**3GPP TSG-RAN WG1 Meeting #114 R1-23xxxxx**

**Toulouse, France, 21-25 August, 2023**

**Agenda Item: 9.17**

**Source: Moderator (Huawei)**

**Title: Summary of email discussion [Post114-38.212-Netw\_Energy\_NR-Core]**

**Document for: Discussion and Decision**

# Introduction

This document summarizes the discussions on the 38.212 draft CR on network energy saving for NR, and aims to stabilize the 38.212 draft CR.

[Post114-38.212-Netw\_Energy\_NR-Core] Email discussion on Rel-18 draft CRs by September 7 – Editors

# First round discussions

This section summarize the first round email discussions on [draft CR v00](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_114/Inbox/drafts/9.17%28Other%29/38.212%20draft%20CRs/%5BPost114-38.212-Netw_Energy_NR-Core%5D/R1-23xxxxx%20Introduction%20of%20Rel-18%20network%20energy%20saving%20for%20NR.docx). Companies are encouraged to provide the first round views by 09/05 (Tuesday), 6:00am UTC, then we can update the draft CR accordingly for the next step discussions.

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| --- | --- |
| *Company* | *View* |
| vivo | **Comment #1:**It would be better to write clearly regarding which CSI report #n can be replaced with CSI sub-report #n, so the CR can be modified as the following,**Suggested text change in section 6.3.1.1.2**: If csi-ReportSubConfig is configured, for a corresponding CSI sub-report, the mapping order of CSI fields of one CSI CSI sub-report is determined following the procedure in this clause 6.3.1.1.2, by replacing CSI report #n in the following ~~applicable tables~~ Table 6.3.1.1.2-7, Table 6.3.1.1.2-9, Table 6.3.1.1.2-10 with CSI sub-report #n.**Suggested text change in section 6.3.2.1.2**: If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the mapping order of CSI fields of one CSI CSI sub-report is determined following the procedure in this clause 6.3.2.1.2, by replacing CSI report #n in the following ~~applicable tables~~ Table 6.3.2.1.2-3, Table 6.3.2.1.2-4 with CSI sub-report #n.Further discussion is needed regarding whether NCJT CSI report can be combined with multi-CSI report. For subband CSI, please see Comment #2.[Chengyan]: It would be good to have explicit agreements on whether a specific table cannot be applicable to the CSI sub-report. Since no agreements in either way, the current approach is the simplest and most comprehensive. To be clearer and safer, let me add an editor note as below to keep it open: *Editor’s note: The applicability of tables other than Table 6.3.1.1.2-7, Table 6.3.1.1.2-9, Table 6.3.1.1.2-10 are to be further discussed. Further update can be done later if certain tables are precluded.* **Comment #2:**1. Regarding the mapping order of multiple CSI sub-reports in one CSI report, subband CSI of even subbands of all CSI sub-reports are prioritized over subband CSI of odd subbands of all CSI sub-reports within one CSI report configuration as shown in the following agreement:

**Agreement@114**For CSIs across multiple sub-configurations in one CSI reportConfig map different sub-configurations based on RAN1#114 agreement in 9.7.1* For Part 2 priority reporting level
	+ Option 1: for a given band type from {wideband, even subband, odd subband}, the omission order follows the priority order determined by sub-configuration index

But in current version of CR as shown in the following is not matched with the above agreement.Table 6.3.1.1.2-14: Mapping order of CSI reports to UCI bit sequence , with two-part CSI report(s)

|  |  |
| --- | --- |
| UCI bit sequence | CSI report number |
|  | CSI report #1, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10Bif CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10Bif CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10Bif CSI part 2 exists for CSI report #n |
| CSI report #1, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11Bif CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11Bif CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11Bif CSI part 2 exists for CSI report #n |
| Note: For a CSI report #i containing CSI sub-reports, where i=1,2,…,n,* all the CSI part 2 widebands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report priority values;
* after the mapping of all the CSI part 2 widebands of CSI sub-reports, all the CSI part 2 subbands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report priority values.
 |

In the current spec, mapping order of odd subbands and even subbands within each CSI report should refer to a Table 6.3.1.1.2-11/11A/11B, in which the even subbands of each report are mapped before the odd subbands of one CSI report. Table 6.3.1.1.2-11: Mapping order of CSI fields of one CSI report, CSI part 2 subband, *pmi-FormatIndicator=* *subbandPMI* or *cqi-FormatIndicator=subbandCQI*

|  |  |
| --- | --- |
| CSI report #nPart 2 subband | Subband differential CQI for the second TB of all even subbands with increasing order of subband number, as in Tables 6.3.1.1.2-3/4/5, if *cqi-FormatIndicator=subbandCQI* and if reported |
| PMI subband information fields  of all even subbands with increasing order of subband number, from left to right as in Tables 6.3.1.1.2-1/2, or codebook index for 2 antenna ports according to Clause 5.2.2.2.1 in [6, TS38.214] of all even subbands with increasing order of subband number, if *pmi-FormatIndicator=* *subbandPMI* and if reported |
| Subband differential CQI for the second TB of all odd subbands with increasing order of subband number, as in Tables 6.3.1.1.2-3/4/5, if *cqi-FormatIndicator=subbandCQI* and if reported |
| PMI subband information fields  of all odd subbands with increasing order of subband number, from left to right as in Tables 6.3.1.1.2-1/2, or codebook index for 2 antenna ports according to Clause 5.2.2.2.1 in [6, TS38.214] of all odd subbands with increasing order of subband number, if *pmi-FormatIndicator=* *subbandPMI* and if reported |

Note: Subbands for given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* are numbered continuously in the increasing order with the lowest subband of *csi-ReportingBand* as subband 0.Taking CSI report#1 as an example, if CSI report#1 has 3 CSI sub-reports, and if the CR is written as it is now, the mapping order of multiple CSI sub-reports would be{even subbands of CSI sub-report#1, odd subbands of CSI sub-report#1, even subbands of CSI sub-report#2, odd subbands of CSI sub-report#2, even subbands of CSI sub-report#3, odd subbands of CSI sub-report#3}, which is clearly not consistent with the current agreement. To explicitly describe the mapping order of the CSI sub-reports, then the mapping table would need to be modified like the NCJT, e.g., by adding a new Table 6.3.1.1.2-11CTable 6.3.1.1.2-11C: Mapping order of CSI fields of one CSI report, CSI part 2 subband, *pmi-FormatIndicator=* *subbandPMI* or *cqi-FormatIndicator=subbandCQI*

|  |  |
| --- | --- |
| CSI report #nPart 2 subband | Subband differential CQI for the second TB of all even subbands with increasing order of subband number for CSI sub-report#1, as in Tables 6.3.1.1.2-3/4/5, if *cqi-FormatIndicator=subbandCQI* and if reported |
| PMI subband information fields  of all even subbands with increasing order of subband number for CSI sub-report#1, from left to right as in Tables 6.3.1.1.2-1/2, or codebook index for 2 antenna ports according to Clause 5.2.2.2.1 in [6, TS38.214] of all even subbands with increasing order of subband number, if *pmi-FormatIndicator=* *subbandPMI* and if reported |
| …… |
| Subband differential CQI for the second TB of all even subbands with increasing order of subband number for CSI sub-report#n, as in Tables 6.3.1.1.2-3/4/5, if *cqi-FormatIndicator=subbandCQI* and if reported |
| PMI subband information fields  of all even subbands with increasing order of subband number for CSI sub-report#n, from left to right as in Tables 6.3.1.1.2-1/2, or codebook index for 2 antenna ports according to Clause 5.2.2.2.1 in [6, TS38.214] of all even subbands with increasing order of subband number, if *pmi-FormatIndicator=* *subbandPMI* and if reported |
| Subband differential CQI for the second TB of all odd subbands with increasing order of subband number for CSI sub-report#1, as in Tables 6.3.1.1.2-3/4/5, if *cqi-FormatIndicator=subbandCQI* and if reported |
| PMI subband information fields  of all odd subbands with increasing order of subband number for CSI sub-report#1, from left to right as in Tables 6.3.1.1.2-1/2, or codebook index for 2 antenna ports according to Clause 5.2.2.2.1 in [6, TS38.214] of all odd subbands with increasing order of subband number, if *pmi-FormatIndicator=* *subbandPMI* and if reported |
| …… |
| Subband differential CQI for the second TB of all odd subbands with increasing order of subband number for CSI sub-report#n, as in Tables 6.3.1.1.2-3/4/5, if *cqi-FormatIndicator=subbandCQI* and if reported |
| PMI subband information fields  of all odd subbands with increasing order of subband number for CSI sub-report#n, from left to right as in Tables 6.3.1.1.2-1/2, or codebook index for 2 antenna ports according to Clause 5.2.2.2.1 in [6, TS38.214] of all odd subbands with increasing order of subband number, if *pmi-FormatIndicator=* *subbandPMI* and if reported |

Note: Subbands for given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* are numbered continuously in the increasing order with the lowest subband of *csi-ReportingBand* as subband 0.[Chengyan]: I am aware of this potential issue. However, the agreements you cited is for Part 2 omission, which has been captured in 214. The current texts are for mapping purpose, and the following agreement applies* *CSI mapping rule across sub-configurations follow legacy specification principle*
* *The mapping order of CSI fields of one sub-configuration is as legacy mapping order of CSI fields of one CSI report;*

In addition, it seems at least one company/QC share this.Since the agreement is a bit broad, it is possible to handle this part in either way. However, it seems controversial on which way to go based on the comments from companies. Thus the issue may need further discussion in RAN1 first. Let’s keep it as it is for now, and let me add the editor’s note below to keep it open and update later if needed. *Editor’s note: Regarding the mapping order of even sub-band and odd sub-band, more discussion in RAN1 is needed first. The current description follows general legacy principle, however further update can be done depending on the outcome of the discussion in future RAN1 meetings.*1. The same problem also exists in Table 6.3.2.1.2-7 and a new table similar to Table 6.3.1.1.2-11C should be added as well.

[Chengyan]: Similar reply as above.  |
| ZTE, Sanechips | Comment 1:There is a mixed use of“from upper part to lower part in increasing order of CSI sub-report number.” and “from upper part to lower part in increasing order of CSI sub-report priority values”. we suggest to use the latter one, i.e., “order of CSI sub-report priority values”[Chengyan]: this is not a mixed use, but in order to be consistent with legacy case where CSI report number and CSI report priorities are separately used for single-part CSI (Table 6.3.1.1.2-12) and two-part CSI(Table 6.3.1.1.2-13/14). However, it can be updated to be clearer. Considering the priority is not defined in 214, for now we can take the similar idea from comment#4 from Samsung below. Please check the updated draft CR. Comment 2:A typo in highlight.“If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the mapping order of CSI fields of one CSI CSI sub-report is determined following the procedure in this clause 6.3.1.1.2, by replacing CSI report #n in the following applicable tables with CSI sub-report #n. ”[Chengyan]: Thanks. Will reflect in the next update.  |
| Samsung | **Comment 1#:** For DCI format 2\_9, UE is not configured with a block, instead, UE is configured with whether dynamic indication of cell DTX/DRX enabled for a serving cell by cellDTRX-DCI-config based on the agreement below. This parameter is different from the cell DTX/DRX configuration parameter. If a serving cell is configured with cell DTX/DRX, it does not mean that the activation/deactivation of the cell can be dynamically indicated in DCI format 2\_9.**Agreement*** An information block field of DCI format 2\_X is variable size either 1 or 2 bits.
	+ Higher layer signaling configures whether the activation/deactivation of cell DTX and/or cell DRX is indicated in DCI format 2\_X for a serving cell.
		- If both cell DTX and cell DRX are configured for a serving cell,
			* 1st bit corresponds to activation/deactivation of cell DTX configuration, and
			* 2nd bit corresponds to activation/deactivation of cell DRX configuration,
		- otherwise, the 1 bit corresponds to the configured cell DTX or cell DRX configuration.

[Chengyan]: As commented by LGE, the note in the same agreements indicate that there may be no dedicated new signaling. ***Agreement@114**** *An information block field of DCI format 2\_X is variable size either 1 or 2 bits.*
	+ *Higher layer signaling configures whether the activation/deactivation of cell DTX and/or cell DRX is indicated in DCI format 2\_X for a serving cell.*
		- *If both cell DTX and cell DRX are configured for a serving cell,*
			* *1st bit corresponds to activation/deactivation of cell DTX configuration, and*
			* *2nd bit corresponds to activation/deactivation of cell DRX configuration,*
		- *otherwise, the 1 bit corresponds to the configured cell DTX or cell DRX configuration.*
	+ *Note: this does not imply there may be separate higher layer signaling to enable L1 signaling based activation/deactivation for a cell DTX and/or cell DRX configuration. Signaling design is up to RAN2.*

Per the current draft CR, with *nes-RNTI* configured, it is expected that a UE would monitor the DCI format 2\_9 and the configuration of cell DTX/DRX would define a block. Therefore, “for the UE configured with the block” seems fine and the definition for Cell DTX/DRX indication should also be fine. On the other hand, given the ‘unstable’ status of *cellDTRX-DCI-config*, there could be a possibility later when aligning with RAN2 that *cellDTRX-DCI-config* should take place of the nes-RNTI for further determining the applicability of a configuration. Let me add the editor’s note below to keep it open for now. *Editor’s note: Per further discussion in RAN1/RAN2, a new RRC parameter, e.g. cellDTRX-DCI-config , may be introduced. If it is decided to introduce this parameter, further update can be done in TS 38.212 here.***Comment 2:** the text “The number of information bits in format 2\_9 shall be equal to or less than the payload size of format 2\_9. If the number of information bits in format 2\_9 is less than the size of format 2\_9, the remaining bits are reserved.” is the restriction for gNB, it should not be captured in 38.212, we suggest to remove.[Chengyan]: This is to reflect the following agreement for DCI size.***Agreement@114****DCI format 2\_X, for activation and deactivation of cell DTX and DRX configuration,* * *at least includes following fields,*
	+ *N information block field(s),*
	+ *Spare/reserved padding bits to match the size configured for DCI 2\_X (if needed)*

We suggest the following update7.3.1.3.10 Format 2\_9DCI format 2\_9 is used for activating or de-activating the cell DTX/DRX configuration of one or multiple serving cells for one or more UEs. The following information is transmitted by means of the DCI format 2\_9 with CRC scrambled by NES-RNTI:- block number 1, block number 2,…, block number *N* where the starting position of a block is determined by the parameter *positionInDCI-cellDTRX* provided by higher layers for the UE configured with ~~the block~~ *cellDTRX-DCI-config* for a serving cell.If the UE is configured with higher layer parameter *~~nes-RNTI~~ cellDTRX-DCI-config* for a serving cell, ~~one or more blocks are configured for the UE by higher layers, with~~ the following field is defined for ~~the~~ a corresponding block:- Cell DTX/DRX indication – 2 bits if higher layer parameter *~~cellDTXconfig~~* ~~and~~ *~~cellDRXconfig~~* cellDTRX-DCI-config configures ~~are~~ both ~~configured~~ cell DTX and cell DRX for a serving cell, with the MSB corresponding to cell DTX configuration and the LSB corresponding to cell DRX configuration; otherwise 1 bit when cellDTRX-DCI-config configures either *~~cellDTXconfig~~* ~~or~~ *~~cellDRXconfig~~* ~~is configured~~ cell DTX or cell DRX for a serving cell. The size of DCI format 2\_9 is indicated by the higher layer parameter *sizeDCI-2-9*. ~~The number of information bits in format 2\_9 shall be equal to or less than the payload size of format 2\_9. If the number of information bits in format 2\_9 is less than the size of format 2\_9, the remaining bits are reserved.~~**Comment 3#:** CRI field for section 6.3.1.1.2In section 6.3.1.1.2, the following description related to CSI fields are as follows: “the bitwdith of a CSI field of the CSI sub-report is determined following the procedure in this clause 6.3.1.1.2 by taking configurations in *CSI-ReportSubConfig* when applicable”.In our view, the above description is ok for most of the CSI fields except CRI field. In the case of type 2 SD adaptation, the actual CSI-RS sources indicated by a sub-configuration is a subset of CSI-RS configured within the CSI-RS resource set. The bitwidth of CRI field should be determined based on the CSI-RS resources indicated by the corresponding sub-configuration rather than the CSI-RS resources within resource set.Hence, the following change in section 6.3.1.1.2 is suggested:“If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the bitwdith of a CSI field of the CSI sub-report is determined following the procedure in this clause 6.3.1.1.2 by taking configurations in CSI-ReportSubConfig when applicable. If *csi-ReportSubConfig* indicates a list of CSI-RS resource IDs, for the determination of the bitwdith of a CRI field, the value of  is the number of CSI-RS resources indicated by the list provided *csi-ReportSubConfig*.”[Chengyan]: Thanks, will reflect in the next update. **Comment 4#:** Table 6.3.1.1.2-12A note is added to table using the “increasing order of CSI sub-report number” for the ordering of CSI for sub-configurations. However, there is no definition of CSI sub-report number. Instead, the sub-configuration corresponding to the CSI sub-report is well defined in the agreement. Hence the following revision is suggested.Under the Table 6.3.1.1.2-12: “Note: For a CSI report #i containing CSI sub-reports, where i=1,2,…,n, all CSI sub-reports within the CSI report #i are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of sub-configuration index configured for the corresponding CSI sub-report ~~number~~.”.[Chengyan]: Please check my reply to ZTE above. **Comment 5#:** Table 6.3.1.1.2-13The mentioned of priority level of sub-configuration is not necessary since there is no agreement to support sub-configuration omission rule for single part CSI or part 1 CSI. Hence, it is more appropriate to use the ordering of sub-configuration index for the ordering instead of priority level of sub-configurations. Hence, the following change is suggested.Under the Table 6.3.1.1.2-13: “, and CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #n in Table 6.3.1.1.2-13 correspond to the CSI sub-reports in increasing order of the corresponding configured sub-configuration index ~~CSI sub-report priority values according to clause x.x.x of [6, TS38.214].~~”.[Chengyan]: Please check my reply to ZTE above. **Comment 6#:** Table 6.3.1.1.2-14We echo the comment from vivo. The current note under Table 6.3.1.1.2-14 does not reflect the agreement in RAN1#114. In RAN1#114, the following agreement was made with the understanding that the order of wideband, even subband and odd subband CSI are mapped as legacy and for each band type, CSI within one report is ordered based on sub-configuration index.Agreement (RAN1#114)For CSIs across multiple sub-configurations in one CSI reportConfig map different sub-configurations based on RAN1#114 agreement in 9.7.1* For Part 2 priority reporting level
	+ Option 1: for a given band type from {wideband, even subband, odd subband}, the omission order follows the priority order determined by sub-configuration index

The current implementation of the spec only treats {wideband, subband} in the same level but not {wideband, even subband, odd subband} in the same level. This gives the sub-configuration index higher priority than the priority of even/odd subband, which is not aligned with the above agreement.Hence, adding a new table as suggested by vivo work for us as well. Alternatively, the following revision can be considered to reflect the agreement mentioned above.

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| Note: For a CSI report #i containing CSI sub-reports, where i=1,2,…,n,* all the CSI part 2 widebands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report priority values;
* after the mapping of all the CSI part 2 widebands of CSI sub-reports, all the even subbands of CSI part 2 subbands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report priority values.
* after the mapping of all the CSI part 2 widebands of CSI sub-reports and after the mapping of all the even subbands of CSI part 2 subbands of CSI sub-reports, all the odd subbands of CSI part 2 subbands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report priority values.
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[Chengyan]: Please check my reply to vivo above. **Comment 7#:** CRI field for section 6.3.2.1.2Similar comments as **Comment#3** for 6.3.1.1.2**Comment 8#:** Table 6.3.2.1.2-6Similar comments as **Comment#5** for 6.3.1.1.2**Comment 9#:** Table 6.3.2.1.2-7Similar comments as **Comment#6** for 6.3.1.1.2[Chengyan]: Please check my reply above.  |
| LG Electronics | Thank you very much for providing the draft CRs.I have a different view on **Comment#1** from Samsung.The previous RAN1 agreement captured by Samsung does not contain full texts.**Agreement*** An information block field of DCI format 2\_X is variable size either 1 or 2 bits.
	+ Higher layer signaling configures whether the activation/deactivation of cell DTX and/or cell DRX is indicated in DCI format 2\_X for a serving cell.
		- If both cell DTX and cell DRX are configured for a serving cell,
			* 1st bit corresponds to activation/deactivation of cell DTX configuration, and
			* 2nd bit corresponds to activation/deactivation of cell DRX configuration,
		- otherwise, the 1 bit corresponds to the configured cell DTX or cell DRX configuration.
	+ Note: this does not imply there may be separate higher layer signaling to enable L1 signaling based activation/deactivation for a cell DTX and/or cell DRX configuration. Signaling design is up to RAN2.

As shown in the Note, the corresponding RAN1 agreement doesn’t necessarily mean that a separate RRC signaling will be introduced. Rather, during RRC parameter discussion in RAN1, several companies already pointed out that the separate RRC signaling is not necessary. In that sense, the current CR is more aligned with the RAN1 agreement in my view.[Chengyan]: Please check my reply to Samsung above. |
| Qualcomm | **Comment 1**: Typo in the following text in 6.3.1.1.2. Similar typo can be found in 6.3.2.1.2.If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the bitwdith of a CSI field of the CSI sub-report is determined following the procedure in this clause 6.3.1.1.2 by taking configurations in *CSI-ReportSubConfig* when applicable. [Chengyan]: Thanks. Will reflect in the next update. **Comment 2**: share the same comments with Comment 1 from vivo for 6.3.1.1.2 – we should call out the related tables explicitly. Furthermore, only tables as pointed out by vivo are needed.Similar comments are also applied to the following text in 6.3.2.1.2If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the mapping order of CSI fields of one CSI CSI sub-report is determined following the procedure in this clause 6.3.2.1.2, by replacing CSI report #n in the following applicable tables with CSI sub-report #n. [Chengyan]: Please check my reply to vivo above. **Comment 3**: On Part 2 CSI sub-band, the current version of CR is aligned with our understandings. We don’t agree with suggestion on Part 2 CSI sub-band update that vivo provided in their Comment 2. The quoted agreement is for Part 2 CSI omission only. |
| Samsung2 | Regarding LG’s comment, we cannot agree. Regarding the note, in our understanding, it should be interpreted that with the agreed NEW higher layer parameter, separate higher layer signaling to enable L1 signaling may not be needed. With LG’s understanding, the agreement should be formulated as “if cell is configured with cell DTX/DRX (which is already agreed in RAN2), the activation/deactivation of cell DTX and/or cell DRX is indicated in DCI format 2\_X.” This makes the feature of activation/deactivation mandatory with a result of unnecessary restriction for gNB. In addition, separate UE capability may be required to support the dynamic indication/activation, the dynamic indication of activation/deactivation should not be based on the configuration of cell DTX/DRX operation.[Chengyan]: Please check my reply above.  |
| Ericsson | **Comment #1**We think that all of the following paragraph should be in square brackets since the RRC parameter *csi-ReportSubConfig* is so far undefined. Furthermore, it is not clear what “taking configurations in *CSI-ReportSubConfig* when applicable” means.If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the bitwdith of a CSI field of the CSI sub-report is determined following the procedure in this clause 6.3.1.1.2 by taking configurations in *CSI-ReportSubConfig* when applicable. [Chengyan]: The CR will be submitted to RAN this time, we cannot leave bracket there. In addition, as you can see I already have the following editor’s note in the draft CR to clarify further update can be done once formal agreement is available. *Editor’s note: Further update if needed can be done depending on the final RRC parameter structures* **Comment #2**Regarding vivo’s comment:*“Further discussion is needed regarding whether NCJT CSI report can be combined with multi-CSI report. For subband CSI, please see Comment #2.”*Our understanding is that at least for Rel-18, this combination is not supported, since we have had no discussion on NES for multi-TRP. Clearly, such a combination would need agreements on how to combine multiple CSIs for multi-TRP with multiple CSIs due to sub-configurations. We are not against such functionality; it’s just that it has not been discussed at all during the WI, so it’s hard to include this in maintenance.[Chengyan]: Please check my reply to vivo above**Comment #3 (Section 6.3.1.1.2)**Regarding the following If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the mapping order of CSI fields of one CSI CSI sub-report is determined following the procedure in this clause 6.3.1.1.2, by replacing CSI report #n in the following applicable tables with CSI sub-report #n. We’d like to receive clarification: Does this restrict operation to just a single *CSI-ReportConfig*? According to legacy behavior, a trigger state can trigger more than one CSI-ReportConfig, and we don’t think this legacy behavior should be precluded.[Chengyan]: There is no any restriction here. Here is just to clarify the procedure for a CSI sub-report. **Comment #4**We have a similar comment as vivo’s Comment #1 that “applicable tables” in the following paragraph needs clarification. Which tables are applicable? This should be spelled out.If *csi-ReportSubConfig* is configured, for a corresponding CSI sub-report, the mapping order of CSI fields of one CSI CSI sub-report is determined following the procedure in this clause 6.3.1.1.2, by replacing CSI report #n in the following applicable tables with CSI sub-report #n. [Chengyan]: Thanks. Please check my reply to vivo above.**Comment #5**We echo vivo’s comment that the following agreement does not seem to be captured.**Agreement**For CSIs across multiple sub-configurations in one CSI reportConfig map different sub-configurations based on RAN1#114 agreement in 9.7.1* For Part 2 priority reporting level
	+ Option 1: for a given band type from {wideband, even subband, odd subband}, the omission order follows the priority order determined by sub-configuration index

Similar to vivo and Samsung, we also expected that new tables would need to be introduced, following a similar principle as for multi-TRP.[Chengyan]: Thanks. Please check my reply to vivo above.**Comment #6**Regarding the following text:where CSI report #1, CSI report #2, …, CSI report #n in Table 6.3.1.1.2-13 correspond to the CSI reports in increasing order of CSI report priority values according to Clause 5.2.5 of [6, TS38.214], and CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #n in Table 6.3.1.1.2-13 correspond to the CSI sub-reports in increasing order of CSI sub-report priority values according to clause x.x.x of [6, TS38.214]. It is not clear to us how the CSI sub-report priority values are obtained. It does seem that there is a clause in 38.214 that defines this.[Chengyan]: Thanks. Please check my reply to ZTE above. |
| LG Electronics2 | **@ Samsung,**Thanks for the follow-up comments.As agreed, UE can be configured with the starting position of a block for a serving cell. For instance, if a UE is associated with 4 serving cells configured with cell DTX/DRX, the UE can be configured with the starting position of a block for 2 serving cells while not configured for the other 2 serving cells. By using this higher layer signaling, gNB can enable L1 based cell DTX/DRX activation, without introducing additional/separate RRC parameter (such as cellDTRX-DCI-config in Samsung’s comment).[Chengyan]: Thanks. Please check my reply to Samsung above. |
| Samsung3 | **@LG**Thank you LG for further clarification. We agree with your comment “For instance, if a UE is associated with 4 serving cells configured with cell DTX/DRX, the UE can be configured with the starting position of a block for 2 serving cells while not configured for the other 2 serving cells.”In our understanding based on the latest version of RRC parameters, cellDTRX-DCI-config is the parameter to configured the 2 serving cells as mentioned in LG’s example. However, *cellDTXconfig* and *cellDRXconfig* are used to configure the 4 serving cells in LG’s example. cellDTRX-DCI-config is the parameter to enable L1 signalling as clarified in the table below.The current text uses *cellDTXconfig* and *cellDRXconfig* which are used for RRC based cell DTX/DRX operation*,* this is not correct in our understanding.

|  |  |  |
| --- | --- | --- |
| cellDTXConfig | New | Include the configuration for cell DTX operation for at least one cell DTX pattern case, of a serving cell. |
| cellDRXConfig | New | Include the configuration for Cell DRX operation for at least one cell DRX pattern case, of a serving cell. |
| cellDTRX-DCI-config | New | Include the configuration for new DCI format 2\_X for activation/deactivation of cell DTX/DRX configuration of one or multiple serving cells. |

[Chengyan]: Thanks. Please check my reply above. |
| LG Electronics3 | **@ Samsung,**Thank you for the further comments.However, it doesn’t seem that my comment is well understood.

|  |
| --- |
| The following information is transmitted by means of the DCI format 2\_9 with CRC scrambled by NES-RNTI:- block number 1, block number 2,…, block number *N* where the starting position of a block is determined by the parameter *positionInDCI-cellDTRX* provided by higher layers for the UE configured with the block.If the UE is configured with higher layer parameter *nes-RNTI*, one or more blocks are configured for the UE by higher layers, with the following field defined for the block:- Cell DTX/DRX indication – 2 bits if higher layer parameter *cellDTXconfig* and *cellDRXconfig* are both configured for a serving cell, with the MSB corresponding to cell DTX configuration and the LSB corresponding to cell DRX configuration; otherwise 1 bit when either *cellDTXconfig* or *cellDRXconfig* is configured for a serving cell.  |

In my example that “the UE can be configured with the starting position of a block for 2 serving cells while not configured for the other 2 serving cells”, UE will follow the above highlighted part for 2 serving cells configured with *positionInDCI-cellDTRX* while UE doesn’t have to follow the above highlighted part for the other 2 serving cells not configured with *positionInDCI-cellDTRX*. Thus, the higher layer parameter *positionInDCI-cellDTRX* is sufficient and cellDTRX-DCI-config is NOT necessary.[Chengyan]: Thanks. Please check my reply above. |
| Samsung4 | **@LG**Thank you LG for the follow up.We do NOT agree that cellDTRX-DCI-config is NOT necessary.cellDTRX-DCI-config is used to configure 1 or 2 bits, for example, a cell is configured with both cell DTX and cell DRX, it does not mean that the DCI always indicates activation/deactivation of both cell DTX and cell DRX. For example, cell DTX can be dynamically indicated based on the traffic arriving at gNB while cell DRX can follow the semi-static pattern. This has been clarified during the discussion of last meeting, and it is the reason to have the following sub-bullet in the agreement.* + Higher layer signaling configures whether the activation/deactivation of cell DTX and/or cell DRX is indicated in DCI format 2\_X for a serving cell.

[Chengyan]: Thanks. Please check my reply above. |
| LG Electronics4 | **@ Samsung,**Although I could understand what Samsung is suggesting, I disagree that the current agreement can be interpreted as Samsung’s. From my understanding, if a serving cell is configured with cell DTX or cell DRX, then 1 bit will be allocated in DCI 2\_9 for the serving cell. On the other hand, if a serving cell is configured with both cell DTX and cell DRX, then 2 bits will be allocated in DCI 2\_9 for the serving cell. To cover these two cases, I thought “and/or” was written in the RAN1 agreement.It seems that it would be better to hear other companies’ views.[Chengyan]: Thanks. Please check my reply above. |

# Second round discussions

Please find the updated [draft CR v2](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_114/Inbox/drafts/9.17%28Other%29/38.212%20draft%20CRs/%5BPost114-38.212-Netw_Energy_NR-Core%5D/R1-23xxxxx%20Introduction%20of%20Rel-18%20network%20energy%20saving%20for%20NR%20v2.docx) based on inputs from the first round. Companies are encouraged to provide the second round views ASAP, the latest by 09/07 (Thursday), 3:00am UTC if any.

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| *Company* | *View* |
| vivo | Thank Editor for the response and update. Here are our further comments:**Comment #1:**Thanks for providing the following agreement for mapping. * *CSI mapping rule across sub-configurations follow legacy specification principle*
* *The mapping order of CSI fields of one sub-configuration is as legacy mapping order of CSI fields of one CSI report;*

In our understanding, the first bullet means that CSI mapping across sub-configurations follow legacy principle where a report includes multiple CSIs, i.e., NJCT. In NJCT case, the mapping order of part 2 CSI is wideband CSI for all CSIs, even subband CSI for all CSIs and odd subband CSI for all CSIs.The intention of the second bullet means in each part (i.e., wideband, even subband or odd subband), the order of CSI fields follows legacy order.Besides, in legacy case, mapping order is always aligned with omission priority, i.e., the omission CSIs would be always at the end of mapped UCIs. If it is not aligned, there will occur the case that middle bits of mapped UCIs would be omitted first, which will make UE implementation more complex.However, I understand that the above agreement is too general as editor mentions. if this can’t achieve common understanding, we can live with Editor’s note without the following highlighted part:Table 6.3.1.1.2-14: Mapping order of CSI reports to UCI bit sequence , with two-part CSI report(s)

|  |  |
| --- | --- |
| UCI bit sequence | CSI report number |
|  | CSI report #1, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10Bif CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10Bif CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10Bif CSI part 2 exists for CSI report #n |
| CSI report #1, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11Bif CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11Bif CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11Bif CSI part 2 exists for CSI report #n |
| Note: For a CSI report #i containing CSI sub-reports, where i=1,2,…,n,* all the CSI part 2 widebands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report number;
* ~~after the mapping of all the CSI part 2 widebands of CSI sub-reports, all the CSI part 2 subbands of CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report number.~~
* CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #n correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*.
 |

**Comment #2:**It seems that Editor’s note is missing for the following table in Section 6.3.2.1.2.Similar with Comment#1, the highlighted part should be removed.Table 6.3.2.1.2-7: Mapping order of CSI reports to UCI bit sequence , with two-part CSI report(s)

|  |  |
| --- | --- |
| UCI bit sequence | CSI report number |
|  | CSI report #1, CSI part 2 wideband, as in Table 6.3.2.1.2-4/4A/4B,or CSI part 2 with group 0, as in Table 6.3.2.1.2-5A/5B,if CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 wideband, as in Table 6.3.2.1.2-4/4A/4B,or CSI part 2 with group 0, as in Table 6.3.2.1.2-5A/5B,if CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 wideband, as in Table 6.3.2.1.2-4/4A/4B,or CSI part 2 with group 0, as in Table 6.3.2.1.2-5A/5B,if CSI part 2 exists for CSI report #n |
| CSI report #1, CSI part 2 subband, as in Table 6.3.2.1.2-5/5C/5D,or CSI part 2 with group 1 and 2, as in Table 6.3.2.1.2-5A/5B,if CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 subband, as in Table 6.3.2.1.2-5/5C/5D,or CSI part 2 with group 1 and 2, as in Table 6.3.2.1.2-5A/5B,if CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 subband, as in Table 6.3.2.1.2-5/5C/5D,or CSI part 2 with group 1 and 2, as in Table 6.3.2.1.2-5A/5B,if CSI part 2 exists for CSI report #n |
| Note: For a CSI report #i containing CSI sub-reports, where i=1,2,…,n,* CSI part 2 wideband of all CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report number;
* ~~after the mapping of CSI part 2 wideband of all CSI sub-reports, CSI part 2 subband of all CSI sub-reports are mapped to the corresponding part of UCI bit sequence of CSI report #i, from upper part to lower part in increasing order of CSI sub-report number.~~
* CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #n correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*.
 |

 |
| Samsung | **Comment #1：**UE monitoring DCI format 2\_9 should not depend on the configuration of nes-RNTI because 1) There is no explicit agreement to support this behaviour and 2) nes-RNTI can be used for scrambling other DCI format in the later release. Therefore, we cannot agree with editor’s reply “with *nes-RNTI* configured, it is expected that a UE would monitor the DCI format 2\_9 and the configuration of cell DTX/DRX would define a block. Therefore, “for the UE configured with the block” seems fine and the definition for Cell DTX/DRX indication should also be fine.” Our concern in the first round is not resolved and we can NOT accept the highlight text below in the draft CR even with the editor note.

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| The following information is transmitted by means of the DCI format 2\_9 with CRC scrambled by NES-RNTI:- block number 1, block number 2,…, block number *N* where the starting position of a block is determined by the parameter *positionInDCI-cellDTRX* provided by higher layers for the UE configured with the block.If the UE is configured with higher layer parameter *nes-RNTI*, one or more blocks are configured for the UE by higher layers, with the following field defined for the block: |

**Comment #2:** Dynamic activation/deactivation of a cell DTX/DRX does not depend on the configuration of starting bit position based on the agreement below. The highlight text clarifies that starting bit position is only configured for cell configured with L1 signaling. It cannot be interpreted that starting bit position is the RRC parameter to enable the configuration of L1 signalling. In addition, Agreement #2 is made after Agreement #1, the Higher layer signaling in Agreement #1 cannot be interpreted as starting bit position when agreeing on Agreement#1.Also, the RRC parameters cellDTXConfig/ cellDRXConfig cannot be used to enable the configuration of L1 signalling as clarified in the first round. This is also mentioned in LG’s example that 4 cells are configured with cell DTX/DRX and 2 cells are configured with L1 signalling activation/deactivation.Based on the above, cellDTRX-DCI-config is the ONLY choice to enable the configuration of L1 signalling.**Agreement #2**For each serving cell configured with L1 signaling based activation/deactivation of cell DTX and/or cell DRX configuration, starting bit position of an information block of DCI format 2\_X is provided by UE specific higher layer signaling.**Agreement #1*** An information block field of DCI format 2\_X is variable size either 1 or 2 bits.
	+ Higher layer signaling configures whether the activation/deactivation of cell DTX and/or cell DRX is indicated in DCI format 2\_X for a serving cell.
		- If both cell DTX and cell DRX are configured for a serving cell,
			* 1st bit corresponds to activation/deactivation of cell DTX configuration, and
			* 2nd bit corresponds to activation/deactivation of cell DRX configuration,
		- otherwise, the 1 bit corresponds to the configured cell DTX or cell DRX configuration.
	+ Note: this does not imply there may be separate higher layer signaling to enable L1 signaling based activation/deactivation for a cell DTX and/or cell DRX configuration. Signaling design is up to RAN2.

Therefore, we can NOT accept the highlight text below in the draft CR

|  |
| --- |
| Cell DTX/DRX indication – 2 bits if higher layer parameter *cellDTXconfig* and *cellDRXconfig* are both configured for a serving cell, with the MSB corresponding to cell DTX configuration and the LSB corresponding to cell DRX configuration; otherwise 1 bit when either *cellDTXconfig* or *cellDRXconfig* is configured for a serving cell. |

**Comment #3 We understand the intention of** the text “The number of information bits in format 2\_9 shall be equal to or less than the payload size of format 2\_9. If the number of information bits in format 2\_9 is less than the size of format 2\_9, the remaining bits are reserved.” is to capture the highlight text below as clarified by Editor. However, as we clarified in the first round, this is the restriction for gNB, it can be captured in 38.331, but it should not be captured in 38.212. We still suggest to remove it.***Agreement@114****DCI format 2\_X, for activation and deactivation of cell DTX and DRX configuration,* * *at least includes following fields,*
	+ *N information block field(s),*
	+ *Spare/reserved padding bits to match the size configured for DCI 2\_X (if needed)*

Based on the above 3 comments, we suggest editor to reconsider our proposed TP below.7.3.1.3.10 Format 2\_9DCI format 2\_9 is used for activating or de-activating the cell DTX/DRX configuration of one or multiple serving cells for one or more UEs. The following information is transmitted by means of the DCI format 2\_9 with CRC scrambled by NES-RNTI:- block number 1, block number 2,…, block number *N* where the starting position of a block is determined by the parameter *positionInDCI-cellDTRX* provided by higher layers for the UE configured with ~~the block~~ *cellDTRX-DCI-config* for a serving cell.If the UE is configured with higher layer parameter *~~nes-RNTI~~ cellDTRX-DCI-config* for a serving cell, ~~one or more blocks are configured for the UE by higher layers, with~~ the following field is defined for ~~the~~ a corresponding block:- Cell DTX/DRX indication – 2 bits if higher layer parameter *~~cellDTXconfig~~* ~~and~~ *~~cellDRXconfig~~* cellDTRX-DCI-config configures ~~are~~ both ~~configured~~ cell DTX and cell DRX for a serving cell, with the MSB corresponding to cell DTX configuration and the LSB corresponding to cell DRX configuration; otherwise 1 bit when cellDTRX-DCI-config configures either *~~cellDTXconfig~~* ~~or~~ *~~cellDRXconfig~~* ~~is configured~~ cell DTX or cell DRX for a serving cell. The size of DCI format 2\_9 is indicated by the higher layer parameter *sizeDCI-2-9*. ~~The number of information bits in format 2\_9 shall be equal to or less than the payload size of format 2\_9. If the number of information bits in format 2\_9 is less than the size of format 2\_9, the remaining bits are reserved.~~**Comment #4** (The order of part 2 CSI)In terms of the order of part 2 CSI, we share similar view with vivo. The order of CSI omission priority and the order of CSI should be consistent. Otherwise, it complicates the procedure of CSI omission. For example, with the consistent ordering between CSI mapping and CSI omission priority, the omission of CSI can be done by the truncation of information bits. However, if those order are not consistent, additional operation is needed to select proper low priority information bits from different segments of CSI, which is unintended.Hence, it is preferred that either adding new table (as suggested by vivo) or further clarify that even subband CSI (of all sub-configurations of a report) is ahead of odd subband CSI (of all sub-configurations of the report) in subband CSI.  |
| **Lenovo** | Thanks for the good effort in preparing the updated TS draft. Regarding the introduction of sub-report, we are OK with that and see it as a good approach. However, there are two agreements in RAN1#114 which state that:* + *For Part 2 CSI corresponding to each sub-configuration, omission is at subConfig level. Follow legacy dropping rules for a CSI report containing multiple CSIs.*
		- *CSI mapping rule across sub-configurations follow legacy specification principle*

AND*Option 1: for a given band type from {wideband, even subband, odd subband}, the omission order follows the priority order determined by sub-configuration index*In light of that, in the presence of K sub-reports, our understanding is that CSI Part 1 should include K sub-parts, CSI Part 2 WB should include K subparts, CSI Part 2 SB even should include K subparts and finally CSI Part 2 SB odd also includes K subparts, In that regards the CSI sub-report is multiplexed in each of the legacy CSI report parts. We are fine with whatever wording the editor sees convenient.We are also fine with vivo’s suggestion which captures similar behavior |
| LG Electronics | Thank you very much for addressing our comments. We are fine with adding a note to *nes-RNTI*.Again, we are against Samsung’s comment #2.To be specific, we disagree with the Samsung’s comment saying that “cellDTRX-DCI-config is the ONLY choice to enable the configuration of L1 signalling.”.Let me take an example:A UE is configured with 4 serving cells for which cell DTX/DRX is configured.If the UE is configured with nes-RNTI and configured with the parameter *positionInDCI-cellDTRX* for serving cells #0 and 1 but not for serving cells #2 and 3,* For serving cells #0 and 1, DCI format 2\_9 provides (de)activation of cell DTX/DRX
* For serving cells #2 and 3, cell DTX/DRX (de)activation is performed by RRC signaling.

Thus, gNB can enable L1 based signaling per serving cell without using a separate RRC parameter (e.g., cellDTRX-DCI-config).Regarding the note (“this does not imply there may be separate higher layer signaling to enable L1 signaling based activation/deactivation for a cell DTX and/or cell DRX configuration. Signaling design is up to RAN2.”), it was clarified that this note is applied not only for Agreement#1 but also for Agreement#2 during online session, by the moderator.In that sense, we still don’t think a separate RRC parameter is necessary to enable L1 signaling.If Samsung sustains their concerns on this matter, our suggestion is as follows and to continue discussion next meeting.The following information is transmitted by means of the DCI format 2\_9 with CRC scrambled by NES-RNTI:- block number 1, block number 2,…, block number *N* where the starting position of a block is determined by the parameter *positionInDCI-cellDTRX* provided by higher layers for the UE.If one or more blocks are configured for the UE by higher layers, the following field is defined for the block:- Cell DTX/DRX indication – 2 bits if higher layer parameter *cellDTXconfig* and *cellDRXconfig* are both configured for a serving cell, with the MSB corresponding to cell DTX configuration and the LSB corresponding to cell DRX configuration; otherwise 1 bit when either *cellDTXconfig* or *cellDRXconfig* is configured for a serving cell.  |