**3GPP TSG SA WG 1 Meeting #107 S1-242416**

**Maastricht, The Netherlands, 19 – 23 Aug 2024** *(revision of S1-242401, S1-242028)*

**Source: Nokia**

**pCR Title: 22.883 pCR on New Use case on exposing subscriber carbon footprint information**

**Draft Spec: 3GPP TR 22.883**

**Agenda item: 7.2 (FS\_EnergyServ\_Ph2)**

**Document for: Approval**

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*Abstract:* *This pCR proposes a new use case on* *exposing carbon footprint information to users.*

**1. Introduction**

This pCR proposes a new use case on exposing subscriber’s carbon footprint information.

**2. Reason for Change**

This information can be made available eg via an APIs to 3rd parties (applications, enterprise customers etc).

Rev2401

- [Samsung] removed “carbon consumption”

- [DT] removed comparison across PLMNs

- [Apple] clarified “user-authorized” 3rd parties

- [Huawei] removed recommendations (PR#3)

- [Qualcomm] clarified that it could rely on exact/subscriber-specific data

Rev2416

- clarified that measurements and/or calculations should be “as accurate as possible”

- moved NOTE3 into use case preconditions

- moved PR#2 (comparative indication) as Note (optional information)

**3. Conclusions**

None.

**4. Proposal**

It is proposed to agree the following use case and add it to TR 22.883 v0.1.0.

FIRST CHANGE

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TR 22.882: "Study on Energy Efficiency as a service criteria".

[3] 3GPP TS 22.261: "Service requirements for the 5G system".

[X] ETSI GS OEU 020 (v1.1.1): "Operational energy Efficiency for Users (OEU); Carbon equivalent Intensity measurement; Operational infrastructures; Global KPIs; Global KPIs for ICT Sites".

[Y] <https://ghgprotocol.org/corporate-value-chain-scope-3-standard>. Accessed 05/08/2024.

SECOND CHANGE

## 3.1 Terms

For the purposes of the present document, the terms given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**carbon intensity:** quantity of CO2 equivalent emission per unit of final energy consumption for an operational period of use [X]

THIRD CHANGE (NEW TEXT)

## 5.x Use case on exposing subscriber carbon footprint information

### 5.x.1 Description

Empowering mobile subscribers to contribute to overall energy and carbon footprint reduction is becoming increasingly important. The carbon emissions resulting from the use of a communication service can be identified as part of Scope 3 of the Green House Gas Protocol [Y] in general. Exposing this information can help:

* Make all actors responsible for their carbon emissions
* Help MNOs achieve their net zero plans
* Act as brand attractor for Millenials and Gen Z subscribers

Gamification around human's carbon footprint is growing, although typically via websites with self-declarative surveys or using API aggregators that try to connect to the various potential sources of carbon emission of an individual to calculate and track their overall footprint.

Carbon footprint (usually expressed as gCO2eq) is becoming a popular metric in the transportation, energy and food industries already.

### 5.x.2 Pre-conditions

MNO 1 wants to provide its subscribers with information about their carbon footprint that can be programmatically provided to users via its own MyMNOCarbon app or via 3rd party aggregators that monitor and compute a person’s carbon emissions. MNO 1 has defined how each of its network entities is contributing to the calculations of carbon equivalent emissions, based on some recommendation for mobile operators in its country.

3rd party aggregator MyOverallCarbonFootprint has integrated MNO 1’s API in order to propose its users to automatically calculate and monitor their carbon emissions due to their mobile activity at MNO 1.

User A is a subscriber of MNO 1 and cares about his own carbon footprint. He uses the MyMNOCarbon app and has given consent to view the carbon footprint of his mobile communication service and to be compared with the other subscribers of MNO 1.

User B manages a fleet of company phones served by MNO 1. She has authorized MyOverallCarbonFootprint aggregator to access MNO 1’s API in order to monitor the carbon footprint of this fleet, together with other types of similar indicators from their company cars’ fleet, offices etc.

### 5.x.3 Service Flows

1. User A downloads the MyMNOCarbon app to monitor his carbon footprint. He gives consent to be compared with other subscribers.
2. Every day, User A checks on his app how much carbon he consumed.
3. After one month of usage, the app shows him how he compares with respect to other users. Since he belongs to category C, the app tells him he can try to use alternative connectivity (e.g. WiFi), lower the video resolution when streaming, or downloading videos instead, in order to lower his carbon footprint.

### 5.x.4 Post-conditions

User A is happy with the transparency of MNO 1 and the recommendations he can get to improve his footprint. He also likes the comparison feature (related to his operator) as an additional motivation.

User B can better monitor the carbon emission of her company, try to reduce it and improve the quality of her company’s annual ESG report.

### 5.x.5 Existing features partly or fully covering the use case functionality

3GPP TS 22.261 [3] has introduced some related requirements in cl 6.15a.4.2:

*Subject to operator's policy, the 5G network shall support energy consumption monitoring at per network slice and per subscriber granularity.*

*NOTE 1: Energy consumption monitoring as described in the preceding requirement is done by means of averaging or applying a statistical model. The requirement does not imply that some form of 'real time' monitoring is required. The granularity of the subscription policies can either apply to the subscriber (all services), or to particular services.*

and in cl. 6.15a.5.2

*Subject to operator’s policy and agreement with 3rd party, the 5G system shall be able to expose information on energy consumption for serving this 3rd party.*

*NOTE 1: Energy consumption information can include ratio of renewable energy and carbon emission information when available. The reporting period could be set, e.g., on monthly or yearly basis and can vary based on location.*

*NOTE 2: The energy consumption information can be related to the network resources of network slice, NPNs, etc.*

However, such requirements have the following limitations:

* carbon emission information can be exposed only “when available”
* the “per subscriber” granularity applies to “energy consumption monitoring” but not clearly to carbon emissions
* there is no further concept covered such as providing some personalized level of comparison, or recommendations towards eco-gestures.

### 5.x.6 Potential new requirements needed to support the use case

NOTE 1: The following requirements do not apply to the use of the communication service when roaming.

[PR.5.x.6-1] Subject to operator’s policy, regulatory requirements and user consent, the 5G network shall be able to expose to user-authorized 3rd parties the carbon equivalent emissions resulting from the use of the communication service, related to one or more specific home subscribers (e.g. fleet of vehicles, IoT devices, company phones etc), over a specific time period (e.g. month etc).

NOTE 2: Exposing carbon equivalent emissions at subscriber level can rely on but does not imply any real-time collection, monitoring or exact subscriber-specific calculations. It can be provided by means of statistics, computations and estimates as accurate as possible, e.g. based on subscriber’s data volume and operator’s carbon intensity to provide the communication service. In particular, it is expected such information to be provided on demand, not more granularly than on a per-day basis.

NOTE 3: The exposed carbon equivalent emissions can further include information to allow to compare subscribers of e.g. the same PLMN, NPN or slice over the same time period. Such information can take the form of e.g. a range (i.e. minimum and maximum) or average of carbon equivalent emissions per subscriber, or the form of a category, class or score of carbon emissions (e.g. A to F, 1 to 5) .

[PR 5.x.6-2] The 5G network shall be able to support the following KPIs when exposing carbon equivalent emission information.

| Use Cases | Characteristic parameter (KPI) |
| --- | --- |
| Information | System Granularity | Time Granularity | Time Range | Obtainment (informative) |
| Subscriber’s carbon footprint information exposure to 3rd party | Carbon equivalent emissions (e.g. in gCO2eq) | Subscriber | Daily | Month | Calculation (average or statistical model) based on aggregation/attribution of network energy consumption, carbon intensity and/or renewable energy ratio. |

END OF CHANGES