



Innovated solution for Gas IM

OTE-COM

OTE Combining opportunities with markets

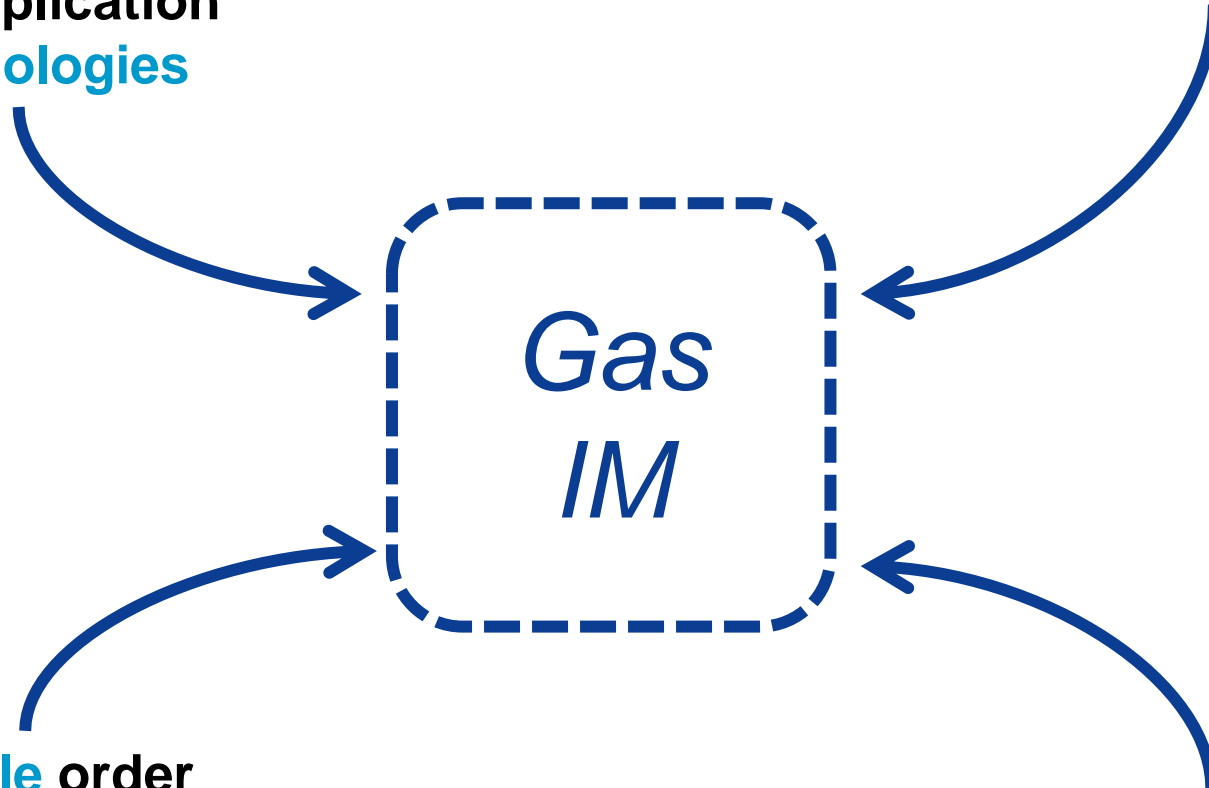
Innovated IM solution **OTE-COM**, developed by OTE a.s., including an application for trading on Intraday Gas Market in the Czech Republic, allows quick response to the current market situation 365 days a year.

New communication
and application
technologies

Adjustable GUI

Simple order
management

New FS principle



O**T****E** **Changes in technical solution**

Innovated IM solution OTE-COM is based on cutting edge technology, application logic and it **ensures fast and reliable distribution of trading data.**

- The solution is based on **a platform for quick exchanges of messages** using the binary protocol AMQP, according to the open international standard (ISO/IEC 19464).
- The **AMQP server** is used to deliver messages to/from client applications and to/from market participant systems. The exchange of messages is done through the pre-existing connections without re-authentication, thus **speeding up the data exchange.**
- Access to the intraday gas market will be possible via an **OTE-COM application** installed on market participant's side or it is possible to use own solution with access via **automatic communication** using an AMQP server

- Each trading client is a **standalone application**, with separate production and testing environment (SANDBOX).
- **Installation of the application is needed before the first use.**
- The application serves as the main user tool for trading on IM.
- It is built on **JavaFX** technology (trading screen). After the participant authentication (the verification of the participant is checked against data on the LDAP server CS OTE), it connects directly to the AMQP server.
- **Supported versions of OS** : Windows 7, Windows 8.1 and Windows 10 (both the 32 bit and 64 bit version).
- The standalone application will always be launched with the required version of JAVA JRE included in the application directory. The application is always distributed with the corresponding version of JRE.



Trading client – Trading screen

Menu

The header containing the menu and active tabs overview

The screenshot shows the OTE trading client interface. The top header contains the menu and active tabs overview. The main area is divided into several sections:

- Trading screen IM:** An aggregated overview of contracts and orders, showing a table of market data for contracts G-DD180615 and G-DD180616.
- Contract detail:** Detailed records of particular orders from the selected contract on the trading screen, showing a table of order data for contract G-DD180616.
- Create order:** Form for creating a new order, including fields for contract, order type, quantity, price, and execution restrictions.
- Own orders:** An overview and administration of own orders, showing a table of order data for contract G-DD180616.
- Audit log:** Messages generated by the system which are relevant for the logged in user, showing a table of audit log entries.

Graphical display of new IM trading client in this presentation might be amended.



Trading Client - Basket

Submit Basket

Sends all prepared orders in the **basket** to the trading screen

Basket for IM

Basket

Items: 3, page 1 / 1. 10

Contract	Type	Ask(Qty)	Bid(Qty)	Price	State	Exec. restriction	Valid to	Comment
G-DD180615	LMT		12.3	22.37	Active	None		
G-DD180615	ICB	2.3 / 10.0		22.37	Active	None		
G-DD180615	LMT	11.7		28.39	Active			

The Basket
Enables mass creation of new orders and modification of existing ones without sending them off for trading

Menu of user's features
eg. import from CSV file, Import/Export the basket content using the clipboard of the operating system eg. from Excel

Submit Basket

Orders in system

Contract: All

ID	Contract	Type	Ask(Qty)	Bid(Qty)	Price	St +
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Orders in the system
The Drag&Drop feature enables users to move their own orders from **Orders in system** (orders are available for trading) to the **basket** (this will delete the order from the trading screen)

Create / modify order in the basket

Contract: G-DD180615

Buy Sell

Order type
 Limit order
 Iceberg

Exec. restriction
 None
 FOK
 IOC

Total qty [MWh]: 11.7 Price [EUR/MWh]: 28.39

Comment:

Inactive

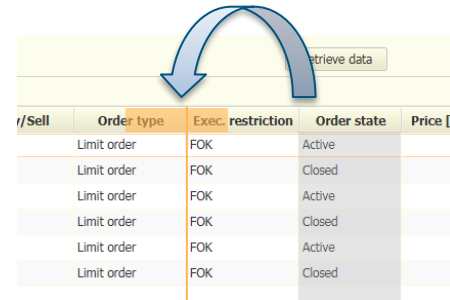
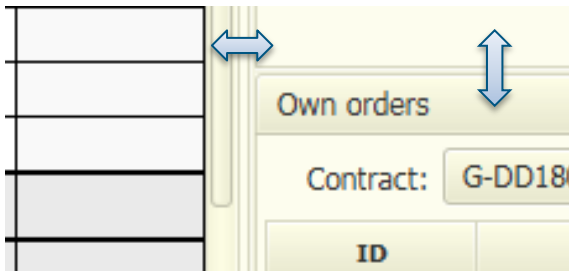
Create new Clear form

Create/ modify order in the basket
The administration of orders in the basket

Graphical display of new IM trading application in this presentation might be amended.

OTE Trading application– GUI

- **The display option** of the various panels and their **layout** on the trading screen is **customizable**. The size of the individual sections is adjustable.
- Users can save **several types of trading screen layouts**.
- Reports are also customizable. Users can **move or hide individual columns** according to their preferences and the changes can be **saved**.



Buy/Sell	Order type	Exec restriction	Order state	Price [
	Limit order	FOK	Active	
	Limit order	FOK	Closed	
	Limit order	FOK	Active	
	Limit order	FOK	Closed	
	Limit order	FOK	Active	
	Limit order	FOK	Closed	



External interface- automatic communication

Participants who prefer to use their own IT systems for trading on IM can carry out all business activities via **automatic communication**

- Automatic communication is **exclusively** based on communication with the **AMQP server RabbitMQ** (www.rabbitmq.com) to ensure fast distribution of messages.
- Compared with the SOAP solution, **no special settings/permission are required on OTE side** and the interface to the RabbitMQ AMQP server is available for all participants regardless of the system used.
- Market participants can create their own clients (own solution instead of OTE-COM application) that connects to the MQ server and sends requests and receives responses and mass messages. It is possible to use the AMQP client library RabbitMQ.

The process of establishing communication and individual communication scenarios is described in the document **External interface of CS OTE.**



External interface – Communication messages

All messages sent between the user and the IM application have their own message content, based on the **XML format**.

Two basic types of communication are used for Client – MQ server exchange:

- **Request-response** – requests initiated by the client to which the MQ server will respond asynchronously. The response is sent only to the initiator of the communication.
- **Mass message** – global message distribution from the MQ server to clients. Messages are sent based on specific distributional rules and access rights.

The description of messages can be found in the **Documentation of OTE-COM application**.

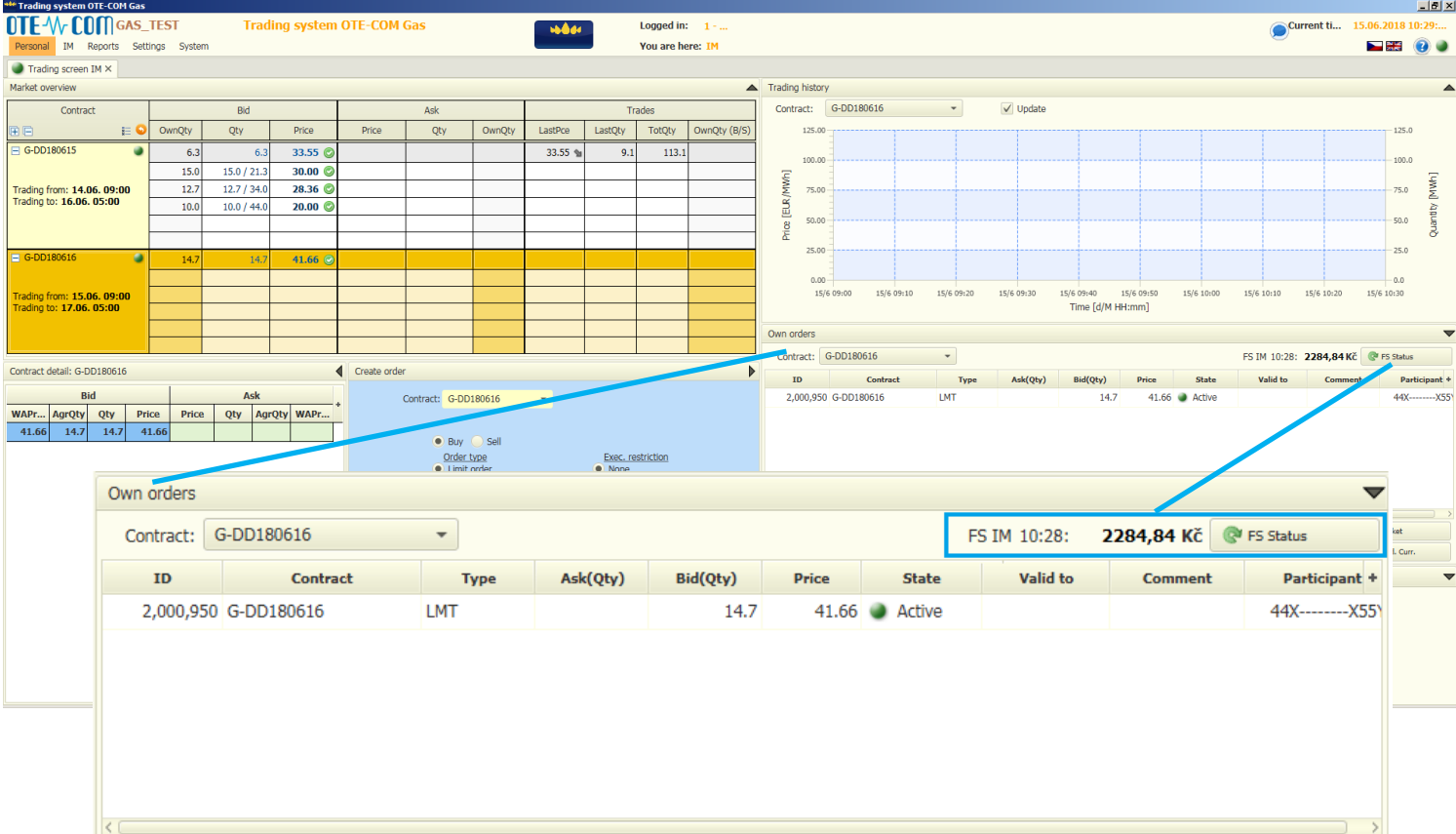


Changes in IM financial security principle

- **Orders** inserted in IM **will be secured within the new trading limit** intended solely for IM, which is allocated out of the current trading limit.
- A separate IM trading limit **accelerates the process of order validation**.
- Market participants **can set up and manage** the trading limit for IM as needed (within the range of resources of the current trading limit).
- **Individual orders will be secured by the following principle**: the sum for imbalance security (sale order) will be calculated using the parametric price and sum for commodity security (buy order) will be calculated based on the price limit stated in the order.
- **Trades on IM will be secured within the range of the current trading limit**. When the trade is created, order security is released back to the trading limit for IM.

OTE Changes in financial security principle

- Information about the trading limit for IM is available both on the main trading screen and in a separate report.



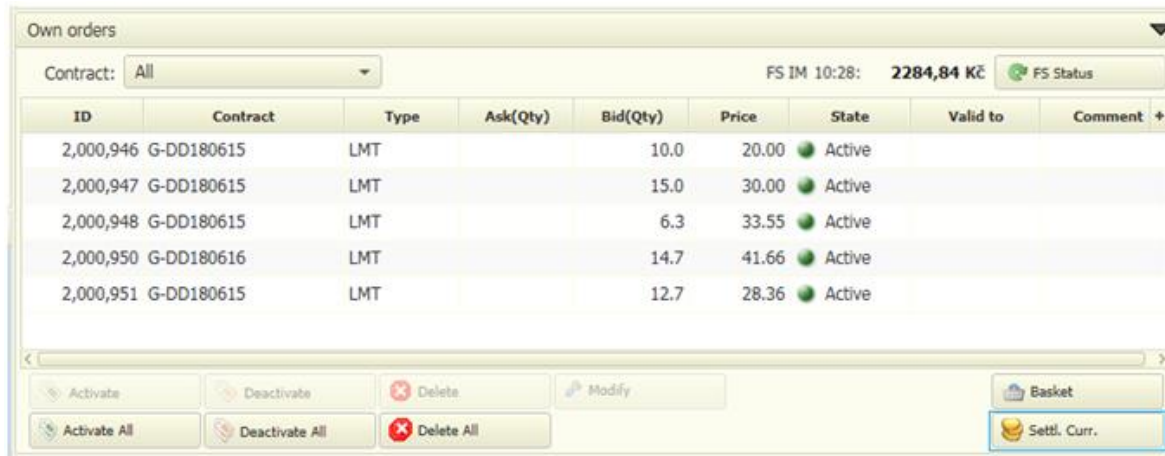
The screenshot displays the OTE trading system interface for 'GAS_TEST'. The main window is titled 'Trading screen IM X' and shows market overview for contract G-DD180616. The market overview table includes columns for Contract, OwnQty, Qty, Price, Ask, and Trades. The current bid price is 41.66. The trading history shows a price chart for the contract. The 'Own orders' section displays a table with columns for ID, Contract, Type, Ask(Qty), Bid(Qty), Price, State, Valid to, Comment, and Participant. A blue box highlights the 'FS IM 10:28: 2284,84 Kč' value in the 'Own orders' section.

Contract	OwnQty	Qty	Price	Price	Qty	OwnQty	LastPce	LastQty	TotQty	OwnQty (B/S)
G-DD180615	6.3	6.3	33.55				33.55	9.1	113.1	
	15.0	15.0 / 21.3	30.00							
	12.7	12.7 / 34.0	28.36							
	10.0	10.0 / 44.0	20.00							
G-DD180616	14.7	14.7	41.66							

ID	Contract	Type	Ask(Qty)	Bid(Qty)	Price	State	Valid to	Comment	Participant
2,000,950	G-DD180616	LMT		14.7	41.66	Active			44X-----X55

OTE Change of IM settlement currency

- The user can:
 - **set up the IM settlement currency** for future trading days using the button **Settl. Curr.** on the panel **Own orders**. Default settings from the relevant CS OTE module will be applied for settlement of trades on IM, if the settlement currency is not changed.



Own orders

Contract: All FS IM 10:28: 2284,84 Kč FS Status

ID	Contract	Type	Ask(Qty)	Bid(Qty)	Price	State	Valid to	Comment
2,000,946	G-DD180615	LMT		10.0	20.00	Active		
2,000,947	G-DD180615	LMT		15.0	30.00	Active		
2,000,948	G-DD180615	LMT		6.3	33.55	Active		
2,000,950	G-DD180616	LMT		14.7	41.66	Active		
2,000,951	G-DD180615	LMT		12.7	28.36	Active		

Activate Deactivate Delete Modify Basket

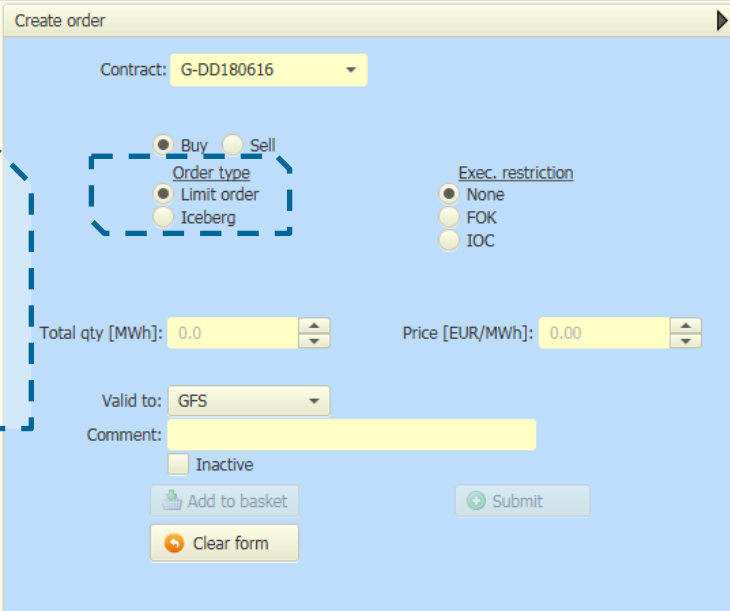
Activate All Deactivate All Delete All Settl. Curr.

- **display** a separate report containing **an overview of IM settlement currency** for chosen delivery days period.

OPE Types of orders– Limit order

Daily order – a contract with a delivery period of 1 day

The order can be traded at a price which is lower or equal to the limit price of the buy order, or at a price which is higher or equal to the limit price of the sale order



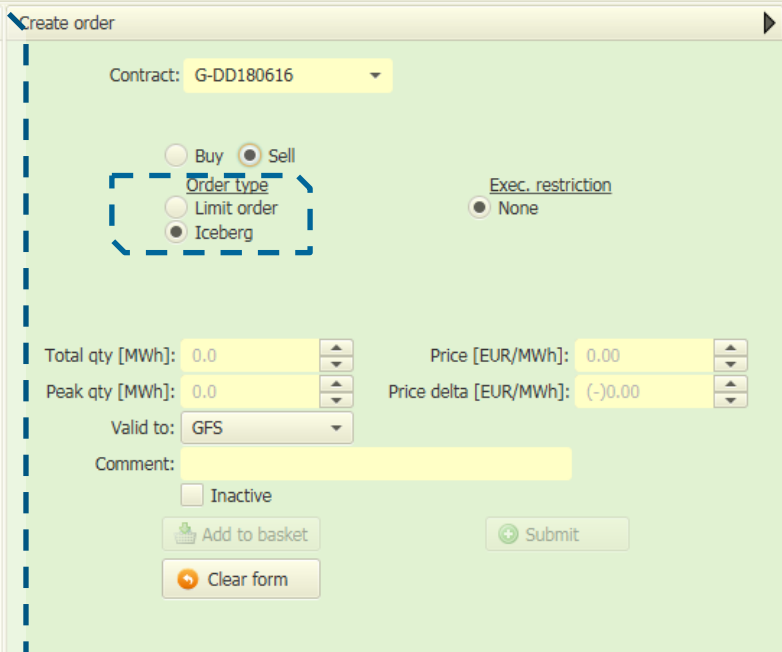
The screenshot shows a 'Create order' form with the following elements:

- Contract: G-DD180616
- Order type: Buy (selected), Sell
- Exec. restriction: None (selected), FOK, IOC
- Total qty [MWh]: 0.0
- Price [EUR/MWh]: 0.00
- Valid to: GFS
- Comment: (empty text field)
- Inactive:
- Buttons: Add to basket, Submit, Clear form

OTE Types of orders– ICEBERG

Daily order– a contract with a delivery period of 1 day

The amount of the order will be shown to the market gradually according to the user's definition of price and quantity step. Once the displayed amount is fully traded, the system automatically shows another part of the order. If the remaining amount of the order is smaller than the defined volume step, the remaining amount is shown. An order is shown until the total amount of the order is traded or the time validity of the order expires (in the case of an order with a specified time restriction GTD)



The screenshot shows a 'Create order' window with the following fields and controls:

- Contract: G-DD180616
- Order type: Buy (radio), Sell (radio, selected)
- Limit order (radio), Iceberg (radio, selected)
- Exec. restriction: None (radio, selected)
- Total qty [MWh]: 0.0
- Price [EUR/MWh]: 0.00
- Peak qty [MWh]: 0.0
- Price delta [EUR/MWh]: (-)0.00
- Valid to: GFS
- Comment: [text input field]
- Inactive:
- Add to basket: [button]
- Submit: [button]
- Clear form: [button]

Create order ▶

Contract: G-DD180616

Buy Sell
 Order type
 Limit order
 Iceberg

Exec. restriction

 None
 FOK
 IOC

Total qty [MWh]: 0.0 Price [EUR/MWh]: 0.00

Valid to: GFS

Comment:

Inactive

Add to basket Submit
Clear form

An order can be traded fully against one order or partly against more orders

Create order

Contract: G-DD180619

Buy Sell

Order type

Limit order Iceberg

Exec. restriction

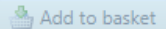
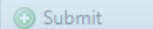
None FOK IOC

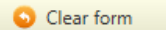
Total qty [MWh]: 0.0

Price [EUR/MWh]: 0.00

Comment:

Inactive

 Add to basket  Submit

 Clear form

The whole amount is traded immediately after the insertion of the order into the system. If this condition is not met, the order will be withdrawn from the market immediately.

Create order

Contract: G-DD180619

Buy Sell
 Order type
 Limit order
 Iceberg

Exec. restriction

 None
 FOK
 IOC

Total qty [MWh]: 0.0

Price [EUR/MWh]: 0.00

Comment:

Inactive

+ Add to basket
+ Submit
↻ Clear form

An order can be traded fully or partly immediately after the order is inserted into the system. If the order amount is not traded fully, the order is withdrawn from the market immediately.



Time restriction – Good for trading session GFS

An order is valid until the end of trading with the respective contract or until it is fully traded or deleted by the market participant.

The screenshot shows a 'Create order' window with the following fields and options:

- Contract: G-DD180616
- Order type: Buy (selected), Sell
- Exec. restriction: None (selected), FOK, IOC
- Total qty [MWh]: 0.0
- Price [EUR/MWh]: 0.00
- Valid to: GFS
- Comment: [Redacted]
- Inactive
- Buttons: Add to basket, Submit, Clear form



Time restriction – Good till date GTD

An order with a set time restriction. After the time expires, the order is automatically withdrawn from trading.

Create order

Contract: G-DD180619

Buy Sell

Order type

Limit order Iceberg

Exec. restriction

None FOK IOC

Total qty [MWh]: 0.0 Price [EUR/MWh]: 0.00

Valid to: GTD 6/20/2018 05:00 AM

Comment:

Inactive

Add to basket Submit Clear form



Restrictions and order types combination

Available combination Unsupported combination	FOK	IOC	NON
Limit order	No time Restriction	No time Restriction	GTD or GFS
ICEBERG	No time Restriction	No time Restriction	GTD or GFS


As orders with FOK and IOC *execution restrictions* are either immediately traded or cancelled, the time restriction can be set only for orders with no *execution restriction*. Note also that FOK and IOC *execution restriction* cannot be used for Iceberg orders.

OTE Fast order acceptance

Market overview

Contract	Bid			Ask			Trades			
	OwnQty	Qty	Price	Price	Qty	OwnQty	LastPce	LastQty	TotQty	OwnQty (B/S)
G-DD180615 Trading from: 14.06. 09:00 Trading to: 16.06. 05:00	6.3	6.3	33.59				33.55	9.1	113.1	
	15.0	15.0 / 21.3	30.00							
	12.7	12.7 / 34.0	28.30							
	10.0	10.0 / 44.0	20.00							



System supports **fast order acceptance**.

By clicking the button  fast acceptance window appears.

Accept order - Sell

Contract: IM_1H_05112016_13-14
Order type: Limit order
Exec. restriction: FOK

Total qty [MWh]: 2,0 Price [EUR/MWh]: 10,00

Fast acceptance order is created with **FOK** restriction.

OTE Testing with market participants

- **Testing** with market participants is expected to be **from 27th August to 7th September 2018**.
- **A workshop** (in the form of a webinar) informing market participants about the OTE-COM application for gas IM and the testing schedule will be arranged. The expected date is **7th August**.
- The **OTE-COM application** and also AMQP automatic communication for the testing environment will be available in **mid-August**.
- If a market participant will use automatic communications through the AMQP server, it will be possible to carry out **connectivity tests from 13th to 24th August 2018**.
- **Public certificates** are needed for access to the OTE-COM application and **qualified certificates** are needed for signing orders.
- Dates will be confirmed in mid-July, at the same time that the information about automatic communication setup will be released.

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