**3GPP TSG-SA WG4 Meeting post 130**  ***S4-242030***

**Orlando,4**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **942** | **CR** |  | **rev** | **-** | **Current version:** |  |  |
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| *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 | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:***  | Summary of energy efficiency standards from ETSI Environmental Engineering (EE) WG.  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | SA4 |
|  |  |
| ***Work item code:*** | FS\_MediaEnergyGREEN |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** |  |
|  | *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 canbe 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Annex A of TR 26.942 is empty. |
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| ***Summary of change:*** | The pCR proposes a summary of energy efficiency standards from ETSI Environmental Engineering (EE) WG to be used in the TR. |
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| ***Consequences if not approved:*** | Annex A is empty.  |
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| ***Clauses affected:*** | Annex A |
|  |  |
|  | **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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| Additional references |

2 References

[ES2027061] ETSI ES 202 706-1: "Environmental Engineering (EE); Metrics and measurement method for energy efficiency of wireless access network equipment; Part 1: Power consumption – static measurement method 5G base station energy performance KPIs".

[ES203700] ETSI ES 203 700: "Environmental Engineering (EE); Sustainable power feeding solutions for 5G network".

[ES203539] ETSI ES 203 539: "Environmental Engineering (EE); Measurement method for energy efficiency of Network Functions Virtualisation (NFV) in laboratory environment".

[EN303470] ETSI EN 303 470: "Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for servers".

[EN303471] ETSI EN 303 471: "Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for Network Function Virtualisation (NFV)".

[ES203475] ETSI ES 203 475: "Environmental Engineering (EE); Standardization terms and trends in energy efficiency".

[ES203136] ETSI ES 203 136: "Environmental Engineering (EE); Measurement methods for energy efficiency of router and switch equipment Update standard for Energy efficiency for router and switch equipment".

[EN303215] ETSI EN 303 215: "Environmental Engineering (EE); Measurement methods and limits for power consumption in broadband telecommunication networks equipment".

[ES202706] ETSI ES 202 706: "Environmental Engineering (EE); Measurement method for power consumption and energy efficiency of wireless access network equipment".

[ES203184] ETSI ES 203 184: "Environmental Engineering (EE); Measurement Methods for Power Consumption in Transport Telecommunication Networks Equipment".

[EN301575] ETSI EN 301 575: "Environmental Engineering (EE); Measurement method for energy consumption of Customer Premises Equipment (CPE)".

[ES203215] ETSI ES 203 215: "Environmental Engineering (EE); Measurement Methods and Limits for Power Consumption in Broadband Telecommunication Networks Equipment".

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| Additional abbreviations |

## 3.3 Abbreviations

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CPE Customer Premises Equipment

DSLAM DSL Access Multiplexer

DSL Digital Subscriber Line

DWDM Dense Wavelength-Division Multiplexing

EEER Equipment Energy Efficiency Ratio

GPON Gigabit-capable Passive Optical Network

MPLS Multi-Protocol Label Switching

MSAN Multi-Service Access Node

OLT Optical Line Termination

OTN Optical Transport Network

SDH Synchronous Digital Hierarchy

NFV Network Functions Virtualisation

NFVI Network Functions Virtualisation Infrastructure

VNF Virtualised Network Function

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| All new text |

#### 4.2.3.6 ETSI

##### 4.2.3.6.1 Summary of energy efficiency standards drafted by the ETSI Environmental Engineering (EE) Working Group

Table 4.2.3.6.1‑1 below shows a summary of energy efficiency standards developed by the ETSI Working Group on Environmental Engineering (EE). The list is non-exhaustive.

Table 4.2.3.6.1‑1: List of ETSI Environmental Engineering (EE) specifications

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| --- | --- |
| Standard | Summary |
| ETSI ES 202 706-1 [ES2027061] | Defines the measurement method for the evaluation of base station power consumption and energy consumption with static load. The methodology described in this specification is to measure base station static power consumption and RF output power. Within the document it is referred to as "static" measurements. The results based on "static" measurements provide power and energy consumption figures for a Base Station under static load. |
| ETSI ES 203 700 [ES203700] | Defines power feeding solutions for 5G, converged wireless and wireline access equipment and network, taking into consideration their enhanced requirements on service availability and reliability, the new deployment scenarios, together with the environmental impact of the proposed solutions. The minimum requirements of different solutions including power feeding structures, components, backup, safety requirements, environmental conditions are also defined. |
| ETSI ES 203 539 [ES203539] | Defines energy efficiency metrics and measurement methods for NFV components including VNFs and NFVI. The energy efficiency of VNF is evaluated according to hardware energy consumption, resource consumption and utilization related with VNF. The energy efficiency of NFVI is evaluated as resource provision capability which is expressed as service capacity of reference VNFs running on it with amount of energy consumption.  |
| ETSI EN 303 470 [ES303470] | Specifies a metric for the assessment of energy efficiency of computer servers. Formalizes the tools, conditions and calculations used to generate a single figure of merit of a single computer server representing its relative efficiency and power impact. The metric is targeted for use as a tool in the selection process of servers to be provisioned. |
| ETSI EN 303 471 [ES303471] | Specifies the method and metrics to determine the energy efficiency of operational Network Function Virtualisation (NFV) applications and their associated infrastructure. It specifies the method and metrics to determine the energy efficiency of operational Network Function Virtualisation (NFV) applications and their associated infrastructure when that infrastructure is implemented outside the boundaries of the access fixed, cable and mobile networks which they serve. |
| ETSI ES 203 475 [ES203475] | Specifies terminology, principles and concepts for Energy efficiency and energy management. It aims to establish a common understanding of measurement methodology used to determine the energy efficiency of a good, service and network. It presents a framework for other ETSI standards and other Standard Development Organization documents about Energy Efficiency . |
| ETSI ES 203 136 [ES203136] | Defines the energy consumption metrics and measurement methods for packet routing and Ethernet switching equipment. It defines the methodology and the test conditions to measure the power consumption of a router or switch. It is applicable to core, edge and access routers. Home gateways are out of scope. |
| ETSI EN 303 215 [EN303215] | Defines power consumption metrics, methodology and test conditions to measure the power consumption of broadband fixed telecommunication network equipment. It does not cover all possible configuration of equipment, but only homogenous configurations. The types of broadband access technologies covered are: DSLAM DSL, MSAN, GPON OLT and point-to-point OLT equipment. |
| ETSI ES 202 706 [ES202706] | Defines methods for evaluation of power consumption and energy efficiency of base station in static and dynamic mode. The methodology described is to measure base station static power consumption and dynamic energy efficiency, which are referred to as static and dynamic measurements respectively. The results based on "static" measurements of the Base Station power consumption provide a power consumption figure for the Base Station under static load. The results based on "dynamic" measurements of the Base Station provide energy efficincy information for a Base Station with dynamic load. |
| ETSI ES 203 184 [ES203184] | Defines the metric, methodology and the test conditions to evaluate the Equipment Energy Efficiency Ratio (EEER) of Transport equipment, including all the transmission equipment connected to the network by means of wired medium (i.e. copper or fiber), typically running at the network OSI Layer 1. The present document also covers the equipment running at the network OSI Layer 2 (e.g. MPLS-TP) that are not included in the ETSI standard on "Measurement Methods for Energy Efficiency of Router and Switch Equipment" (the same approach is followed by ATIS standard on Transport equipment. Examples of typical wired Transport equipments covered by the present document are switches or crosses connects (SDH, OTN) and add/drop multiplexers (DWDM). The present document covers also simpler systems as multiplexers/demultiplexers (DWDM), optical amplifiers, transponders. |
| ETSI EN 301 575 [ES301575] | Defines energy consumption measurement methods for Broadband CPE telecommunication equipment. Also defines a methodology and test conditions to measure the power consumption of end-user broadband equipment. |
| ETSI ES 203 215 [ES203215] | Defines energy consumption limits and measurement methods for fixed broadband telecommunication network equipment. Also defines power consumption limits, a methodology and test conditions to measure the power consumption of broadband fixed telecommunication networks equipment. The types of broadband access technologies covered are: DSLAM DSL, MSAN, GPON OLT, Point to Point OLT equipment. |

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| End of changes |