

The Carbon Emissions from Video Streaming: Assessment Methods and Dynamics of Technological Change - Extended Abstract

Daniel Schien¹

¹University of Bristol, Bristol, UK

Keywords

video streaming, sustainability, carbon footprint, assessment methods


The delivery of video data is estimated to currently make up about 80% of traffic in networks¹. A substantial share of this traffic is for video on demand (VoD). Globally, wired and wireless networks are estimated to account for about 270TWh of annually electricity consumption² (about 1% of global consumption). As television audiences transition from broadcast to streaming³, consume video at higher quality (e.g. in ultra high definition UHD and with high dynamic range HDR), and new forms of video based media emerge, the associated implications on carbon emissions need to be understood. As all parts of the economy are setting decarbonisation goals, we need to understand the current impact of video streaming and the drivers that can influence this impact in the future. Based on this understanding, we can enable the relevant parties (media companies, infrastructure operators, users and regulators) to support the decarbonisation agenda.


In our contribution to the *Towards Sustainable and Energy-aware Video Communications (SEViC)* workshop at the International Conference of ICT4S we review the current estimates and the methods they are based on. With reference to recent work⁴ we highlight shortcomings in the current assessment methods used to decarbonisation potential of interventions. In our opinion, the currently available assessment methods are not appropriate to make quantitative claims about the long-term carbon reductions in networks from reductions of data volumes. Following this, we then review the dynamics of technological change in the sector with the goal of identifying material points of leverage for all parties to support decarbonisation of the sector.

In: B. Combemale, G. Mussbacher, S. Betz, A. Friday, I. Hadar, J. Sallou, I. Groher, H. Muccini, O. Le Meur, C. Herglotz, E. Eriksson, B. Penzenstadler, AK. Peters, C. C. Venters. *Joint Proceedings of ICT4S 2023 Doctoral Symposium, Demonstrations & Posters Track and Workshops. Co-located with ICT4S 2023. Rennes, France, June 05-09, 2023.*

✉ daniel.schien@bristol.ac.uk (D. Schien)

ORCID 0000-0002-5290-7443 (D. Schien)

 © 2023 Copyright for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

 CEUR Workshop Proceedings (CEUR-WS.org)

¹https://www.cisco.com/c/dam/m/en_us/solutions/service-provider/vni-forecast-highlights/pdf/Global_Device_Growth_Traffic_Profiles.pdf

²<https://researchbriefings.files.parliament.uk/documents/POST-PN-0677/POST-PN-0677.pdf>

³<https://www.publicmediaalliance.org/going-all-digital-bbc-france-televisions-consider-online-only-futures/>

⁴<https://hdl.handle.net/1983/45d19f14-1038-4ab7-a499-d51b38d107c9>

Acknowledgments

The presented ideas are based on work with Prof Chris Preist and Paul Shabajee.