CWE Flow-based Intraday Capacity Calculation Consultation Report

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Results of the consultation in March 2017

CWE Flow-Based Intraday Capacity Calculation Survey results: Executive Summary of answers received from the Market Parties

The online survey was available for Market Parties from 1st March 2017 to 15th March 2017. In total, 4 Stakeholders (Market Participants and Associations) submitted their answers.

The public consultation process is anonymous, therefore the identity of respondents will not be disclosed with the publication of this consultation's outcome. Please note that it was however disclosed to the CWE National Regulatory Authorities together with the complete responses.

Main market views and recurring comments have been summed up in this report. The CWE TSOs wish to clarify that the contents of this document are intended to summarize the results obtained in the public consultation. This also means that the report should not be interpreted as the CWE TSOs' position on the concerned topics. The CWE partners will do their best to reply to all comments and concerns. However before engaging in more in-depth discussions within the project and with market parties, CWE TSOs cannot commit to comply with all reported concerns and requests.

In addition to specific observations (see below), market parties provided TSOs with general comments. Some market parties raised concerns over the fact that TSOs do not include countertrading as a possible remedial action. In addition, the consideration of different FRM values for cross-zonal capacity calculation and security assessmenst is perceived as discriminatory behavior. All responses by market parties expressed concerns over TSOs' ability to re-assess ID ATCs, and generally, over TSOs' possibilities to manually influence available capacities.

Even though this consultation focuses on the capacity calculation process, some market parties further criticize that capacity allocation is based on ATC values, which are extracted from the flow based intraday domain. Market parties express that they see a need for a fully flow based capacity allocation system, which from their point of view is a prerequisite for the full exploitation of possible welfare gains.

1.1 Section 1: Survey Questions

1.1.1 A.) Introduction

1. After studying the consultation document, do you have a clear view on the challenges and benefits of the implementation of Flow Based intraday capacity calculation?

Three market parties explicitely answered this question.

Two market parties express their satisfaction with the overview that is provided in the consultation document. However, TSOs are asked to provide exact numerical values for the parameters they plan to apply in the FB IDCC calculation process. In addition, two market parties express their fear that welfare gains of FB IDCC might be underestimated because of an inaccurate impact assessment.

One market party states that the one calculation approach is acceptable as a first step for the implementation of FB IDCC, but urges for multiple recomputations during the day in the future.

One market party states that the evidence provided by the experimentation results is insufficient. Furthermore, this market party is worried that an increase of available capacities compared to the current approach cannot be guaranteed. In addition, the market party fears that TSOs do not properly take into account the improvements in the quality of information in D-1 compared to D-2.

Feed-back of the TSOs:

The economic assessment of the capacity in intraday is more difficult than in DA, indeed no agreed indicator as the social welfare exists. In the current version of the Explanatory Note, TSOs proposed two economic indicators. TSOs will investigate the feasibility of additional indicators as proposed by the market parties.

In parallel, TSOs will perform an internal and external parallel run and the outcomes will allow for MPs and regulators to get a better view on the benefits and drawbacks of the FB IDCC methodology.

The TSOs propose as a first step a recomputation based on updated information in the evening of the DA, after DA allocation but before gate opening. In future versions of the FB ID capacity calculation, TSOs will develop multiple recomputations in the ID timeframe to take into account the latest information of the market.

Transparency topics (parameters and use of costly remedial actions) are further developed in the following question number 16.

1.1.2 B.) Coordinated Flow Based intraday capacity calculation process

One market party provided a combined comment on answers 2 to 9, which states that there seem to be too many opportunities for TSOs to intervene in the algorithm and to manually reduce capacities. From the point of view of this market party, this makes it impossible for market parties and regulators to determine how available capacities have been calculated, resulting in inefficient bidding strategies and, consequently, in welfare losses.

2. Are the inputs for the capacity calculation clearly described and understandable (see M chapter 3.1 and EN chapter 3.1)[1]?

Two market parties explicitely answered this question.

Market parties advocate that TSOs compare historical forcasted flows with realized flows in order to set values for FRM. In addition, market parties wish to receive more information on TSOs' risk policy, especially with regard to the assessment of FRMs and external constraints.

Furthermore, market parties urge TSOs to demonstrate that their approach to determine GSKs is representative. Also, it is asked to review the CNEC selection criteria.

Feed-back of the TSOs:

Regarding the lack of information for the risk policy per TSO, the new ID FRM values will be published by the end of 2017 after the ID FRM assessment has been performed.

CWE TSOs are convinced that the DA GSK approach used is representative. The method to generate the GSK in ID is the same as in DA. Furthermore, TSOs are updating the GSK with the new ID assumption. Moreover, the current use of ID capacity is smaller than the DA capacity, therefore the inevitable error made by the needed linearization of the GSK will be lower.

In ID, most CWE TSOs are using the same method to determine their EC as in DA.

The CNEC selection criteria are presently being investigated in the Core region.

3. Is the capacity calculation process clearly described and understandable (see M chapter 3.2 and EN 3.2)?

Two market parties explicitely answered this question.

Market parties consider the description of the capacity calculation as insufficient and incomprehensible. More transparency is requested on the underlying parameters for capacity calculation. Additionally, the RAO algorithm is considered as not clearly described.

[1] M = Methodology, EN = Explanatory note.

Market parties state that costly remedial actions should only be taken into account if economically relevant.

Feed-back of the TSOs:

The CWE FB ID capacity calculation process relies on the same principle as the DA capacity calculation process. The main change in the process is the introduction of the optimizer to choose the remedial actions in order to cover the already allocated capacity and increase the space around the day-ahead market clearing point for every hour. In DA, this activity is performed manually by the operators.

Transparency topics (parameters and use of costly remedial actions) are further discussed in the following question number 16.

4. Are the outputs of the capacity calculation process clearly described and understandable (see M chapter 3.3 and EN chapter 3.2)?

Two market parties explicitely answered this question.

Market parties feel sufficiently informed regarding the outputs of the capacity calculation process.

Feed-back of the TSOs:

The TSOs will remain available to the market parties through the CWE Consultative Group to continue the discussion on the outputs of the process.

5. Which sections of the capacity calculation process should be more clearly described (see M chapter 3 and EN chapter 3)?

Two market parties explicitely answered this question.

Market parties ask for more information on the capacity validation process.

Feed-back of the TSOs:

For validation, it is planned to directly validate extracted ATC values instead of validating the ID FB domain. Therefore, each TSO can check the impact of the newly calculated ATCs on the grid and redetermine ATC values, if necessary, but only in order to ensure security of supply in exceptional cases.

6. Is the re-assessment of ID ATCs for allocation process clearly described and understandable (see M chapter 3.4 and EN chapter 3.3)?

Two market parties explicitely answered this question.

Market parties recommend that the MCP can be updated to account for potential cross border redispatching actions. In addition, one market party is concerned that TSOs have the option to oppose the new ID ATC domain.

Feed-back of the TSOs:

No feed-back from the TSOs as the re-assessment process is not part of the methodology anymore.

7. Do you feel sufficiently informed about the method of Remedial Action Optimisation and their influences for cross-border capacity (see M chapter 3.1 and 3.2)?

Two market parties explicitely answered this question.

Market parties ask for more detailed information on the method of remedial action optimization, especially with regard to alternative objective functions and the list of remedial actions under consideration.

Additionally, one market party asks for more information about the impact of remedial action optimisation on capacity increase, and generally for more transparency regarding this process.

Feed-back of the TSOs:

CWE TSOs acknowledge that a certain level of transparency is required for market parties in order to gain confidence in the FB process and make the process as a whole more understandable.

However, to provide the list of RAs and their impact on the capacity calculation would be an increase of transparency, which would generally concern CWE market coupling, and which therefore is out of the scope for the FB IDCC methodology. In order to avoid different levels of transparency for the different time-frames, transparency related topics should be discussed on CWE level (e.g. in CWE Consultative Group meetings).

8. TSOs developed the optimisation function in order to have a positive impact on the market as it will provide more domain in the likely market directions (around the DA market clearing point). Do you agree with this point of view (see M chapter 3.2 and EN chapter 3.2)?

Two market parties explicitely answered this question.

Market parties would favour an optimization function that prefers the most valuable market direction (which is described as the market direction that would mostly increase congestion rents under the assumption of fixed DA market prices). At the same time, one market party additionaly states that the optimization function should increases the domain in the direction that is most likely with the latest (updated) flow configuration.

Feed-back of the TSOs:

In response to the current optimisation function to optimise around the DA MCP, there was no shared opinion of market parties (MPs) observed.

On one hand MPs mention that they prefer optimisation in the most profitable direction (with increasing congestion rent) while preserving left-over day-ahead capacity but on the other hand MPs also request to optimise market capacity in the likely market directions of FB DA which results in less capacity in the opposite market direction.

As both views of MPs contradict, CWE TSOs were not able to give preference to either of the MPs suggestions. Furthermore, CWE TSOs would like to underline that due to remedial action optimisation a shift of the FlowBased domain is inevitable. This will lead to a capacity gain in some directions and a reduction of capacity in other directions. As prior studies performed have indicated that DA market spread does not necessarily align with the most congested areas in Intraday, TSOs aim to increase the domain around the DA MCP in all directions in a non-discriminatory manner for all borders.

9. Do you think it is justified to optimize the ID FB domain around the DA Market Clearing Point (MCP), knowing it can lead to FB domain reductions in the unlikely market directions (see M chapter 3.2 and EN chapter 3.2)?

Two market parties explicitely answered this question.

Market parties would favour again an optimization function that is based on an updated MCP; ID ATCs should therefore be recalculated periodically.

Feed-back of the TSOs:

TSOs acknowledge that having multiple recomputations during Intraday, based on updated MCP, is the target solution. Periodic recomputations during the day considering the last nominated capacities are foreseen in a future version of FB IDCC.

1.1.3 C.) Expert experimentation results and parallel run

10. Are you convinced by the experimentations performed so far and the foreseen developments (see EN chapter 4)?

One MP is not convinced by the experimentations. The use of the automatic MCP inclusion for most of the time is seen as a consequence of an insufficient set of RA or other limitation of the current approach (i.e. GSK, CNEC selection).

Another MP points out that the experimentiation is based on a very scarce evidence of five days and that further testing on the RA Optimization is needed.

For both of these MPs, it would be more relevant to consider DA market spreads to weight the variations of capacity in the different directions.

Feed-back of the TSOs:

TSOs performed the experimentation to gain first experiences and to examine the new process. In order to fine-tune the process and get more quantitative results, TSOs will perform an internal and external parallel run in 2017/2018 which results can be shared with NRAs and market parties to get a better view on the benefits and drawbacks of the new FB IDCC methodology. More details regarding the optimization function in general can be found in the answer to question number 8.

11. What are your expectations from the external parallel run process?

Two MPs see very little benefit of an external run in a countinous trading market and would rather have an offline assessment of ID FB domain for historical values and for some specific scenarios in the future.

One MP considers that the parallel run should be more thorough than what was performed for DA FBMC. Full data transparency should also accompany the parallel run from the start to speed up market participants' understanding of the whole mechanism.

Feed-back of the TSOs:

An internal and external parallel run is essential for TSOs to gain experience from technical and operational point of view as the implementation of a fully working system and sufficiently experienced operators are needed before go-live. The parallel runs will also be used to fine-tune the process and get more quantitative results.

Therefore, it is not feasible to conduct the proposed updated planning of an earlier go-live for FB IDCC.

The results of the external parallel run will be shared with NRAs and market parties. In order to get a better view on the benefits and drawbacks of the new FB IDCC methodology the recomputation of a limited number of interesting business days (e.g. days of the internal parallel run) can be considered and shared with market participants. It is to mention that finding representive days for ID (as for the DA SPAIC analysis) is difficult which makes an ID SPAIC analysis not feasible, but TSOs are open for suggestions from market parties.

TSOs will be at least as transparant as in CWE FB DA. More information on this topic can be obtained in the following question number 16.

12. Do you have enough information (results, explanations) about the performed IDCC experimentation to get a clear picture of the possible impact on cross-border capacities for the ID market (see EN chapter 4)?

Two MPs indicate that the approach and the impact assessment (in terms of types of outputs and variety of situations) should be improved.

One MP claims lack of transparency on numerical figures. The other MP argues that the metrics used by the CWE TSOs for the impact assessment are probably more pessimistic than the ID FB domain.

Feed-back of the TSOs:

Experimentations are performed on a limited period of time, and this is why internal and external parallel runs are foreseen in order to provide a wide picture of the process behaviour. External parallel run results will be shared with Market Parties. CWE TSOs would like to remind Market Parties that lower uncertainties in ID do not necessarily lead to more capacities as some lines may be more loaded in ID compared to DA. Many paramaters and assumptions have been updated between DA and ID leading to different capacities, such as generation infeed, grid topology, and updated RES infeed based on the latest assumptions available when running the FB IDCC computation.

1.1.4 D.) Publication of data

13. Do you have enough information regarding the Flow Based intraday capacity calculation process (see M chapter 5)?

One MP answered yes to this question.

Another MP regrets that the numerical values for each parameter used by TSOs are not provided. They also require more transparency regarding TSOs' approaches to define FRMs and GSKs.

Feed-back of the TSOs:

Transparency issues, including numerical values, parameters used by TSOs, as well as TSOs' approaches for defining FRMs and GSKs are further developed in question 16. In addition, please find additional information concering GSKs and FRMs in question 2.

1.1.5 E.) Additional questions

14. What are your general expectations from the new FB IDCC process?

Two MPs expect a significant increase in cross-border capacity in the most economical direction. Efficient trade-offs made by TSOs between internal redispatch and cross-border capacity reduction are also expected.

Feed-back of the TSOs:

CWE TSOs welcome this proposal to consider economical parameters in the process, however CWE TSOs consider the topic of implementing costly remedial actions in order to adapt the capacities and use of congestion rent for redispatch to be a NRA decision. TSOs would additionally like to inform that related discussions are also ongoing at ENTSO-E level.

15. What are the most important go-live criteria for the process from your point of view?

One MP sees predictability as a key criterion.

Two MPs agree that TSOs must be operationally ready and make sure that the IDCC will work smoothly and deliver in conformity to the impact assessment published.

Another MP expresses its strong disappointment regarding the level of transparency before and after the go-live of DA FBMC and is, therefore, very wary about the conditions of the ID FBCC go-live. The key criteria that this MP will require is full data transparency (chapter 5) and the inclusion of details regarding the manual adjustments made, remedial actions taken by the TSOs and their effects. They also request the publication of the intraday flow-based domain (not only the final ATC values). From their point of view, market participants need to be able to fully predict the results of the calculation process.

Feed-back of the TSOs:

Transparency topics are further developed in the following question number 16. The FB ID domain will be communicated as of the starting of the external parallel run and after go-live as well. ATC values will be publicly available, but as it is a FB methodology which is processed, the FB domain will be also provided to all interested parties. The same basis of communication as in FB DA will be used. Furthermore, during the external parallel run (at least 6 months) more data will be available for stakeholders, which can be input for their assessments to improve predictability.

About any new indicator to be followed or developed, TSOs are open to investigate additional indicators considering economic parameters. In addition to the indicators provided by TSOs, MPs are also encouraged to compute indicators during the parallel runs and share the results with CWE TSOs.

16. What is your most important criterion regarding the capacity calculation process and output? (predictability of capacity, volume of capacity…)

One MP highlights predictability and transparency as key issues to achieve an optimal use of the grid infrastructure. In their opinion, both would lead to an increase of capacity in the most economical direction (as they allow market parties to provide TSOs with better predictions and this results in less uncertainties).

Another market party stated that the most important criterion for capacity calculation is the volume of capacity in the likely market direction. They see capacity predictability relevant but not as an ultimate goal per se, since price forecasting depends also on other information. They underline that predictability relies also on full transparency by TSO on the availability of transmission network and on the common grid models to be used as inputs.

Feed-back of the TSOs:

CWE TSOs acknowledge that a certain level of transparency is required for market parties in order to gain confidence in the FB process and make the process as a whole more understandable. However, in order to avoid different levels of transparency for the different time-frames, transparency related topics should be discussed on CWE level (e.g. in CWE Consultative Group meetings).

In FB IDCC at least as much transparency will be provided as for FB Day-Ahead (e.g. non-anonymised presolved CNECs including Fref', FRM, FAV and RAM). Future changes in the level of transparency provided for FB Day-Ahead will also be taken into account for FB Intraday.

In line with provided transparency for FB Day-Ahead, the impact of local TSO validation will be shared by publishing the Day-Ahead left-over ATC, extracted ID ATC from the Intraday FB domain and the validated Intraday ATC values provided for allocation.

During external parallel run, CWE TSOs will publish the Intraday FB domain as well.

1.2 Section 2: Additional questions / comments by MPs

1. MPs request TSOs to keep working on extending the process and offer several recalculations of the domain (within the intraday timeframe) as there is a market need to have updates of the FB domain during the day. They believe that the target should be to perform a recalculation of the domain every hour to get a view on what is available for each hour, provided it keep the same exchange potential as the process today (it should not deteriorate).

The TSOs agree that the target of the FB ID capacity calculation is not only to compute the capacity once in the evening of the DA but TSOs see the process as a first step to multiple recomputations. Performing additional computations during the day would require additional preparations, leading to a delay of the current implementation planning. Also, updated grid models (ID CGM) are required for re-computations but these have not been used in common processes, as the quality and stability is not clear for some TSOs. The frequency of this recalculations shall take into consideration efficiency and operational security and will be further developed.

2. It is unclear to MPs whether the TSOs have decreased their Flow Reliability Margins (FRMs) as real time gets nearer.

The aim of the FRM is to cover the uncertainties in the capacity calculation processes. In order to compute the FRM, TSOs compare the flows on the CNEC between the CGM that is used for the capacity calculation and the realized flow on this element. In the experimentation, TSOs have used proxy FRMs based on DA FRM but TSOs intend to update the FRM values before Go Live. As for DA, the values will be published per CNEC.

3. Why do you consider an external constraint? Isn't the uncertainty already covered by the FRM?

External Constraints prevent the system to reach extreme positions compared to the original market clearing point. They can also prevent grid behavior like voltage collapse that cannot be modeled with the current assumption (DC load flow).

4. The approach to define GSK remains relatively unclear: Regarding the German GSK, the fall-back solution is the GSK from a previous day; is it better than using the DA GSK? Does the French GSK include must-run units?

The fallback solution for all GSKs is to take the GSK of the previous ID and not the one from DA.

Regarding the French GSK, the method for ID is the same as for DA. All units, including must-run units which are in operation in the base case, will follow the change of the French net position on a pro-rata basis.

5. Please provide more transparency on the application of FAV and the operational adjustment in FRM.

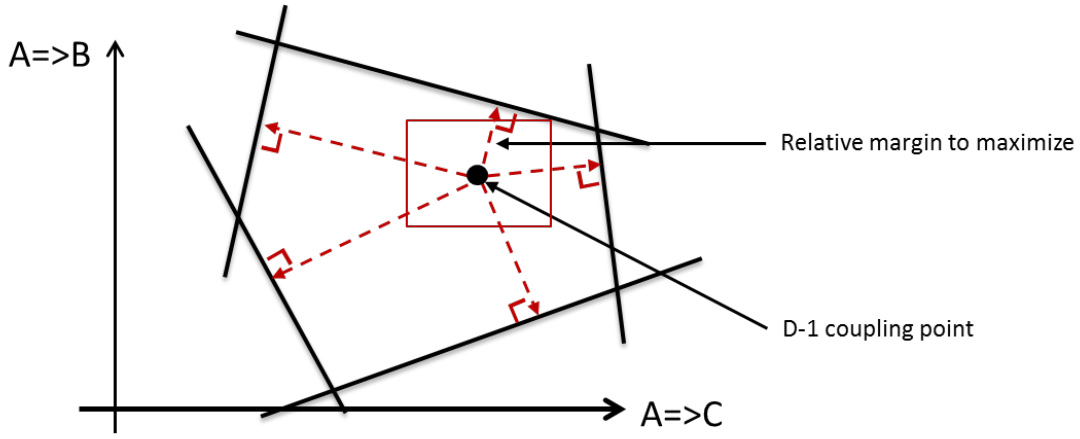
CWE TSOs do not intend to use FAV to change the output of the ID FB calculation as ATC values will be validated directly. The final need of performing operational adjustment will be evaluated after the ID FRM values have been computed and determined by the end of the year 2017.

As a rule, TSOs will be at least as transparent as in CWE FB DA, so future developments regarding the FB DA process will be considered in ID as well.

6. Why is the relative margin denominator the sum of absolute PTDF and not the difference between the max and min PTDF?

This approach was chosen in order to ensure non-discriminatory behavior of the objective function, as it prefers no particular exchange direction.

No border will be advantaged as the room around the market clearing point is maximized. An illustration of this non-discriminatory approach can be seen in the figure below.



$$Relative\ Margin\ (CNEC) = \frac{Margin(CNEC)}{\sum_{i,j \in hubs} \left| PTDF_{i \to j}(CNEC) \right|}$$

7. Questions regarding further clarification of validation phase:

- *What does the computation exactly take into account?*
- *How much time does it take?*
- *What is the exact purpose of the validation? Can it be avoided?*

It is planned to perform the validation directly on the calculated ATC values instead of validating the ID FB domain. Therefore, each TSO can check the impact of the newly calculated ATCs on the grid by their own tools and redetermine ATC values, if necessary, but only in order to ensure security of supply in exceptional cases. Hereby, the latest

information on the grid can be taken into account, e.g. unforeseen outages of grid elements since the start of the ID FB process. The timing depends on the availability of input data as well as the computation times of the predecessing processes.

8. Why should TSOs be allowed to oppose/reject the new ID ATC domain since the increase of capacities will be based on individual grid inputs?

Although it is correct that the computed ID ATC is based on individual grid inputs, these inputs can change during the course of the day (e.g. due to updated grid forecasts, unforeseen outages, etc.). TSOs intend to mitigate the resulting risk, during intraday, by applying a reliability margin (i.e. FRM). Residual risk will be handled as *force-majeur* and solved by TSOs by other means.

9. It should be possible that the MCP, which serves as a starting point for ID ATC extraction, can be updated to account for potential XB redispatching actions, as a result of the ID security assessment.

Cross-border redispatch available before the FB IDCC process will be considered, as these are included in the individual grid models of the CWE TSOs. Although due to the cross-border redispatch the domain will be shifted, the MCP will not be updated to ensure the already allocated capacities are properly taken into account.

10. Taking the DA FB as a reference is contradictory with the recalculation of ID capacity (3.4.1.1): the base case should be to limit the capacities by the FB ID ATC and not the minimum of FB DA ATC and FB ID ATC.

No feed-back from the TSOs as the re-assessment process is not part of the methodology anymore.

11. Concerning the ID ATC re-assessment, one MP stated that the proposed methodology maintains the freedom for individual TSOs to refuse the ID capacity increases proposed as a result of a centralized computation. This MP reasons that this freedom should be limited under three dimensions:

- ***The approval process should apply to only one type of outcome of the centralized process, for instance the new ID Flow-Based domain. If all CWE TSOs recognize that the new FB domain is right, this means that they should cope with any corresponding increase/decrease in cross-zonal exchange capacity.***
- ***TSOs should be fully transparent on their motivation when opting out, make alternative consistent proposals, and propose improvements of the regional capacity calculation process as soon as an opt- out situation becomes frequent.***
- ***TSOs should take their decision quickly so that available capacity can be released to the market in a timely manner. To this end, the market party would suggest that no motivated response from CWE TSOs 30 minutes after proposing an increase should be considered as an acceptance.***

No feed-back from the TSOs as the re-assessment process is not part of the methodology anymore.

12. TSOs consider different FRM in cross-zonal capacity calculation and in security assessment. MPs suggest to consider identical FRMs for cross-zonal capacity calculation and for triggering internal redispatching actions.

Today, it is not common practice for TSOs to apply reliability in security analysis. The main reason is related to the fact that the security analysis aims at identifying and coordinating remedial actions that will have to be considered to ensure a normal state of operation in

real time. This process and the decision which remedial actions will be applied shall be updated and optimized several times, up to close to real time, which will always allow considering the impact of changes in the system. In contrary, the capacities that will be provided to the allocation platform as outcome of the capacity calculation processes will be considered as firm, which justifies the application of Flow Reliability Margin to cover the potential impact of uncertainties. Nevertheless, in the scope of System Operation guidelines implementation, TSOs are assessing the possibility to consider reliability margins during security analysis, but this is out of scope of the FB IDCC methodology.

13. MPs note that they do not understand why lower Imax figures were used in phase 3 of the experiment. Shouldn't corrected results be published?

CWE TSOs have used the correct Imax values during the whole experimentation phase. For cycle 4 of phase 3 the winter limits of the monitored grid elements have been used. These values are higher than the summer limits used in the first three cycles. Usually, TSO switch from summer to winter limits in November.