**3GPP TSG-SA WG4 Meeting #129-eS4-241559\_r1**

**E-meeting, 19 - 23 August 2024**

**Source: Samsung Electronics Co., Ltd.**

**Title: [FS\_MediaEnergyGREEN] Pseudo-CR on Use case on green profiles for media streaming services**

**Spec: 3GPP TR 26.942 v0.2.1**

**Agenda item: 8.7**

**Document for: Agreement**

**1. Introduction**

This contribution is a revision of S4-241035\_r01 submitted, revised and presented at SA4 #128. Updates in this contribution reflect changes made according to the comments received, in particular clarification green media profiles, as well as refining the requirements relevant to SA4.

**2. Reason for Change**

Clause 5.15 of TR 22.882 describes a “Use case on supporting communication service with carbon-aware service requirements”, where subject to user consent and operator policy, the 5GS is able to provide means to modify a communication service based on energy related information criteria based on subscription policies.

In this document we present a refined use case based on the above, in the SA4 context.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TR 26.942 v0.1.1.

\* \* \* First Change \* \* \* \*

## 5.2 Additional use cases defined by SA4

### 5.2.1 Green profiles for media streaming services

Pre-requisites:

1. An MNO offers a "green media streaming service" subscription option, wherein the service has adaptable QoS (and therefore QoE) levels taking into account the ratio of renewable energy used to deliver the service as well as the subscriber’s preferences.

- User C subscribes to the "green media streaming service" provided by an MNO in order to manage the amount of non-renewable power used for the service.

Details:

1. The MNO monitors the supply of energy for its 5G System, including the energy ratios used by its different entities (e.g., Network Functions). Energy ratios may be classified as the ratio of renewable energy, including the different types of green/renewable energy as well as non-renewable energy which make up the total supply of energy.

2. In addition to the current produced energy status, the MNO also tracks the amount of spare energy stored in its energy supply, by energy type, from previously produced energy. The MNO may also create a forecast of future energy supply.

3. In addition to the status of its supply of energy by type, the MNO also monitors and considers the status of its demand of energy by type (by each of its different entities), by other users and/or other consumers of energy in its 5G System.

4. During the commute between home and the workplace, User C consumes media from an Application Service Provider via the MNO's 5G System.

5. At the beginning of a media delivery session, the energy status of the 5G System is made known to User C’s UE, and a list of media energy profiles for the service is also provided. Such energy profiles may be presented with a timetable noting the profiles’ availability on a daily or weekly basis due to Operator C’s energy supply, where some profiles may be available only at a limited time.

a) Media energy profiles may be defined by energy type (calculated by the amount of energy required to stream the media in the profile), e.g. renewable energy, solar energy, wind energy, nuclear energy, coal energy, natural gas, oil etc), with each profile also defining a certain Quality of Experience (i.e. video resolution, data bitrate, latency etc.) for the media.

b) The Qualities of Experience defined also depend on the characteristics and nature of the media content (e.g. 2D video, omnidirectional video, 3D video, point clouds, mesh data), including the target consumption device of the media streaming service.

6. User C may reserve a task such as pre-downloading a media asset using the most preferable profile scheduled. The task may start on schedule or be triggered by an event activation from the MNO in the user's subscribed profile.

7. The energy status of the 5G System may be made known to the UE at the start of the media delivery session.

8. The list of media energy profiles may be provided to the UE at the start of the media delivery session.

9. The list of media energy profiles provided to the UE may be customised and selected by the network according to the current energy status of the 5G System.

12. Depending on User C’s preference, the UE may request one of the media energy profiles from the list provided by the network.

13. By consuming media via the "green media streaming service", User C is able to decide what kind of energy s/he wants to use in order to acquire the media and consumer it during his/her commute. The user is also is able to know what kind of energy s/he is using for the service based on the energy profile selected.

\* \* \* Second Change \* \* \* \*

### 6.1.2 Potential requirements

Subclause 6.4 in [22882] contains the consolidated requirements extracted from use cases, related to information exposure related with this Key Issue:

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| [CPR 6.4-1] Subject to operator’s policy and agreement with 3rd party, the 5G system shall be able to expose information on energy consumption forserving this 3rd party.[CPR 6.4-2] Subject to operator’s policy, the 5G system shall support a means to expose energy consumption to authorized third parties for services, including energy consumption information related to the condition of energy credit limit (e.g. when the energy consumption is reaching the energy credit limit).[CPR 6.4-3] Subject to operator policy, the 5G system shall provide means for the trusted 3rd party, to configure which network performance statistic information (e.g. the data rate, packet delay and packet loss) for the communication service provided to the 3rd party, needs to be exposed along with the information on energy consumption for serving this 3rd party.[CPR 6.4-4] Based on operator policy and agreement with 3rd party, the 5G system shall be able to expose energy consumption information and prediction on energy consumption of the 5G network per application service to the 3rd party.[CPR 6.4-5] Subject to operator’s policy and agreement with 3rd party, the 5G system shall support a mechanism for the 3rd party to provide current or predicted energy consumption information over a specific period of time. |

Additional potential requirements identified from clause 5.2:

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| [PR 1-1] Pre-defined energy type based media energy profiles shall be associated with specific media streaming services offered by the MNO.[PR 1-2] Before the beginning of a media delivery session, media energy profiles and operator energy status shall be made known to the UE.NOTE 1: The selection of a subset of media energy profiles to be made known to the UE shall also be supported, bespoke to the current operator energy status, user preference, user UE type, and/or media characteristics (e.g., even though the profile is defined, it may be impossible to consume high bandwidth media with minimum green media profile due to insufficient QoS).NOTE 2: Media energy profiles defined with different QoS (guaranteed by the MNO if profile is selected) and QoE (e.g. media resolution, codec level, latency etc) characteristics shall also be supported. [PR 1-3] For a green media streaming service, the UE shall support a means to select media energy profiles based on certain perferences, including energy type, QoS, QoE etc.[PR 1-4] A UE shall support the means to schedule a non-real-time media delivery task using a media energy profile.NOTE 3: The UE (or user) shall be able select a media energy profile based on the MNO’s energy status and schedule which is made known the UE beforehand. |

\* \* \* End of Changes \* \* \* \*