



CWE FB ID CC MPs Workshop

27th of February 2017, 13 - 17 pm
Sheraton Hotel, Brussels airport



	SUBJECT	BY WHOM
1	Welcome & introduction	<i>PMO / F-X.DETRAZ</i>
2	Status	<i>F-X.DETRAZ</i>
3	Explanation IDCC methodology <ul style="list-style-type: none"> • High level process overview • Methodology comparison between the D-2 and ID FB methods • Learning experimentation 	<i>V.PROTARD, O.BRONCKART</i>
4	High level planning for implementation	<i>F-X.DETRAZ</i>
5	Q&A methodology & implementation	<i>PMO</i>
6	Approval process <ul style="list-style-type: none"> • Approval package: high level description • Consultation process 	<i>S.MERTENS</i>
7	Closure & AOB	<i>PMO</i>



Objective of today's workshop

CWE TSOs are in the final phase of the completion of the CWE FB IDCC methodology and therefore organize this dedicated workshop with MPs to:

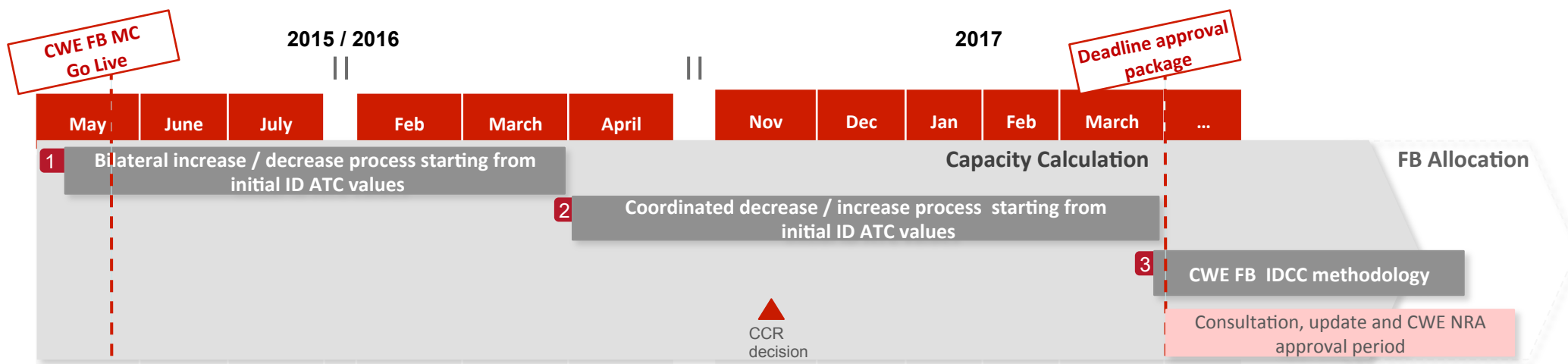
- Explain the (complexity of the) FB IDCC method currently being developed;
- Provide insight in the activities performed and to share details of experimentation performed including high level results & conclusions;
- Provide an updated implementation planning;
- Inform MPs on the Consultation Period.



Background and explanation continuation development FB IDCC in CWE

Background development FB IDCC methodology

- As shared with MPs in CCG meetings, a 3-step approach towards FB IDCC was agreed upon:
 - ID ATC: bilateral increase / decrease process starting from initial ID ATC values (described in FB DA approval package)
 - ID ATC CC: coordinated increase / decrease process for all CWE borders (described in ID ATC after MC approval package)
 - FB ID Capacity Calculation methodology (currently being developed)



ACER decision on Core CCR

- On 17 Nov. 2016, ACER published its Decision No 06/2016 on the TSOs' Proposal for the determination of CCRs
 - ACER amended the original all TSO proposal on, among others, the specific point of merging the proposed CWE and CEE regions to CCR Core. However, the CCR Decision clearly leaves open the option for a stepwise implementation of methodologies
- CWE NRAs provided formal feedback to CWE TSOs on January 4th 2017 on the development of FB IDCC in CWE:
 - *NRAs confirm their common position that the quick development and implementation in the existing CWE Project should continue. The envisaged solution should, in addition to its quick implementation, provide a sound, qualitative methodology for capacity calculation for the intraday timeframe.*



Current status of development FB IDCC approval package & process

CWE TSOs are currently drafting the FB IDCC approval package consisting of:

The technical paper (to be formally approved by the NRAs)

- FB IDCC CWE methodology for FB IDCC to be presented during agenda item 3 of today's workshop.

The context paper (providing additional information and not to be approved as such)

- Description of experimentation results and providing examples explaining the methodology.
- Description of possible future improvements as CWE TSOs recommendation for the FB IDCC CACM methodology for CORE region.
- Criteria to be monitored to assess and evaluate the methodology in the operational process.

Consultation & NRA approval process

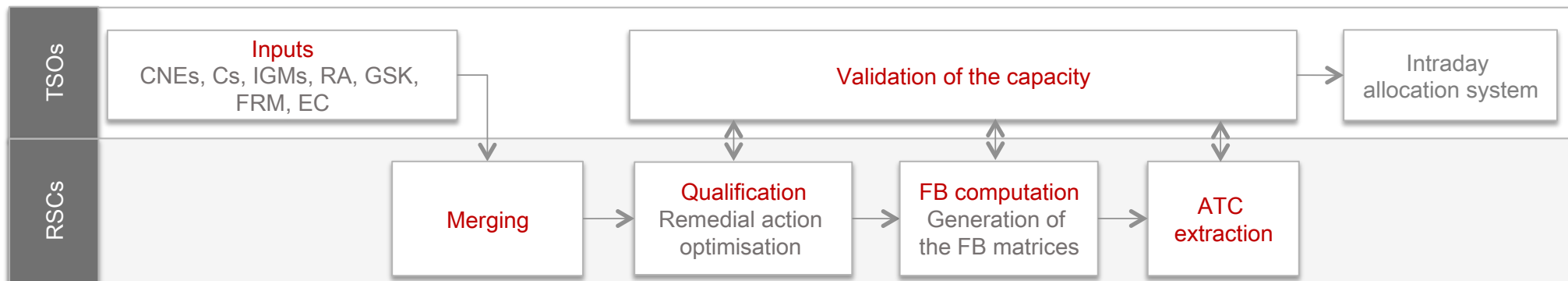
- December 2016 - February 2017: drafting FB IDCC approval package
 - Stakeholder involvement
 - NRA workshop
 - MPs workshop
- 1st of March 2017: start public consultation for 2 weeks
- End of March 2017: foreseen submission of CWE FB IDCC approval package to CWE NRAs

3. Explanation IDCC methodology



High level process overview

High level overview of the FB ID computation steps:



Note

- This sub-process is designed with the capacity calculator coordinator (CCC) of CACM.

Flow based Intraday capacity calculation

- Intraday inputs are locally prepared to perform a common Flow based computation.
- Harmonised optimiser to apply RAs operated by each RSCI based on common input.

3. Explanation IDCC methodology

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Methodology comparison between the D-2 and IDCC FB methods

	FB D-2 Capacity calculation	FB ID Capacity calculation
Method	<ul style="list-style-type: none"> FB computation for every TS 	<ul style="list-style-type: none"> FB computation and local assessment of ID ATC increase request for every TS
Recomputation	<ul style="list-style-type: none"> Non applicable in D-2 	<ul style="list-style-type: none"> One recomputation of FB domain based on DA CGM Local Re-assessment of the ID ATCs per block of several hours
CGM Inputs	<ul style="list-style-type: none"> D-2 CGM without information for market parties for net position and power unit dispatch 	<ul style="list-style-type: none"> Best forecasts available when running the process taking into account data from market parties (D-1 dispatch, cross border scheduling, ...)
CNEC inputs	<ul style="list-style-type: none"> The CNEC are following the "5% sensitivity" rule 	<ul style="list-style-type: none"> Same rule is used
EC inputs	<ul style="list-style-type: none"> TSOs can use EC constraint according to approval package 	<ul style="list-style-type: none"> EC is updated (see approval document)
GSK inputs	<ul style="list-style-type: none"> TSOs method is described in approval package 	<ul style="list-style-type: none"> TSOs use updated GSK in line with new basecase
FRM inputs	<ul style="list-style-type: none"> FRM is computed with statistical analysis of D-2 CGM 	<ul style="list-style-type: none"> FRM is computed with statistical analysis of DA CGM
RA selection	<ul style="list-style-type: none"> Remedial action according to TSO risk policy 	<ul style="list-style-type: none"> All RA available in previous computation should be reused, and possible additional RA should be considered (depending on availability of RA).
Qualification phase	<ul style="list-style-type: none"> The impact of the RA is manually checked to asses if the RA can enlarge the FB domain 	<ul style="list-style-type: none"> Due to operational time constraints, an RA optimiser shall be developed, to include MCP and enlarge around the MCP using explicit RAs. Main challenge is to design and implement RA optimisation: objective function is to maximize minimum relative margin of CBCOs. The relative margin of a CBCO is this absolute margin divided by the sum of PTDFs.
Number TS to optimize	<ul style="list-style-type: none"> Not all TS are assessed (generally peak and of peak) 	<ul style="list-style-type: none"> The optimisation will be performed for every TS without any extrapolation of the RA results to other TS.
FB computation	<ul style="list-style-type: none"> FB computation with automatic LTA inclusion. 	<ul style="list-style-type: none"> FB computation as in DA with automatic MCP inclusion (CWE TSOs commitment that explicit RA should allow covering the MCP without FRM and that automatic inclusion higher than the FRM should only occur in a limited amount of cases).
Re-assessment of ATCs increase	<ul style="list-style-type: none"> Non applicable in D-2 	<ul style="list-style-type: none"> ATCs are extracted out of the recomputed FB domains These ATCs are compared to initial ID ATCs to determine increase requests per border/direction Increase request are locally assessed, during the day, by TSOs per block of hours
Output	<ul style="list-style-type: none"> FB domain for the D-1 allocation ATC are extracted after D-1 allocation for intraday allocation 	<ul style="list-style-type: none"> Consolidated ATCs after local re-assessment will be published for all (24) TS.

3. Explanation IDCC methodology

High level process overview

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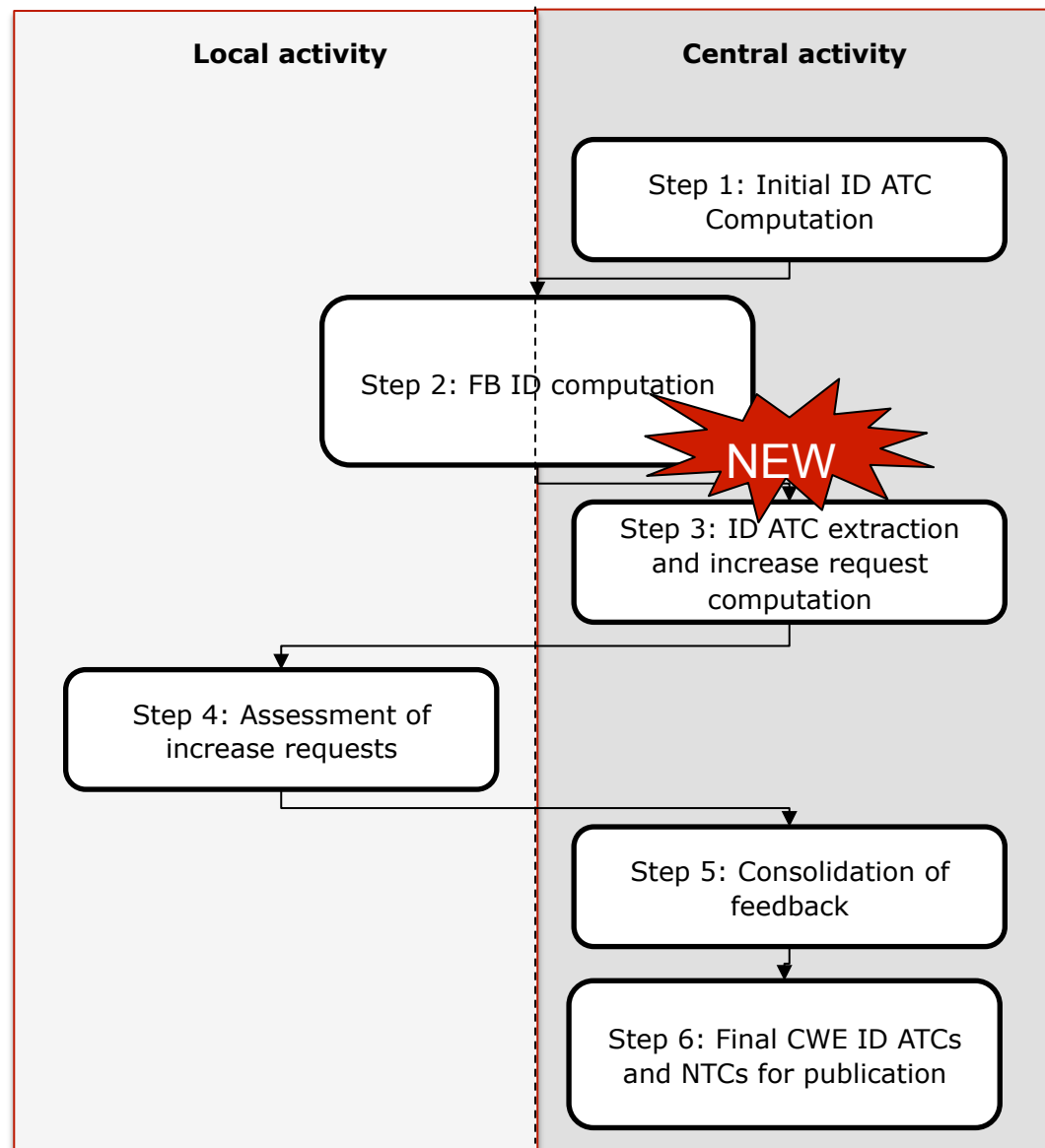


Flow based Intraday capacity calculation

- The process is designed with the capacity calculator coordinator (CCC) of CACM which will be responsible for the central activities.
- The methodology is an evolution of the existing capacity calculation methodology for intraday timeframe
- The determination of the increase request is performed based on a FB ID computation and is further described in the next slides

Increase request computation

- ATC extraction will use same algorithm as in the FB DA methodology.
- For each border and direction, the extracted ATC and initial ID ATCs will be compared: the minimum value is guaranteed and the difference will be considered as increase request in case the extracted ATC is larger than the initial ID ATC.





In collaboration with RSCs, CWE TSOs performed experimentation including three phases in order to develop an ID capacity calculation process focussing on the challenges compared to the FB DA approach.

Main challenges

- Data preparation for the FB IDCC process demands updated inputs and processes from TSOs to facilitate cross-border capacities closer to the expected real-time situation.
- Development of an automatic Remedial Action Optimization (RAO) by RSCs in order to overcome the lack of time for a time-consuming coordination between operators shortly before the real-time situation.

Phase 1: The first steps towards an intraday process were made

- First timestamps (4 cycles) have been calculated with an FB IDCC method and extraction of ATC values.
- Improved understanding of RAO in general and impact of prepared inputs.
- Improvements on RAO objective function were identified.

Phase 2: Gaining experiences over one day computations

- FB computations for complete business days were performed for the first time (5 cycles).
- RAO for pre-selected timestamps was performed and results were extrapolated to the adjacent hours which leads to non optimal FB results and low extracted ATCs.
 - Decision: RA optimization will be performed for all 24 hours of a day instead of using extrapolation.
- Improved objective function gives better results from capacity perspective as the algorithm focusses more on the elements that are sensitive to the cross border exchanges instead of only the elements with absolute low margin.
 - Decision: RA optimization will optimize relative margin instead of absolute margin of CBCOs.



Phase 3: Final experimentation phase was used to gain confidence for the planned parallel run

- Quantitative assessment of the FB IDCC concept (4 cycles a 5 business days) to prove the methodology.
- Development of new indicators to assess the quality of the process.
 1. DA Market Clearing Point Inclusion indicator to check the feasibility of already allocated capacity
 - Positive values: MCP could be included in the FB IDCC Domain (green).
 - Negative values: MCP could not be included in the FB IDCC Domain (orange).
 - Value of Minimum Margin assesses the distance between FB domain and MCP.
 2. ATC indicators to evaluate the benefit of the new ID capacity calculation process in terms of availability of ATC for likely market directions.
 - Comparison of the new extracted ID ATC of FB IDCC domain with former given ID ATC of FB DA domain and reference ATC.
 - Reference ATC were obtained from a statistical analysis of market behavior.
 - Positive values: New ATCs satisfy the demand of the market more than the results of previous processes (green).
 - Negative values: New ATCs satisfy the demand of the market less than the results of previous processes (orange).

3. Explanation IDCC methodology

Learnings experimentation

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Phase 3 cycle 3 results

Hours	ATC indicators														
	24/10/16			26/10/16			27/10/16			28/10/16			29/10/16		
	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion
	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin
H01	1148	2013	211	-638	259	25	350	978	-18	-1138	1015	45	560	1514	174
H02	1148	2013	216	107	233	27	1148	2013	279	-861	-1316	-75	447	1287	186
H03	1148	2013	418	763	1365	36	1148	2013	279	-1148	-2006	-132	452	1416	221
H04	1148	2013	202	-287	1319	28	1148	2013	97	-1148	-2006	-139	236	1494	188
H05	1070	2013	157	124	743	12	0	2013	97	-1148	-2006	-111	479	1319	320
H06	1128	1992	159	-385	-780	-2	-296	1717	222	-1150	-2008	-122	503	1440	207
H07	260	-27	-69	0	71	-76	405	1174	69	-1148	-1531	-52	440	1161	194
H08	286	311	-141	286	357	-77	-588	-961	-103	-135	-1472	-215	-307	1065	199
H09	279	-8	-134	-77	-6	-16	-123	427	15	-1152	-2010	-211	63	1234	280
H10	129	-158	-123	-309	-262	-71	-258	802	23	-1233	-1928	-118	-374	1651	195
H11	-108	177	-43	-287	-240	-132	-229	938	29	-985	-2130	-119	752	2707	214
H12	279	662	-39	-649	-595	-154	-207	-746	-3	-991	-1973	-153	574	2488	170
H13	283	308	-71	-697	-697	-228	-299	-968	-22	-801	-2070	-31	574	2410	112
H14	-330	-330	-80	-726	-1567	-249	-295	-964	-28	-238	824	51	710	2196	82
H15	-825	-825	-121	-625	-650	-295	-285	-954	-17	-205	1062	48	287	1794	30
H16	-715	-1073	-178	-574	-1773	-345	-622	-1004	-49	-234	1322	65	-470	973	106
H17	-58	-369	-240	-389	-1563	-411	-1210	-2192	-87	-236	1291	65	119	1281	232
H18	-758	-1140	-251	-754	-1641	-385	-816	-1223	-207	0	630	23	1120	1985	207
H19	-519	-599	-219	-287	-1174	-410	-787	-2011	-299	-861	1221	24	203	1192	179
H20	-574	-762	-204	-794	-220	-381	-1197	-2204	-321	-1257	174	6	1334	2186	69
H21	-98	-98	-240	-1	-1	-390	-1195	-2131	-38	-1148	804	25	355	769	76
H22	-324	-635	-147	-422	-1309	-219	-574	-1531	-19	-577	-1340	-256	379	1219	186
H23	287	312	-137	0	-862	-195	-574	-1537	-21	-459	-887	-4	359	1227	427
H24	444	1665	41	-311	583	37	-864	-1651	-17	-287	-204	-20	-277	1078	62

- As illustrated by the figure for cycle 3, first three cycles show limited results in terms of capacity even after RA optimization (RAO), except during weekends:
- MCP was not included in the 'virgin' FB domain most of the time.
 - Reasons:
 - High congestions in the used grid models (usage of lower I_{max}).
 - Lack of available/efficient RA in some congested areas.
- MCP inclusion algorithm had to be triggered often to offer capacities for some directions.

3. Explanation IDCC methodology

Learnings experimentation

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Phase 3 cycle 4 results

Hours	ATC Indicators														
	01/11/16			02/11/16			03/11/16			04/11/16			06/11/16		
	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion	ATC indicator Baseline	ATC indicator RAO	MCP inclusion
Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	Total Sum	Total Sum	Minimum Margin	
H01	635	1475	333	0	1003	66	-80	1221	33	979	1843	191	1693	1931	302
H02	-65	1015	215	0	1047	63	-456	895	56	1043	1544	172	2009	2845	445
H03	524	1463	283	0	-74	21	-781	686	43	-191	1821	141	1765	2601	198
H04	127	1513	131	-661	-2266	-41	-474	787	44	0	1984	122	1451	2263	497
H05	655	1408	122	-1168	-2293	-40	-502	175	23	-119	1900	65	852	1269	
H06	233	1095	243	-376	-570	10	122	763	15	293	2005	149	1001	1340	547
H07	-453	756	75	-287	190	45	-152	-1489	-355	1155	2156	112	199	204	455
H08	514	1123	114	-574	-1761	-135	167	-120	-65	-315	-1514	-64	159	174	358
H09	901	1137	283	-574	-1531	-70	-182	-343	-10	-572	138	0	0	97	119
H10	848	1265	281	-574	-1576	-42	-474	-350	-136	-584	934	52	274	1128	302
H11	498	1154	276	-574	-1513	-4	-574	-209	-153	-230	908	100	-972	179	203
H12	362	1193	271	-574	464	45	-658	-1421	-200	-173	1297	81	-645	207	203
H13	-74	1193	225	-574	427	42	-711	-587	-189	92	700	112	-694	174	112
H14	573	1283	136	624	981	45	-741	-330	-168	493	1223	114	-481	173	165
H15	1230	1393	130	809	1456	119	-248	-1827	-215	321	866	98	174	174	289
H16	1148	1605	136	937	1680	92	287	-862	-185	803	1226	70	19	130	379
H17	-379	1000	116	1372	1665	60	-574	-1173	-132	1148	1828	113	0	127	425
H18	-154	1120	83	623	212	-31	-575	-1486	-135	1096	2013	278	1337	1563	308
H19	-341	637	69	-1268	-633	15	-574	-1843	-38	-672	1545	92	1948	1983	253
H20	379	1107	93	-626	-494	0	-1148	-2002	-180	-287	1798	137	1641	1766	187
H21	512	1588	43	0	1048	30	-444	-1689	-146	82	1667	343	1487	1571	158
H22	0	1232	64	123	778	92	-121	-121	17	1130	2000	128	470	1128	251
H23	654	1195	82	747	1362	58	0	1095	10	1148	2013	171	-112	1128	72
H24	1045	1705	145	837	1435	65	-48	-1174	-48	771	1611	565	-112	1128	70

- Improvements in terms of available ID capacity can be seen in the results of cycle 4.
 - Improvements in RAO
 - Usage of winter values for I_{max}
- Most of the time, the MCP was included in the FB domain and a benefit in terms of capacity could be identified, certainly following application of RA optimization (RAO).
- Non-inclusion of the MCP generally leads to negative results in term of FB domain and related ID ATCs.



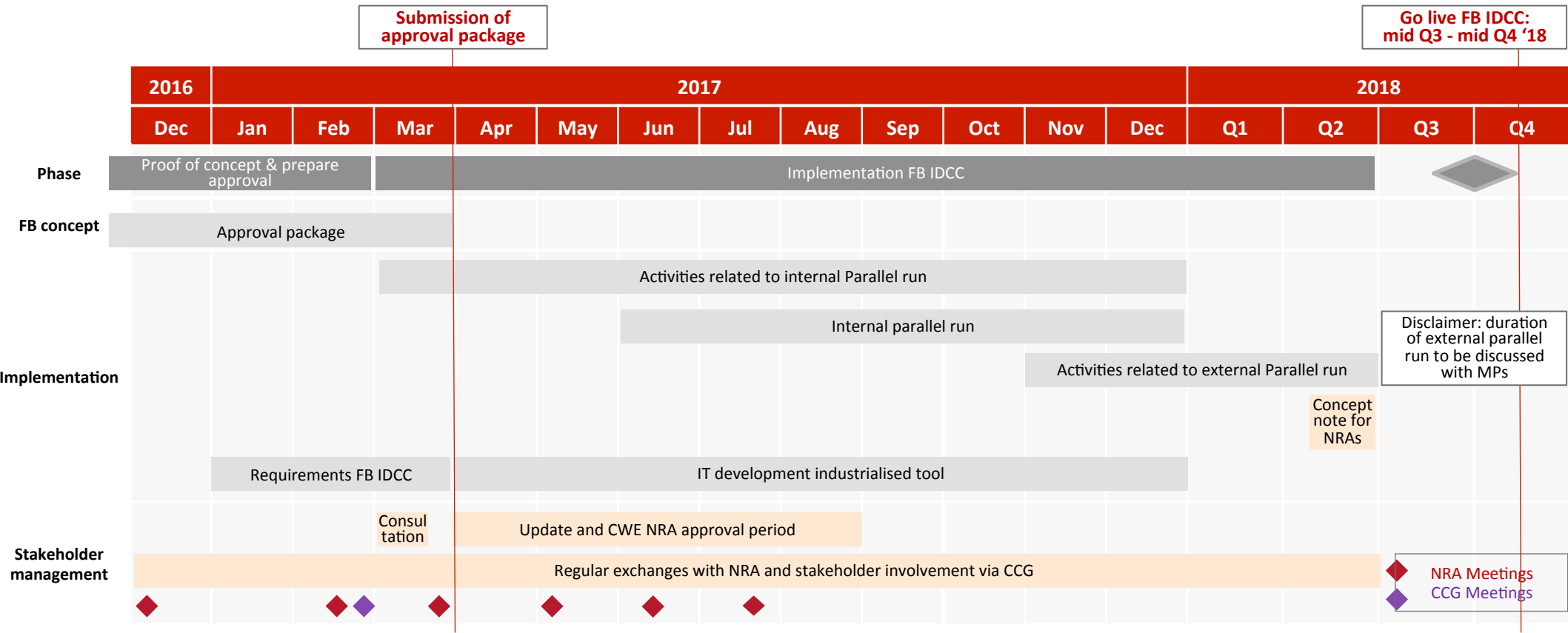
Main conclusions of the complete experimentation phase

- The CWE concept for FB IDCC including Remedial Action Optimization works as designed.
- During the experimentation phase significant improvement of the method and the RAO tool has been achieved.
- Including FB DA Market Clearing Point (MCP) has been identified as the main objective of the ID process in order to improve the method, therefore several mitigation measures have been agreed on and are currently under investigation.
 - Including more Remedial Actions in the process
 - Further improvement of Remedial Action Optimization
 - E.g. fine-tuning parameters, improvement of methodology
- More capacities for all directions compared to FB DA and the ATC increase/decrease process cannot be guaranteed with the new process.
 - Optimization of FB domains can benefit the likely market directions at the cost of capacity in the opposite directions.
- New calculated FB IDCC domains reflect better the expected real-time situation which improves security of supply.

Additional improvements of the process, identified in additional experimentation or parallel runs, are going to be implemented if possible.



In preparation of the implementation phase of CWE FB IDCC from Q2 '17 – Q2 '18 and as part of the FB IDCC approval package, find below the IDCC WG agreed planning.





Do you have any **questions** or **remarks** ?



Approval package: high level description

Currently, CWE TSOs are drafting the FB IDCC approval package, to be shared with MPs during the foreseen Consultation Period.

- The approval package consists of the following two documents:
 - 1. Technical paper** (to be formally approved by the NRAs)
 - Description of the first version of the Flow-Based Intraday Capacity Calculation (FB ID CC) methodology, incl:
 - Description of the inputs, the process and the outputs
 - Back-up procedures
 - Transparency procedures.
 - 2. Context paper** (providing additional information and not to be approved as such)
 - Provides a more detailed explanation of the methodology, the experimentation results and the further improvements foreseen, incl description of:
 - FB IDCC process
 - Experimentation results with the first assessments and learnings
 - Improvements on the inputs
 - Process for the future FB IDCC
 - Technical and quality criteria for the parallel run.

→ See the file enclosed for the table of contents of the FB IDCC approval package:

FBIDCC_Table of
contents_technical
and context
paper_v0.3.pdf



Consultation process

As stated in the formal request CWE TSOs received from CWE NRAs, the FB IDCC methodology currently being developed in CWE, will be treated as an extension of the original approval decision of the CWE NRAs in March 2015.

- However, while any improvements to the current CWE FBMC methodologies will be treated as an extension of the original approval, CWE NRAs insist that any improvements have to be compliant with the general and content-related objectives of the CACM Regulation

Consultation process

- TSOs will consult stakeholders on the draft FB IDCC methodology.
- To receive feedback from external stakeholders, CWE TSOs plan to launch the public consultation process on March 1st 2017.
 - MPs will be pre-informed on the content of the methodology and the consultation process during today's workshop
 - Consultation Document & survey will be made available to MPs via – most likely – JAO website and local TSO websites
- As agreed with NRAs, the Consultation Period will have a duration of 2 weeks.
- After the Consultation, CWE TSOs will carefully analyse the received responses and assemble all views in a Consultation Report.



Reminder objective of today's workshop:

- Explain the (complexity of the) FB IDCC method currently being developed;
- Provide insight in the activities performed and to share details of experimentation performed including high level results & conclusions;
- Provide an updated implementation planning;
- Inform MPs on the Consultation Period.

Next steps:

- CWE TSOs to continue drafting the CWE FB IDCC approval package, tacking into account today's feedback;
- CWE TSOs to finalize the preparations for the Consultation Period;
- CWE TSOs to prepare the implementation of CWE FB IDCC;
- CWE MPs to support the finalisation of the FB IDCC approval package & process.