**3GPP TSG-SA5 Meeting #162 *S5-253904***

Goteborg, Sweden, 25 - 29 August 2025

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.554** | **CR** | **0241** | **rev** | **1** | **Current version:** | **19.4.1** |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)*** *on using this form: comprehensive instructions can be found at  <http://www.3gpp.org/Change-Requests>.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Rel-19 CR 28.554 Add operator-specific energy consumption and energy efficiency KPIs for MOCN scenario | | | | | | | | | |
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| ***Source to WG:*** | China Unicom | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | PM\_KPI\_5G\_Ph4 | | | | |  | ***Date:*** | | | 2025-08-01 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | In MOCN scenarios where RAN resources are shared, monitoring energy consumption and analyzing energy efficiency of shared network elements are essential. The management system should provide operator-specific energy consumption and energy efficiency KPIs to each participating operator. These KPIs can help reflect individual operator’s contribution to overall energy usage and be aware of each operator’s energy efficiency based on operator-specific performance metrics.  The existing energy related KPIs in TS 28.554 are defined in network function or network slice granularity which can’t reflect operator-specific energy related metric. | | | | | | | | |
| ***s*** | |  | | | | | | | | |
| ***Summary of change:*** | | Add operator-specific energy consumption and energy efficiency KPIs for MOCN scenario. | | | | | | | | |
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| ***Consequences if not approved:*** | | In network sharing scenarios, operators lack visibility into their individual contribution to overall network function level energy consumption and hence can’t determine the operator-specific energy efficiency . | | | | | | | | |
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| ***Clauses affected:*** | |  | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

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| **1st Change** |

##### 6.7.3.4.X gNB energy consumption per PLMN

a) ECgNBperPLMN

b) This KPI describes the PLMN-level Energy Consumption (EC) of the gNB when the gNB is shared among several operators in MOCN scenarios. It is obtained by summing up the per PLMN energy consumption of all network functions that constitute the shared gNB. The unit of this KPI is kWh.

c) Below is the equation for gNB energy consumption per PLMN



Where and are energy consumption of NFs that constitute the shared gNB and the enegy consumption of these NFs can be measured as defined in clause 5.1.1.19.3 in TS 28.552. NFstatic is the kind of NFs whose energy consumption is independent from data volume while *NF dynamic*  is the kind of NFs whose energy consumption is affected by data volume. DRB.PdcpSduVolumeDL\_PLMN and DRB.PdcpSduVolumeUL\_PLMN and DRB.PdcpSduVolumeDLand DRB.PdcpSduVolumeUL are defined in clause 5.1.2.1 in TS 28.552. *N* is the number of PLMN sharing the same gNB.

NOTE: The energy consumption of a radio access can be split into two parts: the dynamic part which is only consumed when data transmission/reception is ongoing, and the static part which is consumed all the time to maintain the necessary operation of the radio access devices, even when the data transmission/reception is not on-going.

d) ManagedElement

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| **2nd Change** |

### 6.7.Y gNB Energy efficiency per PLMN evaluated from data volume

#### 6.7.Y.1 Introduction

The KPI is defined to reflect per PLMN energy efficiency with data volume as performance indicator. It can help each participating operators be aware of its individual energy efficiency in network sharing scenario.

#### 6.7.Y.2 gNB Energy efficiency per PLMN on data volume

a) EEgNBperPLMN

b) A KPI shows the per PLMN energy efficiency of shared gNB based on data volume. This KPI is obtained by dividing the per PLMN data volume by the per PLMN energy consumption. The unit of this KPI is kbit/kWh.

c) Below is the equation for gNB energy efficiency per PLMN on data volume



d) ManagedElement

e) The performance indicator DataVolumeperPLMN is the sum of the data volume delivered over air interface both in uplink and down link per PLMN. DataVolumeperPLMN is the sum of DRB.PdcpSduVolumeDL\_PLMN and DRB.PdcpSduVolumeUL\_PLMN, defined in clause 5.1.2.1 in TS 28.552. ECgNBperplmn is the energy consumption per PLMN as defined in 6.7.3.4.X.

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| **End of Change** |