

International Broadcast consortium releases a major holistic study on the energy and carbon impacts of the delivery of TV content across different platforms in Europe.

Study concludes that delivery of content via digital terrestrial television consumed substantially less energy, when compared to IP-based methods and that this will remain the case in the long term under a range of scenarios. Study also indicates that the potential shifting of a proportion of on-demand traffic to DTT networks could bring an additional emission reduction benefit.

Embargo until November 2021, 15 at 2PM CET

November 15, 2021. A group of leading European Broadcast, Streaming and Technology players (1), gathered under the banner of the LoCaT Project, released today the results of a pan-European study to estimate and compare the energy consumption and greenhouse gas (GHG) emissions associated with serving TV and VOD content across three different network platforms (2): Digital Terrestrial TV (DTT), Over-The-Top (OTT) and Managed IPTV.

Digital Terrestrial Television offers the highest energy efficiency and lowest carbon impact for delivery of TV content across Europe in 2020

The study concludes that on average across Europe (3) in 2020, the energy consumption associated with one device viewing hour delivered via DTT (digital terrestrial television) was 14 Wh, 109 Wh for over the top delivery (OTT) and 153 Wh for managed IPTV. This equated to 3g of carbon dioxide equivalent emissions (CO₂e) for DTT, 26g CO₂e for OTT and 37 gCO₂e for IPTV. This excludes the energy consumption of the television set itself (4), typically 56 Wh or 13 g CO₂ per hour.

This same kind of pattern applies in all countries, although there are variations between countries driven by differing viewership behaviors (viewing durations and penetrations of each delivery method), usage of in-home peripherals as well as the proportion of the internet traffic attributable to OTT or IPTV viewing. For a similar energy consumption, there are also differences in GHG emissions between countries owing to the differences in carbon intensity of the national electricity grid of the respective countries.

The lower energy consumption of DTT results from the efficiency of the broadcasting networks, as well as the simplicity of the in-home reception equipment. Apart from a small fraction of households requiring an antenna amplifier, the DTT antenna cable is typically connected directly to the TV without the need for an active device. The one-to-many distribution method also meant that the energy consumption of the DTT transmission networks was relatively low when divided by the total viewing hours using DTT.

Unit energy consumptions and carbon emissions of TV viewing will generally decrease in the future: scenarios with the highest usage of DTT will show lowest aggregate energy usage and CO₂ emissions

The study projected the long-term evolution of the situation across four different scenarios covering the time period from 2020 to 2035, in which were factored, amongst others, the evolution of viewing behavior (e.g. on demand vs linear, UHD, ..), the expected reduction of grid emissions per kWh, as well as possible changes in the distribution of viewing hours between the respective platforms (DTT, OTT, IPTV); the scenario results suggest that the lower unit energy consumption of DTT compared to IPTV and OTT (and of OTT compared to IPTV) will remain true over time in all scenarios, so that overall energy consumption tends to be lower for scenarios that have a higher proportion of DTT.

As for on-demand viewing, OTT has a lower energy usage than IPTV and may be the ideal complement to DTT; shifting part of on-demand traffic to DTT in the future could bring an additional environmental benefit

While OTT has a higher energy consumption than DTT, it still has a lower consumption than IPTV, mainly because of lower average energy consumption of peripherals (either none needed, or a lower-energy streaming device is used), which suggests that it is a good complement to DTT to deliver the on-demand content desired by consumers.

The study furthermore evidenced the possible energy consumption and emission reductions which could occur if part of the on-demand viewing (e.g. ; the most popular on-demand contents) would be shifted from IP based networks to the DTT network through a home caching approach.

Mr. Hervé PAVARD, Chairman of ATET commented : *“All broadcasters who are part of ATET are convinced of the importance for their respective public service mission, or commercial business interests, of delivering their programs through DTT amongst other options; we now have the clear confirmation that it has also an important environmental benefit which needs to be protected”.*

Mr. Arnaud Lucaussy, Chairman of Broadcast Networks Europe (BNE) commented *“In the context of the fight against climate change, this study provides new evidence that the most popular television distribution platform, DTT, which is present in 42% of European households, is also very energy efficient, and is likely to remain so for the long term”.*

Mr. Xavier BATTAS, GM and co-founder at QUADRILLE commented : *“This unique and high value study is adding another major and compelling reason to consider the delivery of on-demand content through broadcast networks, which is what QUADRILLE has been doing for many years. “*

Mr. Thomas FOLLIN, CEO of SALTO commented: *“SALTO is committed to be a responsible streaming platform, and we welcome the neutral assessment made by the LoCaT study which gives us a starting point to monitor and improve our environmental impact; we will consider all approaches to reduce this impact, including the promising push and cache alternative for our most popular contents.”*

Mr. Michael WAGENHOFER, Managing Director of ORS commented: *“ORS is paying attention to reduce its own carbon footprint and now we have a clear signal that in doing so we have created a very efficient delivery platform at carbon level in Austria.”*

Mr. Glynn ROBERTS, Senior Partner and Director at Carnstone Partners commented: *“We are thrilled to have had the opportunity to work on the LoCaT project which brings a new pan-European view and prospective dimension to the research on carbon impacts of TV consumption.”*

About the study

The study was conducted by Carnstone, a management consultancy specializing in sustainability and corporate responsibility (5), adopting an attributional life-cycle assessment (LCA) approach, consistent with that of the BBC White Paper and the DIMPACT project. The study used primary data for some components of the delivery system available from the LoCaT Project Sponsors, but also drew upon market research published by organizations such as European Audiovisual Observatory, BARB, Ofcom, and the European Broadcasting Union to understand TV viewing behaviors across Europe; the results of the LoCaT study align closely with other similar studies looking at DTT and OTT, notably the academic paper produced in partnership with the BBC *“Using Behavioural Data to Assess the Environmental Impact of Electricity Consumption of Alternate Television Service Distribution Platforms (2021)”*.

A complete report summarizing the study results as well as the key assumptions and elements of methodology can be obtained on www.thelocatproject.org.

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Note 1 : The LoCaT Project is a collaborative initiative backed by ;

- Association Technique des Editeurs de la TNT (**ATET**) – the trade organization of TV channels delivered via DTT in France, which includes all leading private and public broadcasters such as Arte, France Télévision, TF1, M6, Canal Plus and NRJ.
- Broadcast Networks Europe (**BNE**) – the trade organization of DTT and radio network operators in Europe). BNE members operate networks in 20 European countries.
- **ORS Group** – the main Austrian DTT network operator
- **Quadrille** – a French content delivery technology provider which is powering the delivery of on demand content via satellite and terrestrial networks with its proprietary push technology.
- **SALTO** – the new French OTT streaming platform

- Note 2 :** At this stage, the LoCat Study has assessed energy and carbon impacts for the TV hours delivered by DTT, IPTV and OTT, though the significant volumes of TV viewing using cable and satellite platforms were not ignored and factored into the study.
- Note 3 :** The geographical scope of the LoCat study is EU28 i.e. the 27 countries of European Union plus the UK.
- Note 4 :** The scope considered by the LoCaT study is limited to the **delivery** of content, excluding the production of content (shooting, play-out, ..) as well as the viewing device (TV set or other viewing devices). At this stage, only in home viewing on the TV set is included (excluding laptop, tablets, mobile phones, mobile networks).
- Note 5 :** Carnstone also developed in partnership with the University of Bristol's Computer Science Department and leading media organizations the DIMPACT web-based tool (<https://dimpact.org>) that allows large media companies to estimate the GHG emissions of serving their digital content.