**3GPP TSG-SA3 Meeting #115 *S3-240972***

**Athens, Greece, 26 Feb - 01 March 2024 (revision of S3-240652)**

**Source: Nokia, Nokia Shanghai Bell, OPPO, Telecom Italia**

**Title: New SID on 5GS enhancements for Energy Saving**

**Document for: Approval**

**Agenda Item: 6**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on 5GS enhancements for Energy Saving

Acronym: TBD

Unique identifier: TBD

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  |  | X | X |  |
| No |  |  |  |  |  |
| Don't know | X | X |  |  | X |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| N/A |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 960019 | Study on Energy Efficiency as service criteria | (SA1, Rel-19)Related to topic of this study and may also take into account related normative requirements if any agreed. |
| 870021 | Study on new aspects of EE for 5G networks | (SA5, Rel17) Related to topic of this study. |
| 810023 | Energy Efficiency of 5G | (SA5, Rel-16) Related to topic of this study. |
| 760064 | Study on system and functional aspects of Energy Efficiency in 5G networks | (SA5, Rel-15) Related to topic of this study. |
| 710049 | Study on Energy Efficiency Aspects of 3GPP Standards | (SA, Rel-15) Related to topic of this study. |
| 940036 | Study on new aspects of EE for 5G networks Phase 2 | (SA5, Rel-18) Related to topic of this study. |
| 940037 | Enhancements of EE for 5G Phase 2 | (SA5, Rel-18) Related to topic of this study. |
| 940080  | Study on network energy savings | (RAN1, and secondary resp. RAN2/3, Rel-18) Related to topic of this study. |
| 1010029 | Study on Energy Efficiency and Energy Saving | (SA2, Rel-19) Related to topic of this study. |

# 3 Justification

Energy consumption is a significant source of operations costs for Mobile Network Operators (MNOs) and depending on the energy generation mix that is used to power networks, it can also have impact on the environment. 3GPP has already undertaken work (see the above list of related work items) to provide recommendations on energy saving and actual OAM or Radio Network enhancements to save energy.

SA plenary has issued also a 3GPP-wide recommendation on considering Energy efficiency as an important design criterion for the technical solutions 3GPP defines in their specifications (see [SP-211621](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGS_94E_Electronic_2021_12/Docs/SP-211621.zip)). This should guide SA3 in picking solutions that are inherently as efficient as possible from energy consumption standpoint.

SA1 have studied, “Energy Efficiency as service criteria”, which mentions two use cases,

“Monitoring and measurement related to energy efficiency” and “Information exposure related to energy consumption”, which concerns gathering and exposure of user/operator/” third party” energy efficiency information to authorised third parties. This information can be sensitive to the user or operator and therefore security and privacy impacts needs to be studied.

SA2 has agreed a study concerning energy efficiency, SP-231192, which has 3 objectives called WT’s. The study takes the SA1 study into consideration which is evident from objective definitions.

* WT#1 concerns gathering energy efficiency information and potential exposure through a “framework for network energy consumption exposure”.
* WT#2 concerns subscription and policy enhancements to enable energy savings as a service criteria.
* WT#3 concerns enhancements enabling further energy savings in the network.

SA2 has progressed their study and aspect of collecting and exposure of power consumption per. UE, slice or PDU session. By exposing information, which can be linked to a subscriber, there is a potential for a privacy leak. Whether additional measures need to be taken to preserve the privacy of the subscriber needs to be further studied.

The power consumption of an operator can reveal operational cost, load etc. which for the MNO is business sensitive. As part of the data collection, not all information is concealed in the thrust domain of the core network but needs to be collected from 3rd party application functions. As the data is sensitive and can bias the power consumption analytics, it’s important to study how the AF can be authenticated by the consumer when not in the same trust domain.

In general, the study in SA1 and SA2 aims at improving the sustainability of the 3GPP ecosystem and it is proposed that SA3 investigates the security and privacy impacts of the SA2 study WT’s.

# 4 Objective

The following aspects will be studied:

1. Study privacy and security aspects concerning the collection of information studied by SA2 WT#1.
2. Study privacy and security impacts of exposure of energy related information studied by SA2 WT#1.

NOTE: Additional privacy and security aspects related to SA2 WT2 and WT3 can be added based on SA2 progress.

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Task ID | TU Estimate(Study) | TU Estimate(Normative) | RAN Dependency(Yes/No/Maybe)  | Inter Work Tasks Dependency Editor’s Note: This column should highlight if WT#x is self-contained, or is dependent on the completion of other WTs |
| 1. | 2 TUs (4 meetings) | 1 TU (2 meeting cycles) | No | Depends on 2. |
| 2. |  |  | No | Depends on 1. |

Total TU estimates for the study phase: 2 TUs (4 meeting cycles, 0.5 in each meeting cycle)

Total TU estimates for the normative phase: 1 TUs (2 meeting cycles, 0.5 in each meeting cycle)

Total TU estimates: 3

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| Internal TR | TR 33.xxx | Study on 5GS enhancements for Energy Saving | SA#105 (September 2024) | SA#106 (December 2024) |  |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |

# 6 Work item Rapporteur(s)

# 7 Work item leadership

SA3

# 8 Aspects that involve other WGs

RAN impacts covered by RAN WGs (RAN2, RAN3).

Architecture aspects covered by SA2.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Nokia |
| Nokia Shanghai Bell |
| Deutsche Telekom |
| Intel |
| China Telecom |
| Samsung |
| CableLabs |
| Lenovo |
| AT&T |
| OPPO |
| Philips |
| Telecom Italia |
| BMWK |
| Apple |
| Interdigital |
| Huawei |
| HiSilicon |
| CATT |
| Ericsson |
| Google |
| Xiaomi |