**3GPP TSG-SA5 Meeting #158 *S5-247122***

Orlando, USA, 18 - 22 November 2024 (revision of S5-246666 and merge of S5-246422)

**Source: Nokia, Huawei**

**Title: Rel-19 pCR TR 28.880 Potential solution for use case Exposure of carbon and renewable energy related information**

**Document for: Approval**

**Agenda Item: 6.19.20**

# 1 Decision/action requested

***The group is requested to discuss and approve the pCR below.***

# 2 References

[1] 3GPP TR 28.880: "Study on energy efficiency and energy saving aspects of 5G networks and services".

# 3 Rationale

This pCR proposes a potential solution for Use case #4: Exposure of carbon and renewable energy related information, of TR 28.880 [1].

# 4 Detailed proposal

The following changes are proposed for TR 28.880[1].

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| **1st 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 TS 28.554: "Management and orchestration; 5G end to end Key Performance Indicators (KPI)".

[3] ETSI GR NFV-IFA 029 (V3.3.1): "Network Functions Virtualisation (NFV) Release 3; Architecture; Report on the Enhancements of the NFV architecture towards "Cloud-native" and "PaaS"".

[4] ETSI GS NFV-IFA 040 (V4.3.1): "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Requirements for service interfaces and object model for OS container management and orchestration specification".

[5] ETSI GS NFV-IFA 027 (V4.3.1): "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Performance Measurements Specification".

[6] ETSI GS NFV-IFA 027 (V5.2.1): "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Performance Measurements Specification".

[7] 3GPP TS 22.261: "Service requirements for the 5G system".

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

[9] ETSI EN 303 472: "Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for RAN equipment".

[10] ISO/IEC 30134-3:2016: "Information technology -- Data centres -- Key performance indicators -- Part 3: Renewable energy factor (REF)".

[11] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

[12] 3GPP TS 28.310: "Management and orchestration; Energy efficiency of 5G".

[13] 3GPP TS 28.313: "Management and orchestration; Self-Organizing Networks (SON) for 5G networks".

[14] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[15] [Energy Benchmark 2023: Telco Insights and Industry Health Check](https://www.gsmaintelligence.com/wp-content/uploads/2024/03/EnergyBenchmarkDeck_forWeb-1.pdf).

[16] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[17] 3GPP TS 23.501: "System architecture for the 5G System (5GS)".

[18] 3GPP TS 22.104: "Service requirements for cyber-physical control applications in vertical domains".

[19] ETSI EN 303 471 V1.1.1 (2019-01): "Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for Network Function Virtualisation (NFV)".

[20] ITU-T Recommendation L.1333: "Carbon data intensity for network energy performance monitoring".

[21] ETSI ES 202 336-1 V1.2.1: "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 1: Generic Interface"

[22] ETSI ES 202 336-2 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 2: DC power system control and monitoring information model"

[23] ETSI ES 202 336-3 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 3: AC UPS power system control and monitoring information model"

[24] ETSI ES 202 336-4 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 4: AC distribution power system control and monitoring information model"

[25] ETSI ES 202 336-5 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 5: AC diesel back-up generator system control and monitoring information model"

[26] ETSI ES 202 336-6 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 6: Air Conditioning System control and monitoring information model"

[27] ETSI ES 202 336-7 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 7: Other utilities system control and monitoring information model"

[28] ETSI ES 202 336-8 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 8: Remote Power Feeding System control and monitoring information model"

[29] ETSI ES 202 336-9 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 9: Alternative Power Systems"

[30] ETSI ES 202 336-10 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 10: AC inverter power system control and monitoring information model"

[31] ETSI ES 202 336-11 V1.1.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 11: Battery system with integrated control and monitoring information model"

[32] ETSI ES 202 336-12 V1.2.1 "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) Part 12: ICT equipment power, energy and environmental parameters monitoring information model"

[X] 3GPP TS 28.533: "Management and orchestration; Architecture framework".

[Y] 3GPP TS 28.532: "Management and orchestration; Generic management services".

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| **Next Change** |

#### 5.4.3.X Potential solution #X: Retrieval of energy related information information associated with managed functions

##### 5.4.3.X.1 Introduction

The energy related information can be represented using MnS component type B as Network Resource Model (NRM) (see clause 4.2.3.1 of TS 28.533 [X]) or MnS component type C as performance information of the managed entity (see clause 4.2.3.1 of TS 28.533 [X]).

Energy saving state(s) is represented by MnS component type B, and energy consumption measurements and/or KPIs are represented by MnS component type C. Carbon and renewable energy related information can be represented by MnS component type B and MnS component type C.

This potential solution describes how an authorized MnS consumer can get the data represented by MnS component type B using MnS component type A (operations and notifications).

##### 5.4.3.X.2 Description

An authorized MnS consumer can get the energy related information that is represented as MnS component type B as Network Resource Model (NRM) using MnS component type A (operations and notifications), described as follows:

- Using getMOIAttributes operation (see clause 11.1.1.2 of TS 28.532 [Y])

- By subscribing to notifications, using createMOI operation (see clause 11.1.1.1 of TS 28.532 [Y]) with NtfSubscriptionControl IOC (see clause 4.3.22 of TS 28.622 [14]). The MnS consumer will notify the MnS consumer for the subscribed scope using the notifications notifyMOICreation, notifyMOIDeletion notifyMOIAttributeValueChanges and notifyMOIChanges (see TS 28.532 [Y]).

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### 5.4.4 Evaluation of potential solutions

The potential solution #1 and #2 describe how an authorized MnS consumer can get the data represented by MnS component type C, and potential solution #3 describes how an authorized MnS consumer can get the data represented by MnS component type B using MnS component type A. The 3GPP management system, supports the NRMs and operations proposed by the potential solutions.

The solutions proposed in clauses 5.4.3.1, 5.4.3.2 and 5.4.3.X satisfy the requirements and these solutions are already available.

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# 6 Conclusions and recommendations

## 6.4 Use case #4: Exposure of carbon and renewable energy related information

The use case, requirements and potential solutions for the exposure of carbon and renewable energy related information are described in clause 5.4. For normative work, it is proposed to document use case #4, related requirements and solutions in TS 28.310 [12].

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| **End of change** |