

# Media-Related Standards Activities Around Sustainability - Abstract<sup>\*</sup>

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## Keywords

standardisation, energy consumption, sustainability, media

The transmission of video in all its forms (broadcast, streaming, social media, teleconferencing, etc) represents a very significant portion of all internet traffic – estimates hover around 80% of all transmitted data. In addition, much of this data is for human consumption, and as such will be displayed on a screen. Studies have shown that IP-based video transmission (IPTV) and over-the-top streaming (OTT) use more energy per programme than digital terrestrial television (DTT) [1, 2]. The display used by the consumer matters significantly, with phone screens taking the least energy, laptops an intermediate amount, and television screen being the most energy-hungry. Televisions may use as much as 50% or more of the total energy consumed to deliver and display a programme [3]. The trend is that televisions are becoming larger, with higher resolutions, wide color gamuts and a high dynamic range, which means that televisions may end up using more energy in the future [4].

Given that the internet is a large heterogeneous system with many actors each having only partial responsibility, understanding the energy consumption, let alone controlling it, is proving a difficult problem. Standardisation can and should play a major role in this.

Standardisation activities are currently ramping up with several standardisation organisations looking at how they may get involved. The following presents a brief overview of current activities in this area. For video transmission the oldest sustainability standard, informally known as Green MPEG, is part of the MPEG specification [5]. It has components to reduce the power consumption of decoders, the power consumption of displays, and a method for energy-efficient media selection. This standard has been revised in 2023. It is unfortunate that this standard is not currently in active use. The International Telecommunications Union (ITU) has ITU-T Study Group 5 devoted to the environment and climate action. This study group is active in producing recommendations to help guide the energy consumption of telecommunications infrastructure, notably including data centres. These are described in the L-series of documents with numbers ranging between 1300 and 1399. ICT assessment methodologies

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and CO2 trajectories are described in the L-series documents in the range between 1400 and 1499. ITU-R Study Group 6 works on broadcasting technologies. In the context of programme production and interchange, they have an activity looking at energy aware broadcasting. Within this context, they have produced an opinion document giving advice on sustainability strategies incorporating carbon offsetting policies [6]. They have also held a webinar inviting three speakers to talk about various aspects of sustainable broadcasting, which is documented in a report [7]. Other standards organisations, including SMPTE and DVB are currently in the process of understanding what their contribution to sustainable video delivery may be. SMPTE has produced a discussion paper in this regard [8]. The Ultra HD Forum is currently deploying a similar activity.

Regarding displays, power measurement standards are set by CTA [9], which the U.S. government uses for its energy labelling. In Europe, the European Commission has a regulatory activity defining limits on power use of television equipment, as well as energy labelling.

At the level of individual standardisation proposals, JVET is currently considering a proposal for an SEI message that would allow a sender to attach metadata to a video stream that at the receiving end can be used to modify the image so that it requires less energy to be displayed [10]. Beyond this, at the moment there are very few standards that define ways to reduce, measure or control the energy consumption of video transmission and consumption eco-systems. To help broadcasting and streaming achieve a net-zero target, much work remains to be done.

Finally, two industry forums dedicated to sustainability in streaming have been created: DIMPACT and Greening of Streaming. The United Nations hosts an initiative entitled “ECCA - Entertainment and Culture for Climate Action” (formerly known as the UN Entertainment Net-Zero Accord).

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