

**Market monitoring system for the Agency's REMIT Information  
System (ARIS)**

**FRAMEWORK CONTRACT**

**TECHNICAL SPECIFICATIONS**

**OPEN CALL FOR TENDERS**

**ACER/OP/ADMIN/21/2012**

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## **1. Introduction**

This document contains detailed technical specifications for the market monitoring system and related services and describes the following:

- the current situation of technical activities for the implementation of ARIS;
- the technical requirements of the requested system;
- the terms for licensing and other arrangements;
- the service level requirements and the reports to be provided to verify the fulfilment of the service level requirements.

The definitions contained in the glossary of terms used for describing ARIS in Annex I Tender specifications apply also to these Technical specifications.

## **2. Overview**

### **2.1 The Agency's plan for implementing ARIS**

Section 2.3 of Annex I Tender specifications provides an overview of the ARIS background, architecture and goals. ARIS is divided into four tiers:

- Tier 1 – Sourcing
- Tier 2 – ETL (cleansing layer)
- Tier 3 – Market monitoring system
- Tier 4 – Data sharing and exporting

With the aim to implement ARIS, the Agency launched two public procurement procedures in June 2012:

- Procurement procedure no. ACER/OP/ADMIN/14/2012 for the provision of IT infrastructure hosting services of the required underlying ICT infrastructure for ARIS.
- Procurement procedure no. ACER/OP/ADMIN/12/2012 for web applications development services and IT consultancy services for the implementation of ARIS (Tiers 1, 2, and 4 of ARIS).

The selected Contractor shall provide a market monitoring system for the EU wholesale energy market which shall include off-the-shelf software products, professional services to customize and improve such software products, including the installation and operation of the resulting deliverables, namely development and implementation of Tier 3. The services under the framework Contract may be executed in parallel to other services related to Tiers 1, 2 and/or 4 of ARIS which are not a part of this procurement procedure and will not be a part of the framework Contract.

### **2.2 General principles**

There are three (3) main principles which shall always be followed proposing technical options and solutions to the Agency:

- For user interaction the Contractor should make use of web technologies. Standard browsers shall be used by the Agency and the Authorised parties to operate web applications, including computer software applications that are coded in a browser-supported language and reliant on a common web browser to render the execution feasible. The selected Contractor should avoid, wherever possible, the introduction of proprietary technologies that would impose client installations on the computers of end users. The following can be considered as standard browsers: Internet Explorer 6 or

- superior, Mozilla 3 or superior, Safari.
- REMIT and its associated processes are still under discussion. Bearing this in mind, the Contractor should ensure high flexibility and code re-use wherever possible so that in the event that software requires modification, either as a result of legislative changes or of a limited design change, the system could be modified with minimum effort.
- Use of open source components is permissible as long as those obligations stated in the Contract are met. In any event, such open source components should only be included if those components have a long potential lifespan, are generally understood by the software-development community and are fully declared.

### **3. Technical specifications for the market monitoring system**

In this section the requirements of the market monitoring system are differentiated between the minimum and advanced requirements. All minimum requirements are mandatory and constitute product A. The advanced requirements, either all or some, together with all minimum requirements constitute product B.

Each tenderer must, in his technical offer, specify how the offer conforms to the minimum requirements, which are the advanced requirements of the proposed product B and how these requirements will be implemented.

#### **3.1 Data sourcing**

##### **3.1.1 Sources of data**

The Agency may determine that an external system, different to that provided by the selected Contractor, may be the most efficient means of contributing data to the market monitoring system.

Nevertheless, numerous data sources will require handling to get data into the market monitoring system.

##### Minimum requirements

- Data will be submitted to the market monitoring system in a variety of formats therefore the proposed system has to have at least a functionality of bulk data import (batch).

##### Advanced requirements

Flexible data sourcing functionalities: Data inputs may include one or more of the following technological sources:

- Continuous flow of data (market data feeds);
- Message queue formats (e.g. Microsoft MQ, IBM MQ Series, etc...);
- Trade repositories;
- XML document formats;
- HTTPS file upload;
- Delimited CSV batch upload that might utilise FTP/FTPS and HTTP/HTTPS;
- Web forms (similar to a trade ticket system) operated by the Agency and/or NRAs;
- Other data interface types in addition to any data sources that may be provided by the Agency.

### 3.1.2 Data types

#### Minimum requirements

The following data types are envisaged to be collected by the market monitoring system.

- Orders
- Transactions (exchange, broker, bilateral):
  - Standard contracts
  - Non-standard contract
- Regulated information:
  - Transparency information (“fundamental data”)
  - Inside information
- Other data:
  - News
  - Price indexes
  - Weather data

#### Advanced requirements

- Lifecycle Event handling: the system should be able to follow and reconstruct a relevant time series of events.

*For instance an order can evolve in a transaction, or there can be post-trading events after the execution of one transaction that modifies values in some fields.*

### 3.1.3 Sequencing and recoverability

#### Minimum requirements

- All events successfully submitted by the data collection systems as specified by the Agency shall be provided with a unique internal sequencing reference code by those systems. This code will be additional to any sequencing codes provided by other systems (external sequencing codes). The internal sequencing code will be incremental and assigned to every discrete element of event information submitted.
- The market monitoring system must, at all times, maintain the correct chronological order of events.

#### Advanced requirements

- In the event of a failure and irrespective of the format, the market monitoring system should be in a position to provide sufficient information to enable the Agency to automatically identify the last event that was successfully acquired. This will enable the Agency to take action to ensure completeness of submitted events.

### 3.1.4 Data field management

#### Minimum requirements

- Each canonical data type (e.g. trade, nomination, inside information, fundamental data) will have a set of data fields associated with it. All canonical data types will require several fields of information to describe an event.

For example:

*The “Pre-trade Order” canonical data type may have the following fields associated with it: time stamp, product name, quantity, buy/sell, price, units, counterparty, venue ID, etc.*

#### Advanced requirements

- Managing data fields by system administrators who are not software programmers.
- Data field management functionalities may include, but are not limited to:
  - Create and edit fields of information;

- Associate certain fields with attributes and canonical data types (e.g. asset reference ID with fundamental data, trade quantity with transaction);
- Make individual fields mandatory per canonical data types for data submission (e.g. execution time with transaction);
- Specify fields to be calculated from other fields;
- Other functionalities proposed by the tenderer for maximising flexibility.

### **3.1.5 Data checks and enrichment**

#### Minimum requirements

- Calculated data that is derived from tables of information within the market monitoring system.

*For example, calculating an additional data value based on a look up to another table within the market monitoring system utilising values from the submitted data.*

#### Advanced requirements

- Event information that is submitted to the market monitoring system may cause other derived data to be stored within the transaction record itself or be stored elsewhere within the market monitoring system.
- Limited volumes of data enrichment.

### **3.1.6 Reference data management**

#### Advanced requirements

- The ability to manage reference data within the proposed market monitoring system is optional, even though in the envisaged architecture reference data are expected to flow in Tier 2.

*Reference data may relate to market participants (registration system) or products (list of products). Another example might include maintaining holiday data for each jurisdiction.*

## **3.2 Canonical data amalgamation**

### **3.2.1 Standardisation and amalgamation**

#### Minimum requirements

- Different data types may be grouped together by systems external to the market monitoring system. Such systems will be exclusively specified by the Agency and under the control of the Agency. If so determined, the Contractor will be dependent upon all change control processes operated by the Agency and shall be responsible for using the available interfaces to these external systems.
- A strict process to handle inevitable changes to the scope, structure, and format of collected data is required. This process will be specified by the Agency in cooperation with the Contractor wherever possible.

#### Advanced requirements

- In case an internal interface system is available from the tenderer, the Contractor may be requested to adapt the system to the needs of the Agency. In this case, the market monitoring system will also be responsible for:
  - Data cleansing;
  - Enriching;
  - Integrity checking;
  - And reformatting.

### 3.2.2 Periodic aggregation

#### Minimum requirements

- To help users view data in charts and tabulated form, the capability to aggregate data on a periodically basis is required; the period must be defined on a parametric basis.

*Examples include periodical aggregation of total volume, number of trades for each instrument and retaining that derived data for a prescribed period in intervals within the time series that can be pre-defined (i.e. market activity in the day-ahead market for Austrian power (prices and volumes) with aggregated values every hour for a time period of 1 week or 1 month or 1 year).*

### 3.3 Market monitoring functional requirements

#### 3.3.1 Flexibility, user friendliness and overall requirements

##### Minimum requirements

- The market monitoring system software must have the ability to monitor multiple canonical data types, be modular and present a range of information that might include tabulated data as well as configurable graphical presentations of data. Software must be easy to use, be responsive and provide the end-user with options to obtain, for each functionality, on-line help.

##### Advanced requirements

- The system should have the ability to operate across multiple monitors.

#### 3.3.2 Enhanced display of transparency information

##### Advanced requirements

- The end-user is able to view transparency information (fundamental data) within an innovative graphical presentation i.e. dash-board or other visual tool. Such a presentation might include information overlaid across geographic maps relating to certain assets operated by TSOs.
- A capability to drill into historical and narrower data sets through the graphical presentation.

*The fundamental data format will be defined through the Implementing acts and therefore a final format is not yet available. Fundamental data should include at least the following information:*

- *Information related to the capacity and use of facilities for production, storage, consumption or transmission of electricity or natural gas, including planned or unplanned unavailability of these facilities,*
- *Information related to the capacity and use of LNG facilities, including planned or unplanned unavailability of these facilities.*

#### 3.3.3 Data retention and archiving requirements

##### Minimum requirements

- *Immediately accessible and archived data.* Data for which the end date of a delivery obligation has already exceeded a minimum of 3 years shall be removed from the market monitoring system periodically (ideally every 6 months) and archived. All other data will

- remain immediately accessible.
- *Retention of auditable information.* Auditable logs and unmodified, original data shall be archived for a minimum of 20 years.
- *Archiving.* Data, including audit logs, will be archived so as to optimise the performance of the immediately accessible areas of the market monitoring system.

#### Advanced requirements

- *Reconstruction of archived data.* For case preparation, data from the archive may require to be immediately recalled and reconstructed so as to perform business intelligence tasks upon it.

### **3.3.4 Graphical presentation**

#### Minimum requirements

- The capability to visually reproduce a knowledgeable market summary of events in chronological order in order to illustrate market conditions.
- The capability to associate in visual market summary certain non-transactional events with transactional data (i.e. *Pipeline interruption in the North Sea associated with gas transactional activity in Continental Europe*).
- Graphical representations of trade related data, including orders to trade, from exchanges, brokers, OTC and bilateral transactions.

#### Advanced requirements

- Replay events within the graphical interface;
- Alternative graphical presentations to adjust formatting and layers of detail;
- Graphical presentation of certain elements of fundamental;
- Annotate charts manually: visualisations, along with their annotations, should be able to be exported to other documents.

### **3.3.5 Alerts**

Alerts will be defined by the Agency and other Authorised Parties to interpret and identify information across canonical data types, whilst respecting the Authorised Party's data view.

#### Minimum requirements

- *Alert defining and modifying:* The market monitoring system shall include a comprehensive set of "state of the art" alert rules for possible market abuse similar to those that apply in the financial market sector, including alert rules for cross-market analysis (including multi-venue (e.g. consolidation across several organised market places; traded at organised market places versus OTC) and multi-asset (e.g. derivatives versus underlying) analysis). Parameters of existing alerts shall be easy to apply and adapt. Existing alerts shall be easy to modify. Additional alerts shall be easily defined by the Agency and other Authorised Parties to interpret and identify information across canonical data types, whilst respecting the Authorised Party's data view. Statistics of data must be available for alert definition.
- *"Alert operation"* Alerts can be run in real time and across historic data sets either manually or scheduled by the end-user. All alerts shall be carried out in an efficient way so as not to undermine the safe running of the market monitoring system.

#### Advanced requirements

- Ability to schedule alerts and run on demand;
- Ability to specify an alert by linking types of non-transactional data (e.g. regulated information, inside information and news) to transactional activity;



- Ability to enable alerts to be triggered once data sets are deemed sufficiently well populated so that an alert has meaning;
- Ability to run alerts in a test mode so as to check the ability of complex functions to complete their task within an efficient timeframe;
- Ability to ensure the stability of the platform (alert controller);
- Ability to deploy alerts without having to re-compile substantial parts of the application;
- The capability to identify trading pattern behaviour;
- The ability to launch additional alerts when other triggering alerts (or market events) have occurred;
- Ability of an alert to compare and identify changes in aggregated and derived values;
- Ability to create documentation about the alert.
- “*Alert sharing*”: existing alerts and alerts defined by one user within an Authorised Party are available to be utilised by other Authorised Parties anywhere within the system. However, the alert will only operate across the applicable data view for which that Authorised Party is entitled, on a case-by-case basis.

### **3.3.6 Reports and statistics; position handling**

#### Minimum requirements

- *Report engine*. The ability to prepare automated periodic reports about market activity containing charts and parameterised text.
- *Publication of limited extracts*. Periodic reports containing limited extracts of information which will be made published on the Agency’s web site (based on Microsoft SharePoint 2010).
- *Statistics*. A wide range of statistics shall be available. Statistics must be applicable to any quantitative fields and can be summarised or conditioned per each single entity (market participants, countries, trading venues, products, day-of-time, etc.) or group of entities.

#### Advanced requirements

- *Position handling*. A position handling tool should allow keeping track of positions on an intraday basis. Each new trade should add to the initial position of a market participant. Each position should be able to be broken down into its corresponding trades and additional position entries.

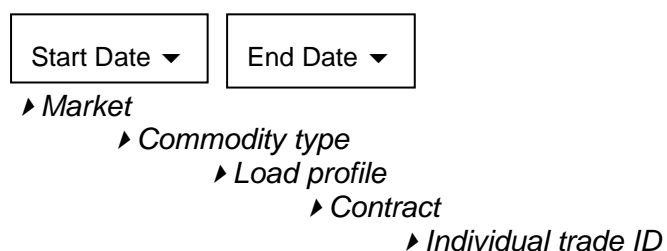
### **3.3.7 Data mining**

#### Minimum requirements

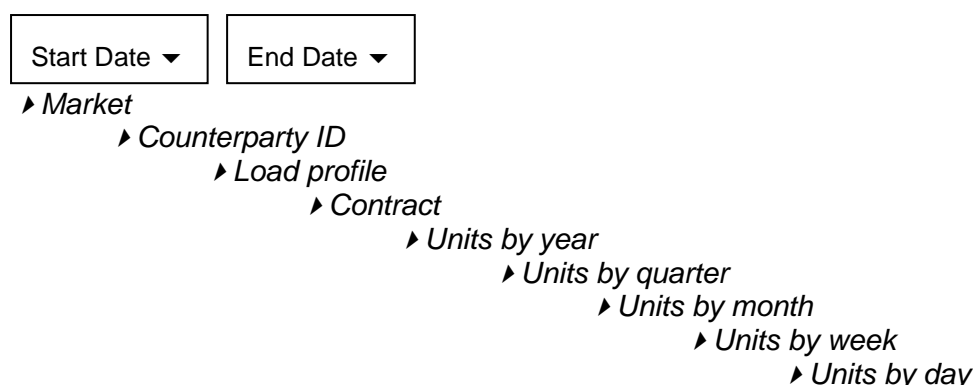
- *Search engine*. A search engine is required to quickly and efficiently find data within the data view. Searches shall operate across all data submitted.
- *Filter mechanism*. The capability to filter datasets by using the fields of information that are available.
- *Drill down and data aggregation*. The capability to drill into and extract data based on many tiered groups of structured data and aggregate totals for each group.

For example, drill down capabilities might include the following:

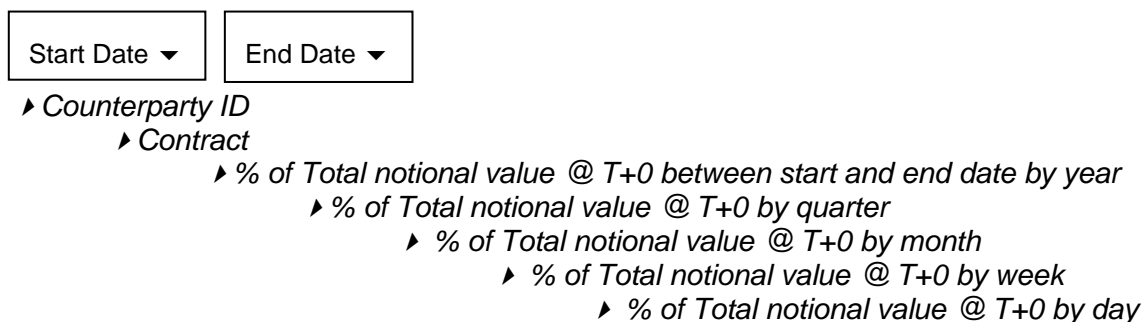
E.g. hierarchy 1 - “List of trades” might be:



Hierarchy 2 – “Units traded by counterparty” might be:



Hierarchy 3 “Percentage of notional value traded by counterparty” might be:



Advanced requirements:

- The ability to save user-defined filters, share and export those filters templates to other users.

### 3.3.8 Case management

Minimum requirements

- To assist in the management of cases, the Authorised Party user shall be able to open, amend and close cases. It is required that a case opened by an Authorised Party can be shared with other Authorised Parties entitled to that specific case.

Advanced requirements:

- The case management tool should be able to handle attachments of additional files for each case.

### 3.3.9 Auditability

#### Minimum requirements

- A robust auditable record of activity by any user is requested to identify tasks being performed.

#### Advanced requirements

- Functionality to enable levels of auditability to be configured by an administrator.

## 3.4 Data sharing

### 3.4.1 Data views

For the purposes of the market monitoring system, data views define the working data set that is applicable to each Authorised Party. The entitlement to use data within a data view will enable Authorised Parties to:

- View;
- Extract;
- Interpret and
- Run alerts against the data within the data view.

Key to the notion of a data view will be the belonging country for an event. A flexible system is required to associate data with a country (or countries) using parameters applicable to different canonical data types. A data view applies to all types of canonical data types.

*For example, for the purposes of the market monitoring system, data may be deemed to belong to a country if the end delivery point (or equivalent) for a wholesale energy product is within the geographic boundary of that jurisdiction. In this case, if two counterparties located in the separate countries X and Y make a transaction for a wholesale energy product where delivery will be within country Z with the transaction executed on a venue located in country W, the data related to this transaction may be deemed to belong to country Z. Additional parameters and criteria (e.g. geographic location of market participant) should be available to be used by administrators.*

This notion will be used hereafter to define an Authorised Party's data view.

#### Minimum requirements

- Each Authorised Party will be assigned a data view to limit the amount of accessible data to which that Authorised Party is entitled to. The Agency will have an unrestricted data view (i.e. entitled to view all data).
- The data view for an Authorised Party includes the following items that are associated to a country for which the Authorised Party is entitled:
  - Transaction data,
  - Fundamental data and
  - Inside information that is subject to exemption
  - Unlimited view on everything else related to the same jurisdiction (news, aggregated fundamental data, etc.).

### **3.4.2 Periodic modifications to a data view**

#### Minimum requirements

- Each data view will undergo periodic modifications, subject to legally binding agreements between the Authorised Parties. Periodically, additional criteria may be specified within the data view for an Authorised Party that changes the previous data view. Consequently, that data belonging to another country in turn becomes available to another Authorised Party.

*For example: Authorised Party A, previously entitled only to data from country X, and is from date Z entitled to data from both country X and country Y.*

### **3.4.3 Sharing of reports**

#### Advanced requirement

- Data sharing for case investigation purposes should be possible with other authorities by sharing reports among Authorised Parties that are entitled to, on a case-by-case basis.

## **3.5 Non-functional requirements**

### **3.5.1 Data security**

#### Minimum requirements

- The system must ensure the confidentiality, integrity and availability of the data with state-of-the-art security mechanisms.
- Provisions must be made to ensure that the software's security model integrates within the security plan for the market monitoring system that is required for the full implementation.
- *Inbound data.* Data submitted to the market monitoring system requires a high level of security. All data submitted must be regarded as commercially sensitive and confidential.
- *Outbound data.* Data extracted and disseminated from the market monitoring system will be a subject to a high standard of security.

### **3.5.2 Access to the system**

#### Minimum requirements

- The system must ensure that proper user authentication, authorisation and accounting processes are in place before granting access to the data.

### **3.5.3 Security administration**

#### Minimum requirements

- The Contractor shall perform the services and provide the products in accordance with technical norms, standards and procedures based on best professional practices in the information technology and/or telecommunications field (i.e. ISO 9000 and ISO 27000 standards).
- The contractor shall provide the necessary administrative capabilities during the establishment phase and during the operational phase to support the required mechanisms that will enable the Agency to fully comply with the above standards.

### 3.5.4 Performance

#### Minimum requirements

- Performance of the system at every level is essential in order to ensure that the monitoring tasks can be fulfilled even in case of huge quantity of data. Tasks for the end-user should be prioritised in preference to background tasks.

### 3.5.5 Resilience

#### Minimum requirements

- The market monitoring system's resilience requirements specified below are consistent with the rest of the infrastructure for the full ARIS system. Whereas resilience requirements are, in part, governed by infrastructure the market monitoring system software plays a role in maintaining a resilient system.
- Minimum resilience requirements (excluding disaster conditions) for the market monitoring system per month are:
  - Event submission/import: 99.9%;
  - Monitoring: 99.5%;
  - Reporting engine: 99.5%;
  - Data extraction: 99.5%,  
provided that a suitable infrastructure is available.

### 3.5.6 Recoverability

#### Advanced requirements

- *Component failure recoverability.* In the event of a failure, not related to a disaster as described below, of one or more components of the market monitoring system, the system should be able to fully recover within 2 hours following a successful restart of the affected server or servers.
- *Disaster recoverability.* In the event of a physical disaster, e.g. destruction of the data centre or a server, the system must technically be fully recoverable within 3 calendar days provided that a suitable infrastructure is provided and data backups are available.

### 3.5.7 Error handling and system monitoring

#### Minimum requirements

- *Error handling.* The system must identify errors and notify technical administrators.

#### Advanced requirements

- *System monitoring.* Technical alerts should be available to flag capacity issues relating to hard disks, processors and other key aspects of the server that are relevant.

## 3.6 Technical characteristics

### 3.6.1 Software characteristics

#### Minimum requirements

- Dependent software for the functioning of the market monitoring system will include server operating systems, database technologies, software languages and communication protocols amongst others.
- The market monitoring system must adopt modern and fully supported dependent software and, where applicable, such systems shall have an expected supportable

- lifetime of at least 5 years.
- Software to be used for remote support must also be specified.

### **3.6.2 Hardware characteristics**

#### Minimum requirements

- Requirements for minimum hardware specifications to support a responsive system shall be outlined.

#### Advanced requirements

- The market monitoring system should support running in virtualized environments.

### **3.6.3 Limiting technical characteristics**

#### Minimum requirements

- Limiting technical characteristics are important to identify so that they can be factored into the system.

## **3.7 Governance and quality of work**

### **3.7.1 Development methodology**

#### Minimum requirements

- To enable effective project management a widely known development methodology shall be included and used by the Contractor.

### **3.7.2 Change control process**

#### Minimum requirements

- When changes cannot be performed by users or administrators, a change control process shall apply. Such a process will govern all changes from the time the Agency considers it necessary to introduce a change control process. Such a change process will include the following stages as a minimum:
  - Requirement gathering from the Contracting Party;
  - Specification writing and costing by the Contractor;
  - Signing-off by the Contracting Party;
  - Development;
  - Functional testing;
  - Integration testing;
  - Performance testing;
  - Reporting back to the Contracting Party on the status of the testing cycles;
  - Documentation changes;
  - Scheduling and deployment to the production environment;
  - Reporting on lessons learnt.

The process needs to ensure, amongst others:

- Requirements are succinctly captured and prepared by the Contractor for signing-off by the Contracting Authority;
- Groupings of requirements are recommended by the Contractor, so as to ensure cost efficiency and that easy-to-execute changes are not unduly delayed;
- Fees are correctly quantified and fixed for each development cycle;

- Any third-party involvement through sub-contracted work is fully declared and agreed with the Contracting Party prior to commencement;
- Sufficient testing time for functionality improvements and performance load tests is allocated within the project plan.

### **3.7.3 Testing process**

#### Minimum requirements

- All software will require rigorous testing prior to being released.
- Prior to the start of the operations, test data for each canonical data type will be made available by the Agency for the use by the Contractor. Such test data will be validated by the Contractor as being meaningful and adequately reflecting the characteristics of real-life data in so far as required by the market monitoring system.

### **3.7.4 Quality of work**

#### Minimum requirements

- Quality of management;
- Overall quality of implementation;
- Thoroughness of interaction with stakeholders;
- Early issue identification;
- Performance of software;
- Responsiveness of staff;
- Security;
- Longevity of the system and associated additions;
- Integrity of programming code;
- Timing and delivery of the system;
- Professionalism of staff;
- Accurate estimations and thorough justifications.

## **3.8 Software maintenance and other related services**

#### Minimum requirements

- A software maintenance plan shall keep all versions of the market monitoring system compatible with updates to the server operating system and other dependent software.

#### Advanced requirements

- In order to ensure the Agency the sustainability of software maintenance at the end of the framework Contract, the Contractor should have a broad range of third party partners with specialist skills in:
  - Operational support;
  - Software support;
  - Maintenance;
  - Software development;
  - Security.
 Such third parties should operate independently from the Contractor.

### **3.8.1 Provision of support**

#### Minimum requirements

- After go-live, operational support is required at least in English language and during

office hours (from 8 am to 6 pm Continental Europe time, Monday to Friday, except on pan-European holidays) to enable all Authorised Parties to get prompt support over the phone for the duration of their licenses.

#### Advanced requirements

- The capability to provide support in other European languages, other than English, and through other channels than telephone.

### **3.8.2 Minimising deployment failures**

#### Minimum requirements

- Following successful integration and performance testing in non-production environments, further contingency measures are required to ensure, in the event of an unforeseen failure, that a software version roll back can take place.

### **3.8.3 Backup and Restore**

#### Minimum requirements

- Overnight backups of data and the system on a fortnight cycle.
- Clear operational guidelines for the emergency restoration of backed up information.

### **3.8.4 Technical system monitoring**

#### Minimum requirements

- All critical parts of the system will require monitoring by administrators. Such monitoring should be able to easily identify and alert administrators on disk capacity overruns, communication link and hardware failures, as well as other server load measurers associated with the market monitoring system software.

### **3.8.5 Training**

#### Minimum requirements

- Training for users employed by the Agency and Authorised Parties is essential. The foreseen training location is Ljubljana, Slovenia. A programme for induction, annual refresh and advanced courses is required. A mixture of the following is envisaged for each of the courses:
  - Hands-on, example-led experience (one PC per individual);
  - Tutor-led direction and interaction;
  - Pre-prepared electronic materials (including slide decks, background reading, case studies etc.);
  - Question and answer session;
  - 1 hour written test to cover the material of each course.

### **3.8.6 Documentation**

#### Minimum requirements

- Electronic documentation for the market monitoring system is required. These materials will include:
  - A user manual;
  - A description of the platform;
  - A technical administrator's guide to be used by staff of the Agency, containing operational support procedures and technical parameters specific to the implementation;



- A technical description of all modifications requested by the Agency;
- Any document related to specific settings and development done by the Contractor prior the go-live to achieve specific needs of the Agency.

### **3.8.7 Data export declaration and other terms and conditions**

#### Minimum requirements

- No technical or commercial restrictions should apply to the ability of authorised data extractors at any point to receive, download, extract and further manipulate data held within the market monitoring system outside the front-end application(s) provided by the Contractor. Any other business terms and conditions require identification.

### **3.9 Authorised Parties' remote access and operation**

#### Minimum requirements

- To enable Authorised Parties to interact directly with the market monitoring system there must be a capability to remotely operate a graphical user interface, possibly over the Internet via a secure protocol. The architecture of the proposed system must take into account bandwidth limitations and latency, as well as a robust security model. Technical performance of complex tasks should be optimised also for remote users.

#### Advanced requirements

- The Authorised Parties should operate the market monitoring system remotely through a web-based GUI.

## **4. Envisaged timeline**

This schedule of envisaged phases is provisional and is for information purposes only.

- First phase: build-up of the system, including development, customisation and testing. This phase will end with the acceptance test in the final user environment and the Go-Live of the market monitoring system.  
Envisaged duration for first phase, in case of adoption of product B, is maximum 10 months. During this phase the integration with the data collection system (Tiers 1, 2 and 4) is also envisaged (depending upon the timeline of Implementing acts).
- Second phase: ramp up: running the market monitoring system with data provided by trading venues willing to test the data collection system before the reporting obligation starts. This phase includes comprehensive security assessment and, if necessary, remedial actions, and may include first changes according to the adopted legislation. The duration of the second phase depends on the timeline of Implementing acts. The second phase foresees also the certification of reporting entities
- Third phase: Real operation and evolution. This phase shall start six months after the Implementing acts enter into force.

## **5. Licensing and other terms of arrangement**

### **5.1 Licensing and support**

#### **5.1.1 Type of arrangement**

The tenderer shall, as a minimum, for every single product, every single software element and/or module included in the price list, also include a price quote for the use of such products/elements/modules by 25 AND by 10 concurrent users. In addition, the tenderer may include in its price lists different price quotes for different concurrent user combinations.

The Authorised Parties may order directly their licenses from the Contractor at the price indicated in the financial offer (Annex II). New Authorised Parties can start to operate at any time in the year. The Agency will, every six months, confirm to the Contractor the number of new Authorised Parties.

For any Authorised Party that will order a licence, a license for up to 10 concurrent users should be issued. Should an Authorised Party require more than 10 concurrent users, a second license may be issued for the same Authorised Party.

All licenses, for the Agency and for Authorised Parties, shall have an initial duration of one (1) year and shall be renewable, on a yearly basis, for the duration of a framework Contract. Licenses shall not expire automatically at the end of the year. A grace period of a minimum of two months shall be granted.

Orders for licenses for Authorised Parties, as well as individual negotiations between the Contractor and the Authorised Party for any additional services, will not include the Agency as a party.

All support costs associated with providing end-user advice should be incorporated into the licensing model so as to ensure a simple and transparent cost structure.

Before the expiry of the contract, the Agency reserves the right to request a re-tender for operational support to enable third parties to provide associated services. Information about the system which may be required to enable such third parties to carry out operational support will be provided by the Contractor free of charge, should the Agency so request.

#### **5.1.2 Licensing start date**

The validity of the licence for the Agency shall start on the day the Agency accepts and gives conformity to the delivered market monitoring system.

### **5.2 Cooperation requirements with the Agency's Contractors**

During the implementation of individual contracts the Contractor shall cooperate with the system providers of Tier 1, 2 and 4 of the architecture where needed, to ensure tight integration of the different tiers of ARIS. It is also expected that the Contractor advises the Agency in the best way to set up the underlying infrastructure for its market monitoring system. Moreover, following the architecture illustrated in section 2.3 of Annex I Tender specifications, the Contractor shall ensure that:

- All interfaces between the components of the system are correctly specified;
- All functional requirements satisfy the interoperability between components;
- Work can be prioritised and re-prioritised if necessary and should the Agency so require;

- Performance (stress test) requirements for the operation of the complete system are satisfied;
- Issues that arise during the project are resolved swiftly;
- Milestones and deadlines are met;
- Project status and percentage-complete administrative devices to enable project tracking can be communicated to stakeholders;
- A centralised issue tracking schedule maintained by the Agency can be updated;
- Communication across all parties involved ensures the minimisation of delays;
- Where appropriate, the versioning of software components is correctly coordinated so as to ensure all parties are working using source code that is consistent;
- Integration testing of components can be performed by the Agency;
- The security model is enforced for the complete system and a comprehensive pre-operational security assessment can be made with subsequent remedial action taken whenever appropriate;
- Test data can be utilised by all parties concerned;
- The process for connecting parties that will provide data to the market monitoring system is straightforward and tightly controlled;
- The process for extracting data by Authorised Parties is coordinated and efficient.

### **5.3 Procedure for reporting entities**

All parties who shall provide data via Tier 1 of the architecture or directly into Tier 3 (the market monitoring system) will undergo a carefully controlled procedure consisting of the following milestones:

1. Engagement;
2. Pre-live testing;
3. Full technical compliance;
4. Full operational compliance in which the reporting certification standard for the system has been met.

### **5.4 Obligations**

#### **5.4.1 Contractual obligations of the selected Contractor**

- To supply, maintain and support the functionality described in these Technical specifications, in accordance with the Contract and high-quality standards as mutually agreed between the Contractor and the Agency.
- To establish a remote administration tool that can operate servers and software as and when required.
- To set up all relevant back up and archiving jobs.
- To create and maintain development, quality assurance and integration technical environments so as to minimise complexity for the Agency.
- To work with the infrastructure hosting provider to ensure a successful deployment, operational reliability and accessibility of the production system.
- To treat all data, materials and communication associated with the arrangements of the market monitoring system strictly confidential and not to release information related to terms of any commercial arrangements to any other person or entity.
- To supply and maintain all documentation in accordance with the Contract.

#### **5.4.2 Agency's obligation**

- To provide all applicable hardware, communication infrastructure, data centre software services as illustrated in section 2.3 of Annex I Tender Specifications, namely Tier 1, 2 and 4 that are necessary to enable the market monitoring system to operate and receive data and to ensure that remote operation is available to the Contractor for administrative purposes.
- To monitor operational reliability of the market monitoring system and define technical parameters under which alerts will signal a failure within the core system.
- To develop certification criteria for potential reporting entities to adopt.
- To host periodic conference calls amongst reporting entities, third party system providers and the Contractor.
- To sign off specifications prepared by the Contractor prior to any work commencing.
- To operate the back-up operation and archiving processes.

### **6. Types of specific contracts**

Under the framework Contract three (3) different types of order could be placed, depending on a type of a project, namely:

- orders for fixed-price projects;
- orders for time-and-means projects;
- orders for person-day quoted projects;

The type of the order shall be clearly indicated in the request for services the Agency shall send to the Contractor. Detailed descriptions of different types of orders are defined below.

#### **6.1 Fixed price projects**

Services shall be provided at a fixed price as stipulated in a specific contract. The overall value of a project shall be set according to the prices for man-days or products as listed in the framework Contract. The payments shall be made on the basis of the Agency's written acceptance of the work.

The work shall be carried out by the Contractor in accordance with the specifications set out in the specific contract and its annexes. This shall include a description of the work, the timetable, reports, standards, reference manuals and details of the results and deliverables required.

Each result and deliverable shall be subject to approval by the Agency with the aim to ensure conformity with the specifications. The acceptance period will run up to a maximum of thirty (30) working days from the day of signature of a delivery note by the Agency. During this acceptance period, the Agency may notify the contractor in writing of any defaults in the result or deliverable.

#### **6.2 Time-and-means projects**

Services shall be provided on a time-and-means as stipulated in a specific contract. The overall value of a project shall be based on a specified daily sum to be paid for a given number of days for the provision of the means to perform the services. The specific contract shall state the purpose of the provision of the services, i.e. an obligation for the Contractor to achieve a specific result.

The Contractor shall, at the request of the Agency, supply all the necessary professional information regarding his staff providing the services.

The Contractor shall provide monthly attendance reports of its staff involved in the Agency activities which must be accepted by the Agency. The before mentioned report must be provided per each staff member employed by the Contractor.

The acceptance period will run up to a maximum of thirty (30) working days from the day of signature of a delivery note by the Agency. During this acceptance period, the Agency may notify the contractor in writing of any defaults in the result or deliverable.

### **6.3 Person-day quoted projects**

The “person/day quoted” method may be used for service providers working mainly outside the Agency’s premises, when not using the “fixed price” method.

The services will be ordered for a maximum number of days and will be divided into various sub-tasks (or "quoted person-day").

In the request for services, the Agency shall provide the Contractor with a detailed description of each sub-task. The Contractor shall submit a draft offer which shall include an estimate of the number of days needed to carry out the sub-task and the expected delivery date(s). When the estimate is accepted by the Agency, it shall become binding for both parties; only the number of days indicated in the estimate which will be a subject of a specific contract, shall be chargeable.

The payment, approved by the Agency, will refer to each sub-task fully delivered and accepted by the Agency in writing.

The acceptance period will run up to a maximum of thirty (30) working days from the day of the signature of a delivery note by the Agency. During the acceptance period, the Agency may notify the Contractor in writing of any defaults in the result or deliverable.

## **7. Professional profiles**

### **7.1 A-level profiles**

A-level profiles are those which have senior experience of at least 10 years in management in the field of software development lifecycle and in managing large IT teams and are able to manage and intensively interact with the stakeholders.

<b>Project Manager (PM)</b>	
Minimum education	University degree in the field of Economics, Computer Science or Engineering with a focus on Financial or Energy Markets.
Tasks	<ul style="list-style-type: none"><li>– Manage the development and implementation of information systems to meet the identified business needs, acquiring and utilising the necessary resources and skills, within agreed parameters of cost, timescales and quality.</li><li>– Give proposals for project strategies, planning, definition of tasks and deliverables, review of project deliverables, quality control, risk analysis and management, status reports, problem reporting and management systems, follow up and organisation.</li></ul>

	<ul style="list-style-type: none"> <li>– Guide the team in charge of project activities and review their deliverables.</li> <li>– Participate in functional working groups and progress meetings.</li> <li>– Estimate costs, timescales and resource requirements for the successful completion of each project according to the agreed specifications.</li> <li>– Prepare and maintain project and quality plans and tracks activities against the plan, provide regular and accurate reports.</li> <li>– Monitor costs, timescales and resources used and take action where these deviate from the agreed tolerances as well as ensure that delivered systems are implemented according to these criteria.</li> <li>– Manage the change control procedure gaining agreement for revisions to the project from the Agency.</li> <li>– Provide effective leadership for the project team ensuring that team members are motivated and constantly developing their skills and experience.</li> <li>– Support the Agency's staff in specifying requirements for activities of other Agency's contractors where needed;</li> <li>– Lead, under Agency's staff coordination, any relationship with other Agency's contractors, and inform the Agency in case of potential disagreements.</li> </ul>
Knowledge and skills	<ul style="list-style-type: none"> <li>– In-depth knowledge of project management frameworks;</li> <li>– Knowledge of project management tools;</li> <li>– Excellent command of English language which should allow him/her to participate in meetings and draft minutes and notes of internal teams' meetings and external meetings with other Agency's contractors and stakeholders.</li> </ul>
Experience	<ul style="list-style-type: none"> <li>– Minimum 10 year experience in IT field, with a similar position for at least 7 years;</li> <li>– Experience in quality assurance procedures;</li> <li>– Must have successfully completed the project management for at least 2 international projects.</li> </ul>

## 7.2 B-level profiles

B-level profiles are those which have senior experience of at least 7 years in middle management in the area of software development lifecycle, are able to intensively interact with stakeholders (internal and external) and coordinate the activities of a small team of technical people.

IT experts in a specific area with a continuous experience of at least 7 years in specific IT technical sectors and platforms and leading research and development or customer relationships are also considered B-level.

<b>Functional Analyst (FA)</b>	
Minimum education	University degree preferably in the field of Economics with focus on Financial or Energy Markets. Alternatively, university degree in the field of Mathematics, Engineering, Computer Science.
Tasks	<ul style="list-style-type: none"> <li>– Convert specific business procedures in procedures which can be easily implemented technically;</li> <li>– Gather requirements and prioritise their implementation;</li> <li>– Interact with the Agency (in particular with business experts) and minimise the interaction to gather functional and where applicable, technical requirements.</li> </ul>

	<ul style="list-style-type: none"> <li>– Summarise processes and, in case the processes are too complex, suggest alternative strategies to better comply with the user needs.</li> <li>– Formalize gathered requirements in UML diagrams and communicate them to a technical analyst who will be able to put them in a UML format for final implementation;</li> <li>– Follow-up the implementation of the requirements and prioritize them in co-ordination with the project manager, based on business needs and experience.</li> </ul>
Knowledge and skills	<ul style="list-style-type: none"> <li>– Knowledge of market monitoring matters or knowledge of working methods in the world of financial markets, or functional knowledge of the wholesale energy market;</li> <li>– Knowledge of at least a UML design tool.</li> <li>– Excellent command of English language which should allow her/him to participate at stakeholders meetings and the ability to draft efficient functional analysis, minutes and notes for technical analysts and developers.</li> </ul>
Experience	Minimum 7 years of experience, of which 3 in the analysis of business processes in the field of wholesale energy market or in the field of financial markets or in the field of market monitoring and surveillance.

<b>Technology Expert (TEX)</b>	
Minimum education	University degree in the field of Mathematics, Engineering, Computer Science.
Tasks	<ul style="list-style-type: none"> <li>– Develop the concept of the software platform with the Agency and in the view to clearly understand the Agency's expectations for the software;</li> <li>– Develop technical guidelines which must be followed by the development team in the development phase;</li> <li>– Work with the software developers, technical analysts, data base architect and system administrator to ensure the final product is in line with the Agency requirements and needs;</li> <li>– Responsible for ensuring effective software deployment;</li> <li>– Test and validate that the software is free from inaccuracies and operating problems and fully compliant with the technical guidelines;</li> <li>– Prioritize and schedule features and changes to the software as requested by the Agency;</li> <li>– Research and keep current with software and systems designs;</li> <li>– Ensure that the software deliverable are handled to the Agency;</li> <li>– Ensure quality control for all software developed by carrying out testing, taking into account feedback from the Agency and external stakeholders.</li> </ul>
Knowledge and skills	<ul style="list-style-type: none"> <li>– Depending on the project, must have at least an in-depth working knowledge of the market monitoring system.</li> <li>– Knowledge of at least a UML design tool;</li> <li>– Excellent command of English language, the person must be able to read both UML diagrams and attached notes which could come from the Agency's staff and must be able to provide guideline papers which shall be used by the contractor's and Agency's staff.</li> </ul>
Experience	Minimum 7 years of experience in the role of technology expert with particular reference to the market monitoring system.

### 7.3 C-level profiles

C-level profiles are those which have experience of at least 5 years in technical aspects in the area of software development lifecycle, are able to cover independently a technical role inside a development team and interact with other members of a team.

<b>Development Expert</b>	
Minimum education	University degree in the field of Computer Science, Engineering, or related subjects
Tasks	<ul style="list-style-type: none"><li>– Design, code and debug customisation of the market monitoring system;</li><li>– Front end graphical user interface design using Web Interfaces;</li><li>– Unit test of developed components;</li><li>– Software deployment, performance tuning, improvement, balancing, usability, automation;</li><li>– Document software functionality;</li><li>– Integrate developed components with pre-existing components;</li><li>– Maintain standards compliance;</li><li>– Coordinate with the system administrator, or eventually the data base architect, to have appropriate versions of operating system, application server, data base in place before the software deployment;</li><li>– Responsible to manage software lifecycle management (releases, versions, etc.);</li><li>– Coordinate any possible issue related to the system of performance problems during the execution of the project;</li><li>– Document all the deployment phases and all the pre-requirements needed to deploy the platform.</li></ul>
Knowledge and skills	<ul style="list-style-type: none"><li>– Very good knowledge of the specific market monitoring system proposed;</li><li>– Good knowledge of deployment phases in the specific surrounding technical environment;</li><li>– Knowledge of scripting languages to automate deployment phase;</li><li>– Good command of English language to be able to draft documentation and guide the Agency's staff in case any change is needed.</li></ul>
Experience	5 years of experience in similar roles, with particular reference to the market monitoring system.

## 8. Service level agreements

### 8.1 Specific contract provisions

#### 8.1.1 Process for placing orders

The ordering process shall follow the process described in Annex I Tender specifications and shall respect the following benchmarks.

<b>Number</b>	<b>Purpose</b>	<b>Benchmark</b>
Benchmark 1	For timely indication of receipt of the request for services	A maximum of 1 working day from the date on which the request for services is sent out by the Agency.
Benchmark 2	For timely provision of submitting the offer	A maximum of 5 working days from the date on which the request for services is sent out by the Agency.



### 8.1.2 Replacement of Contractor personnel not initiated by the Agency

Where there is a need to replace personnel in normal circumstances (excluding situations of force majeure) and this is not initiated by the Agency, the following process shall be followed:

1. As soon as the Contractor becomes aware that the original person will no longer be able to carry out the work, the Contractor is obliged to immediately inform the Agency. The Contractor shall give one month's notice (20 working days) to the Agency.
2. If the Contractor does not propose suitable replacement staff in due time, the Agency may apply a penalty of 10 man-days free of charge.
3. The Contractor shall arrange sufficient training for any replacement person, and where possible during the handover period, to guarantee the continuity of the service provided to the Agency.
4. A handover of at least 10 working days, free of charge for the Agency, shall take place.
5. If no handover is possible, at least 15 working days must be provided by the replacement person free of charge for the Agency. The days free of charge will be the first 15 working days of the period to be worked by the replacement person.
6. Any such replacement will not represent any additional cost to the Agency.

## 8.2 Quality monitoring

Monitoring the quality of different project's deliverables will measure whether the Contractor is delivering a standard of service in line with expectations. In addition, management of Contractor's personnel should be pro-active and such that it contributes to the efficient execution of projects and tasks.

Where the deliverable either fails to meet the benchmarks in a single instance or continuously over a period of time, the Contractor will be required to immediately produce a remedy plan.

### 8.2.1 Fixed price projects

Number	Purpose	Benchmark
Benchmark 3	For providing quality deliverables	Deliverables are accepted by the project manager without functional change requests and the user acceptance test is completed with only minor non-conformities.
Benchmark 4	For timely provision of deliverables	Does not exceed by more than 10% the time foreseen for a work package.
Benchmark 5	For quality and security audits	The deliverable complies with quality and security standards and successfully passes security and quality audits.

### 8.2.2 Support activities covered by licenses

Number	Purpose	Benchmark
Benchmark 6	For incident management	The average time to solve critical issues detected (severity 1) does not exceeding 24h per issue.
Benchmark 7	For severity proportion	The proportion of severity 1 incidents does not exceed 20% of the total number of issues.

### 8.3 Quality audits

The Agency will audit the Contractor's processes related to the delivery of the service. Three types of audit are foreseen. Costs for these audits will be covered by the Agency. It is not foreseen that any costs will be incurred by the Contractor, except for their own business time which cannot be invoiced to the Agency.

- i. Short-notice point audit:
  - Notice period: 24 hours
  - Content: Request to provide documented evidence that a specific step in the processes related to the delivery of the service has been fulfilled
  - Maximum frequency: Once per month
- ii. Shallow system audit announced in advance:
  - Notice period: 5 working days
  - Content: On-site audit, at the Contractor's premises, of all auditable processes and systems (cf. Infra)
  - Maximum duration: 0.5 days
  - Maximum frequency: Once per quarter
- iii. In-depth system audit announced well in advance:
  - Notice period: 10 working days
  - Content: On-site audit, at the Contractor's premises, of all auditable processes and systems (cf. Infra)
  - Maximum duration: 2 days
  - Maximum frequency: Once per year