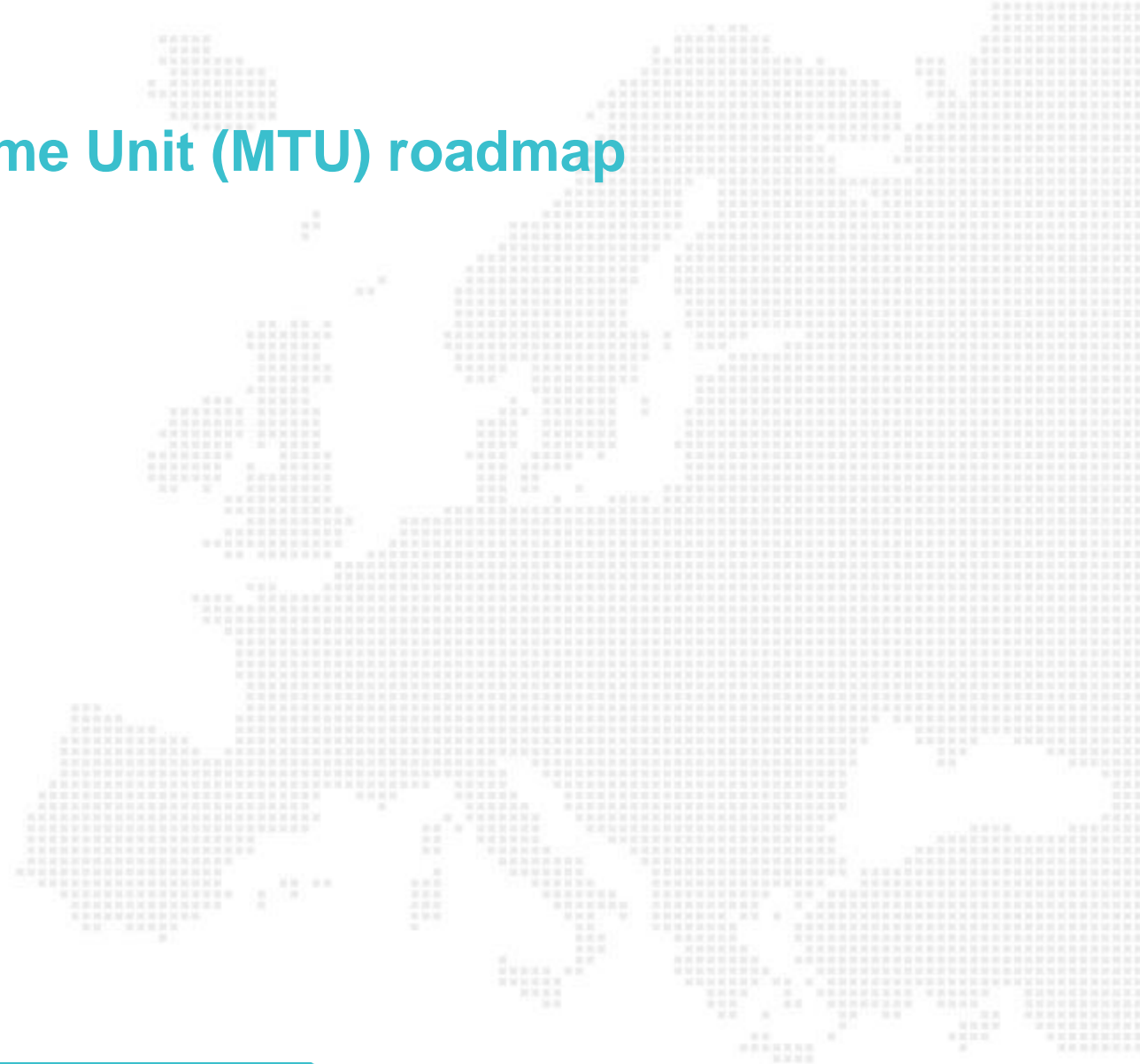


Material shared upfront to MCCG participants in preparation of the MCCG meeting on 20/10/2023

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SDAC: 15 minutes Market Time Unit (MTU) roadmap overview



15 min MTU implementation in SDAC

Update on extended algorithm calculation time:

As extension of calculation time is mandatory in comparison with the current 17', the calculation time has been evaluated within SDAC and following options have discussed:

– **30min calculation time**

- With optimal go-live configurations (BZ MTU and product configuration) the simulation data shows that the 30min is sufficient to find at least one solution

– **45min calculation time**

- More complex configurations can be used if the calculation time will be extended to 40/45min

The simulations have also indicated that the calculation time is significantly dependent on market data used

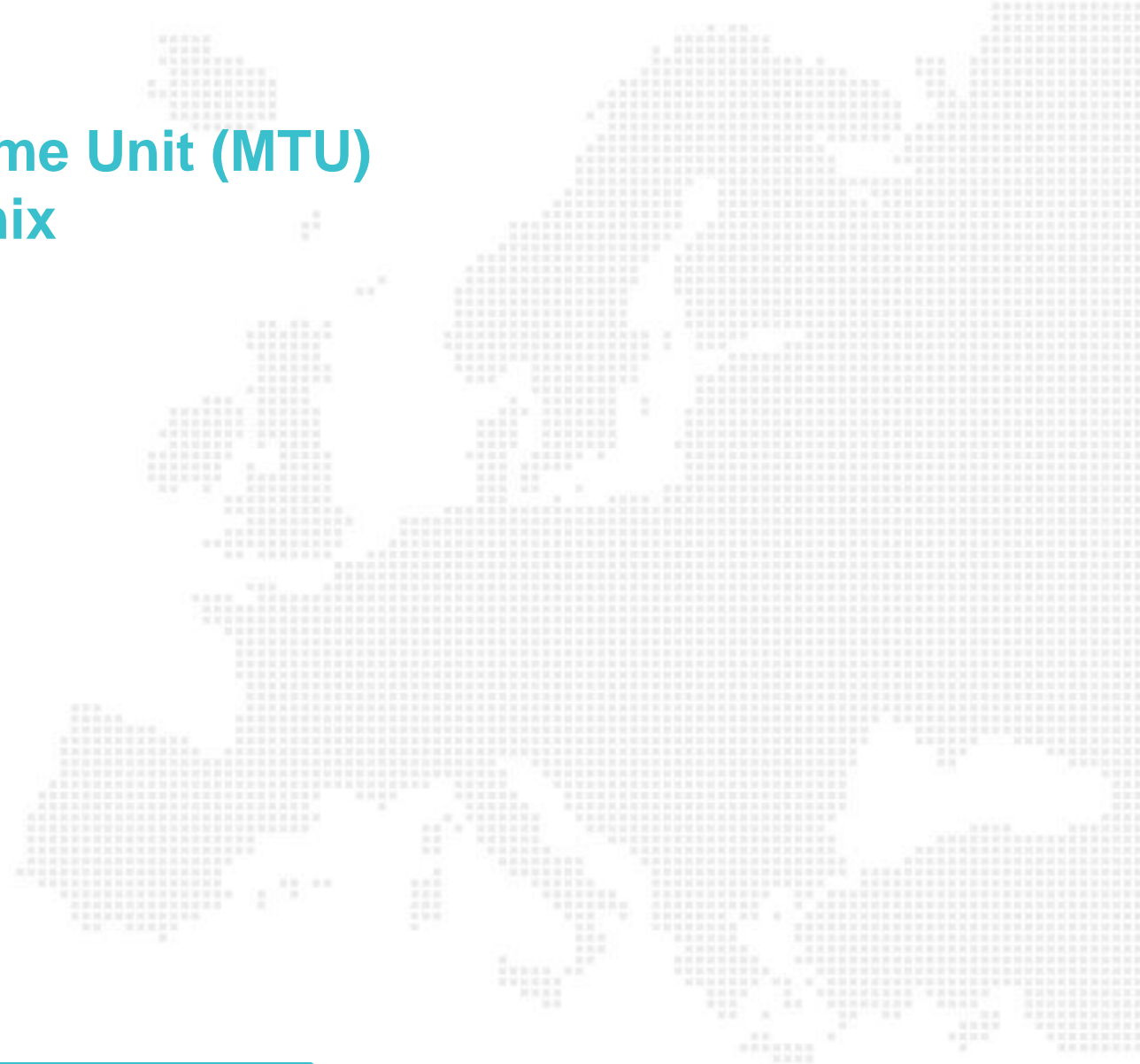
- **A safety buffer in timing must be considered to avoid unnecessary calculation time extensions**

SDAC 2025 - Setting the scene on different Market Design options

Possible identified options for several open points in the market design for 15 min MTU and IDA



SDAC: 15 minutes Market Time Unit (MTU) calculation time & product mix



Alternative options for computation time, product mix, topology – simulations

- A. If 15 min curve orders are used extensively from go-live, also cases "delay in Core BZ" or "extensive number of block orders", go-live with 30 minutes computation time is possible
- B. If 60 min curve orders are used extensively in 15 min BZ and there are "no delay in any Core BZ", some outliers exist, but it is foreseen to be able to solve these situations with the urgent application of alternative configurations. Therefore this scenario is foreseen to be manageable but with a risk in operations, currently inconsistent with go-live criteria
- C. If 15 min curve orders have very low liquidity and Delay in Core BZ, Go-live is not possible as likelihood for frequent full decoupling is extremely high

	Configuration	%solved (#unsolved sessions) under 30; 40; 60 minutes with current software			Scenario acceptable for Go-Live
		30	40	60	
A	Ratio 15'/60' products (80/20), SCO, NO PUN, LTA	100%	100%	100%	Yes
	Ratio 15'/60' products (80/20), SCO, NO PUN, LTA, Delay of Core BZ	100%	100%	100%	Yes
	Ratio 15'/60' products (100/0), Increased number of block orders, SCO, NO PUN, LTA	100%	100%	100%	Yes
B	Ratio 15'/60' products (20/80), SCO, NO PUN, LTA	96.70%** (#3)	97.80%** (#2)	98.90%** (#1)	Manageable*
C	Ratio 15'/60' products (20/80), SCO, NO PUN, LTA, Delay of 1 Core BZ	93.41% (#6)	93.41% (#6)	94.51% (#5)	No-Go scenario
	Ratio 15'/60' products (01/99), SCO, NO PUN, LTA	92.31% (#7)	95.60% (#4)	95.60% (#4)	No-Go scenario
	Ratio 15'/60' products (01/99), SCO, NO PUN, LTA, Delay of 1 Core BZ	90.11% (#9)	93.41% (#6)	94.51% (#5)	No-Go scenario

* It is to be noted that N-side is currently working on improving these sessions by making use of configuration improvements of Euphemia, hence this scenarios is currently assumed to be "manageable" as the remaining gap is expected to further reduced, possibly closed.

** Every 1% deviation would risk one full decoupling in every 3 months

Alternative options for computation time, product mix

Topic description & background	<ul style="list-style-type: none"> • How much computation time will be allowed to Euphemia on ordinary basis, once 15 min MTU is implemented in SDAC (Q1 2025)? <ul style="list-style-type: none"> • The recommendation was defined in MCSC September and is shared with MCCG for decision proposal. Decision is to be taken in a subsequent MCSC • To ensure informed decision, SDAC MSD has assessed the computation timeline with under different scenarios in order to identify the important drivers for an efficient decision making process • For Options, 30 and 40 minutes are kept, 60 min option was decided to remove in MCSC June 2023 • Calculation time is tightly linked to product offering and are to be evaluated together (see slides from SDAC OPSCOM) 		
Options*	Description	Pros	Cons
Option 1: 30 mins	For Euphemia 30 minutes calculation time is given for finding solution.	a) More contingency and time for other stages of the coupling process to cover partial decoupling cases. b) Second auction can be held c) 2 re-runs can be held with different configurations (recommendation from N-side) d) IDA1 time schedule can be kept e) N-side's recommendation to keep the 30 min computation time	f) Risk not to find a solution --> calculation time may need to be extended beyond 30min in case of delay in Core BZ or very low 15'MTU products at Go-Live
Option 2: 40 mins	For Euphemia 40 minutes calculation time is given for finding solution.	a) same as Option 1(a) b) In theory same as Option 1(b) however the case would require further assessment c) same as Option 1(d)	e) Operational time limit need to be extended, if not then less time for solving issue in production -> operational robustness at risk f) More time needed for ex-post/ex-ante offline market assessment g) No significant gain compared to 30 min computation time

*MPs requested for extension of the nomination timeline in case of delay of results publication time. TSOs will provide transparency on this

Summary

- By setting calculation time to 30 minutes, there are less impact to the current procedures, however in some cases the operational robustness is at the risk.
- 30 minutes can be supported if at least all (but one) Core BZs are all in the 15 min MTU and market participants are committed to use 15 min MTU orders widely.

Alternative options for computation time, product mix - 30 min

- Latest simulations were run with two software options:
 - **Today's mathematical solver** is currently used and is **foreseen to be used for the go-live of 15 min MTU**,
 - **A solver improvement is foreseen** but given its significance can only be taken into production **after go-live of 15 min MTU**.
- **In general:** with some significant solver improvements it is possible that Euphemia is performing better and solving more cases in the 30 minutes timeframe and have less outliers in all cases for 15 min MTU compared to today.
- Despite which solver version used, **only if market participants start using 15 min MTU curve orders extensively from the go-live, performance is under control even in case one large BZ in Core region remains in 30/60 min MTU. MCSC has no control of MPs behaviours.**

To be noted: No support for more than one Core BZ delay is possible.

Summary:

- **With current mathematical solver , 30 minutes calculation time can be supported** in cases where **15 min MTU orders are used extensively by MPs** and only one Core BZ is delayed (no delay even more preferred).
- **With other solver improvement also cases where 60 min MTU products are majority** in the 15 min MTU BZ, **30 minutes calculation time can be supported**, even with delay in one Core BZ.

Alternative options for computation time, product mix - 40 and 60 minutes

- In case calculation time is extended to the 40 minutes
 - Current software is solving more outliers, **however no significant improvement to the robustness of calculation,**
 - **The significant software replacement** is performing at the same level as with 30 min computation time. A few outliers exist in a complex batches and are not solvable either if computation time is extended to 60 min.
- **60 min computation time was agreed to be disregarded in June MCSC**

Mitigation measures

- In order to secure an enhanced product mix offering (15' and 60'), corrective measures can be proposed:
 - Application of corrective measure : a single MTU linked to the ISP of the BZ is proposed (SIDC IDAs-like approach), this measure can be implemented only in temporary basis,
 - Urgent application of multiple alternative configurations for calculation is to be investigated to ensure robust process in case any issues in calculation.
- **IMPORTANT:** If any enforcement is necessary for Market Participants to implement, information to MPs is to given timely (12 months) before go-live in Q1 2025, in order to be able to make changes their internal procedures and systems

Summary:

- Extension calculation time to 40 min would not bring significant improvement compared to 30 min.
- Procedure in exceptional situations can be applied to keep the process running as long as possible – hence even if the default timing would be 30 or 40 min, the computation could be extended to 60min if needed, and alternative configuration triggered.
- **Any mitigation actions seen necessary for Market Parties need to be communicated timely (12 months) in advance.**

SDAC 2025 product mix and calculation time - Conclusions

- Since, the **product mix and computation time are not mutually exclusive topics**, fixing the computation time to 30 minutes leads to certain implications if the product mix is not monitored and managed in the DA market.
- Drivers for the set-up change were identified thanks to this sensitivity analysis performance vs input data:
 - Delay in Bidding zones readiness : SDAC QARM is monitoring the expected resolutions for the Go-Live, **and so far all the TSOs and NEMOs expect to Go-Live with 15 minutes resolution** for applicable bidding zones (i.e Ireland excluded).
 - Usage of time resolution :
 - Scenario with very low 15' products usage is either manageable (i.e risky) or a No-Go scenario.
 - SDAC NEMOs cannot control or anticipate with 100% guarantee the orders of different MTUs submitted by market participants. SDAC NEMOs can monitor ex-post from the Bid Curve Aggregation data the actual usage of the 15, 30 and 60min orders.

Summary:

- MCSC expect Market Parties to be ready to use 15 MTU at a noticeable level and to be prepared to a scenario where only 15' time resolution is proposed.
- MCSC is working hard to propose the combination of 15 and 60 min products at go live. However given that MCSC parties are not in full control of the 15 min product usage, MCSC is not in a comfortable position at this moment (Oct 23) to confirm a go-live in Q1 2025 where both 15 and 60 min products can be used.
- MCSC would like to receive the feedback from MPs on the anticipated usage as well as when the final decision shall be taken, if not in October 23.

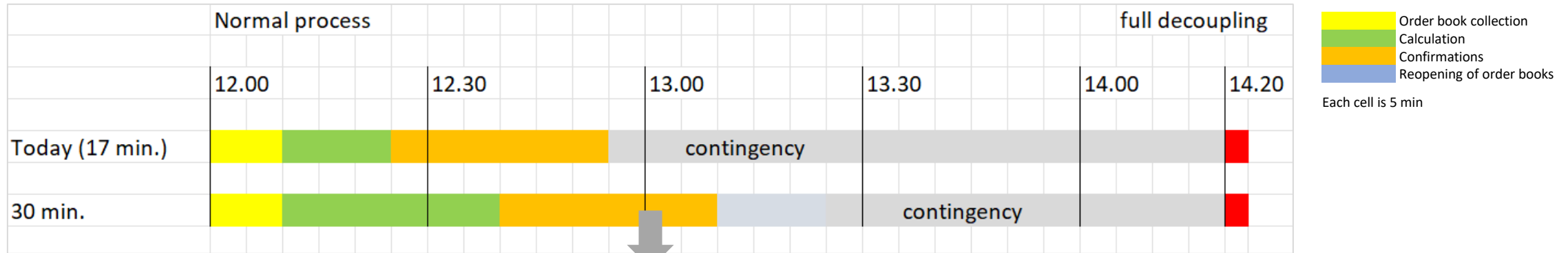
SDAC Operational timings



Daily operational process given 30 min computation time

Topic description & background

Currently, the time dedicated to the SDAC process is 12.00 -14.20. 12.00 is the order book gate closure and is written in CACM. 14.20 is the full decoupling deadline and is derived from the deadline for nomination which is set at 15.30 in several countries. Time from 14.20 to 15.30 is the time dedicated to the actions after full decoupling to respect the 15.30 deadline. With an extension in the calculation, contingency time is reduced.



	17' calculation time	30' calculation time
Preliminary results publication	12h45	12h58
Publication of Final Results	12h58	13h11

Summary:

- Extension of calculation time to 30 min requires finding additional 13 min in the daily operational process.
- Hence, assessment of possible parallelization or time shortening of the SDAC results confirmation process is ongoing. The assessment is ongoing in SDAC OPSCOM.
- The results publication deadline is **foreseen to be 13:11**. This is without any positive outcome on possible parallelization or time shortening of processes for the confirmation. Market Participants shall be clearly informed about the proposed timings and impacts on the result publication.

Daily operational process given 30 min computation time: Partial decoupling (2/2)

- Operational experience has shown that the **partial decoupling deadline 12.55 was never reached since the partial decoupling deadline was set to 13.05.**
- This allows for an assumption for the **new partial decoupling deadline to be set around 12:52 – 12:55.**

Indicative timings proposal for 30 min computation time:

	Current timings	2025. timings	
Coupling	12:00	12:00	NEMO Order book Gate Closure Time
	12:10	12:10	PMB GCT // Reception of all Order Data files in PMBs à Start of Calculation
	12:40	12:27	Deadline to send the message for Risk of Partial Decoupling
	12:27	12:40	End of Calculation
	13:05	12:52	Deadline to declare Partial Decoupling
	12:45	12:58	Publication of Preliminary Results and sending to the TSOs
	12:58	13:11	Publication of Final Results à Start of Notification Process
	13:50	13:50	Deadline to send the message for Risk of Full Decoupling
	14:20	14:20	Deadline to declare the SDAC Full Decoupling or Publication of coupled Results

Summary:

- MCSC expect Market Parties to confirm that market participants are fine with the envisaged 2025 extended operational timings, granting 30' calculation time to the algorithm
- MCSC TSOs do not envisage to change nominations deadlines

SDAC 2nd Auction

NEMOs and TSOs consider that from an operational perspective:

- Second auction process could still be proposed even with a calculation time extended to 30mins by 2025.
- Second auction process application is still risky and experience has proved that no contingency exists in case of deviation from the agreed process.
- The efficiency of the second auction process on the price formation can be challenged, given that not 100% of the situations were improved after the second calculation run. On the contrary, a significant number of occurrences led to no bid being modified or to a change of the price into the wrong direction.

NEMOs would like to engage with market participants in order to consider a potential removal of the second auction process from the SDAC framework:

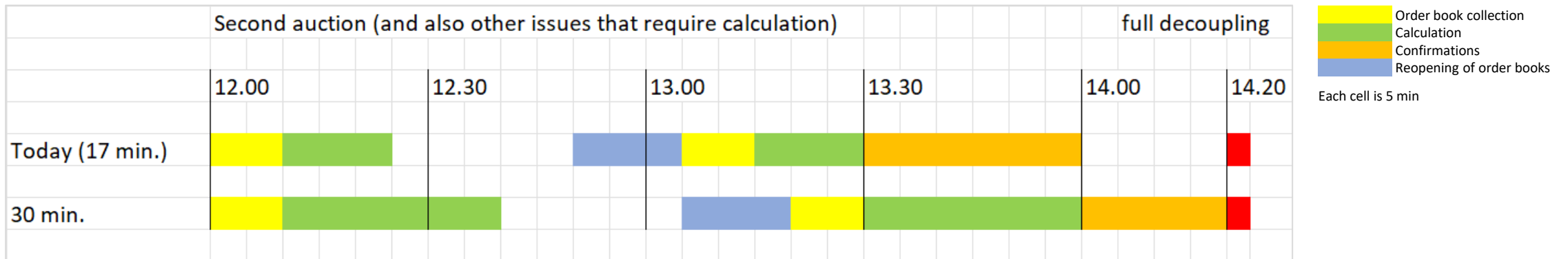
- **Pros**
 - More time to solve incidents
 - Simplified operational framework
- **Cons**
 - Market participants needs to anticipate (ie before 12:00 Gate Closure Time), in cooperation with individual NEMOs, any case of mistake as well as exceptional situation from a clearing price level perspective

Summary:

- SDAC NEMOs would like to receive confirmation from the market participants that a plan can be drafted in order to remove second auction process by 2024 or 2025. If confirmed, SDAC NEMOs welcome inputs with regards to the timeline or the process (consultation)

Daily operational process given 30 min computation time: Second auction

Topic description	30 min are required between the end of the first calculation and the second one.
	<ul style="list-style-type: none"> • 5 - 10 minutes organization and information to MPs • 15 minutes reopening of order books • 10 minutes resending of order books



Summary:

- From the process and usage perspective MCSC advocates to remove second auction process due to limited to no benefit, higher operational risk (tight process timeline).
- By removing the second auction the operation process can benefit from more contingency time available.

Note: topic is still under discussion

SIDC: IDA1 interaction with SDAC delays and fallback processes

IDA1 interaction with DA

Topic description & background	<ul style="list-style-type: none"> ▪ Calculation of network capacities for IDA1 and possibly other internal processes such as scheduling / generation availability information preparation are dependent on completion of the DA processes. ▪ Recent DA procedures foresee the central processes shall be finished by 14:20 otherwise full decoupling and local process follows. These procedures are under review in relation to 15min MTU implementation for DA (details are covered under separate agenda points of MCSC WS in June 2023). Local processes will be also impacted with IDAs introduction ▪ IDA SG discussed in particular until when the DA final results must be available to be able to run IDA1 in line with normal procedure. Initial IDA SG conclusions may be impacted by outcomes of the discussion on DA process changes
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Options	Description	Pros	Cons
Option 1	IDA1 to be cancelled in case results of DA are not available at 14:10 /continuous trading will start once DA process is completed and gate opening time for continuous trading is reached/	<ul style="list-style-type: none"> ▪ Allows to use maximum time for DA process ▪ TSO and NEMO resources are not distracted with parallel processes handling ▪ Allows to accommodate regional/local specifics regarding fallback processes and gives possibility to offer capacity to continuous trading based on these regional/local processes ▪ IDA 2 is still scheduled at 10pm 	<ul style="list-style-type: none"> ▪ May impact market participants interest for IDA1 if cancelation frequency is high
Option 2	IDA1 to be delayed (also with maximum time limit and cancellation when the time limit is reached) /continuous trading is halted until the delayed IDA1 is finished or cancelled/	<ul style="list-style-type: none"> ▪ Allows to use maximum time for the DA process 	<ul style="list-style-type: none"> ▪ IDA process is designed to the maximum extent as automatic to be able to respect very strict time limitations. By delaying the IDA1 number of processes would need to switch to a manual mode increasing operational risks. ▪ The shifted IDA1 timeline will need to respect the slowest regional/local process. In the same time it would delay start of reliable continuous allocation process.
Option 3	IDA1 to replace DA in case of risk of decoupling	<ul style="list-style-type: none"> ▪ Unified pan-European solution for case when DA process fails 	<ul style="list-style-type: none"> ▪ Considering the target where the topologies and other configurations of DA and IDA are aligned there is a high risk that also IDA1 could fail due to same reasons as DA and due to more strict time constraints

IDA1 interaction with SDAC delays and incidents

*Option 1 is recommended for the IDA Go-Live
Option 2 and 3 are considered as not feasible for MCSC parties for go live*

IDA1 interaction with SDAC delays of fallback

Workshop outcome

- Regional feedback was received regarding the analysed options on interaction between IDA1 and SDAC.
- Full visibility on local impacts on other open aspects related to Option 2 are not clarified at this stage. Therefore, MCSC suggest to go live with option 1 while the option 2 could be investigated after go-live (no implementation of option 2 in 2024)
- SIDC experts will focus on building systems and operational procedures for 2024 go-live according to option 1. They will focus on option 2 in a subsequent step
- **IDA as instead of shadow auction or in general as replacement for DA in case of risk of decoupling (Option 3)**
 - Prepared by TSOs in alignment with regional projects and in alignment with work of ENTSO-E
 - Using IDA as fallback instead of shadow auction is not considered as feasible, mostly given IDA cannot be considered as a stable & robust alternative at its moment of go live
 - Next rounds of discussion with market participants and NEMOs can be expected when there is more experience with IDA operations and behavior

Summary:

- SIDC NEMOs and TSOs would like receive feedback of MPs on the proposal to cancel IDA 1 if SDAC process delays, giving the maximum opportunity to SDAC process to be completed successfully
- SIDC NEMOs would like to receive the feedback if a process shall be implemented in order to have IDA 1 delayed but still performed later in the afternoon in case of SDAC delays