

## Broadcast Satellite Distribution of TV Programs Offers Substantial Sustainability Benefits vs. IP in Europe and Americas, Study Finds.

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September 14 2025. The LoCaT Project releases today the results of an extension (1) of the landmark pan-European study (2) published in 2021 which assessed the energy consumption and greenhouse gas (GHG) emissions associated with delivering TV content across Europe; in this extension, the satellite delivery option has been added to the three network platforms considered in the LoCaT Original study, namely digital terrestrial TV (DTT), over-the-top (OTT) and managed IPTV. Study indicates that **Satellite is a highly energy efficient and low carbon impact delivery option in Europe, 6 to 8 times more efficient than IP, and second only to DTT.**

The study concludes that on average across Europe (3) in 2020, the energy consumption associated with one device viewing hour delivered via satellite was 19.5 Wh, compared to 109 Wh for OTT and 153 Wh for managed IPTV (4). DTT still outperforms satellite with only 14 Wh per viewed hour.

**This equates to 4.7 g of carbon dioxide equivalent emissions (CO<sub>2</sub>e) for one hour of viewing delivered by satellite,** compared to 26.2 g for OTT, 37g for IPTV and 3.3 g for DTT, excluding the energy consumption of the TV set itself (5).

The same kind of pattern applies in all countries, although there are variations between countries driven by differing viewership behaviours (viewing durations and weight of each delivery method) and differing usage of in-home peripherals. For a similar energy consumption, there are also significant differences in GHG emissions between countries owing to the differences in carbon intensity of the national electricity grid of the respective countries.

**Satellite energy usage and emissions are almost entirely tied to In-Home reception equipment, where significant improvement opportunities exist**

Interestingly, the LoCaT Sat study has evidenced that the overwhelming majority (more than 99%) of electricity usage in satellite delivery is attributable to in home equipment (LNB, decoder, amplifier, etc.) with up-link facilities representing only 0.1 Wh per hour in a total of 19.5 Wh ; the weight of in-home equipment was comprised between 40% (DTT) and 75% (IPTV) for other delivery methods, which makes satellite quite different. The overwhelming preponderance of in-home equipment remains true when emissions are considered, as launch phase would account for only 0,02 gCO<sub>2</sub>e per viewed hour in a total of 4.7 g per hour.

Another striking feature revealed by the study is that the energy usage by in home equipment (and the associated emissions) greatly varies (in a 1 to 15 scale) depending on the in-home reception situation, influenced by factors such as usage of an external decoder (set-top-box) vs using the embedded satellite decoder of the TV set, or whether the household using satellite TV reception is an individual home (most efficient) or situated in a collective multi-dwelling building; these unexpected findings open an array of promising improvement opportunities, as the satellite TV ecosystem is now in a position to define and promote the most efficient in-home reception models, which could potentially cut the satellite energy and GHG impacts by a factor as high as 2 or 3.

**Energy efficiency of Satellite delivery of TV is similar in North America and substantially higher in Latin America**

As a significant addition to LoCaT Original, LoCaT Sat has assessed the impacts of TV delivery (in the case of satellite) in North America and Latin America. The results indicate that delivery of TV via satellite is marginally more efficient in North America when compared to Europe, with 19.1 Wh per viewed hour compared to 19.5 Wh, and substantially more efficient in Latin America with only 10.5 Wh per viewed hour. For Latin America, these variations are explained principally by (1) the significantly higher proportion of individual homes (versus collective housing, which also applies in North America) and (2)

the significantly higher amount of linear TV watched in an average Latin America home, due to lower streaming usage and to the larger size of the typical household (this does not apply to North America, on the contrary). These energy upsides of North and Latin America are largely absorbed by higher grid factor in these regions, so that emissions attributable to one hour of TV delivered by satellite amounts to 8 gCO<sub>2</sub>e in North America (vs 4.7 gCO<sub>2</sub>e in Europe) and to 4.25 gCO<sub>2</sub>e in Latin America.

### **In mid-term projection, unit energy consumptions for satellite delivery will slightly increase but emissions will significantly decrease**

The study projected the long-term evolution from 2020 to 2035 and indicates that energy usage / viewed hour in Europe will slightly increase from 19.5 Wh in 2020 to 20.4 Wh in 2035, mainly due to a projected erosion in both linear TV viewing and satellite DTH market share. The emission impact will on the opposite be significantly reduced (from 4.7 to 1.3 gCO<sub>2</sub>e), driven by the expected strong reductions of emissions from electricity production; North and Latin America would follow similar trends, although with lower projected reduction factors (NB: these scenarios integrate only prudent improvement in in-home reception energy usage with higher usage of embedded decoders, and could be significantly improved if more efficient in-home reception are promoted).

**Aymeric Genty, President of Eutelsat's Video Business Unit**, commented: *"Satellite delivers around one-third of all TV viewing hours in European homes, underscoring its continued importance in the broadcast ecosystem. As a leading operator in Europe and globally, we are pleased to see satellite included in the latest LoCaT assessment. The confirmation of satellite's high energy efficiency reinforces its value—not just in reach and reliability, but also in sustainability"*

**Jorge Rodriguez, Head of Product and Marketing at Hispasat**, commented: *"As a major provider of DTH services across Spanish and Portuguese speaking countries, we can now reassure our customers in the region that satellite technology offers a highly energy-efficient and environmentally friendly video distribution solution"*

**Rhys Morgan, VP, Western Europe & Africa, Media at INTELSAT** (Now part of SES) declared: *"Satellite remains one of the most energy-efficient ways to deliver high-quality content from a single feed to millions of viewers. To keep up with evolving content viewing habits, broadcasters can blend DTH, DTT, and IP services to deliver content, using satellite to reach large-scale audiences, and streaming for niche and personalized content. As a leading global space solutions provider, we are proud to provide our media customers a sustainable way of distributing content."*

**Christophe Perini, CEO at Inverto**, commented: *"The confirmation of the high energy efficiency of satellite delivery creates another compelling reason to use satellite for streaming-styled traffic; this is what we enable with our Q-Stream solution, based on DVB-NIP. "*

**Brian Jakins, VP Global Sales, Market Development and Strategy at ST Engineering iDirect**, commented: *"Forty years in satellite taught us one thing—real impact comes from collaboration. We joined our satellite ecosystem partners in this study to demonstrate the industry's relevance beyond technology and market growth, illustrating how our solutions deliver low-energy connectivity at scale to bridge unconnected communities efficiently and sustainably. "*

**Alberto SIGISMONDI, CEO at Tivu**, commented: *"We are very pleased with these results which comfort Tivu in its choice of maximizing usage of DTT and DTH, the two most energy efficient TV delivery methods, to deliver advanced services to Italian viewers "*

### **About the LoCaT Sat study**

The LoCaT Sat study was conducted by Carbone4, the first independent consultancy specialized in low carbon strategy and adaptation to climate change, adopting an attributional life-cycle assessment (LCA) approach, consistent with the one used in the LoCaT Original study of 2021 conducted by Carnstone (now part of SLR Consulting). The study used primary data for some components of the satellite delivery system available from the LoCaT Sat Sponsors, but also drew upon market published research; when applicable, inputs and results from LoCaT Original were used without any change to ensure consistency of LoCaT Sat and LoCaT Original, although certain changes could be considered to more accurately reflect the 2025 situation (vs the 2020 timing considered in both LoCaT Sat and LoCaT Original)

A complete report summarizing the study results as well as the key assumptions and elements of methodology can be obtained on [www.thelocatproject.org](http://www.thelocatproject.org) .

**Contact:** [info@thelocatproject.org](mailto:info@thelocatproject.org)

**Note 1 :** The 2025 extension of LoCaT dedicated to satellite (denominated LoCaT Sat) has been funded by an ad-hoc consortium made of

- **Eutelsat Group**, the world's first GEO-LEO satellite operator
- **Hispasat**, a Spain based satellite operator and service provider, leader in content distribution across Spanish and Portuguese speaking countries
- **Intelsat, now part of SES**: A leading space solutions company with integrated multi-orbit satellites and global terrestrial network that help governments to protect, businesses to grow, and people to stay connected
- **Inverto**, a Luxembourg based developer and marketer of broadcast reception equipment, video streaming solutions and end-to-end content delivery platforms based on DVB-NIP
- **ST Engineering iDirect**, a subsidiary of ST Engineering and a global leader in satellite communications (satcom) providing technology and solutions that enable its customers to expand their business, differentiate their services and optimize their satcom networks
- **Tivù**, an Italia based DTH platform provider

**Note 2 :** The LoCaT Original study published in 2021 is available at [www.thelocatproject.org](http://www.thelocatproject.org) ; it was funded by an ad-hoc consortium made of ;

- **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 French 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** - (now part of INVERTO) 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 (at that time) new French OTT streaming platform

**Note 3 :** The geographical scope of the LoCaT Sat is the same as the one in LoCaT Original, namely EU28 i.e. the 27 countries of European Union plus the UK.

**Note 4 :** Results for DTT, OTT and IPTV are extracted from LoCaT Original Study (and were calculated for 2020).

**Note 5 :** 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).