3GPP TSG-RAN WG3 Meeting #110-e R3-206878

E-meeting, 2 – 12 November, 2020

**Agenda item: 10.2.1.2**

**Source: Ericsson (moderator)**

**Title: CB: # 1002\_SONMDT\_EnergyEff - Summary of email discussion**

**Document for: Approval**

# 1 Introduction

This paper provides summary of discussions at RAN#110-e on:

**CB: # 1002\_SONMDT\_EnergyEff**

**- Attempt to agree on EE granularity: gNB level vs. gNB/DU/UP level**

**- If there is an agreement, discuss the TP**

(E/// - moderator)

# 2 For the Chairman’s Notes

[To be completed]

# 3 Discussion

SA5 replied to RAN3 with an LS in [1]. The LS from SA5 reports the following answers relevant to this discussion:

1. *With regard to the following (excerpt from R3-205657):*

*‟RAN3 would like to point out that if gNB-DUs are distributed in different sites, the metric above is not able to measure energy efficiency per site.”*

*⇒ In Release 16, SA5 did not aim to define per RAN site EE KPI. Instead, SA5 aimed at defining per gNB EE KPI, as per ETSI ES 203 228.*

[…]

1. *With regard to the following (excerpt from R3-205657):*

*‟RAN3 has converged on the following agreements:*

*In split gNB architecture Energy Efficiency measurements are calculated based on RLC SDU Data Volume measurements; non-split architecture is FFS*

*Therefore, RAN3 would like to ask SA5 whether it is feasible to specify data volume reporting at RLC SDU level. ”*

*⇒ SA5 currently has no plan to define EE KPI per site either in its Rel-16 work item EE\_5G or in its Rel-17 work item EE5GPLUS, therefore so far SA5 does not see the need to specify the performance measurements related to RLC SDU Data Volume for the EE KPI per gNB. SA5 thinks it’s not within 3GPP scope to define any site EE KPI, as sites can be composed of various types of ‘equipment’, incl. belonging to the mobile network, fixed network, site equipment, edge computing, etc.*

1. *With regard to the following (excerpt from R3-205657):*

*‟RAN3 would also like to ask SA5 to evaluate whether the* *UL/DL PDCP SDU Data Volume per interface measurements in clause 5.1.3.6.2.2 and clause 5.1.3.6.2.3 of TS 28.552 can be used to calculate the data volume consumed at a gNB-DU.”*

*⇒ The UL/DL PDCP SDU Data Volume per interface measurements in clause 5.1.3.6.2.2 and clause 5.1.3.6.2.3 of TS 28.552 are measured at the gNB-CU-UP level, i.e. with no per gNB-DU split. Consequently, they can’t be used to calculate the data volume consumed at a gNB-DU.*

In [2] and [3] it is proposed to define measure of Energy Efficiency “per gNB, per gNB-DU, per gNB-UP”. The papers mention that “related measurements defined in TS28.552 [45] for a 5G Physical Network Function can be used, combined with data volume measurements”.

However, the LS from SA5 clearly states that

*In Release 16, SA5 did not aim to define per RAN site EE KPI. Instead, SA5 aimed at defining per gNB EE KPI, as per ETSI ES 203 228.*

And

*SA5 currently has no plan to define EE KPI per site either in its Rel-16 work item EE\_5G or in its Rel-17 work item EE5GPLUS, therefore so far SA5 does not see the need to specify the performance measurements related to RLC SDU Data Volume for the EE KPI per gNB.*

SA5 also specified that

*The UL/DL PDCP SDU Data Volume per interface measurements in clause 5.1.3.6.2.2 and clause 5.1.3.6.2.3 of TS 28.552 are measured at the gNB-CU-UP level, i.e. with no per gNB-DU split. Consequently, they can’t be used to calculate the data volume consumed at a gNB-DU.*

Therefore, it appears that SA5 deemed as not feasible to define Energy Efficiency measurements that have a finer granularity than per gNB. SA5 has also clarified that there would be no data volume measurements currently defined to calculate per gNB-DU Energy Efficiency.

In [4] the answers from SA5 have been taken into account and it has been proposed to agree in RAN3 that measurement of EE at gNB level is sufficient and that no further enhancements to the standard is needed to achieve per gNB EE measurements, i.e. all the measurements needed are already defined by SA5.

**It is proposed to agree that measurement of EE at gNB level is sufficient and that no further enhancements to the standard is needed to achieve per gNB EE measurements**

**Companies are invited to state their position towards the above proposal.**

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| --- | --- |
| Company | Comment |
| Ericsson | Agree to the proposal |
| Huawei | Agree to the proposal |
| Qualcomm | Agree |
| CMCC | Agree |
| ZTE | There are some confusion for per gNB EE measurement:  1 In LS , “SA5 aimed at defining per gNB EE KPI, as per ETSI ES 203 228”, but in the TS28.554 , the EE KPI is defined for a subnetwork, so it introduce confusion that how to use this formula to calculate MN site or SN site EE in the case of DC or how to calculate a gNB EE in the case of one CU-UP shared by different gNB.  2 It is possible to deploy a gNB-CU with multiple DUs to cover a very large area, in this case, the calculated gNB EE KPI is a high level network EE KPI. Considering the energy saving is achieved by cell switching on/off, the high level network EE is useless for most energy saving algorithm..  3 For a gNB deployed only for URLLC vertical services, the data volume measured at RLC is possible very different with measured at UP,due to the PDCP entity may inform some RLC entity(ies) of the DRB configured with duplication to discard these successfully delivered packets at another leg. We don't think the energy wasted by discard packet should be ignored.  4 Therefore we propose to use the PEE(Power, Energy and Environmental) related measurements defined in TS28.552 for a 5G Physical Network Function to calculate energy efficiency of a physical RAN node, combined with some data volume measurements? In fact, this is already done in some implementations.  So, We suggest to send an LS to SA5 for clarification. |
| Lenovo, Motorola Mobility | Agree |
| Samsung | Agree |

If companies agree to the proposal above, it is proposed to close discussions on Energy Efficiency in the Enhancement of Data Collection for SON/MDT in NR WI and to LS back to SA5 the decisions taken by RAN3.

**Companies are invited to state their position towards the above proposal.**

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| --- | --- |
| Company | Comment |
| Ericsson | Agree to close the topic of Energy Efficiency in the Enhancement of Data Collection for SON/MDT in NR WI and to LS back to SA5 the decisions taken by RAN3 |
| Huawei | Agree. |
| Qualcomm | Agree |
| CMCC | OK |
| Lenovo, Motorola Mobility | Agree |
| Samsung | Agree |

# 4 Conclusion, Recommendations [if needed]

If needed

# 5 References

[1] R3-206921, Reply LS on energy efficiency (SA WG5)

[2] R3-206692, Further Discussion on RAN energy efficiency (ZTE, China Unicom ,China Telecom)

[3] R3-206693, (TP for SON BL CR for TS 38.300) RAN energy efficiency (ZTE, China Unicom ,China Telecom)

[4] R3-206507, Way forward on Energy Efficiency (Ericsson)