**3GPP TSG-WG SA2 Meeting #162 *S2-2405144***

**Changsha, China, April 15- April 19, 2024**

**Source: China Mobile, Huawei, vivo,Toyota, SK Telecom, Deutsche Telekom, Tencent, NTT DOCOMO, LGE, Samsung, ZTE,**

**Title: Evaluation and conclusion on KI#1: Network energy related information exposure**

**Document for: Approval**

**Agenda Item: 19.4**

**Work Item / Release: FS\_EnergySys / Rel-19**

*Abstract of the contribution: Propose an evaluation and conclusion on KI#1: Network energy related information exposure.*

# 1 Discussion

This paper provides evaluation and conclusion of KI#1: Network energy related information exposure.

# 2 Proposal

It is proposed to include the below changes into TR 23.700-66 v0.4.0.

# 

*FIRST CHANGE (all new text)*

## 8.x Interim Conclusion for KI#1: Network energy related information exposure

The following bullets are recommended for normative work for KI#1:

- The following granularities of the energy consumption information are supported to be exposed, based on operator policy/configuration:

- per-UE-per-QoS flow.

- per PDU session, per UE, per Service, which are derived based on per-UE-per-QoS flow level.

- per NF level, or per Network Slice level, which are originated from OAM.

Editor’s NOTE: whether or not to expose energy consumption per NF level or per Network Slice level by NEF is FFS.

Editor’s NOTE: whether there are additional energy-related parameters to be exposed is FFS.

- AF may request the energy consumption information together with the network performance statistic () exposure with reporting request e.g. Periodic reporting or Threshold based reporting.

- The information for the calculation of the Energy Consumption information is obtained from the following sources :

- OAM: provides the energy consumption information at the NF level, i.e., energy consumption of the gNB(s) and UPF(s) serving the UE, or Network Slice serving the UE;

- OAM: provides the overall data volume for the gNB;

- UPF: provides the overall data volume of the UPF;

- UPF: provides the data volume for the QoS flow;

- New functionality in the 5GC calculates the E2E energy consumption per QoS flow based on energy consumption of the flow at each serving NF.

NOTE: The formula to calculate the energy consumption per QoS flow at each NF may be: NF energy consumption × (data volume of QoS flow) / overall data volume of the NF.

- New functionality stores/aggregates/exposes the energy consumption information of the QoS flow including UPF and gNB energy consumption.

NOTE 1: Exposure and collection of renewable energy and carbon emission information depend on the coordination with SA5.NOTE 2: In this Release, the gNB does not support reporting neither per-UE-per-PDU session nor per-UE-per-QoS flow level energy consumption.

Editor’s NOTE: whether the NG-RAN can provide the per UE level energy consumption information is FFS.

Editor's NOTE: It is FFS whether the new functionality will be supported by a new and/or the existing NF(s).

Editor's NOTE: It is FFS whether the contribution of other NFs, e.g., SMF, AMF, will be considered.

*End of CHANGES*