

Combining opportunities with markets

Webinar on the Introduction of **15-minute Products on** the Day-Ahead Electricity Market in 2025

March 5, 2025

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- **1. Webinar Objectives**
- 2. Introduction
- 3. Concept of 15-minute Products on the Day-ahead Electricity Market (DAM)
 - 3.1 Changes in Orders on DAM
 - **3.2 Price Determination on DAM**
 - **3.3** Paradoxically Rejected 60-min. Standard Orders
 - **3.4** Changes in Process Timings
 - 3.5 Trading Screen on DAM
- 4. Timeline
- 5. Member Test Planning
- 6. Documentation
- 7. Application of Corrective Measures and Rollback Procedure
- 8. Removal of the Second Auction Mechanism
- 9. Solution for Supported Energy Sources
- 10. Q&A
- **11. Conclusion**

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Inform market participants about the implementation of 15-minute products on the day-ahead electricity market in 2025

Provide market participants with the opportunity to ask questions about the presented information



HOW TO ASK QUESTIONS?

Any questions regarding this presentation can be sent to the email address <u>market@ote-cr.cz</u>

Both the questions and answers will also be published in a <u>dedicated document on the OTE</u> <u>website</u>

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The market operator provides the following material to present to market participants the changes related to the **introduction of 15-minute products on the day-ahead electricity market in 2025**

✓ The implementation of the 15-minute settlement and trading period in the Czech Republic, with the exception of the day-ahead electricity market, took place on July 1, 2024, based on the Regulation on the Internal Electricity Market. (Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity and Regulation No. 408/2015 Coll. on the Rules of the Electricity Market.)

	20	24		2025
Imbalance Settlement Period (ISP)	60-min. ISP		15-min. ISP	
Day-ahead Market (DM)		60-min. products		15-min. and 60-min. products
Continuous Intraday Market (IM)	60-min. products	15-	min. and 60-min. pr	roducts
Intraday Auction (IDA)	60-min. products		only 15-min. produ	icts
Delivery Day	June 14, 2024 July	1, 2024	Q2/20	025
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The market operator provides the following material to present to market participants the changes related to the introduction of 15-minute products on the day-ahead electricity market in 2025

The implementation of the 15-minute settlement and trading period in the Czech Republic, with the exception of the day-ahead electricity market, took place on July 1, 2024, based on the Regulation on the Internal Electricity Market. (Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity and Regulation No. 408/2015 Coll. on the Rules of the Electricity Market.)



The introduction of 15-minute products on the day-ahead electricity market depends on **the coordinated implementation of this period at the European level** within the coupled day-ahead electricity market (SDAC – Single Day-Ahead Coupling)! OTE-W-

From June 11, 2025 (for the delivery day of June 12, 2025)*, the possibility to trade also 15-min. products on the day-ahead electricity market (DAM) will be introduced, while the option to trade 60-min. products will still be available.
 The 60-min. products will be matched with 15-min. products (so-called Cross-product matching). At the same time, other procedural changes will occur on DAM:

- Introduction of 15-min. prices for the settlement of DAM, 60-min. price being provided as the arithmetic average of the corresponding 15-min. prices
- ➤ Extension of the calculation time → shift of the final results publication time to 13:02
- Removal of the Second Auction mechanism (already from January 29, 2025)

Detailed information on each point on the following slides

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* The date indicated is subject to successfully completed central tests in the first half of 2025

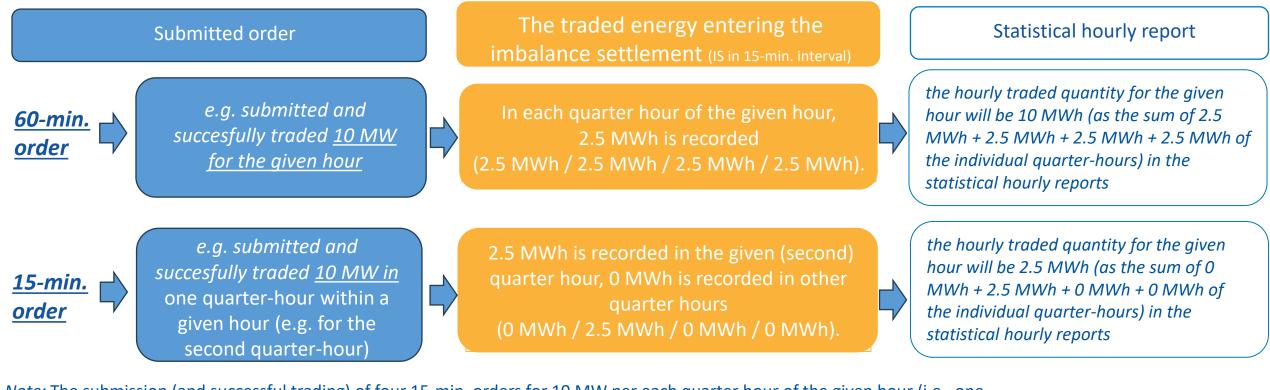
3.1 Concept of 15-min. on DAM – Changes in Orders

1) CHANGES IN ORDERS ON DAM

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It will be possible to submit orders with both <u>15-min. and 60-min. granularity</u>
 Orders will be submitted in MW for the given trading interval (15-min. or 60-min.)



Note: The submission (and successful trading) of four 15-min. orders for 10 MW per each quarter hour of the given hour (i.e., one 15-min. order for 10 MW per each quarter hour), means the traded energy of 2.5 MWh for each quarter-hour of the given hour i.e., a total of 10 MWh in the given hour (as the sum of 2.5 MWh + 2.5 MWh + 2.5 MWh + 2.5 MWh of the individual quarter-hours)

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Same restrictions apply for orders with a 15-minute granularity as for 60-minute granularity orders (a complete list of order parameters is available <u>here</u>)
 The minimum quantity is 0.1 MW, and the maximum quantity is 2 999 MW
 Power can be specified with the accuracy of one decimal place (quantity step: 0.1 MW)

The algorithm will automatically match products with longer granularity with multiple products with shorter granularity (so-called cross-product matching)
 meaning that 60-min. and 15-min. products will be traded and matched together

Orders are always matched in the granularity in which they were submitted!!!

60-min. order can be matched (or partially matched) only within the entire 60-min. interval (i.e. the same amount is always cleared for each 15-min. interval within the corresponding hour, see the example on the slide 27 of this presentation)

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Supported types of orders – unchanged (changes to the orders took place in June 2024)

- □ Standard order divisible by volume
- □ Profile block order divisibility option (minimum acceptance ratio: 10 100 %)
- Exclusive group of profile block orders
- Linked profile block orders
- Parameters of individual types of orders (e.g. maximum number of segments of a standard order, maximum number of linked Profile Block Orders in one family and maximum number of families, maximum number of link levels of Profile Block Orders, maximum number of Profile Block Orders in one Exclusive Group and maximum number of Exclusive Groups, etc.)

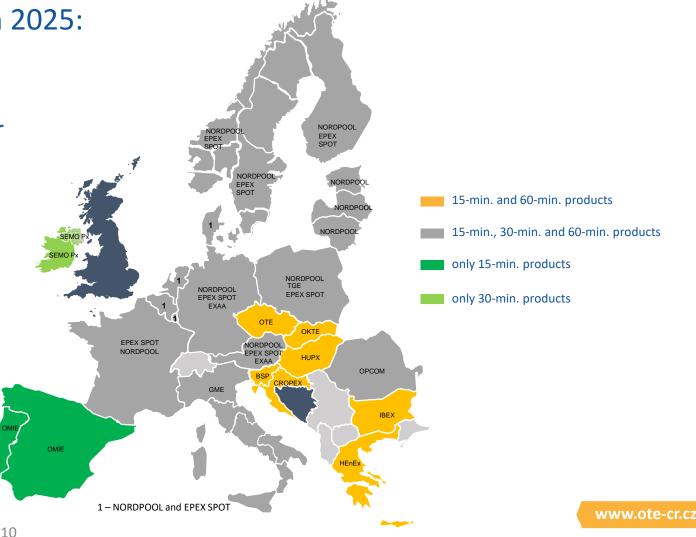
remain unchanged even after the introduction of 15-minute orders! (see Parameters of short-term markets and DAM User Manual available in CS OTE)

A 15-min. profile block order can be submitted from/to any quarter-hour (i.e. there is no need to stick to whole hours)
 For example, a 15-min. profile block order can be defined from 00:45 to 02:30

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The time resolution of products proposed by individual NEMOs from the introduction of 15-min. products within SDAC in 2025:

- Coordinated introduction of 15-min. products within the SDAC (except for Ireland – exemption granted for SEMO Px)
- 60-min. products will be maintained by most NEMOs even after the introduction of 15-min. products, with the exception of SEMO Px (Ireland) and OMIE (Spain, Portugal).



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2) PRICE DETERMINATION ON DAM

Until the implementation of 15-min. products on DAM, all prices on the DAM are available only for hourly products (i.e., one price for 60 minutes)

After the implementation of 15-min. products:

- The 15-minute price will be used for the settlement of the Day-Ahead Market (regardless of the product granularity traded)
- The 60-minute price will continue to be determined by the algorithm as the reference price for a subsequent use



- > The 60-minute price will be calculated by EUPHEMIA algorithm as the arithmetic average of the corresponding rounded 15-minute prices (the arithmetic average of the four 15-min. prices within the hour, rounded to two decimal places, gives the 60-minute price, which will also be rounded to two decimal places) – so-called Average Rule
- > Both <u>15-min. and 60-min. prices will be given with the precision of two decimal places</u>

Period	Price (EUR/MWh)
03:00 - 03:15	0.00
03:15 - 03:30	0.77
03:30 - 03:45	- 312.01
03:45 - 04:00	11.25
03 – 04	-75.00

Aritmetic average of the 15min rounded prices: (0.00 + 0.77 - 312.01 + 11.25) / 4 = -74.9975 EUR/MWh \rightarrow Rounding to two decimals gives the 60-min. price: -75.00 EUR/MWh © OTE, a.s. 2025 – All rights reserved

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3) POSSIBILITY OF PARADOXICALLY REJECTED 60-min. STANDARD ORDERS

- □ Due to the strict adherence to the Average Rule (i.e., the 60-minute price corresponds to the arithmetic average of the respective 15-minute prices see the previous slide), it may occur that standard orders with a higher granularity than the smallest granularity of the bidding zone may be paradoxically partially or fully rejected*
- <u>60-minute standard orders may be paradoxically be rejected</u> within the Czech Republic bidding zone
 A paradoxical rejection of 60-minute standard order by the EUPHEMIA algorithm will occur if, in at least one of the sub-periods (quarter hours) of the given 60-minute standard order, it is necessary to mantain the price within the price limits. This will affect the resulting 60-minute price (due to the Average Rule), leading to a situation where the 60-minute standard order may be paradoxically partially or fully rejected
 - Since this case only concerns standard orders with a higher granularity than the smallest granularity of the bidding zone, <u>15-minute standard orders cannot be paradoxically</u> <u>rejected</u>!

*Paradoxically rejected order = an order that was not accepted, although it should have been according to the original conditions and price environment. However, after the application of additional system rules or price corrections (e.g., price limits), it was partially or fully rejected by the EUPHEMIA algorithm © OTE, a.s. 2025 – All rights reserved

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3) EXAMPLE OF PARADOXICALLY REJECTED 60-min. STANDARD ORDER

□ State before the correction:

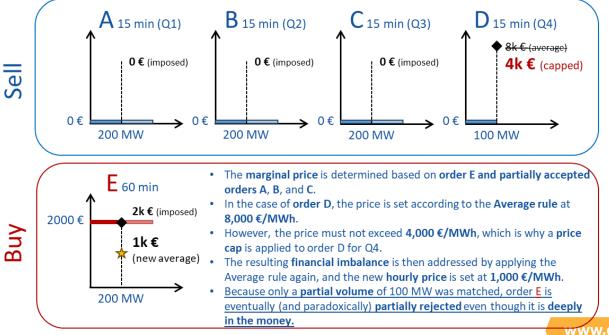
- > 60-min. buy order E : 200 MW at 2,000 €/MWh
- > 15-minute sell orders A, B, and C each order 200 MW at 0 €/MWh in the individual sub-periods (Q1, Q2, Q3, respectively)
- ▶ 15-minute sell order D for Q4 offers 100 MW at 0 €/MWh
- > Orders A, B, C, and E are marginal, resulting in a partial matching of only 100 MW
- Order D is fully accepted, causing so-called Indeterminancy problem (the price of order D for Q4 is therefore determined using the Average rule at 8,000 €/MWh, because 2000 = (0 + 0 + 0 + x)/4, where x = 8 000)

□ After introducing the price cap (correction):

- The price of order D for Q4 must be capped at 4,000 €/MWh.
- The new 60-minute price after the correction is calculated as the average of the 15-minute intervals: (0 + 0 + 0 + 4,000) / 4 = 1,000 €/MWh

Result:

- After the correction, order E is now well "in the money," but only partial volume of 100 MW has been matched.
- A 60-minute order that was originally to be partially accepted "at price" may end up being fully or partially rejected once price caps are applied and market rules followed, in order to preserve system and price consistency.



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3.3 Concept of 15-min. on DAM – Paradoxically Rejected 60-min. Standard Orders

3) POSSIBILITY OF PARADOXICALLY REJECTED 60-min. STANDARD ORDERS

Summary:

Paradoxically, rejected/accepted standard orders on DAM after the introduction of 15-min. orders:

- **60-min. standard orders can be partially or fully paradoxically rejected!!**
- **15-min. standard orders** <u>canNOT</u> be paradoxically <u>rejected</u>!
- Any standard orders (15-min. and 60-min.) <u>canNOT</u> be paradoxically <u>accepted</u>!



Probability of paradoxical rejection of standard 60-minute orders and higher price fluctuations (volatility) between quarter-hours increases if the traded quantity is <u>mainly</u> <u>included in 60-minute products!!!</u>



4) CHANGES OF PROCESS TIMINGS ON DAM

Due to the introduction of 15-min. products, the calculation time will be extended to 30 minutes (the current calculation time is 17 minutes), and the publication time of the results will be adjusted accordingly. To minimize the impact on market participants, the follow-up processes of NEMOs and TSOs have been optimized as follows:

	Current timings	Timings after 15-min. go-live	Process
	12:00	12:00	NEMO Order Book Gate Closure Time
C O	12:10	12:10	PMB Gate Closure Time Reception of all Order Data files in PMBs and Start of Calculation
U	12:27	12:40	End of Calculation
P L	12:45	12:52*	Submission of Preliminary Results to Transmission System Operators
l.	12:57	13:02*	Publication of Final Results
N G	13:50	13:50	Deadline to send the message for Risk of Full Decoupling
0	14:20	14:20	Deadline to declare the SDAC Full Decoupling or Publication of coupled Results

* The final confirmation of these timings will take place after the completion of the central NEMO and TSO tests in the spring of 2025 www.ote-cr.cz © OTE, a.s. 2025 – All rights reserved

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4) CHANGES OF PROCESS TIMINGS ON DAM (continuation)

- □ Time dedicated for SDAC process is from 12:00 to 14:20
 - The nomination deadlines remain unchanged
 - □ 12:00 is the deadline for submitting orders, as required by the <u>CACM Regulation</u>
 - □ 14:20 is the deadline for full market decoupling, it stemms from the nomination deadline, which is set at 15:30 in several countries
 - □ The time from 14:20 to 15:30 is dedicated to processes following the potential full market decoupling to ensure compliance with the 15:30 deadline
 - Extending the calculation time from 17 minutes to 30 minutes required optimization in daily operational processes
 - This led to the shortening of NEMOs and TSOs processes, which allowed the final results to be published only 5 minutes later*
 - The planned time for publishing the final results is 13:02*
 - > With the extended calculation time, the contingency of the process is reduced

5) TRADING SCREEN

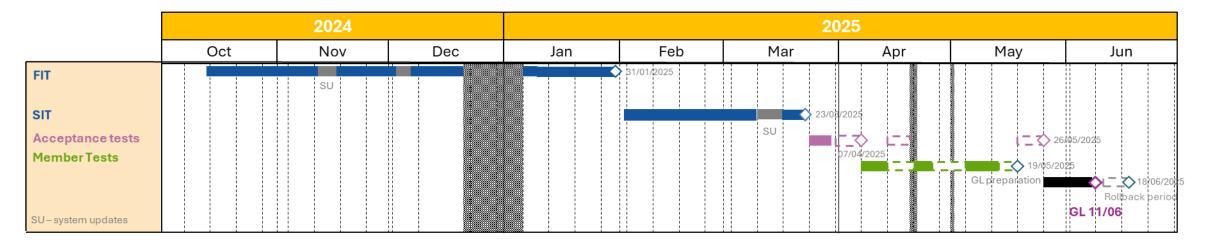
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5) TRADING SCREEN

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Go-Live is scheduled for the trading day of June 11, 2025 (for delivery day of June 12, 2025)

Testing at the pan-European project MCSC SDAC level among all nominated electricity market operators (NEMOs) and transmission system operators (TSOs):

Completed:

- Preparatory testing (from April 2024)
- ✓ Functional testing (FIT Functional Integration Tests) - integration testing of all local, regional, and central systems (October 2024 – January 2025)

<u>Ongoing</u>

Simulation testing (SIT –
 Simulation Integration
 Tests) has been ongoing
 since February 2025

Upcoming:

- Acceptance testing (additional tests to verify stability)
- Tests with market participants

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Testing with market participants



- **Testing environment <u>Sandbox2</u> is already available for market participants**, where they can test changes associated with the introduction of 15-min. products on DAM
 - Matching takes place irregularly depending on the various scenarious of the central NEMOs and TSOs testing, so the publication of results does not occur at a specific time.



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Pan-European member tests



- Coordinated pan-european testing with all NEMOs, TSOs and market participants will be launched on **7th April 2025** and will last for **6 weeks** – detailed plan on the next slide
 - The confirmation of the start of testing (Go/No-go) will be communicated by the end of March 2025
- □ A detailed testing plan, including a description of individual testing scenarios, was presented at the Market Coupling Consultative Group workshop on February 14, 2025 (slides 12-18 from the presentation available <u>here</u>).
 - <u>A communication package with all the details regarding the testing will be sent to</u> the Market Participants during the week starting with March 17,2025

OTE PubWeb tests

- □ The changes on OTE PubWeb related to the introduction of 15-min. products on DAM will be available for testing from approximately the first half of May 2025
 - The details will be clarified in due time

Expected planning for pan-European coordinated testing with market participants

Scenario/ date													April	202	5																	Ma	iy 20)25						
	7	8	9	10	0 1	1	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Normal day (with nominations)																																								
Full decoupling with shadow auction (with nominations)																																								
Partial decoupling of Nordic region (with nominations)																																								
Second calculation due to bidding error management																																								
Daylight Saving Time (DST) Long Clock Change (LCC)																																								
Max / min price reached + curtailment																																								
No liquidity in a given time resolution (15minMTU)																																								
Max number of blocks																																								\square
Paradoxically rejected curves																																								
Re-execution																																								
System updates																																								

Testing day
Weekend/Friday/Bank holiday

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DOCUMENTATION

- Documentation describing the relevant IT interfaces, presentations and summary of the frequently asked questions and answers are available on a dedicated page for 15 minutes on the OTE website:
 - https://www.ote-cr.cz/en/documentation/electricity-documentation/information-to-switch-to-15min-interval?set_language=en
 - Changes to DAM related to the introduction of 15-minute products have already been included in the specifications published in 2024 (in connection with the introduction of the 15-minute billing period in CZ bidding zone and intraday auctions)
- Documentation for the Sandbox2 test environment is available here:
 - https://www.ote-cr.cz/en/documentation/electricity-documentation/documentation-for-sandboxwith-15-min-period

DAM User manual is available in CS OTE

□ The key parameters of DAM (and other short-term electricity markets) are summarised here:

https://www.ote-cr.cz/en/short-term-markets/electricity/parameters-of-short-term-markets

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- Despite thorough testing of the systems and verification of the algorithm performance, the SDAC project is prepared also for <u>completely unexpected</u> errors after the introduction of 15-min. products on DAM (Go-Live), which might affect the successful completion of SDAC process. For these unexpected cases, mechanisms are agreed at the SDAC project level in order to minimize negative impacts on the following settlement days.
 - In the case of unexpected critical errors within 1 week after Go-Live, a decision may be taken to revert the systems at the SDAC level back to the state before the introduction of 15-min. products on DAM, when only 60-min. products can be traded (so-called Rollback)



- June 24, 2025, is the latest possible day for the rollback to be implemented. For this reason, it is necessary to mantain systems/features related only to 60-min. products available until June 24, 2025!!!
- When the rollback procedure is announced on day D, day D+3 will be the first trading day with only 60-min. products (for the delivery day D+4)
- Details of the rollback procedure were presented at the Market Coupling Consultative Group (MCCG) workshop on February 14, 2025 (slides No. 20-22 from the presentation available <u>here</u>)
- If there is an unexpected deterioration in the performance of the algorithm, corrective measures can be applied within SDAC
 - The mechanism of corrective measures can already be applied today in accordance with the ote-cr.cz
 <u>Algorithm methodology</u> 24
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- □ The Second Auction mechanism was removed jointly with other NEMOs from the single European Day-Ahead Market SDAC on January 29, 2025 (for the delivery day of January 30, 2025), with the exception of the bidding zones in the Baltic states, which will remove the Second Auction mechanism together with the implementation of 15-min. products on DAM
- The planned <u>removal of the Second Auction mechanism</u> has already been communicated, a <u>public</u> <u>consultation</u> was held in 2023 on this topic
 - □ The Second Auction mechanism was applied when electricity prices reached a predefined threshold in the affected bidding zones. The Second Auction allowed market participants to adjust their orders in order to improve the market situation
 - The removal of the Second Auction occured due to the following reasons:
 - The results of the Second Auctions in recent years showed that the Second Auctions increased operational risk, and their originally expected benefit was negligible or even none
 - With the introduction of 15-min products and the associated extension of the calculation time, overall process optimization was required to maintain operational reliability





 In Act No. 165/2012 Coll., on Supported Energy Sources, <u>the hourly</u> <u>settlement period</u> for subsidy in the form of green bonus or feed-in tarif <u>is</u> <u>temporarily maintained</u>

The 60-min. price will continue to be used for the calculation of the hourly green bonus or feed-in tariff (for settlement with the obligatory purchaser)



<u>Transition to 15-min.</u> (using 15-min. price for the subsidy calculation in the form of green bonus or feed-in tariff) is planned on <u>January 1, 2026</u>, according to the recent Act amendment Lex OZE III

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The frequently asked questions and answers regarding the introduction of 15-min. products on the DAM are summarized in the document <u>here</u>

- **Questions that were not addressed in this presentation:**
 - With regard to the availability of 60-minute orders, will it still be possible to submit a 60-minute standard order as today, i.e. there will be no need to convert such order to 15-minute block orders?
 - Yes, it will be possible to submit a 60-minute standard order in the same way as today, there is no need to convert to 15-minute block orders.
 - Is it possible to display zero values for the Day-Ahead Market results, so that the participant can generate a full 24 hours (vs. 96 intervals in 15-minute products)?
 - Yes, the results already show zero values of the amount of electricity.
 - Is it possible to enter orders with 60-min. and 15-min. granularity together in the Exclusive Group of Profile Block Orders?
 - Yes, it is possible to enter Profile Block Orders with 60-min. and 15-min. granularity together in the Exclusive Group of Profile Block Orders.
 - Will the principle of financial security of linked Profile Block Orders or Exclusive Groups of Profile Block Orders change with the introduction of 15-min. products on DAM?
 - The principle of financial security remains the same even after the introduction of 15-min. products on DAM.



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- Questions that were not addressed in this presentation(continuation):
 - How will the quarters differ on the day of the transtiotin to daylight saving time, when the intervals for the 2 hours are the same?
 - For the Day-Ahead Market (the same as for IDA), there will be 100 intervals instead of 96 (just as there were 25 intervals on DAM until now)
 - *Can a 60-minute order be partially matched on a quarter-hour basis?*
 - No, orders are always matched in the resolution in which they were entered, i.e. a 60-minute order can only be matched on an hourly basis.
 - A 60-minute order can still be partially matched, but this means that the order is partially matched within the entire 60-minute interval, i.e. the same amount is cleared for each 15-minute settlement interval
 - Example: If you submit a 60-minute order for 10 MW, but successfully trade only 8 MW for that hour, the traded energy will be 2 MWh in each quarter-hour of that hour. The traded energy for the whole hour will be 8 MWh. In the hourly statistical reports, the hourly traded quantity for the given hour will be 8 MWh (as the sum of 2 MWh + 2 MWh + 2 MWh + 2 MWh of the individual quarter-hours).
 - Do you expect market participants to trade more 15-minute products or stick with 60-minute products? What about market liquidity?
 - It is not possible to predict the behavior of market participants when using the respective products nor the impact on market liquidity.
 - While the algorithm is able to work with both 60-min and 15-min products, In the case where the traded quantity is mainly included in 60-minute products, the probability of paradoxical rejection of standard 60-minute orders, and error higher price fluctuations between quarter-hours increases. 28







 Overview of anticipated events related to the implementation of 15-minute products on DAM.
 Details to the individual points are part of the previous chapters of this presentation (especially Chapter 5 and 8)

Date	Event
Already now	Possibility of local OTE testing of 15-min. products on DAM on Sandbox2
17. 3. 2025	Distribution of detailed materials for the coordinated pan-European testing by the SDAC project
End of March	Confirmation (Go/No-Go) regarding the coordinated pan-European testing by the SDAC project
7. 4. – 15. 5. 2025	Coordinated pan-European testing with market participants
First half of May 2025 (the exact date will be confirmed)	Beginning of the possibility to test PubWeb OTE
End of May 2025 (the exact date will be confirmed)	Confirmation (Go/No-Go) regarding the Go-Live by the SDAC project
11. 6. 2025 (delivery day 12. 6. 2025)	Go-Live 15min v SDAC
till 24. 6. 2025	Support for systems/features related to only 60-minute products availability (due to the potential unexpected activation of the Rollback procedure)

□ For the latest information, please follow the <u>market operator's website</u>!

Detailed information on the above mentioned changes, including this presentation and documentation, can be found on the OTE website: <u>Transition to a 15-minute settlement and trading period for the electricity</u>

<u>commodity — English</u>



Frequently asked questions and answers are summarized <u>here</u>
 Should you have any question, please send us an email to <u>market@ote-cr.cz</u>



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TST	OF AP	obrevia	itions

CACM	Commission Regulation (EU) 2015/1222 of July 24, 2015 establishing a guideline on capacity allocation and congestion management	MCSC	Market Coupling Steering Committee
CS OTE	Central System of OTE	MP	Market Participants
D	Delivery Day	NEMO	Nominated Electricity Market Operator
DAM	Day-Ahead Market with electricity	PMB	PCR Matcher and Broker
EUPHEMIA	Pan-European Hybrid Electricity Market Integration Algorithm	Q&A	Questions and Answers
FIT	Functional Integration Tests	SDAC	Single Day-Ahead Coupling
IDA	Intraday Auction	SIT	Simulation Integration Tests
IS	Imbalance settlement	SU	System Update
MCCG	Market Coupling Consultative Group	TSO	Transmission System Operator

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Spojujeme trhy a příležitosti



THANK YOU

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