**3GPP TSG-**SA4 **Meeting SA4#127-bis-e *S4-240652***

**online,** 8-4-2024 **–** 12-4-2024

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| *CR-Form-v12.3* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | 26.942 | **pCR** |  | **rev** | - | **Current version:** | 0.0.1 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | FS\_MediaGREEN related work | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | InterDigital | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_MediaGREEN | | | | |  | ***Date:*** | | | 2-4-2024 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | D |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Proposed addition of introductory text | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Addition of background information regarding relevant standards activities of other SDOs. | | | | | | | | |
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| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 4.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| 1st Change |

# 2 References

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| 2nd Change |

## 4.2 Related work

### 4.2.0 Introduction

Several standards setting organisations broadly active in the areas of broadcasting and telecommunications are considering energy efficiency and the reduction of climate impact. Likewise, several industry fora are active in this area. This section documents some of the efforts underway, and links to standards and reports currently available.

### 4.2.1 Standards Development Organisations

#### 4.2.1.1 ITU-T

Within the International Telecommunications Union, the T-sector includes Study Group 5 “[Environment and Circular Economy](https://www.itu.int/en/ITU-T/about/groups/Pages/sg05.aspx)” (SG5). Part of its mandate is to define and develop “methodologies for evaluating ICT effects on climate change and publishing guidelines for using ICTs in an eco-friendly way. Under its environmental mandate SG5 is also responsible for studying design methodologies to reduce ICT's and e-waste's adverse environmental effects, for example, through recycling of ICT facilities and equipment.”

Among its activities, ITU-T Study Group 5 is developing [technical reports, supplements and international standards](https://www.itu.int/en/ITU-T/climatechange/Pages/ictccenv.aspx) for the environmental requirements of 5G. The 5G energy-related documents currently available are:

- Recommendation ITU-T L.1210 "[Sustainable power-feeding solutions for 5G networks](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=14079&lang=en)".

- Recommendation ITU-T L.1220 "[Innovative energy storage technology for stationary use – Part 1: Overview of energy storage](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=13283&lang=en)".

- Recommendation ITU-T L.1221 "[Innovative energy storage technology for stationary use – Part 2: Battery](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13721)".

- Recommendation ITU-T L.1222 "[Innovative energy storage technology for stationary use – Part 3: Supercapacitor technology](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=13579&lang=en)".

- Recommendation ITU-T L.1331 "[Assessment of mobile network energy efficiency](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14303)".

- Recommendation ITU-T L.1350 "[Energy efficiency metrics of a base station site](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=12883)".

- Recommendation ITU-T L.1351 "[Energy efficiency measurement methodology for base station sites](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13580)".

- Recommendation ITU-T L.1380 "[Smart energy solution for telecom sites](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14082)".

- Recommendation ITU-T L.1381 "[Smart energy solution for data centres](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=14305&lang=en)".

- Recommendation ITU-T L.1382 "[Smart energy solution for telecommunication rooms](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=14306&lang=en)".

- Recommendation ITU-T L.1383 "[Smart energy solutions for cities and home applications](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=14719&lang=en)".

- ITU-T L.Suppl.36 to ITU-T L.1310 "[Study on methods and metrics to evaluate energy efficiency for future 5G systems](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13476)".

- ITU-T L.Suppl.43 to ITU-T L.Series "[Smart energy saving of 5G base station: Based on AI and other emerging technologies to forecast and optimize the management of 5G wireless network energy consumption](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14762)".

Further, the [L.1400 series of reports](https://www.itu.int/ITU-T/recommendations/index_sg.aspx?sg=5) and recommendations present methodologies and guidelines for the assessment of the greenhouse gas emissions and energy consumption of the ICT sector. For example , ITU-T L.1450 “[Methodologies for the assessment of the environmental impact of the information and communications technology sector](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13581)” presents a methodology for the assessment of the impact of telecommunications systems. It was used in the assessment of the electricity usage and greenhouse gas emissions of the ICT sector in Jens Malmodin, Nina Lövehagen, Pernilla Bergmark, and Dag Lundén. "[ICT sector electricity consumption and greenhouse gas emissions–2020 outcome.](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4424264)" Telecommunications Policy (2024): 102701.

#### 4.2.1.2 ITU-R

The remit of ITU-R Study Group 6 (SG6) is programme production and interchange. Its Working Party 6A (WP 6A) has published ITU-R Report BT.2385 “[Reducing the environmental impact of terrestrial broadcasting systems](https://www.itu.int/pub/R-REP-BT.2385)”. Working Party 6C (WP 6C) has a rapporteur group which has produced the following documents:

- ITU-R Opinion 104, “[Advice for sustainability strategies incorporating carbon offsetting policies](https://www.itu.int/pub/R-OP-R.104)”

- ITU-R Report BT.2521, “[Practical examples of actions to realize energy aware broadcasting](https://www.itu.int/pub/R-REP-BT.2521)”. This report is based on a [webinar](https://www.itu.int/en/ITU-R/seminars/Pages/Webinar-on-Energy-Aware-Broadcasting.aspx) held in March 2022.

#### 4.2.1.3 MPEG

The ISO/IEC JTC 1/SC 29 committee “[Coding of audio, picture, multimedia and hypermedia information](https://www.iso.org/committee/45316.html)” has published the ISO/IEC 23001-11:2023 standard “[Information technology: MPEG systems technologies Part 11: Energy-efficient media consumption (green metadata)](https://www.iso.org/standard/83674.html)”. The various components of the standard define methods for the reduction of the power consumption of decoders and of displays. A further component defines a method for the selection of energy-efficient media. A final method allows for quality recovery after low-power encoding. The standard is currently in revision, and is to be extended to enable the carriage of metadata to more efficiently reduce the power requirements of display devices receiving the content with the metadata.

#### 4.2.1.4 DVB

DVB has carried out a study mission to assess the potential for developing energy-efficient video transmission systems. This work has resulted in the creation of a new CM-EE (Energy Efficiency) working group in its Commercial Module. It has also published a report on the topic available as Blue Book S100 "Study Mission report on Energy Aware service Delivery and Consumption".

#### 4.2.1.5 ATSC

ATSC has a group currently studying the implications of energy efficiency on its broadcast systems.

### 4.2.2 Industry Fora

#### 4.2.2.1 Greening of Streaming

[Greening of Streaming](https://www.greeningofstreaming.org/) is a member association investigating energy efficiency in the context of media streaming applications. One of the challenges the group is aiming to address is that of accurately measuring the energy expenditure of streaming services, given that currently the available data is sparse and not very precise. It further intends to define best practices.

#### 4.2.2.2 DIMPACT

“[DIMPACT](https://dimpact.org/about) is a collaborative initiative between leading media, entertainment and technology companies and world-class researchers.” The group has developed a tool to measure the emissions of serving digital media and entertainment products. This tool is available as a web application. The [DIMPACT website](https://dimpact.org/publications) makes available several publications explaining their methodology and defining principles for streaming and digital media carbon footprinting.

#### 4.2.2.3 Ultra HD Forum

The Ultra HD Forum has a group investigating energy efficiency.

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| End of change |