**3GPP TSG-SA WG4 Meeting #128 S4-241011 is revision of S4-240802**

**is revision of S4-240715**

**Jeju, Korea, 4**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **26.942** | **pCR** |  | **rev** | **004** | **Current version:** | **0.1.1** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | Key Issue #2: Monitoring and measurement | | | | | | | | | |
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| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_MediaEnergyGREEN | | | | |  | ***Date:*** | | | 14-05-2024 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | The latest draft of 3GPP TR 26.942 contains clause 5.2 on Key Issue #2: Monitoring and Measurement. In this context, it is proposed to add the proposed content to the latest draft of TR 26.942 v 1.0.0 so that it is not left incomplete. | | | | | | | | |
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| ***Summary of change:*** | | This CR proposes new text to be added in TR 26.942 on “Key Issue #2: Monitoring and Measurement” section. | | | | | | | | |
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| ***Consequences if not approved:*** | | Proposed objectives will not be met. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1 (new), 5.1.1 (new), 5.1.2 (new) | | | | | | | | |
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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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| 1st Change |

# 2 References

[x] 3GPP TS 22.882: "Study on Energy Efficiency as a service criteria".

[x] 3GPP TS 28.310: "Management and orchestration; Energy efficiency of 5G".

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| 2nd Change |

## 5.2 Key Issue #2: Monitoring and measurement

### 5.2.1 Description

Advanced media services such as XR services, Split Rendered media services, etc. are expected to incur substantial energy consumption both at the device and network levels, presenting significant challenges for operators and service providers.

For instance, when Operator A deploys a communication service to fulfill application service requirements, such as those of a gaming app, it's crucial for the customer (whether a service provider or a vertical) to ensure that the application service minimizes energy consumption for end-users and the data network. Failure to do so could necessitate application layer adaptations within the service provider's domain. This may result in adjustments to be made to service levels in response to anticipated high energy consumption in specific service areas or during peak hours.

The prediction of Application Service Energy Efficiency (AEE) is based on monitoring Application Service Energy Consumption (AEC) within the 5G system. This data can be shared with the Service Provider to enable timely application layer actions. Monitoring can occur periodically or event-triggered, depending on the application service provider's requirements, which are typically outlined in the Service Level Agreement (SLA).

In a practical scenario, Service Provider X intends to deploy a gaming service within a designated service area, served by Operator A's 5G network. Various service levels may exist, each associated with specific Key Performance Indicators (KPIs), such as automation levels or video quality targets. To ensure energy efficiency, Service Provider X subscribes to Operator A's “Appplication Energy Efficiency Monitoring" feature, allowing them to monitor the energy efficiency of the application service across specified service levels. The operator A and service provider X have agreed on certain energy efficiency target for the application service and optionally for given service levels.

### 5.1.2 Potential new requirements

Based on TS 28.310,the following potential requirements need to be considered in this feasibility study:

1. Based on the collected and/or predicted energy efficiency information exposed from the 5G System, the Application Service Provider should be able to adapt the application service parameters based on the 5GS feedback. Such adaptation of the application service parameters can be, for instance, relocation of the Application Server to an edge Data Network to enhance the energy efficiency of the application. In order to perform such operations, the Application Service Provider requires relevant APIs to be exposed by the 5G System in order to expose Energy efficiency related information, which may lead to, for instance, edge server relocation.

2. Based on the derived energy efficiency information notifications for one or more application services exposed by the 5G System, the Application Service Provider needs to be able to decide to, e.g., switch dynamically to a different service level, which may have different associated service KPIs, or request the 5G System to provide appropriate connectivity based on service KPIs. The switching of service level applies across all users/UEs subscribed to the application. In order to perform such operations, the Application Service Provider requires appropriate APIs to be exposed by the 5G system.

#### 5.1.2.1 Analysis required

The subsequent analysis by this feasibity study should consider:

1. The extent to which different application service parameters can be described by applications provisioning these systems.

2. The extent to which application flows are adaptable (possibly in real time) to these different service levels in reaction to reported energy consumption information.

3. The extent to which service levels can adjusted heterogeneously across different target service areas of a 5G System with different energy consumption status.

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| End of change |