**3GPP TSG-WG SA2 Meeting #160 *S2-230xxxx***

**Chicago, US, November 13 – 17, 2023 (revision of S2-230xxxx)**

**Source: SK Telecom**

**Title: New KI: NF selection based on real-time energy consumption**

**Document for: Approval**

**Agenda Item: 19.4**

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

*Abstract: This document proposes a new Key Issue description regarding the selection of Network Function with considering the energy saving and energy efficiency.*

# 1. Introduction

This document proposes new Key Issues description regarding the following aspects:

* Selection of Networking Function with considering the energy saving and energy efficiency. As stated in SA1 EnergyServ in TR 22.882 and WT#3 highlights the following parts:

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| * Subject to operator policy and regulatory requirements, the 5G system **shall be able to provide a mechanism for one or more network functions to operate based on energy consumption** to meet various end-user’s service requirements.
* Subject to operator policy and regulatory requirements, the 5G system **shall be able to provide** **means to configure and coordinate the operation of one or more network functions** to operate based on MNO's energy consumption requirements and targets.
* WT #3. Study 5GS enhancements (e.g., energy usage adjustment for NF from CN aspect, energy saving related decision making, **NF selection leveraging NF energy states**) for network energy saving including 5GC(NFs) and NG-RAN interactions, analytics, etc. Impacts on the UE are not ruled out e. g., for scenarios specified in TR 22.882 by SA1 EnergyServ.
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\* Start of change \*

# 2. Text Proposal

It is proposed to capture the following changes vs. TR 23.700-66

## 5.x Key Issue #x: NF selection based on real-time energy consumption

### 5.x.1 Description

In 5GC architecture, NF needs a mechanism to perform discovery and selection based on energy consumption efficiently. This could be achieved through NRF/SCP via including energy consumption information. A set of NFs responsible for the call-procedures needs to be aware of overall energy consumption requirements, and how they interact together as coordination is needed. The NF’s reduced capabilities based on various energy consumption level may need to be known to other NFs for efficient and optimal selection. Furthermore, real-time energy information exchange between NFs maybe needed to achieve faster selections and decisions.

This key issue will study how to enhance the mechanism of NF selection accounting for network energy saving. In particular, this KI will address:

* Whether and how to support NF discovery and selection using NRF and SCP, based on e.g., real-time energy information from NFs.
* Whether and how to measure, monitor energy consumption state and exchange information directly between NFs.
* Whether and how to define NF’s reduced capability from different energy-saving mode, e.g., power-saving NFs.
* Whether and how to control the NF’s traffic process based on NF’s power consumptions (NF’s QoS, Overload control, PPS control…)
* How and when to notify other NFs for when energy needs are limited due traffic process and QoS control.

\* End of change \*