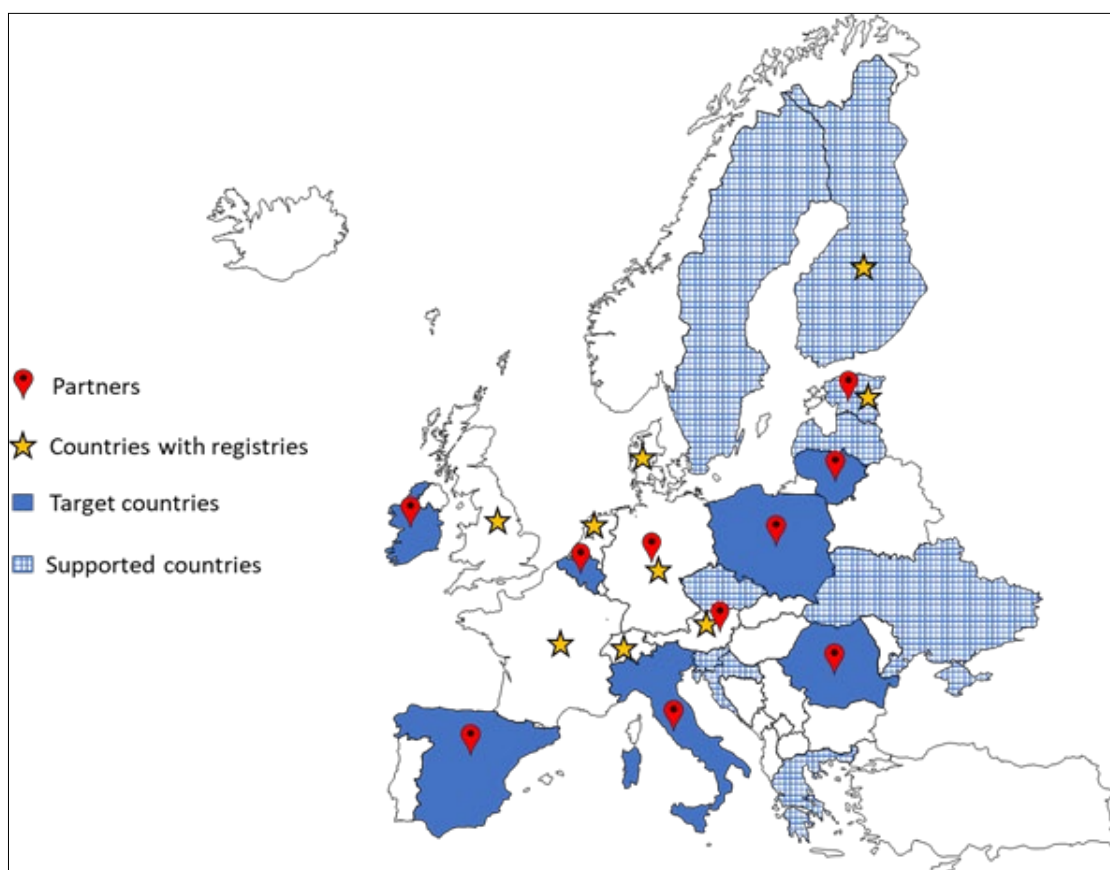


**Figure 1: REGATRACE countries and partners**

The network of issuing bodies will be established by including existing national biomethane registries (Austria, Denmark, Estonia, Finland, France, Germany, The Netherlands, Switzerland and UK) and by creating issuing bodies in the Target countries of the project (Belgium, Ireland, Italy, Lithuania, Poland, Romania and Spain).

Moreover, REGATRACE will prepare the ground for setting-up national biomethane registries in other 7 Supported countries (Croatia, Czech Republic, Greece, Latvia, Slovenia, Sweden, and Ukraine).

Using a participatory process involving several stakeholders, REGATRACE will develop strategic visions and national roadmaps to boost the biomethane market.

## 1.2 Executive summary

This project report provides guidelines on different aspects of a tender process to acquire specific IT-services for a renewable gas trading platform. To find the best possible IT-provider, an open, clear, structured, and fraud-excluding tender process should be performed, allowing a transparent competition of a broad variety of bidders. The tendering organization must provide clear requirements on the tendered IT-service to enable bidders to submit precise offers.

The content of this report is prepared in a broad manner to allow applicability for different IT-services, such as a dashboard and/or a trading platform for renewable gas certificates, a renewable gas registry and an issuing body. The combination of two related REGATRACE project reports, namely the present report D2.5 on the tender process and a following report D2.6 on the technical specifications, form the necessary documentation to enable a tendering organization to conduct such a tender.

This report considers information published by the European Union institutions on public procurements and provides practical insights by the authors of this report who are experts in the renewable gas sector and have knowledge in the procurement of IT-services. The addressed audience comprises the tendering organization as well as the possible bidders. The whole chain from the first publication of the information on the tender, to the different stages of the tender process, as far as the contract signing concerning the respective IT-services, are covered in this report. The first chapter addresses organizational aspects of the tender process including different stages, necessary tender documents, and requirements on award criteria, supported by practical examples, where appropriate. The following chapters cover information technology related requirements for consideration by the tendering organization, referring to the IT-infrastructure (hardware, operation, non-functional requirements), software (architecture, security, performance, usability, interfaces, data formats, reporting) and operational phase (availability, support, maintenance) of the respective IT-service. A potential bidder list comprises selected companies, known for their experiences in providing software solutions related to the energy sector and/or trading, which should be directly addressed when a European renewable gas trading platform is tendered.

## 1.3 Target of REGATRACE D2.5

The project title highlights the project goal namely, to establish a REnewable GAs TRAde Centre in Europe (REGATRACE) by preparing the framework for an efficient trade system based on issuing and trading renewable gas certificates with exclusion of double sale or fraud. Trade refers to the exchange of renewable gas certificates of a specific monetary value, including a change in ownership ("title transfer"). A web-based trading platform enables producers, consumers, and traders of renewable gas to get in contact and communicate with each other. A renewable gas certificate must be assigned to an owner at any point in time, while the operator of the trading platform neither acts as owner at any point, nor takes any influence on pricing. The functionalities to operate such a trading platform must be highly secure, reliable, and automated. The trading platform must comply with state-of-the-art requirements on IT-solutions, including the software solution and the operation of reliable and

powerful hardware to run the trading software. Additionally, the solution must be user-friendly to support the interplay of market participants with the platform.

IT-services shall always be operated based on a suitable balance of efficiency, highest possible quality, and cost-effectiveness. To select the best possible provider of IT-services for a renewable gas trading platform, these services should be tendered in an open, clear, structured, and fraud-excluding process. The definition of the best possible bidder shall be determined based on the tender requirements and the award criteria. This report considers information published by the European Union institutions on public procurements and provides practical insights by the authors of this report who are experts in the renewable gas sector. To gather insights and feedback from market participants who intend to use the respective system in the future, interviews with experts of trading organizations and interest groups, particularly in the gas sector, were held. Vast experiences by the Association of Issuing Bodies (AIB aisbl) have been taken into account. The AIB hub enables the transfer of electricity GO between trading companies of different national Issuing Bodies. It has been connected to the electricity GO trading platform Powernext[1]. The authors consulted interest representatives of the gas market and interviewed GIE Gas Infrastructure Europe, EFET European Federation of Energy Traders and ENTSO-G European Network of Transmission System Operators for Gas. Representatives of cooperates associated with trading of commodities, especially certificates of renewables were also consulted, including EXAA Energy Exchange Austria, Green Power Hub (by ISN AB), Arcanum Energy. Some of these corporates are members of the association ERGaR aisbl (European Renewable Gas Registry) including bmp greengas, STX Services and Landwärme GmbH.

Three related project tasks (2.5, 2.6 and 2.7) build a joint documentation package with guidelines to enable an organization to conduct a tender for the IT-services needed to establish active trade on the European renewable gas market. While the present report (D2.5) describes the organizational and technical aspects of the tender process for IT-services, the follow-up report (D2.6) will detail technical specifications of the necessary IT-services. The aim of the present report is to provide guidance to a tendering organization actively seeking to establish an integrated European renewable gas market and potential bidders on how to adopt best practices and avoid frequent errors. Chapter 2 describes requirements on the Tender process, including guidelines/templates on the provisions for bidders and suitable award criteria. The following chapters of the report provide insights on technical requirements, describing IT-infrastructure (see chapter 3), Software (see chapter 4), and Operations (see chapter 5). A Potential bidder list will be an additional result of this report (see chapter 6).

This report presents useful guidelines to steer the involved parties through the tender process specifically for the set-up of a trading platform for renewable gas certificates. Based on this information, analysis of existing trading systems may be conducted to select the best-possible options for IT-services and find an efficient combination of security, workability, performance, cost sharing and user-friendliness.

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[1] https://www.powernext.com/french-guarantees-origin-registry

# 2 Tender process

## 2.1 Introduction into a tender process

### 2.1.1 Purpose of a tender process

The aim of the tender process is to initially reach out to a high number of potential bidders to be limited at each stage to reach a small group of most-suitable bidders when taking a final decision on the IT-provider. While the number of bidders decreases, the requirements on offer documents increase and the award criteria become more specified over the course of the tender process.

One option for the acquisition of IT-services for any kind of software for trading facilities is acquisition via a tender process. Another option refers to directly ordering the respective services from a pre-selected company/provider. In the latter case, there is neither price comparison possible, nor the potential of different solution concepts or implementation approaches are gathered. IT-services of established trading functions in the energy sector are usually only ordered in private industries with long-term relation to their suppliers.

Major differences exist between public and private tenders. Whereby private sectors are procuring on individual established frameworks, public procurement conducted primarily for public investments for projects in Member States are requested to adhere to the respective applicable public procurement rules. Public procurement is estimated to account for 48% of the European Structural and Investment Funds[2]. Such widespread European rules are valid for governmental authorities or companies which are required to publicly tender services above a specific threshold, currently set at EUR 139,000[3]. Only contracts with higher financial values are subject to general EU public procurement rules. For example, a European procurement has to be conducted for construction contracts above a threshold of EUR 5,350,000[4]. Additionally, public procurement processes may be defined on national level for specific entities, sectors, or services. All defined rules have been developed with the aim to keep procurement markets EU-wide open to ensure the most efficient use of public funds, value for money and fair competition in the market by awarding timely and cost-effective contracts to qualified corporates.

### 2.1.2 Structure of a tender process

Different types of tender processes are open, restricted, and competitive negotiated tenders. Although there are basic principles to conduct a tender, the applied method, provided documentation and guidelines must be appropriate for tendering the IT-services of a trading platform for renewable gas certificates.

Tender processes of comparable IT-solutions are usually divided into several stages to provide an iterative process for the decrease of the number of bidders. The tender process should be clearly structured to ensure efficiency of the overall process for the tendering organization. To facilitate a clear and efficient selection process and allow an equal level playing field, tender documents of each stage on the required services such as software, hardware, and their operation, and the respective quality criteria should be publicly available to all participants (see chapter 2.2.2 Documentation). In the following, a two-phased approach for a selection process is described, which has been identified

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[2] https://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_public_proc_en.pdf
[3] https://europa.eu/youreurope/business/selling-in-eu/public-contracts/public-tendering-rules/index_en.htm, accessed on 2020/08/12
[4] https://europa.eu/youreurope/business/selling-in-eu/public-contracts/public-tendering-rules/index_en.htm, accessed on 2020/08/12

as the most suitable tendering approach by the authors whereby different other options to conduct the procurement of IT-services are also possible.

The first stage, usually referred to as RFI ("Request for Information"), represents the first time when information on the tender is officially published to possible bidders. Respective information on the overall tender process is provided together with detailed information on the actual tendered service. To trigger interest of potential bidders, the information should be as accurate as possible. During the RFI process stage, bidders submit a detailed offer which is further evaluated by the tendering organization. At the end of the RFI stage, all offers must be evaluated which may be time-consuming. As a result of the evaluation during the first stage, the number of bidders is pre-filtered.

The next stage of the tender process is the RFP ("Request for Proposal") where these pre-filtered bidders provide a detailed offer including the commercial, technical, and financial aspects. The information to prepare such offers may only be provided to those specific corporates who reach the RFP stage. Within the RFP stage, personal presentations constitute a suitable measure to further narrow down the list of participants/bidders. In special circumstances, when travelling is not possible, the personal presentations and meetings can be made through video conferences.

Optionally, an additional stage referred to as BAFO ("Best and Final Offer") may be conducted. During this stage, shortly after the RFP and after a demonstration, the bidder may adapt their RFP offer based on additional information gathered through communication with the tendering organization particularly through a demonstration or presentation. This stage includes the provision of a final offer by the bidder and a first round of negotiation which shall determine whether main obstacles exist for a future cooperation.

Since bidders usually raise several questions during each stage of the tender process, the tendering organization shall pay attention to those questions and shall implement a contact point (e.g. hotline, service desk) dedicated to answering those questions, aggregating different opinions, and communicating the respective answers. This contact point could be supported by a ticketing system to document incoming questions, released explanations, and administer transparent communication loops. It is common practice, that the questions and respective answers are transparently published to all bidders which reduces the risk of information conflict.

After evaluation of the best possible bidder, information needs to be provided to all bidders about the outcome of the tender. A stage should be implemented allowing for any objections to the outcome of the tender, e.g. two weeks after notification of the awarding results. This way, bidders receive a platform to raise their objections and challenge the result which should be answered by the tendering organization. Their raised doubts should be analysed, and the answers need to be communicated properly.

Finally, the best possible bidder shall be selected, and the tendering organization may start the contract negotiation before signing.

### 2.1.3 Tender platforms

Guidelines on the tender requirements and process should be published on several platforms, especially well-known ones to address a broad audience. The requirements should be publicly accessible by a variety of companies throughout Europe and possibly also beyond to receive a high number of offers. A publication platform provides the basis for gathering several different offers to a wide range of corporates. The SIMAP system (French: système d'information sur

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les Marchés Publics[5]) provided by the European Union, offers publicly available information about tenders in the European Union and is accessible in several European languages. The system comprises different functions such as the best-known tender platform TED (Tenders Electronic Daily[6]). The TED platform offers advanced information on the launch of a tender, which allows additional perception and higher outreach prior to the main procurement process.

In addition to the publication on portals, organizations known to be capable of submitting a suitable offer for the tendered services should be personally contacted by the tendering organization.

### 2.1.4 Neutrality and external support

During the tender process, neutrality is important to secure transparent and fair service ordering. The design of a tender process must be highly fraud-resistant which must be ensured via suitable measures. The structure of involved personnel and organizations within the tender process must be free from any personal interest or influence on bidding organizations. No persons with direct involvement are allowed to take decisions on the evaluation of the tender.

The involvement of external organizations or consultancies is a good support option, also referred to as "deal advisory". Such entities may actively contribute to the selection process throughout the whole bidding process, management of communication with bidders and reviewing the bidder's documents and the evaluation results of the tendering organization.

## 2.2 Details on the tender process

### 2.2.1 Terminology

The tendering organization shall provide a clear terminology on the project description, which shall comprise definitions for specific terms directly viewable to the bidders when developing an offer. The following list includes the most important terminologies to be defined:

1. Tender parameters → project title, tendering organization details, background, deadlines, communication, others.
2. Deliverables: what shall be delivered → IT-service (product) and maintenance (time).
3. Test and Integration → tests expected and integration of processes.
4. UAT (User Acceptance Testing) → customer testing based on acceptance criteria related to deliverables.
5. Go-Live → parameters of Go-Live and conditions for "Go To Production".
6. Staging → phases expected by the tendering organization such as additional support during "short post-go-live-period" (referred to as hypercare).
7. Hosting concept → who will provide infrastructure and operation thereof.
8. Exploitation or transfer → who will be the owner of the tendered IT-service.

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[5] https://simap.ted.europa.eu/web/simap/home
[6] https://ted.europa.eu/TED/main/HomePage.do

### 2.2.2 Documentation

The bidder must provide suitable documents during the tendering process, specific requirements for each stage of the tender are defined by the tendering organization. The following list provides potential documents to be exchanged between the tendering organization and bidders - respectively the selected corporate - to provide the requested IT-services:

1. Tender process
    a. RFI: Request for information
        i. Bidder information (company register excerpt, confirmation about liquidity, national insurance contributions, financial reports of past three years and extract from police records of the key staff and management)
        ii. References on similar projects within a defined period for example within the past three years
        iii. Signed Confidentiality Agreement
    b. RFP: Request for proposal
        i. Technical Offer
        ii. Financial Offer
        iii. Legal Offer
        iv. Project Management Approach
        v. Risk Management Methodology
        vi. Competences
        vii. Profiles of bidder's key staff e.g. Project Manager, Business Analyst, Test Manager and expected workload for each profile
        viii. Project Schedule
        ix. Presentation / Demonstration material
    c. OPTIONAL: BAFO
        i. Final Offer
        ii. Negotiable contract documents
    d. Project Signing
        i. Implementation Contract
        ii. Payment Plan
        iii. Service Level Agreement (SLA)
2. Development and implementation
    e. Project Implementation
        i. Project handbook
        ii. Software design concept
        iii. Detailed technical specifications
        iv. Project time schedule
        v. Risk charter
        vi. Protocols / Minutes of meeting
        vii. Hardware description
        viii. User manuals
        ix. Administration manuals
        x. Online-help
        xi. Testing scenarios
        xii. Test protocol

xiii.     Acceptance certificate

xiv.     Release Notes

   f.    Operations

       i.    Monitoring Reports

      ii.    Incident Reports

     iii.    Update Reports

     iv.    Release Notes

Through the provision of profiles for specific project roles and their estimated workload, the tendering organization makes it possible to compare offers more easily. Moreover, it enables to determine whether the project schedule realistically meets the expected workload.

### 2.2.3 Requirement specification (required IT-services)

The requirements of the tendered IT-services must be provided by the tendering organization as clearly and detailed as possible, since they represent the core information for the bidder. Therefore, the tendering organization shall provide a detailed documentation on the requirements of the business processes, interfaces, functions, also including functional and non-functional requirements. Functional requirements particularly describe the core functionality of the requested system, e.g. submission of bids whereby non-functional requirements include technical requirements applicable for the overall system use, e.g. the access to the system shall be provided using, e.g. username and password together with 2FA (Two-Factor Authentication). While the requirements should be precisely documented, they should enable the bidders the freedom to use their architecture or data model (balance between minimize restrictions for bidders and defining the requirements as detailed as possible). Based on the provided requirement specifications, the service provider must develop the detailed technical specifications in the stage of project development. It is the task of the tendering organization to provide detailed definitions of the business process, while the underlying functionalities and their implementation are solely up to the bidder. Still, requirements on the implementation method or supporting methodologies can be made mandatory if deemed supportive to supply the tendered services. This might be the case when the specification of the tendered service is not 100% clear or might change during the implementation phase. In this case it is recommended to include a possibility to change requirements (up to a certain extent) during the implementation phase which needs a flexible project management approach by the supplier.

REGATRACE Deliverable 2.6 will provide template specifications for a dashboard and a trading platform which serve as supporting documents when performing a tender.

### 2.2.4 Testing

To enable a robust and efficient quality assurance of delivered services and to paint a picture of the future services, bidders shall describe their testing processes and methodology within their tender documents. Details must be provided on the testing procedure, including the provision of testing documentation, the execution of test phases, the involvement of the tenderer into testing and the handling of issues for example via an issue tracking software (e.g., Jira, OpenProject, VMware, etc).

In order to conduct any test, a dedicated IT-environment (for example demo version with access for tendering organization) should be provided on which the services can be tested prior to the release on the production environment. Any release of the tendered service shall be only made available to the production environment in case testing can be finalised successfully. Thus, it is necessary that tenderer and supplier agree on specific testing procedures and success criteria. The tenderer shall provide

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detailed information on handling and executing such testing procedures during implementation, project delivery and maintenance phase.

### 2.2.5 Training

Within the testing phase, specified trainings for staff members of the organization who will eventually operate the IT-system shall be provided. The personnel phase of the tendering organization may change between the evaluation and the operational phase because the IT-service may be operated by a different organization than the tendering organization. Those trainings shall enable the operational team to understand and get acquainted with the system behaviour and workflows of the business processes. The trainings are deemed necessary to understand if the business processes will be executed according to the tendered documents and in-line with the requirements set by the tendering organization. The trainings shall be planned with appropriate preparation time in order to secure the availability of necessary operational experts. The time, place, material, involved persons, documentation, expected results and other different parameters are to be defined prior to the training. To ensure a successful training, suitable documentation and training material should be provided to all participants, in the best case in advance of the dedicated training sessions. To prove the successful completion of trainings, a final examination could be performed. In case of further questions from the operational team, a contact person on the side of the service provider must be named and their availability clarified.

The number of trainings can be flexible and should be mentioned in the tender documents. It may be valued differently by the tendering organization, if bidders offer only video training or offer the organization of on-site trainings for each user group.

### 2.2.6 Commercial aspects

The structure of a bidding organization or of a consortium of organizations submitting an offer together may differ significantly and thus may provide different commercial aspects.

It is important for bidders to include background information on their structure, location, financial background, equipment, expertise of staff members. This will allow the tendering organization to consider different backgrounds of all bidders and may provide trust, security, and flexibility. The bidder shall submit the information in a structured way with additional certificates confirming the provided details such as a commercial register excerpt. Such differences should be considered during evaluation, e.g. by providing flexibility to smaller companies and considering the expertise and extended resources of large corporates.

Also, the involvement of subcontractors ("deal advisory") should be allowed as one corporate may not be able to deliver all requested services. This is particularly the case in software related projects where the provision of the software and the provision of the respective IT-infrastructure (data centre services) may be conducted by different corporates (maybe interlinked through shares). However, one organization has to take the leading role and will be the one with whom the contract is finally signed and who is taking all risks of the corresponding subcontractor(s).

### 2.2.7 Financial aspects

The financial capability to procure all tendered IT-services shall be confirmed by the tendering organization to the bidder. Underlying documentation either through financial reports, income statements or liabilities may be made available for the bidders in order to confirm financial robustness particularly when tendered by non-profit organizations. In case of insecure financing, there might be a lack of participants for the tender or higher charges due to risks of uncertain payments.

The tendering organization does not bear costs of the bidders, neither for the creation of bid documents nor human resources (spent working time) for questions nor travels during the tendering process. All costs by the tendering organizations, as well as by the bidder must be handled by themselves. The tendering documents shall provide a clear statement on the exclusion of costs to be remunerated.

In order to share the risk of financing, the bidder may be offered a share on the income or shares of the tendering organization to reduce costs of the offer. This concept reduces the risk of financial obligations towards the bidder, as the latter is actively involved in the project and creates own interest on the success of the project and even beyond.

### 2.2.8 Cost structure definition

The simplified and efficient comparison of costs of each bidder, will be supported by an initial provision of a detailed table for bidders to enter costs in a specific format. This table should define different segments considering costs, which occur during the delivery and operation. The delivery costs comprise one-time occurring implementation costs, including project management, testing, development, design, and quality assurance, among others. Operational/Maintenance costs occur continuously such as licence fees, hosting, maintenance, and support. To allow comparability of tenders, the tenderer should define a service contract duration in years to enable the bidders to provide an offer for implementation and maintenance. To receive offers comparable related to their financial value, the currency should be EURO and be stated excluding VAT.

### 2.2.9 Legal aspects

The conditions under which the services are performed must be based on mutual agreements. Therefore, specific framework conditions shall be considered from a legal perspective. This framework shall comprise at least a service delivery contract covering the implementation phase and a maintenance contract covering the operation/maintenance period after the Go-Live of the respective IT-services. In the best case, the tendering organization has its own general terms and conditions which can be used as a standard document to which all tenderers need to comply with.

In general, IT-service contracts comprise specific chapters on performance, functional and non-functional requirements, which include the necessary obligations for the contracting parties in order to fulfil their requirements. The tendering organization may have obligations to challenge the performance or specific functional deliverables by a third party, particularly considering performance aspects through a penetration test. In this sense, the obligations of the tendering organization and of the winning bidder shall represent an integral part of the tender documents. It is recommended to provide a draft of the contract documents already in the tendering phase, as it might influence the bidders' answers and the prices. Specific contractual items, which influence the bidders' proposals related to price are warranty periods, response times of errors, repair times, support times, penalties, financial guarantees to be deposit. Contractual chapters influencing the bidders' overall proposals are for example the provision of suitably trained staff, required documentation items, requirements on testing and training, language, place of delivery, dispute settlement, communication channels, certification of the bidder and emergency management.

Confidentiality should be an integral constant throughout the whole tender process and the service delivery. Therefore, clear and precise rules about confidentiality particularly related to documents and communication must be defined. Any claims or damages caused by the violation of the confidentiality rules shall be subject to penalties for the supplier.

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The bidders shall be independent from a trade organization which actively takes part in the tendered renewable gas trading platform to guarantee neutrality and market trust.

### 2.2.10 Time of delivery

The bidder shall comply with the timeline for implementation set by the tendering organization. There may be deadlines which are fix for the tendering organization.

The timeline and time of delivery need to be defined precisely, as they majorly influence the bidders' costs and ability to deliver the respective IT-service. One major question is whether the service delivery has a strict deadline requested by national or international laws or because of competition reasons (first-mover). Such circumstances need to be considered during the preparation of the tender documents in order to provide cost-efficient offers from bidders.

In case the deadline is not stipulated by the tender documents, it should be at least considered within the award criteria. Earlier Go-live dates should be valued higher whereby the tendering organization should set a fair structure.

For example, if the tendering organization does not set a specific Go-live date for the IT-service, it could define a maximum number of points within the award criteria related to the velocity of service delivery.

Example: Go-Live is majorly important.

- Bidder 1: 01.01.2022
- Bidder 2: 01.05.2022
- Bidder 3: 01.01.2023

Bidder 1 will implement the IT-service faster than the others. Bidder 1 receives the maximum number of points on the criterion "time of delivery". Each additional month can be valued by a 5%-point-reduction for the others. Bidder 2 would receive 20% less points and bidder 3 would receive 60% less points in this case.

### 2.2.11 Place of delivery

The place of delivery defines where the tendered service shall be delivered and maintained in the future. Commonly, the place of delivery is the address of the tendering organization but there might be deviations in case another company than the tendering organization will become the operator of the IT-services. In the latter case, the additional postal address should be clearly stated in the tender description and in the assigned contract.

For example, Party A (the tendering organisation), e.g. a non-governmental association located in Brussels, Belgium has been selected as the central tendering organization for its members but one of the members of Party A, Party B (located in Berlin, Germany) shall become the system operator after implementation. Therefore, the place of delivery will not be Brussels, Belgium, but Berlin, Germany. In this case, it is important for Party C, the contracting party, to be aware that the respective IT-service must be delivered to another place than the registered seat of Party A. Particularly, national requirements for service delivery in Germany or trainings to be held in Berlin need to be considered by the bidders. Still, the contracting phase may be handled by the tendering organization (Party A) in Brussels.

### 2.2.12 Environmental impact

Climate protection is of high value particularly considering the ambitious targets set by European and Member States policies and recent adaptations thanks to the European Green Deal. Still, the overall environmental impact of an IT-solution is very low. The main influencing factors are the energy use primarily for infrastructure and the travels during the project implementation. The use of green electricity for the operation of the data centre may reduce the environmental impact and could be listed within the environmental aspects to be considered in the tendering documents. Those can be valued within the evaluation but should be very limited in case physical meetings are reduced to a minimum focusing on online and virtual communication channels.

## 2.3  Offer

### 2.3.1 Provisions for bidders

The bidders must comply with several requirements in their offers for IT-services to allow the evaluation by the tendering organization in a transparent and efficient manner. The offers shall be structured in a way to make them comparable with each other. The tendering organization needs to provide the structure and table of content of the offer for which the bidders shall provide detailed information.

The tendering organization may limit the extent of documents to be provided for example maximum 100 pages for the requirement specification at minimum 10pt font excluding appendices. The documents shall be provided in digital form using standard file formats, such as .doc, docx., .pdf, .xls or .xlsx.

### 2.3.2 Project management

Project Management is required on both sides (tendering organization and awarded bidder) and is essential for the success of a project. Therefore, it should be known within the tendering process which project management methodology would be applied by each bidder. The provision of related information improves the comparability of offers. Additional information on the staff members acting as project managers may improve the quality of the offer and enable additional points to be allocated during the tendering evaluation process.

Communication within the project is essential. The bidder shall inform on exchanges, particularly on used communication tools, such as email for standard communication, ticketing systems e.g. JIRA for bugs and change requests, chat tools for short communication, such as MS teams, slack, whatsapp or GoTo and meeting tools for virtual communication like MS teams, GoTo or Zoom.

### 2.3.3 Project schedule

The bidder must provide a project schedule listing the detailed project steps with deadlines, respective milestones and the critical path. It has to respect the deadlines given by the tendering organization and reflect the durations to implement the required aspects. There may be penalties applied if milestones are not met within the project schedule. Therefore, the project schedule is subject to be agreed between the tendering organization and the bidder whereby the bidder provides an initial offer.

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### 2.3.4 Language

The main language to be used is English to allow for a common ground with all involved parties. A native language level is not to be expected from participants of the tendering organization; however, the support of English native speakers may provide significant advantages during the implementation phase, particularly concerning legal issues.

## 2.4 Award criteria and evaluation

### 2.4.1 Definition and evaluation of award criteria

Award criteria shall be defined to select the best possible bidder. By providing a clear template of criteria and their weighting, as well as clearly-defined profile description of each score, each bidder is transparently informed about the evaluation process and the most important requirements and their influence on the overall outcome of the bidding process. Rules and guidelines on public procurement are defined in the European legislation[7]:

- Directive (EU) 2014/24[8] on public procurement
- Directive (EU) 2014/25[9] on procurement by entities operating in the water, energy, transport, and postal services sectors
- Directive (EU) 2014/23[10] on the award of concession contracts (More information[11])

They serve as a meaningful and mature framework for tender processes. The EU directive 2014/24 on public procurement states rules/guidelines on contract award criteria in Article 67. In general, the tendering authority in the public sector needs to limit the freedom of choice based on pre-defined and transparent criteria. The award of public contracts has to be done based on the most economically advantageous tender. This includes primarily the financial costs to receive the service but still an overall assessment over the whole life cycle has to be considered. Information provided by the bidders shall be verified in an appropriate way which shall allow evaluating the offers based on the best price-quality principle. This balance shall be determined based on criteria, including qualitative, environmental and/or social aspects, linked to the topic of the public contract.

The award details in the tender documents should include clear definitions about which requirements have to be met by bidders to be considered for evaluation. In case specific requirements are not met, e.g. non-functional requirements, country of server hosting or data protection law, the whole bid will be excluded from evaluation and the offer totally rejected. Therefore, the tender documents may include a MUST-criteria which must be fulfilled by the bidder and OPTIONAL-criteria for requirements which are considered "NICE TO HAVE". Functions marked with the latter may be individually valued within the award criteria, e.g. extra points within quality evaluation.

Tenders in the private sector may define their own framework to receive services or evaluate offers. Still, the receipt of several different offers provides an essential benefit to find the most economically advantageous offer. During the evaluation of offers, award criteria need to be translated into score points for each offer by a bidder which should be done by a selected evaluation consortium defined prior to the official tendering procedure. The consortium should be experienced and have qualitative knowledge to evaluate the offer and must be able to act neutrally. The evaluation consortium may

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[7] https://ec.europa.eu/growth/single-market/public-procurement/rules-implementation_en
[8] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014L0024-20180101
[9] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014L0025-20180101
[10] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014L0023-20180101
[11] https://ec.europa.eu/growth/single-market/public-procurement/rules-implementation/concessions_en

comprise experts for each category of the tender (technical-functional, technical-non-functional, commercial, project management, operation), which can serve as a representative for the corresponding award criterion category.

The evaluation may be performed in several ways. Either, each member of the evaluation consortium prepares an individual evaluation of the received offers which will be aggregated by the chairperson of the evaluation consortium at the end, or the consortium holds personal meetings to discuss individual offers and perform evaluation and awarding of points of each bidder jointly. The consortium meeting leads to one agreed evaluation. This approach gives room for open conversation about details of the offers instead of just aggregating all available points. In the second option, the balance of power has to be clarified before entering the evaluation process. In case no joint agreement on the allocation of points can be found, the representative of the criterion category may receive power to take a final decision on points in the respective category.

To provide a simple example on the allocation of points during the evaluation, it is assumed that the maximum number of points to be gained by a single bidder may be set at 100. In practice, there are two options to define award criteria. Either the price accounts for 100% or additionally to the price, specific quality criteria are weighted and counted. In the first case, the most cost-efficient bidder will win the tender. Such an option should be only considered if the tendering documents are extremely precise on the content to be delivered, the form, place and materials of delivery and methodologies. No room for flexibility or interpretation should exist. For the delivery of IT services, this concept is usually not applicable because various bidders might propose diverse technologies, project methodologies, software components, graphical user interfaces or workflow engines to handle business processes within an IT-application. Also, the experience of the bidder, their references, technical approach, risk management and project schedule including project management shall be recognized within the award criteria. Hence, the diversification of award criteria is deemed more valuable for the tendering organization than just the pure focus on price as award criterion. Beside the financial criteria, quality and technical (or maybe combined) criteria should count in the evaluation of received offers. The price might still be of major importance for the tendering organization. The second option to define award criteria includes a specification of weighting for price and quality criteria. An assumption could be to use award criteria of 100 points with a weighted ranking, e.g. 50:50 or 30:70 weighting, on price and quality including technical and organizational requirements. The authors recommend to value quality higher than price to reduce risk of external costs because of poor quality.

### 2.4.2 Financial award criteria

The financial award criteria are usually solely based on the final price. The bidders need to submit financial information for evaluating offers related to their price. To enable transparent comparison of prices, a template could be provided by the tendering organization which all bidders shall adhere to. By aggregating the prices, which can also be individually weighted, a final weighted price can be determined for further evaluation. The bidder with the most-cost efficient price receives the maximum number of points. Points calculation for more expensive bidders might look as follows:

Financial points = "price of most cost-efficient bid" / "bidder price (n)" * "maximum number of points"

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**Table 1: Example calculation of scores for financial award criteria**

| Bidder company (n) | Bidder price (EUR) | Awarded points considering weighting (maximum of 50 points) |
|---|---|---|
| 1 | 100 | 100 / 100 * 50 = 50 |
| 2 | 125 | 100 / 125 * 50 = 40 |
| 3 | 200 | 100 / 200 * 50 = 25 |

In the example above (see Table 1) the most cost-efficient bidder receives the maximum number of points (50). Bidder 2 with a higher price receives only 40 points (25% more) which provides an advantage for bidder 1 compared to bidder 2. In case the price is doubled compared to the most cost-efficient bidder, still 25 points and therefore half of the maximum points to be gained are allocated to the third bidder.

Article 68 of directive (EU) 2014/24 on public procurement requires the consideration of life-cycle costing. The most economically fit offers shall be determined by calculating all cost incurred by the tendering organization throughout the life cycle of the tendered service. The total costs comprise costs of the actual service/product, costs borne by the tendering organization such as acquisition, duration of use, costs for maintenance, end of life costs and any costs based on environmental impact of the IT-service.

Also, in the private sector, such an approach seems meaningful and should be considered because it may increase the number of offers through the provision of a transparent and non-discriminatory evaluation framework to evaluate costs.

### 2.4.3 Quality award criteria (technical and organizational requirements)

The quality award criteria will comprise the quality level of technical and organisational aspects, following the specific descriptions in the tender documents. The allocation of points to the specific criteria is up to the tendering organization and based on the tendered service. For IT-services typically a specific share is allocated to the technical offer proposed by the bidder and its answers on fulfilling functional and non-functional requirements of the tender. Furthermore, organisational aspects, such as experience, project management, risk management, change management, testing, training, final presentation of offers and demonstration cases should be valued within this type of award criteria.

Table 2 illustrates a template for technical quality award criteria based on the maximum number of 50 points to be gained. It might even include a break-down into sub-categories which may help to point out crucial requirements for the tendering organization. Furthermore, a detailed description of the individual evaluation scores guarantees a transparent evaluation process and enables the bidder to assess their bid themselves.

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**Table 2: Example calculation of scores for technical and quality award criteria**

| Technical / Quality Award Criteria | Points (max. 50 points) |
|---|---|
| **Functional requirements** | 20 (overall) |
| Flexibility of service | 5 |
| Completeness of service | 15 |
| **Non-functional requirements** | 10 (overall) |
| Solution concept | 5 |
| Maintenance concept | 5 |
| **Project Management incl. Risk-MM** | 5 |
| **Testing and Training** | 5 |
| **Experience** | 5 |
| **Presentation** | 5 |

Any award selection process not considering an economic threshold (financial value of contract) is applicable for a minority of projects which may be the case for extremely complex solutions or products where it is generally in doubt if the tendered service can be even delivered. This is not the case for IT-services covered by the REGATRACE project. Nevertheless, such kind of contracts are merely performed on time and material basis which can be valued very limited.

### 2.4.4 Development of evaluation standards

Directive (EU) 2014/24 on public procurement and repealing Directive (EU) 2004/18 provide fundamental requirements to secure the European principles particularly on the free movement of goods, freedom of establishment and the freedom to provide services.

Procurements must be based on the principles of competition, proportionality, neutrality in contracting and the effective and efficient use of public funds. Procurement decisions should be neutral and without discrimination and aim at seeking the highest quality goods and services at the best price. Procurement must be fair, transparent, and open to ensure that all economic operators can compete for business on a level playing field.

Hence, tender evaluation standards have developed over the years. Whereby the main focus within the directives up to 2004 was merely on price, the evaluation criteria have developed further over the years also respecting costs and other qualitative measures such as social or environmental impact.

The evaluation criteria can be specified simply by lowest price only or by using a more sophisticated approach, e.g. "most economically advantageous tender" (MEAT). The latter considers quality, price, technical merit, cost-effectiveness, and environmental characteristics in a combined way. This approach has been developed further thanks also to the Directive (EU) 2014/24 on public procurement. MEAT will be assessed based on the following three main attributes: price or cost, using a cost-effectiveness approach such as life-cycle costing or the best price-quality ratio (BPQR).

By combining the before-mentioned criteria, the bidders can be motivated to make better offers to gain more points. Whereby the price and quality can already provide sufficient basis for evaluation, a more exhaustive approach would be to use the attributes cost-effectiveness and best price-quality

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ratio which evaluate offers based on a combination of price, costs and various non-economic criteria. This can be for instance: qualification, experience of staff, after-sales services, technical support, delivery conditions, social and environmental characteristics.

# 3 IT-infrastructure

## 3.1 Introduction to IT-infrastructure

The chapter IT-infrastructure describes the various possible hardware options underlying the tendered IT-services. Additionally, other non-functional requirements need to be fulfilled by the bidder irrespective of the selected hardware option. Still, they are essential to compare offers and evaluate them within the award criteria determination.

## 3.2 Hardware

The tendered IT-solution needs to be operated on a corresponding IT-infrastructure, also referred to as hardware for which different design types are feasible. The specifications of the hardware must comprise backup restore, performance, security, scalability, and location of data storage.

The setup and maintenance of operation need to be hosted in a professional, reliable, and secure manner to fulfil the given requirements by the tendering organization. Recent developments in the IT-sector have made physical client-owned machines for the operation of IT-service negligible. Currently, other options such as virtualized machines or even cloud services are also offered by infrastructure providers to operate their IT-solutions. It is evident that virtualized or cloud-based operated hardware fulfils the same technical requirements or even goes beyond the performance of dedicated physical machines. Based on different parameters of the tendering organizations, e.g. hardware scalability, different options of hardware may be in- or excluded.

## 3.3 Operation modes

### 3.3.1 Background on operation modes

The hardware may be provided by the tendering organization itself, being tendered as an integral part of the tender or tendered as an additional service. In the latter case, the entity providing the infrastructure service may have no connection to the awarded bidder for the software part.

The tendering of hardware as a separate/additional service may be more cost-efficient but potentially increases the organizational efforts to combine the software related part and the infrastructure part. This may be of value in case the software is well-known and detailed information are provided to run the software in any data centre by an individual operator than the one used by the IT-solution provider for the trading platform. There might be a higher risk of communication problems and higher efforts to clearly define sharing of responsibilities between software supplier and infrastructure provider and additional coordination efforts. Potential cheaper offers do not necessarily compensate for these efforts and risks. Therefore, this report focuses on the combined tendering of hardware and software as integral building blocks of the overall IT-solution.

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The bidder shall be obliged to secure the IT-service redundance, reducing the risk of unplanned downtimes. This redundancy can be provided on-site (same data centre) or geographically separated in a different data centre. The specification of having the redundancy in the same or in separate geographical location should be clearly specified in the tender description.

### 3.3.2 Central server at tendering organization (inhouse hardware)

This option is feasible only for tendering organizations, which operate their own infrastructure and are equipped with experienced staff to provide hosting services and support up to 24/7 availability. For such corporates, the additional hosting of IT-services may be possible to integrate into the existing infrastructure and provide economically advantages compared to the provision by a new bidder. Still, the costs for the provision of in-house hosting and an option involving the delivery by an independent corporate should be conducted resulting in a comprehensive cost-benefit analysis. For tendering organizations which would need to establish this service only for the given project, high costs for secure hosting and operation of infrastructure will arise whereby the quality of the in-house hosting is questioned compared to corporates experienced in the provision of hosting services. Knowing the structure and setup of operating corporates, or organizations involved in the provision of certificate issuing, verification and transfer, the hosting services should be tendered based on economic parameters determined by the tendering organization. The main aspect for doing so is the security of hosting services whereby data centre providers are usually equipped with numerous certificates in the areas of reliability, security, and preventive measures for data loss. Those requirements are hardly possible to provide equally in a beneficial way for the tendering organization.

### 3.3.3 Dedicated hardware in data centre

The provision of dedicated hardware may be of interest in case it needs to be exactly known where the data are located (on which physical machine). The infrastructure provider offers dedicated machines in so-called "racks" where the servers are placed. These physical parts are connected and only used for the purpose of a single client. Only the owner of these machines has access and may install programmes or other software modules. This concept was used for many years until the virtualization of infrastructure environment took place, which is explained in more detail in the next chapter.

The concept of dedicated hardware is outdated and should be avoided because it is costly, not flexible, and even more risky in the operation. It is costly because the machine needs to be bought at the beginning, requiring up-front investment costs. It is not flexible, as the size of the machine cannot be reduced or scaled down to the initial necessity. Also, upscaling is limited due to a possible lack of performance or memory. It is riskier because one physical machine can break-down. In such a case the machine needs to be replaced completely which may lead to potential down-times and longer back-up times than with other hardware options.

### 3.3.4 Virtualized server environment

The virtualized server environment in a data centre includes several physical machines that are interlinked with each other via virtualization software. This service provides the flexibility to use one server for various purposes and clients. The virtualisation includes the sharing of load between different clients to provide highest performance based on balanced allocation of data requests. The concept can be extended multiple times in case of more clients, higher demand, or the need to increase performance. Hence, also other infrastructure related machines and modules are installed redundantly.

The virtualized server concept is more cost-efficient, flexible, and more reliable than the physical machine concept. It is lower priced, as costs are usually calculated based on the requested number of users, licences, and storage size. They can be individually ordered at the data centre. This automatically provides more flexibility as the hardware requirements may be low at the beginning due to limited number of users. By means of the virtualization concept, additional services, storage or performance can be easily ordered and do not necessarily need new infrastructure. In general, the concept is more reliable, as the load and processing are allocated to a wide number of servers. In case of a break-down of one server, other servers will automatically take over without any knowledge of system users. Reduced performance or a decreased processing time might be the consequence, but a total unavailability of the service will definitely not happen.

### 3.3.5 Cloud service

The cloud service provision is the "modern" virtualization where the servers and data are allocated to numerous data centres. While beforementioned concept provides virtualization within one data centre or maybe two, the cloud service allocates the data over a multiple number of data centres and servers. This adds complexity to understand where the data is physically located. In case the provider has five data centres in Germany and provides cloud services it is expected that the data will be stored or processed in Germany too. This may be different in case global cloud services are used, e.g. by Alphabet (mother company of Google), Amazon or Microsoft.

The cloud service provides the same advantages as the virtualized data centre. Additional benefits of the cloud service are a greater flexibility on the allocation of computing resources and a guarantee of an even higher performance thanks to the wide-spread interconnected hardware and hosting software components. The cloud service also provides more security because even during the downtime of a data centre due to fire or any other exceptional circumstances, the data is still available on other server located in different data centres. A weak aspect of this hardware architecture may be the vague clarity on location of data storage, which is subject to the respective definition within the tender documents. This can be avoided by defining the geographical area of data storage, e.g. in Europe only and the requirement of operation of data centres are based on renewable energy.

## 3.4 Other non-functional requirements

### 3.4.1 Backup restore

The provision of data centre services shall include a reliable and efficient backup scenario in case of any data loss or break-down of the service. Usually the back-up scenario is defined based on the level of criticality of data and number of transactions. For example, a 24/7 operated IT-service with many transactions requires at least daily back-ups. In case of low numbers of data being exchanged or processed during working days, the daily back-up can be executed only on working days or on a weekly level at least.

### 3.4.2 Performance

The offered hardware concept by the bidder shall comply with the performance requirements specified in the tender documents. Such performance indicators can be defined on time level referring to seconds to process a file or conduct a screen update. Another option is that they can be related to volume, particularly to the size of files to be processed or data storage or a combination of time and volume for example files below 1 Megabyte shall be processed within less than 3 seconds. In order to

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prove the fulfilment of the requirement in the best possible way, the bidder shall explain the hardware concept in detail and how the performance indicators are complied with.

### 3.4.3 Security

The data centre provider shall be equipped with up-to-date security and auditing standards confirmed through external certification such as ISO27001 or ISAE3402 to guarantee prevention of data loss and data protection based on international defined and comparable standards such as ISO or tier topology. Information on data handling standards is reliable and trustworthy, based on existing certification schemes for data centre operators, and should be used as an indicator for data security. Security is related to the operation of the data centre. Also, the technical treatment of data and software has to be secured in emergency cases, such as fire.

Data privacy and processing is more important than ever confirmed by corresponding EU regulations. The General Data Protection Regulation (GDPR) builds a corner stone for data protection and has to be fulfilled by the bidder. The definition of such kind of data has to be done by the tendering organization and measures have to be undertaken by the bidder to fulfil the request and subsequently the General Data Protection Regulation.

### 3.4.4 Data storage

The place of data storage shall be defined within the tender documentation of the IT-service. There may be a requirement based on the contracts with corresponding entities to hold and store the data in a specific geographical area or even country. This may influence the bidders in offering hardware solution concepts. At least the data protection regulation forces the tendering organization to provide detailed requirements on how and where the data are stored particularly in cases where personal data are processed.

The above-mentioned General Data Protection Regulation has to be implemented not only considering aspects of the software as such but also applying to the storage of data. In accordance with the regulation, and given tender requirements, specific data has to be anonymised after a defined time period.

# 4    Software

## 4.1   Introduction to software

The main pillar of an IT-solution is the software related part. It includes the technical capability to execute the required business processes in a highly digital way potentially based on secure, reliable, and automated processes. Tendered software solutions are primarily divided into two blocks. The first block is the main one, which includes the execution of business processes and surrounding functions such as graphical user interfaces (GUI) or reporting and monitoring of data flows and user actions. The second block is deemed necessary to run the business software. Those are categorized as run-time or operation systems such as Microsoft, Linux, java, etc. This software is standardized and continuously updated by the manufacturers of the software. The business-related software is primarily a customized software solution, which has been developed and configured to serve the requirements of the tendering organization. The bidders shall be requested to provide a detailed design for the tendered software, in compliance with the provisions of the technical requirement specification and in accordance with good engineering practice in information technology. For the software part

customized specifically for the completion of the project, in addition to any standard documentation, a detailed documentation including visualized charts describing the function, shall be delivered.

The following chapters comprise detailed information particularly on the customized solution of a gas trading platform and dashboard.

## 4.2 Architecture (self-contained system, service-oriented system, blockchain)

The architecture of the IT-service is subject to the bidder's set-up and corporate culture. The provided architecture can be different for bidders and should be valued accordingly by the tendering organization. Some architectures are very future-oriented and hardly used in daily operations around the globe. Others have been in operation for decades and have been continuously updated. The tendering organization needs to evaluate the advantages and disadvantages of each architecture and value the information of the bidders in a way, which fits the tendered requirements best.

For example, module-based software architecture with direct communication between modules can be easily scaled up and modified because processes and functions are more isolated and independent. A centralised system architecture might be more difficult to adapt if several directly interlinked software parts must be changed. This can influence other processes and functions, which will require detailed testing of the overall system. Within a modular system only adapted modules need to be tested which will likely reduce the efforts required for future changes significantly.

## 4.3 Security

IT-solutions need to be secure in various aspects to properly protect the processed data. Such aspects shall be considered during the software design and optimally integrated into the business processes. The bidder shall describe how to deal with the most critical security risks for the IT-service during the maintenance and future change requests, e.g. prevention against OWASP (Open Web Application Security Project) Top 10. The following security criteria shall be addressed within the requirement specification and correspondingly the solution concept specified by the bidders:

- Login: A dedicated login shall secure the access limitation to the IT-solution to a specified group of users. To access the IT-solution, the login needs to be successfully set-up. The login options can have different steps and levels for example:
  - username and password generated by the user → final confirmation by operator of IT-solution
  - username and password, where username is given by operator and password set by system user
  - username and password where username and password are set by operator, but password is subject to change by user itself
  - Multi-Factor Authentication (MFA) requesting two or more pieces of information for the login to the system, such as username, password, and additional step, e.g.:
    - PIN received via phone number
    - PIN received via email
    - Physical token solution, e.g. RSA SecurID token solution
    - Chip card

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* Mobile application
- Role based security concept: the users may operate different business processes following a role-based security concept. By setting different rights and roles within the IT-solution, the access to different data can be restricted and flexibly updated in the future based on the request of the IT-solution operator.
- Encryption and signatures: any transactions or actions by users or via system to system should be highly secure. This is necessary to clearly identify the user or system, which sends, receives, or processes data and, in addition, provides higher security against manipulation or data loss.
- Documentation of all user actions and tracking (Audit Log): each action shall be well documented within the IT-solution enabling tracking and verifying user actions. Some of the information may be accessible for specific users in the IT-solution. Other information may only be accessed in case of data loss. Such information does not necessarily need to be accessed via the graphical user interface. It is enough if the IT-provider or bidder provides this data on request of the IT-operator. Still, all information related to the users' actions shall be well documented to allow their tracking.
- Protection against common threats: the bidder shall provide information on how the offered IT-service is protected against common threats such as hacking, electricity outages or fire.
- Backup restore concept: Data loss must be prevented in any case. Therefore, the bidder has to provide a respective backup and restore concept.
- Integrity: the bidder shall provide a meaningful and comprehensive data integrity model. Completeness and correctness of data and information stored in IT-services are of importance. Any modification is restricted to authorized users only.
- Data protection and security: European data protection regulation (GDPR General Data Protection Regulation (EU) 2016/679) and any national requirements related to data protection and data security have to be respected by the bidder.
- Risk prevention such as secure coding and testing practices must be considered based on international standards such as OWASP Top 10 during the project implementation, maintenance, and future change requests.

## 4.4  Workability

The tendered IT-service may serve different requirements particularly related to the number of business processes. These processes are conducted by specific users with different user rights. The users usually act in the name of registered companies (e.g. production company, auditing company, trading company). Those companies may have different functions depending on their company role. Such circumstances must be reflected in the workability of the provided IT-service. It should be able to add and modify content that is subject to numerous changes particularly in the areas of users, companies, their roles, and rights, as well as to enable smooth and future-oriented use of the IT-services with the least involvement of the IT-provider (bidder). The operators of the IT-solution should be able to do this on their own. Therefore, workability is strongly connected to the ability of simultaneously handling various clients with different rights and roles within a common IT-environment.

The tendering organization is required to provide a detailed list of users and companies within the requirement specification, including their roles, which serve as basis for a comprehensive design by the bidders.

## 4.5  Performance

The IT-service shall provide data requests or other actions within a defined period. These parameters, such as automatic response of the graphical user interface, should be guaranteed by the bidder and confirmed within respective test scenarios and acceptance tests. Any performance indicators included in contracts by the tendering organization with other entities shall be translated into requirements to be fulfilled by the bidder.

For example, the processing of bid submission documents shall be finished within a maximum of 30 seconds. The graphical user interface shall respond within three seconds, should an activity take longer than three seconds, a progress bar is to be displayed.

The IT-solution shall ensure that the data volume of actual and future processes will not affect the usability of the system and exceed the defined performance parameters at least until the end of the operational phase contracted.

## 4.6  User-friendliness

The standard interface of IT-services, referred to as Graphical User Interface (GUI), supports the user-friendly and intuitive handling of the IT-solution. It provides the users direct access to execute and control their processes in a modern and responsive manner. Aspects such as the appearance, the navigation structure and authorizations shall be easily adaptable and expandable. The GUI shall be adapted for access to people with disabilities in order to guarantee equal rights.

## 4.7  Interfaces

The tendering organisation needs to define the interactions with other components or systems in detail. Those are an important element within the requirement specification and shall be considered by the bidder within the technical response to the tender. The interfaces are either specified in detail within the tender documents or it is mentioned that an interface to a specific party is required, but the specification will be developed within the implementation of the respective project phase. Hence, this uncertainty may add costs to the initial price offer. Such unpredictably arising costs make it even more difficult to compare different offers.

Therefore, the tendering organization shall specify the interfaces in an extensive and comprehensive manner using proper documentation, including visualized charts or graphics. The requirements are of high quality if the interfaces are combined with the respective business processes within the tender documents in order to make it distinctly for the bidder.

Interfaces of an IT-trading platform are particularly:

1. to certificate providers (national biomethane registries/assigned Issuing Body) taken over by a centralized hub – an interface is costly and needs to be operated/continuously updated; therefore, an interface developed for a single provider of certificates is inefficient; in case the provision of certificates is fragmented over multiple certificate registries, additional complexity on testing and support as well as costs is expected.

2. to market participants: depending on the business processes executed such as registration, submission of offers, receipt of trading results or provision of reports and other information, the interface may be highly manual and user-friendly or frequently requiring interfaces for machine-to-machine communication (for example through web service technology).

3. to settlement provider: the trading is connected to settle the trades financially. Any costs related to transactions or the use of the IT-solutions, such as registration fees, are connected to this as well. The information package to be generated, transferred, and exchanged with the settlement provider shall be automated as much as possible to reduce any manual and risky executions.

4. to reporting organizations: information may be provided transparently such as the auction price or traded volume to the reporting entity. Such entities might be other platforms, or other market entities not market participants within the trading process. The interface to such entities shall be highly automated to reduce any manual interaction.

5. for regulation purposes: reporting requirements may be mandatory by providing trade platforms for certificates or tradeable products defined by European regulations. Such interfaces are usually highly automated and are commonly defined.

There are various interface types such as, but not limited to the following options:

- Graphical User Interface (GUI),
- E-Mail,
- FTP, SFTP,
- web services,
- stand-alone clients,
- blockchain.

## 4.8 Data format

Any data exchange is performed using defined data formats which need to be respected by all system participants represented by an IT-service or system user. The data format may be openly accessible, as national or international standards are used within the tender. In case of proprietary data structures, the data formats need to be defined explicitly within the requirement specifications.

In general, wide-spread data formats for machine-to-machine communication are .XML and Microsoft .CSV in the energy sector. The latter may also be used by system users due to a more suitable human readable structure.

## 4.9 Process integration

The smooth operation of processes is of utmost importance for a renewable gas trading platform. This includes integrations of external systems and data exchange between those Therefore, the existence of interfaces and data formats is only of high value if they can be easily integrated. This includes a business process drawing and necessity to understand how the process integration shall be executed with clear input and output parameters. With the understanding of the overall business process by the bidder, usually undermined by the experience and references, risks on the implementation time and discussions about unexpected workloads can be reduced to a minimum. Usually, experienced bidders are aware of the complex integration processes of energy-related data exchanges, e.g. with network

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operators, traders, publication platforms such as REMIT Regulation (EU) No 1227/2011 on Wholesale Energy Market Integrity and Transparency[12].

It is not enough to mention standard technical interfaces and data formats. It needs clear definitions on the expected workflow supported by expected integration scenario. Also, potential migration of existing interfaces must be considered. This may be irrelevant for newly developed IT-services, such as a renewable gas trading platform, whereby definitions of interfaces, such as support of web services and XML data format, seems robust and clear. A drawing of such a process massively adds value and helps the understanding of the expected process. An example for bid submission via XML using web services is illustrated in Figure 2.



**Figure 2: XML bid submission process**

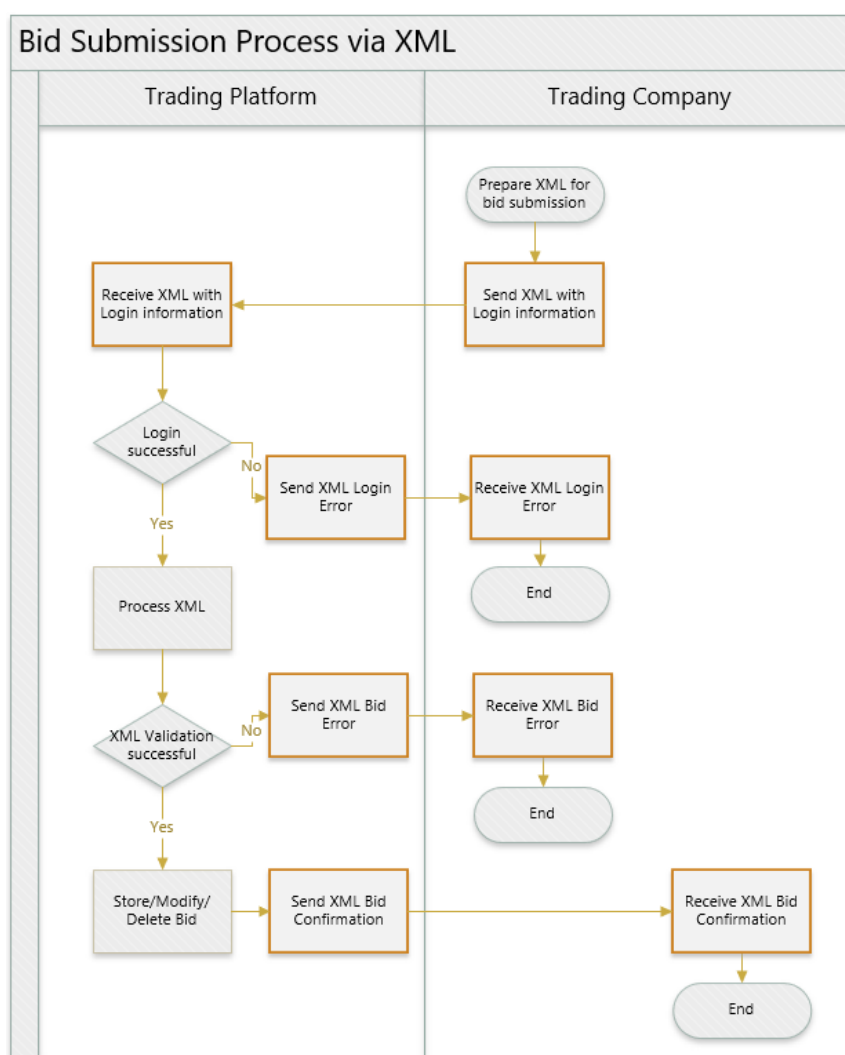For a detailed estimation, each data exchange can be defined using interface descriptions and validations. Additional efforts for their development might be excessive but provides several long-term benefits because of detailed explanations for bidders to enable proper price estimation and implementation requirements.

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[12] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011R1227

## 4.10 Configuration engine

The software should provide a functionality to configure business processes during the operation with very limited effort. The IT-solution may offer a configuration engine (process control) to flexibly change existing processes in a user-friendly manner. This means that the bidder may not be asked to individually enhance the business process via a change request. It should be able to solely configure this by user actions of system administrators. The changes of business processes are still difficult to predict. Therefore, no extensive adaptation of the initial scope of business processes shall be requested within this functionality. Still, it should be possible to edit specific business processes and adapt them in a simple and meaningful manner, for example related to change process steps, thresholds, to include user decisions or to account for the progress.

The following example of a business process may be subject of a configuration engine: the provided trading platform sends auction results after a finalized auction. The initial definition within the tender includes the sending of auction results to a specific user group via E-Mail. During operation, the market participants request to change the communication channel to web service for higher automation which is also part of the tendered communication channels. The IT-solution should be flexible to configure this channel of auction results transmission for each participant via simple configuration of the underlying business process through the configuration engine. Another parameter of the process might be the data format of the auction results, which could be changed directly through the configuration engine. More sophisticated adaptations would be the inclusion or deletion of specific validations during the bid submission process, for example if the bids shall be checked against financial securities. Such kind of process changes may be handled through the standard change request procedure.

## 4.11 Monitoring and reporting

Any kind of user actions (for example login, logout, changes of master data, actions which change the process status etc.) or automated processes (due to specific deadlines or triggered by data communication via external interfaces) must be logged in the IT-solution. The user, types of actions, date and time and resulted changes must be recorded and displayed in a user-friendly way to be accessed by a specific user group. Other information might just be stored and made available for reporting purposes. The needed extent of monitoring and reporting activities shall be defined in the requirement specification. The bidder may provide a standard tool for reporting, which can explicitly monitor trade-related information, such as certificate transaction price, and facilitate a way to withdraw price statistics that can be used for publication. Such a customised report shall be created by the operations team without involvement by the IT-provider (bidder) during the maintenance period.

## 4.12 Future-proof

The software and the hardware should be as close to state-of-the-art as possible, which shall be demonstrated by the bidder. There needs to be proof that the introduced services will be able to run on the provided technology for a period defined by the tendering organization. This period should at least correspond to the contract period minimizing the risk of retendering during that time. In general, this requirement is difficult to integrate into a legal document. Still, the technology offered within a bid shall be state-of-the-art or close to it, so it will not run out of updates or support within the contract period. The bidder shall argue why intending to use the offered technology and why believing this

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technology is future proof. This requirement is of importance particularly for proprietary technologies without global standards, such as the blockchain technology.

# 5 Operations

## 5.1 Introduction into operations

The operation phase of the underlying IT-software typically starts with the Go-Live respectively the use in real operation on the tendered production environment. Several acceptance tests and trainings need to be conducted prior.

In general, IT-services, and particularly software, need to be maintained and continuously updated. This requirement is based on new versions of third-party components and new regulations and technology developments in the IT-sector. Continuous or sometimes sudden error cases, software bugs or downtimes of infrastructure can occur but shall be serviced within the operation phase of the IT-services. Usually a service level agreement (SLA) defines the support during the operation. But to define the chapters within the contract, the requirements for the operation need to be analysed by the tendering organization. The following chapter comprises different requirements to be considered during the operation and shall be an integral part of the tendering documents which is valued within the award criteria. The best IT-solution implemented also needs continuous updates and a robust infrastructure to operate smoothly and faultlessly.

## 5.2 Maintenance

The maintenance includes several different aspects to operate the IT-solution after the Go-Live until the end of the contract period. The core of the maintenance operation particularly includes maintaining the software solution, ensuring adequate restoring action in case of errors, establish updates in the master data, ensure smooth operation of the software and provision of continuous updates and audits. The items of maintenance need to be listed in the operations contract in detail, in the Service Level Agreement (SLA) or maintenance contract. There might be different responses on interfaces to and from the tendered IT-solution. This needs to be defined in written form and the responsibility of each item has to be listed.

## 5.3 Availability

An important aspect to define in this chapter is the required availability of the IT-solution. In case of 24/7 operation of the IT-solution, the availability should be very high, for example 99.9%. In case of working day operation, the availability might be limited to 99.9% during support times (e.g. working days 09:00 to 17:00). This releases pressure from the bidder to immediately resolve runtime failures outside operational hours. Still, there should also be an availability defined for the period outside support times, but this can be less, for example 99%. The definition of the availability influences the maintenance costs significantly on both sides.

Higher availability, e.g. 99.9% 24/7 may require additional support (timewise) by the tendering organization to resolve problems or errors. This consequently includes the provision of adequate staff by the bidder and the operations team of the IT-service platform adding significant costs for both

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parties. Each unplanned downtime may require active responses by the bidder which must be defined in the SLA. Such response times are agreed for different types of errors and shall respect the operation times of the IT-platform.

To get a feeling about availability times, a few examples are listed below:

- 99.9% availability → maximum downtime per year 24/7: 365 days * 24 hours * 0.1% = 8.76 h/a
- 99% availability → maximum downtime per year 24/7: 365 days * 24 hours * 1% = 87.6 h/a → approximately 4 days per year
- 99.9% during working hours assumed 8:00 to 17:00 → maximum downtime per year: 52 weeks * 5 days * 9 hours * 0,1% = 2.34 h/a
- 99% outside working hours assumed 8:00 to 17:00 → maximum downtime per year: 52 weeks * 5 days * 15 hours * 1% = 39 h/a

The examples above show high differences in the availability if multiplied with a different number of hours. Therefore, it should be clear for the tendering organization, which maintenance requirements are to be fulfilled with a high availability of the IT-service and which cases might be non-critical and consequently require a lower availability.

Planned downtimes and their involvement on availabilities of the IT-service shall be defined in the SLA. Typically, the downtimes for planned updates of third-party components are handled on weekends outside of critical business times, e.g. Sundays 20:00 to 24:00 and are not treated as non-availabilities. This also includes the provision of updates of the common IT-platform.

## 5.4 Support

### 5.4.1 Aspects of support

The tendering organization shall receive support during the operation of the IT-solution. This includes a single point of contact for the operation team of the IT-solution and the definition of communication channels to be used in cases when external support is required. Those channels may vary depending on the error class and support time but should at least include a ticketing system to monitor issues in a transparent manner.

In case of 24/7 support, there might be different communication channels during the week and on weekends. Support during office hours can be agreed as alternative, usually between Monday to Friday excluding public holidays of the country where the operational organization is located. This might be favourable in case the IT-solution is mainly used during business days and no business-critical processes are executed outside of this timeframe, particularly on weekends. Such alternative support times are usually more cost-efficient than 24/7 support.

The support should be divided in different levels to differentiate between the quality (also cost) of support. The definitions are based on first, second and third level. The first level support primarily answers all claims and errors to the customer and analyses the request in a first step. The first level support provides feedback immediately to the client and tries to solve the issue through simple and standardised actions. If the problem cannot be solved by the first level support, the second level must continue the investigation which includes involvement of highly skilled experts and programmers. If the second level is not able to resolve the problem, finally, the third level with the most skilled experts or consultancy of external experts of third-party corporates are used for investigation and problem solving. The consultation of third level support should only be used in extraordinary situation such as continuous inaccessibility of the platform for the customer after unsuccessful investigation by first and

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second level support. From a holistic point, the first level should be able to resolve most of the issues raised by the client. This also includes the handling of continuous updates. The second level support only in a minority of incidents and the third level hardly ever.

### 5.4.2 Priority classes for support

Typically, three types of priority classes are defined for the operation of IT-services which correspond to the criticality of the problem and the influence on the use of the IT-service:

1. Low – problems or errors not impacting the business processes but are subject to be repaired in a defined time frame;
   a. longer response time acceptable (e.g. five working days),
   b. repair time until next release of software (e.g. latest within six calendar weeks).
2. Medium – problems or errors impacting the business processes, but workarounds are available to overcome the situation;
   a. medium response time (e.g. 24 hours),
   b. medium repair time (within three working days).
3. High – blocks the operation of the IT-solution;
   a. Short response time (e.g. 30 minutes),
   b. short repair time: work-around to enable use of overall system within 1 hour and provision of fix within a maximum of one working day.

There may also be repair times defined for the error classes mentioned above or at least when the IT-service shall be available again at least with the provision of a work-around. The response time may be defined only for a specific time window. This can be of importance if only one auction per day is conducted by the trading platform. In such a case the response time shall be even shorter than 30 minutes and directly second level support experts available to overcome any problems immediately. Other issues outside business-critical times may be handled with much lower response time limiting the support time mentioned earlier. Priority classes and support times should be defined and negotiated in-line with the criticality of business processes and their timing.

## 5.5  Warranty

A warranty period shall be defined to secure the faultless operation of the IT-solution without additional costs for the tendering organization. Any remaining defects or errors arising throughout the warranty period need to be repaired by the bidder free of charge within a defined time frame, in case those did not show up during the acceptance testing. The warranty period will influence the bidder's price. The longer the warranty period, the higher this cost element will be in the price proposal. It is recommended to define the warranty as a fixed price covering any time and material efforts by the bidder.

## 5.6  Penalties

The tendering organization shall define penalties in the delivery and maintenance contract for a situation when the bidder is not able to deliver the requested services in due time or in a faultless manner. The penalties should be defined in a way to motivate the bidder to solve the issues with undue delay in a pre-defined period. Those penalties should be fair and not of such height to put pressure on the financial situation of the bidder, but still be high enough to encourage the bidder to solve them

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quickly. If this is not possible or any defined deadlines to fix the problem are overdue, the tendering organization is be entitled to receive penalties for the occurred claims. The way to solve those claims is usually monetary, defined by a percentage of the contract value. For example, for each day of error solving which is overdue, the tendering organizations is entitled to receive 0.1% of the contract value. The amount of penalties is usually capped by a percentage of the contracting value for a defined period, for example maximum 10% per case and a maximum of two cases per calendar year. In this case the bidder may pay a maximum of 20% of the contracting value for penalties per calendar year.

## 5.7 Change requests

Updates of the IT-solution are a standard process to enable proper and future-proof operations of the software apart from new requirements which are needed because of market design changes or new legislative decisions. Such changes are ordered and implemented during the operation phase for the IT-solution or the infrastructure. To not launch a new project tender, the maintenance contract shall include a chapter about change requests under which the bidder is held accountable to provide offers and services to extend or upgrade the IT-solution beyond the initially defined scope. For instance, an additional function of the IT-solution will not be integrated as part of a new project using an extensive tendering process. It shall be efficiently and smoothly orderable based on pre-defined processes stipulated in the maintenance contract in the chapter on the change request procedure. This particularly includes the mandatory provision of an offer respecting deadlines for the bidder and tendering organization to provide information, price offer and implementation times. The bidder shall define a well-functioning overall process for the execution of change requests that allows for a transparent process of updates, precise requirements, monetary value, and test cases including acceptance measures. The tendering organization may request hourly rates which have to be offered for future change requests and are subject to future offers during the contracting period.

The tendering organization shall be aware of the continuous development of IT-solutions. It is difficult to predict the extent of future developments after the implementation phase. But still a respective budget shall be considered throughout the operation phase to guarantee the smooth and robust functioning of the IT-solution.

## 5.8 Contract period

The contract period is separated into two blocks. The first block includes the time until the IT-service shall turn operational or the final acceptance of the IT-service. The tendering organization may determine a fixed time when the IT-service shall be operational. Another option is to set a maximum delivery time for the IT-service which is determined in months. The delivery time may be split into different parts (based on milestones), in order to transparently publish its expectations about the delivery time to bidders. The contract period of the delivery contract is subject to any of the above-mentioned dates.

The maintenance period specifies a dedicated time period for the operation of the tendered IT-service. This period starts depending on the contract definitions with the Go-Live of the IT-service or the final acceptance. From this point in time onwards, the warranty for the IT-services comes into effect and the operations team of the bidder takes over the control and monitoring. The duration of a contract is normally several years (for example five) with the option to extend the contract under given circumstances. This period secures continuous support for the tendering organization and on the other hand provides an additional relationship and turnover for the bidder.

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## 5.9  Service provision

The respective IT-service (trading platform/dashboard) shall be directly linked with the European IT-solution for European cross-border title transfer of renewable gas certificates (details elaborated in REGATRACE D2.4[13]). For simplicity reasons it is presumed that a centralized European IT-solution might be chosen. All National Organisations (biomethane registries/Issuing Bodies) will be directly connected to this IT-solution and have joined a European Scheme to harmonize business processes between each other. Clear processes and technical requirements are fulfilled by the connected entities and the European IT-solution itself to automatically exchange renewable gas certificates (possibly including GOs) without manual processes. In particular, this covers the title transfer between two traders with accounts in two different domestic registries.

## 5.10 Reporting requirements

In order to secure the monitoring requirements of national and European institutions, attention shall be paid to publication and reporting. Either through direct involvement or defined interfaces, data shall be made available in a comfortable manner to monitoring institutions. The bidder may be requested to cope with any amendments during the operation phase free of charge. In case the tendering organization does not consider this option, the change request procedure needs to be carried out for each new requirement or function related to the valid reporting requirements.

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[13] https://www.regatrace.eu/wp-content/uploads/2020/10/REGATRACE-D2.4.pdf

# 6   Potential bidder list

This chapter shall provide information on a potential bidder list for the IT-services to be tendered for a trading platform of renewable gases. The authors of this report have conducted desk research and interviews to receive information on potential corporates which may be able to deliver such kind of IT-software.

The companies selected have experience in software solutions related to the energy sector and/or trading.

Throughout the last years, several trading platforms and IT-solutions have been developed to trade certificates, particularly for electricity, gas, and balancing services.

**The following list is an excerpt of companies in this sector which should be directly addressed in case of a tender for a European renewable gas trading platform and asked to submit an offer (provision of link of tendering platform). Furthermore, the tender shall be published on different tendering platforms listed in**

Table 3.

Table 3: Potential bidder list structured based on current user groups

| System provider of electricity exchanges | System provider of other trading platforms for gas and certificates | System provider of certificate registries with experience also in trading | System provider of other trading companies |
|---|---|---|---|
| EPEX European Power Exchange | EEX European Energy Exchange | Arcanum Energy | STX Services |
| EEX European Energy Exchange | Arcanum energy | Landwärme GmbH | Danske Commodities A/S |
| Nasdaq | EFET European Federation of Energy Traders | Biogasregister International AG | RWE AG |
| Nord Pool (Nord Pool Spot AS) | CEGH Central European Gas Hub | AGCS Gas Clearing and Settlement AG, operator of Biomethan Register Austria | EEX European Energy Exchange: listed brokers[14] |
| EXAA Energy Exchange Austria | Tender 365 | Dena German Energy Agency, operator of Biogasregister Deutschland | Prisma European Capacity Platform GmbH |
| GME - Gestore del Mercato Elettrico (Italian Power Exchange) | | Energinet | |

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[14] https://www.eex.com/en/eex-ag/partners/brokers

| System provider of electricity exchanges | System provider of other trading platforms for gas and certificates | System provider of certificate registries with experience also in trading | System provider of other trading companies |
|---|---|---|---|
| OTE (Czech electricity and gas market operator) | | GRDF Gaz réseau distribution France | |
| ICE Intercontinental Exchange | | AIB Association of Issuing Bodies and its members | |
| OPCOM – Romanian Electricity and Gas Market Operator | | Vertogas B.V. | |
| PXE – Power Exchange Central Europe, a.s. | | | |
| Belpex, Epex Spot Belgium SA | | | |
| Europex Association of European Energy Exchanges and its members | | | |

The following IT-corporates are known to the authors to provide IT-services for European markets in the energy sector. This is an indicative, non-exhaustive list in alphabetic order:

- Arpaweb
- Atos IT Solutions and Services GmbH
- Deutsche Börse
- Grexel Systems ltd.
- HP Belgacom
- Navitasoft AG
- Nord Pool (Nord Pool Spot AS)
- PONTON GmbH
- SAP Software Solutions
- smart technologies Management Beratungs- und BeteiligungsgesmbH
- Unicorn a.s.

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# 7   Glossary

**Attribute**

Information field within the electronic document, comprising different types of information related to the installation, quantity and quality of the renewable gas product.

Attributes are essential to the overall value of the renewable gas as different marketing pathways require different characteristics/specifications of the renewable gas product according to the legislative framework and consequently lead to different monetary values for renewable gas producers. Attributes shall be harmonised from organisational (audited attributes) and technical (content option of field) point of view to enable Europe-wide harmonisation. Biomethane Certificates are shaped by their specific attributes which have to be designed in a holistic and flexible way to fulfil all requirements of the respective marketing pathway and underlying legislative framework. At the same time, Biomethane Certificates have to be harmonised to allow a transfer between IT-systems of different competent bodies.

**Association of Issuing Bodies (AIB)**

AIB is an international non-profit organisation established under Belgian law registered in Belgium as aisbl with office in Brussels. The Association of Issuing Bodies (AIB) operates the European Energy Certificate System (EECS), a multipurpose and multi-energy carrier certificate system facilitating standardised cross border transfer of energy certificates. This system was in 2019 complemented with the EECS Gas Scheme. Early 2020 AIB reorganised to facilitate independent decision making by respectively electricity and gas issuing bodies for all topics that relate to either electricity or gas specifically. Guarantees of Origin under REDII art.19 can be issued under the EECS Gas Scheme.

**Authorised Issuing Body**

A body operated under governmental mandate, responsible for the issuing of GO according to Art 19 RED II and the respective national implementation.

**Best and Final Offer (BAFO)**

Following the stages Request for Information (RFI) and Request for Proposal (RFP) of the tender process, the BAFO ("Best and Final Offer") stage may be conducted. This stage includes the provision of a final offer by the bidder and a first round of negotiation which shall determine whether main obstacles exist for a future cooperation.

**Best Price-Quality Ratio (BPQR)**

The BPQR is part of the MEAT approach within a tender process defining award criteria beyond the price of the received offers.

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**Bidder**

The bidder is a legal entity who partakes in an ongoing tender process submitting its offer to compete for the assignment of the tendered IT-service.

**Certificate (Renewable Gas Certificate)**

An electronic document that records (quantitative and qualitative) information about a renewable gas consignment, injected into the Natural Gas Network. A Certificate may be used by a renewable gas producer to market the green value of their related renewable gas consignment. A Certificate may be used by a gas consumer to demonstrate their use of a renewable gas consignment, in that this consignment described in the Certificate can be set against an amount of gas that the consumer has withdrawn from the Natural Gas Network. Certificates follow the approach detailed in Article 15 of Directive 2009/28/EC on the promotion of the use of energy from renewable sources, including amendments as per Directive (EU) 2015/1513 (also referred to as "RED I") and Article 19 of Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) – also referred to as "RED II".

**ERGaR aisbl**

ERGaR (European Renewable Gas Registry) aisbl is an international non-profit organisation established under Belgian law with its registered seat in Rue d'Arlon 63-65, 1040 Brussels. ERGaR was founded in September 2016 as a cooperation between national renewable gas registries in Europe to enable cross border transfer of renewable gas certificates among the member registries. The association currently counts 26 members from 14 European countries comprising established biomethane/renewable gas registries, gas distribution and transmission system operators, biogas associations and other major stakeholders of the European biomethane market.

**General Data Protection Regulation (GRDP)**

Regulation (EU) 2016/679[15] of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive (EU) 95/46.

As of May 2018, with the entry into application of the General Data Protection Regulation, there is one set of data protection rules for all companies operating in the EU, wherever they are based.

**Go-Live**

The Go-Live refers to the date when the IT-service becomes available to the market and its market participants for operational use. From that point onwards, the IT-service is officially and formally accessible to perform its market activities. It is the kick-off for the operation phase, which requires the prior, successful finalization of various testing phases and acceptance tests. The operation is handed

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[15] https://eur-lex.europa.eu/eli/reg/2016/679/oj

over to the operational team, which execute their work under an established maintenance contract particularly from this date onwards.

**Graphical User Interface (GUI)**

The Graphical User Interface (GUI) of an IT-solution allows users to access the IT-services and intuitively perform and handle its business processes.

**Guarantee of Origin (GoO or GO)**

The RED II2 defines the purpose of Guarantees of Origin as follows (recital 55):

"Guarantees of origin issued for the purposes of this Directive have the sole function of showing to a final customer that a given share or quantity of energy was produced from renewable sources."

Specifically, according to Article 19 RED II, a Guarantee of Origin (BGO) is an electronic document certificate, containing the purpose of the GO, issued by:

(a) a Designated Competent Bodies; or

(b) by a Member acting as the duly authorised agent on behalf of a Competent Authority, under the laws of a State

as a guarantee of the nature and origin of energy for the purpose of providing proof to the final consumer of energy that a given share or quantity of energy, as the case may be:

(i) was produced from the energy source to which the guarantee relates; and/or

(ii) was produced by the specified technology type to which the guarantee relates; and/or

(iii) has, or the Production Device(s) which produced it has (or have), other attributes to which the guarantee relates;

**Most Economically Advantageous Tender (MEAT)**

The MEAT concept describes a selection approach within a tender process focused on award criteria beyond the price of the received offers. In this approach, the award criteria are referring to the Best Price-Quality Ratio (BPQR).

**National Biomethane/Renewable Gas Registry**

An organisation that operates an account-base administration system which documents the chain of custody of injected biomethane/renewable gas from the moment of injection until the moment of withdrawal from the domestic natural gas network. A National Biomethane Registry may be established either through government mandate or by voluntary cooperation of market participants and is operated on a domestic market.

**Open Web Application Security Project (OWASP)**

The Open Web Application Security Project® (OWASP) is a non-profit foundation that works to improve the security of software. Through community-led open source software projects, hundreds of local chapters worldwide, tens of thousands of members, and leading educational and training conferences, the OWASP Foundation is the source for developers and technologists to secure the web. One of the projects of OWASP is to provide the OWASP TOP 10, which comprises the TOP 10 web application security risks. It represents a broad consensus about the most critical security risks to web applications in a standard awareness document for developers.

**Regulation on Wholesale Energy Market Integrity and Transparency (REMIT)**

Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency[16]. REMIT came into force in 2011 with the aim to support open and fair competition in wholesale energy markets in Europe. REMIT focuses on increased market transparency and integrity. The main goal is to protect the interests of companies and consumers.

**Renewable Energy Directive (recast) – RED II**

Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast).

**Request for Information (RFI)**

The Request for Information represents the first stage of a tender process, the first time when information on the tender is officially published to possible bidders. During the RFI process stage, bidders submit a detailed offer which is further evaluated by the tendering organization. As a result of the evaluation during the first stage, the number of bidders is pre-filtered.

**Request for Proposal (RFP)**

The next stage of the tender process is the Request for Proposal. The bidders provide a detailed offer including the commercial, technical, and financial aspects. Within the RFP stage, personal presentations constitute a suitable measure to further narrow down the list of participants/bidders

**Service Level Agreement (SLA)**

The Service Level Agreement or maintenance contract is made between the operator and provider of the IT-service. It defines the support by the IT-provider during the operational phase of the IT-service.

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[16] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011R1227

**Tender documents**

The bidder must provide suitable documents during the tendering process, specific requirements for each stage of the tender are defined by the tendering organization.

**Tendering organization**

The tendering organization conduct the tender. This includes providing the tender documents, overseeing the tender process and assigning points for each bid according to the pre-defined award criteria. Using the MEAT concept (most economically advantageous tender), the term "contracting authority" (CA) is used to describe the tender organization.

**Tender process**

A tender is an open invitation to legal entities to compete for the assignment of the tendered IT-services. The aim of the tender process is to initially reach out to a high number of potential bidders to be limited at each stage to reach a small group of most-suitable bidders when taking a final decision on the IT-provider. The tender process represents one option for the acquisition of IT-services as opposed to a direct order.

**Trader**

The term "trader" refers to a market participant who performs an exchange (title transfer) of a respective Certificate, not consuming it directly, but transferring it to another market participant. In this document, the term "trader" is used in a generic way. In practice, a trader may be of different: end consumer, a supplier, or a commodity trader.

**User Acceptance Testing (UAT)**

Tests have to be performed to verify (accept) the delivered IT-service operates according to the tender requirements. This kind of test is performed by the end users of the IT-solution.