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**Information technology — MPEG  
systems technologies —**

**Part 11:  
Energy-efficient media consumption  
(green metadata)**

*Technologies de l'information — Technologies des systèmes MPEG —  
Partie 11: Consommation des supports éconergétiques (métadonnées  
vertes)*

Withhold

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Withdrawn



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# Contents

Page

<b>Introduction</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms, definitions, symbols, abbreviated terms and conventions</b> .....	<b>2</b>
3.1 Terms and definitions.....	2
3.2 Symbols and abbreviated terms.....	5
3.3 Conventions.....	5
3.3.1 Arithmetic operators.....	5
3.3.2 Mathematical functions.....	6
<b>4 Functional architecture (Informative)</b> .....	<b>6</b>
4.1 Description of the functional architecture.....	6
4.2 Definition of components in the functional architecture.....	7
<b>5 Decoder power reduction</b> .....	<b>8</b>
5.1 General.....	8
5.2 Complexity metrics for decoder-power reduction.....	8
5.2.1 General.....	8
5.2.2 Syntax.....	9
5.2.3 Signalling.....	9
5.2.4 Semantics.....	9
5.3 Interactive signalling for remote decoder-power reduction.....	11
5.3.1 General.....	11
5.3.2 Syntax.....	11
5.3.3 Signalling.....	11
5.3.4 Semantics.....	12
<b>6 Display power reduction using display adaptation</b> .....	<b>12</b>
6.1 General.....	12
6.2 Syntax.....	12
6.2.1 Systems without a signalling mechanism from the receiver to the transmitter... 12	
6.2.2 Systems with a signalling mechanism from the receiver to the transmitter..... 13	
6.3 Signalling.....	13
6.3.1 Systems without a signalling mechanism from the receiver to the transmitter... 13	
6.3.2 Systems with a signalling mechanism from the receiver to the transmitter..... 13	
6.4 Semantics.....	13
<b>7 Energy-efficient media selection</b> .....	<b>15</b>
7.1 General.....	15
7.2 Syntax.....	15
7.3 Signalling.....	15
7.4 Semantics.....	15
7.4.1 Decoder-power indication metadata semantics.....	15
7.4.2 Display-power indication metadata semantics.....	16
<b>8 Metrics for quality recovery after low-power encoding</b> .....	<b>16</b>
8.1 General.....	16
8.2 Syntax.....	17
8.3 Signalling.....	17
8.4 Semantics.....	17
<b>Annex A (normative) Supplemental Enhancement Information (SEI) syntax</b> .....	<b>18</b>
<b>Annex B (normative) Implementation guidelines for the usage of Green Metadata</b> .....	<b>20</b>

## Introduction

This part of ISO/IEC 23001 specifies the metadata (Green Metadata) that facilitates reduction of energy usage during media consumption as follows:

- the format of the metadata that enables reduced decoder power consumption;
- the format of the metadata that enables reduced display power consumption;
- the format of the metadata that enables media selection for joint decoder and display power reduction;
- the format of the metadata that enables quality recovery after low-power encoding.

This metadata facilitates reduced energy usage during media consumption without any degradation in the Quality of Experience (QoE). However, it is also possible to use this metadata to get larger energy savings, but at the expense of some QoE degradation.

Withdrawing

# Information technology — MPEG systems technologies —

## Part 11:

# Energy-efficient media consumption (green metadata)

## 1 Scope

This part of ISO/IEC 23001 specifies metadata for energy-efficient decoding, encoding, presentation, and selection of media.

The metadata for energy-efficient decoding specifies two sets of information: Complexity Metrics (CM) metadata and Decoding Operation Reduction Request (DOR-Req) metadata. A decoder uses CM metadata to vary operating frequency and thus reduce decoder power consumption. In a point-to-point video conferencing application, the remote encoder uses the DOR-Req metadata to modify the decoding complexity of the bitstream and thus reduce local decoder power consumption.

The metadata for energy-efficient encoding specifies a quality metric that is used by a decoder to reduce the quality loss from low-power encoding.

The metadata for energy-efficient presentation specifies RGB-component statistics and quality levels. A presentation subsystem uses this metadata to reduce power by adjusting display parameters, based on the statistics, to provide a desired quality level from those provided in the metadata.

The metadata for energy-efficient media selection specifies Decoder Operation Reduction Ratios (DOR-Ratios), RGB-component statistics and quality levels. The client in an adaptive streaming session uses this metadata to determine decoder and display power-saving characteristics of available video Representations and to select the Representation with the optimal quality for a given power-saving.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 13818-1:2013, *Information technology — Generic coding of moving pictures and associated audio information — Part 1: Systems*

ISO/IEC 14496-10, *Information technology — Coding of audio-visual objects — Part 10: Advanced Video Coding*

ISO/IEC 14496-12, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format*

ISO/IEC 23001-10, *Information technology — MPEG systems technologies — Part 10: Carriage of Timed Metadata Metrics of Media in ISO Base Media File*

ISO/IEC 23009-1, *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats*

ISO/IEC 23009-1:2015/Amd 2:2015, *Spatial relationship description, generalized URL parameters and other extensions*

ISO/IEC/TR 23009-3:2015, *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 3: Implementation guidelines*