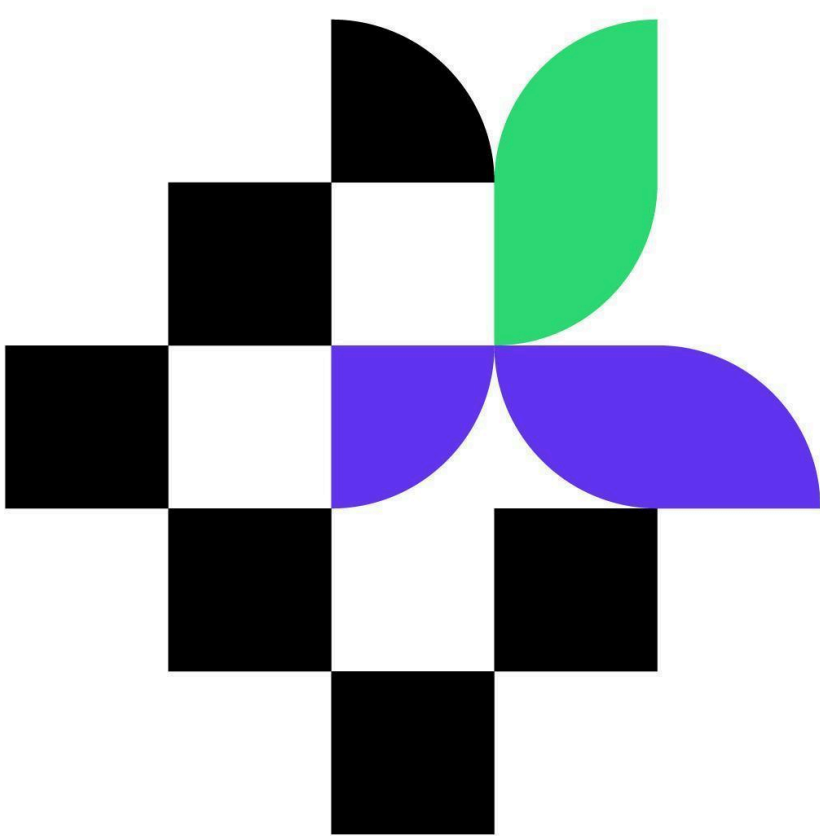




D1.1 Set the stage workshops: report

Work Package 1 PlaySCAPES: Stakeholder workshops

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Technical references

Project acronym	StreamSCAPES
Project name	Driving Sustainable Climate Transition of Video-On-Demand Platforms at a Time of Transformation
Project number	101177811
Type of action	HORIZON Innovation Actions
Granting authority	European Research Executive Agency
Project duration	1 March 2025 - 31 August 2028 (42 months)
Coordinator	Antonios Vlassis, University of Liège (BE), avlassis@uliege.be

Deliverable presentation

Deliverable no.	D1.1
Deliverable Name	Set the stage workshops: report
Work Package no.	WP1
Lead Beneficiary	UNIVIE
Contributing Beneficiaries	ULIEGE, EUI, VUB
Reviewers	Katharine Sarikakis (WP1 leader, UNIVIE), Mafalda Dâmaso (EUI), Heritiana Ranaivoson (VUB), Antonios Vlassis (ULIEGE)
Type	Report
Dissemination Level	Sensitive
Due Date (month)	31 October 2025 (M8)
Actual Submission Date	31 October 2025
Key Words	Streaming, Video-on-Demand Platforms, VOD, Audiovisual Industry, Climate Change, Sustainability, Sustainable

	Climate Transition, Policy, Creative and Cultural Industries, Distribution, Production, Consumption, Environmental Impact, European Union.
Language	English
Licencing terms	CC BY-NC-SA 4.0
DOI No.	10.5281/zenodo.17482790

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

Citation

Keinonen Heidi, Katharine Sarikakis, Pedro Tinen, Marina Rossato Fernandes, Antonios Vlassis, Pauline Bissot, Solenn Houard, Sergio Goffredo, Mafalda Dâmaso, Heritiana Ranaivoson, Marlen Komorowski (2025), *PlaySCAPES: Set-the-Stage Report on Sustainable Climate Transition and VOD platforms*, Horizon Europe project StreamSCAPES (ID: 101177811).

This publication can be viewed online and downloaded as a pdf. Visit: <https://www.streamscapes.eu/>

1st Edition 2025

StreamSCAPES URL at Zenodo: <https://zenodo.org/communities/streamscapes/>

Revision history and list of contributors

Version	Date	Authors
1	30/10/2025	Heidi Keinonen, Katharine Sarikakis, Pedro Tinen, Marina Rossato Fernandes, Antonios Vlassis, Pauline Bissot, Solenn Houard, Sergio Goffredo, Mafalda Dâmaso, Heritiana Ranaivoson, Marlen Komorowski

Executive Summary

StreamSCAPES brings together a consortium of twelve organisations, composed of academic institutions and key representatives of creative and cultural industries (CCIs), to explore the under-utilised strengths, existing challenges and knowledge, practice and policy gaps in the Video-On-Demand (VOD) services in Europe, which hinder or enable their sustainable climate transition (SCT). As VOD platforms are increasingly important nodes within audiovisual and cultural ecosystems, StreamSCAPES focuses on this dynamic intersectional juncture of technology, business models, consumption habits and meaning makers to develop and pilot solutions to untap the potential of VOD platforms to support the green transition.

This project deliverable is the outcome of the research activities organised in Work Package 1 – PlaySCAPES: Stakeholder workshops. WP1 aims to establish contacts between the audiovisual sector, academia, the CCIs, and local, national, and international authorities, by bringing key stakeholders together to identify common challenges and needs, generate ideas and challenge established thinking. Five online workshops with 24 participants were organised between June and September 2025 to discuss 1) the social relevance and understanding of SCT, 2) the SCT in production and distribution, and 3) policies and initiatives related to the SCT. The workshop data were analysed by using the qualitative thematic analysis method.

While the SCT of the sector remains a complex issue, the deliverable reveals growing awareness of the environmental impact of the VOD industry. Throughout the workshops, participants consistently identified a significant lack of verified data and shared knowledge as the main challenge of engaging in the SCT. Knowledge should here be understood not only as technical skills or guidelines, data and tools, but also as the institutional capacity to measure, interpret and operationalise sustainable practices across the value chain.

For many established broadcasters and platforms, carbon accounting has become routine – extending from office and on-premise infrastructure to cloud workloads. However, there is no unified understanding of what and how should be measured nor to what ends the resulting metrics are to be acted upon. This leaves space for greenwashing, which was recognised as a critical threat. While financial considerations remain a barrier for the adoption of the SCT especially for smaller platforms, sustainability was also recognised as an opportunity to bring

financial benefits and enhance brand image and long-term relevance. In this direction, the workshops underscored the influential role of VOD platforms in promoting sustainability and, in particular, the social responsibility of public service broadcasters. Providing content related to climate change was seen as a powerful medium for shaping public attitudes toward sustainability.

The workshops also revealed that sustainability practices in content production are more developed than in digital distribution, content delivery, advertising and post-production. Widely adopted frameworks have normalised greening practices, and established commissioners can use contractual leverage to require measurement and greener practices in their value chains. Smaller streaming platforms, however, suffer from lack of power in this regard. On the consumption side, interface-level nudges showed promising results: incentives and defaults (e.g. the use of eco settings) multiplied small savings without degrading the user experience. Nevertheless, the responsibility for end-user device emissions remains a contested topic.

In terms of policy and governance, existing ambition and initiatives contrast with the lack of comprehensive frameworks to support concerted action. Fragmentation is recognised on various levels, resulting in a patchwork of localised developments rather than a systemic integration in operations. However, regulatory complexity risks diverting scarce capacity from reductions to compliance interpretation. To address this, tiered obligations were suggested to protect small services while pushing for harmonisation, transparency, and region-wide standards. Indeed, participants expressed openness to the potential of future regulations that could provide common frameworks and vocabularies to produce more comparability and accountability.

The findings demonstrate that the SCT in the VOD ecosystem is a goal requiring structurally interdependent initiatives due to a reliance on shared infrastructures of cloud services, networks, devices, and energy providers, and the fact that sustainable transformation in the audiovisual sector requires collective effort. Cross-industry coalitions, regulator-convened groups, and shared tools or labels reveal a cooperative ethos but more sector-wide collaborative approaches are needed. In this direction, stakeholders stressed the importance of harmonising measurement methods and developing shared frameworks to foster collaboration and prevent fragmentation. The workshop discussions thus highlighted both the complexity of the topic and

the urgent need for harmonised conceptual understanding, measurement, and implementation across the value chain.

In conclusion, the conditions for the effective SCT in the VOD sector are not merely technical but infrastructural, epistemic and organisational. Further progress requires harmonised measuring frameworks, multistakeholder cooperation, structured policy and industry dialogue, and the transformation of current fragmented policies and industry initiatives into shared standards, understandings and goals.

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List of abbreviations

ADEME	Agence de la transition écologique (French Agency for Ecological Transition)
AI	Artificial Intelligence
Arcom	Autorité de régulation de la communication audiovisuelle et numérique (French Regulatory Authority for audiovisual and digital communication)
BAFTA	British Academy Film Awards
CCIs	Creative and Cultural Industries
CSRD	Corporate Sustainability Reporting Directive
D1.1	Deliverable 1.1
ESPR	Ecodesign for Sustainable Products Regulation
EU	European Union
EUI	European University Institute
MAUD	Multicast-Assisted Unicast Delivery
SCT	Sustainable Climate Transition
ULIEGE	University of Liège
UNIVIE	University of Vienna
VOD	Video On Demand
VUB	Vrije Universiteit Brussel

Technical glossary

Ad Net Zero	An advertising-industry initiative to reduce operational and campaign-related carbon emissions to net-zero.
API (Application Programming Interface)	A programming communication tool that allows software components or services to talk to each other.
AV1 (AOMedia Video 1)	A royalty-free video codec optimised for internet streaming.
BAFTA albert	BAFTA's industry initiative for film and TV to reduce environmental impact and move toward sustainable production.
Carbon Trust White Paper	From the Carbon Trust, it outlines concepts and frameworks for personal carbon allowances and their role in climate mitigation.
CND (Content Delivery Network)	A geographically distributed network of servers that deliver web and video content faster and with lower latency.
Codecs	Algorithms that compress and decompress audio or video to reduce file size and enable storage and transmission.
CSRD (Corporate Sustainability Reporting Directive)	An EU-Directive that mandates large companies to publicly report detailed environmental, social, and governance (ESG) data.
DIMPACT Tool	An industry-collaborative carbon calculator for digital media companies to measure their streaming, advertising, and cloud operations.
Ecodesign for Sustainable Products Regulation	EU regulation that requires products to meet energy-efficiency and environmental performance criteria by design.
Ecoflow	A live-streaming and analytics tool focused on measuring the environmental impact of streaming workflows.
Ecoprod	A France-based initiative providing tools, training, and guidelines to make audiovisual production more sustainable.
Energy Labelling Regulation	EU regulation that mandates standardised energy-efficiency labels on products to inform consumers.
Environmental Lifecycle and Sustainability	A methodology for evaluating environmental impacts across a product or service life cycle.

Assessment (ELSA)	
EU's Industrial Strategy	The EU's plan to future-proof European industry by supporting green, digital, and resilient transformation.
European Green Deal (EGD)	The EU's overarching strategy to become climate-neutral by 2050 through emissions reduction, green investment, and regulation.
German Ecological Standards for greening audiovisual productions	The sustainability standards for German audiovisual production.
GHG Protocol (Greenhouse Gas Protocol)	An emissions' accounting standard for measuring and reporting greenhouse gas emissions across Scopes 1, 2, and 3.
Scope 1	Direct greenhouse gas emissions from sources a company owns or controls, such as company vehicles, on-site fuel combustion, and industrial processes.
Scope 2	Indirect emissions from the generation of electricity, steam, heat, or cooling consumed by the company.
Scope 3	Indirect emissions from a company's value chain outside its direct control, typically the largest share of total footprint.
Green Film	A certification and protocol guideline for sustainable film production practices.
Green Producer's Tool	A Norway-based platform providing tools, certification, and support to help media and creative producers cut emissions.
Green Toolkit Film and TV	A European toolkit offering practical measures and resources to green film and TV productions.
Greenly	A platform that automates carbon calculation and ESG reporting for organisations.
H.265/H.264	High Efficiency Video Coding is a video compression standard.
IP switchover	The transition from terrestrial broadcasting to IP transmission.
ISP (Internet Service Provider)	A company that provides users with connectivity to the internet.
ITU (International Telecommunication Union)	A UN agency that sets global standards for telecommunications and spectrum coordination.

MAUD (Multicast-Assisted Unicast Delivery)	A hybrid delivery model that combines multicast with unicast, grouping single streams into a shared one and directing it to viewers.
Metrikflow	A platform for media companies to measure and reduce carbon across advertising and content workflows.
Multicast or Peer-to-Peer (P2P)	Network methods that distribute the same data stream to many users more efficiently than separate unicast streams.
NES (The Nordic Ecological Standards)	A Nordic framework defining sustainability criteria for film and TV productions.
Watershed	A platform for carbon calculation, decarbonisation planning, and ESG disclosure.

1 StreamSCAPES: Overview of the project

StreamSCAPES is a multistakeholder and multidisciplinary research project conducted under the auspices of the European Union (hereinafter 'EU') Horizon Europe programme dedicated to the ways in which decision-making in the Cultural and Creative Industries (hereinafter 'CCIs') is leading the Sustainable Climate Transition (hereinafter 'SCT') with a special emphasis on Video-on-Demand (hereinafter 'VOD') platforms as key parts of the audiovisual and cultural ecosystems. StreamSCAPES brings together twelve organisations in a consortium of academic institutions and industry beneficiaries to provide a mapping of data on best practices and methods that can unlock the underexplored potential of VOD services to accelerate Europe's green transformation. In line with the expertise of the participating institutions and partners, the consortium delivers a comprehensive analysis of VOD and the SCT from cultural and media studies, economics and business, environmental impact analysis, policy and governance studies.

In pursuit of its overarching aims and objectives, StreamSCAPES' research agenda rests on four key dimensions: examining production processes, industry practices and needs, as well as business models; consumption and everyday practices; institutions and policies; and storytelling and narratives. The project provides and analyses how these dimensions enable VOD platforms to advance the SCT and also addresses gaps that may currently limit the sector's capacity to collaborate with it. To activate this agenda, StreamSCAPES combines qualitative and quantitative research and pursues three main research streams, as follows:

- An interdisciplinary mapping and assessment of ways to substantially "green" VOD operations across the CCIs,
- Piloting the transformative potential of VOD through a hubs-based, future studies approach in a "Blue Skies" generation of ideas with a special focus on children and youth,
- Co-testing, with platforms and industry partners, the contribution of VOD to the SCT in line with the European Industrial Strategy and the European Green Deal.

The research outcomes of the abovementioned streams activities will be consolidated into scientific reports and academic publications and made available to the public through online

and open-access databases. Additionally, the results and outputs of StreamSCAPES will provide paths to development of unique tools, such as:

- A SCT VOD certification, developing robust methods to measure the carbon footprint of VOD platforms,
- Designed business clinics that provide advice and guidance to VOD platforms on greening operations,
- A 'StreamSCAPES Dashboard' designed to make public data available to policymakers, professionals and citizens,
- Identify underutilised approaches that VOD platforms can use to boost the SCT,
- A 'First-Aid Kit Handbook' that empowers VOD professionals, audiovisual and cultural workers, and citizens to support the SCT in a bottom-up manner, with particular attention to youth- and children-engagement in practices and 'Blue Skies' imaginations towards innovation.

2 Introduction

The StreamSCAPES project is organised into eleven Work Packages (WPs). WP1 – Playscapes: Stakeholder Workshops aimed at creating a solid basis for the project by establishing contacts between the audiovisual sector, academia, the CCIs, as well as local, national, and international authorities. By bringing key stakeholders together to generate new ideas and to challenge established ones, the workshops provided an opportunity to contribute to the research design and inform the subsequent Work Packages. The workshops were organised around three main themes: 1) the social relevance and understanding of SCT in the context of VOD platforms, 2) SCT in production and distribution, and 3) the policy and governance of SCT.

Audiovisual industry is a key sector within the cultural and creative industries. In recent years, the consumption of audiovisual works has shifted from linear television channels to VOD platforms. As a result of increasing online media consumption, the growing number of distribution platforms, and rising expectations for high production value and technical quality,

the environmental impact of the audiovisual industry in Europe has been increasing.¹ Streaming video has, in fact, been described as a self-perpetuating circle, where increased energy efficiency leads to greater consumption, as the availability of online video fosters new consumption patterns. As Laura Marks et al state, streaming video thus exists “within a market-driven feedback loop of infrastructural expansion and consumer demand”.²

Despite the highly polluting and wasteful practices of the screen industry, there are no industry-wide systems for auditing and reporting the environmental impacts, and only few formal policies are widely recognised or adopted.³ A recent report published by the European Audiovisual Observatory maps the current legislation related to the greening of the audiovisual industry, including the Paris Agreement as well as national and EU sustainability legislation. Most of the policy instruments are not specific to the audiovisual sector.⁴ Instead, national and supranational criteria of film funding are increasingly fostering sustainability, and film funds are providing toolkits and guides for sustainable production.⁵

Actors in the film and television industry have themselves been working towards the sustainable climate transition. Environmental industry associations, networks and other collaborative initiatives have emerged with the aim of promoting sustainability and exchanging best practices. Most of these actions are rooted in the strategies of specific players and their ambition to influence others. In recent years, several calculators measuring the carbon footprint of audiovisual productions as well as rating systems to assess the overall sustainability of the audiovisual productions have been developed.⁶ A number of reports on industry initiatives concerning the greening of film and television production have also been published. However, the various carbon calculators and ratings systems currently lack comparability. In response to

¹ Philip Gassmann and Marie Gouttefarde, *Greening the European audiovisual industry. Best practices and their costs* (European Commission 2021).

² Laura U. Marks, Stephen Makonin, Radek Przedpełski and Alejandro Rodriguez-Silva, *Tackling the Carbon Footprint of Streaming Media* (Simon Fraser University 2021).

³ Inge Ejbye Sørensen and Caitriona Noonan, ‘Production, policy and power: the screen industry’s response to the environmental crisis’ (2022) 44(1) *Media, Culture and Society* 172.

⁴ Eric Munch, *Green transition in the audiovisual sector* (European Audiovisual Observatory 2025); Ruxandra Lupu, Marlen Komorowski, Gregory Mothersdale and Justin Lewis, *CLWSTWR policy brief no 4: Green innovation for the screen sector* (Cardiff University 2022).

⁵ Munch (n 4), 32.

⁶ Munch (n 4); 2025; Lupu and others (n 4).

this challenge, the European Commission has launched a project that will deliver a common calculation methodology to assess the CO2 impact of audiovisual works.⁷

The current calculators are not complete, as they primarily focus on production practices thereby excluding other parts of the value chain, such as distribution and consumption.⁸ While streaming and digital distribution may appear to be environmentally friendly modes of delivery, they have embedded film and television within a broader ecosystem of technological industries, connected devices and infrastructures. Data transmission and storage often account for the majority of emissions. The main contributors to streaming-related emissions therefore include energy-intensive data centres, content delivery networks (CDNs), transmission networks and end-user devices.⁹

While video streaming comes with a carbon footprint of its own, research on the sustainability of the VOD platforms remains limited. Marks et al estimate that video streaming (including VOD, YouTube, video embedded in websites and social media, video conferences, and games, etc) is responsible for over one percent of greenhouse gas emissions worldwide, arriving at a similar calculation to that of The Shift Project. They suggest that mitigating the increase in carbon emission begins with slowing individual demands for more high-resolution streaming. The report offers recommendations for individuals, organisations, media platforms, manufacturers, service providers, data centre companies and governments in the streaming video industry to make their actions more sustainable.¹⁰

A white paper by Carbon Trust analyses the carbon impact of watching one hour of video streaming, and aims to improve the understanding of the carbon footprint of video streaming and its inherent complexity, variability and uncertainty.¹¹ Moulhierac et al have analysed several models that have been proposed to estimate the carbon footprint of one hour of streaming to understand the roots of the observed discrepancies. The article highlights that the main challenge in comparing these models lies in the difficulty of obtaining adequate estimates for

⁷ Gassmann and Gouttefarde (n 1).

⁸ Sørensen and Noonan (n 3).

⁹ Munch, (n 4), 7; Hunter Vaughan and Pietari Kääpä, *Sustainable digitalisation. Ensuring a sustainable digital future for UK film and television* (Minderoo Centre for Technology & Democracy 2023); Kara Anderson, 'The Carbon Cost of Streaming' (14 February 2025) *Greenly.earth*.

¹⁰ Marks and others (n 2), 4.

¹¹ Andie Stephens, Chloe Tremlett-Williams, Liam Fitzpatrick, Luca Acerini, Matt Anderson and Noor Crabbendam, *Carbon impact of video streaming white paper* (Carbon Trust 2021).

the constants of the models. In addition, the lack of transparency and data sharing from streaming further complicates the comparison efforts.¹²

In light of this context, this report examines how professionals working in the VOD industry perceive and engage with SCT. Adopting a bottom-up perspective, it seeks to capture how SCT processes unfold in practice, providing insights into how industry actors interpret, negotiate, and respond to existing challenges, opportunities, and policy frameworks. Through this approach, the report aims to contribute to a more grounded understanding of the sustainable climate transition in the European VOD industry. This report consists of six sections:

Section 1 above provides an overview of the StreamSCAPES project by outlining its aims and objectives as well as expected outcomes.

Section 2 contextualises the aims of WP1 in relation to recent research on the SCT of the VOD platforms.

Section 3 introduces the aims and relevance of the study.

Section 4 explains the data collection and analysis methods employed to produce this report.

Section 5 presents the results of WP1. Sub-section 5.1 addresses the social relevance and understanding of SCT among the stakeholders by introducing five main approaches: SCT as awareness, metrics, everyday practices, a value, and business. Sub-section 5.2 further examines the industry's awareness of SCT and the stakeholders' efforts to assess and reduce the carbon footprint from production to distribution to consumption. Sub-section 5.3 presents the participants' awareness and views on existing policies at the international, EU and national levels and the key policy needs, as well as their views on industry practices, and finally, their understanding of industry challenges and SCT skill and knowledge needs.

Section 6 concludes the report by summarising the key findings and recommendations from each section.

¹² Joanna Moulhierac, Guillaume Urvoy-Keller, Marco Dinuzzi and Zhejiayu Ma, 'What is the carbon footprint of one hour of video streaming?' (2023) HAL open science.

3 Aims and relevance

The European Union (EU) is facing a moment of profound transformation. On the one hand, public debate and policies regarding the climate transition evolve in a context of polycrisis (COVID-19, energy crisis, inflation, armed conflict, forced migration, financial crises), revealing a European political system that is either divided or not fully equipped to act. On the other hand, CCIs are facing multiple unexpected challenges, including persistent economic and technological constraints. In particular, platformisation,¹³ understood as the widespread uptake of digital content platforms, allowing for the digital exchange of information, products and services, is reconfiguring production processes and outcomes in the CCIs in profound, complex, and highly uneven ways. However, this transition has been accompanied so far by the fragmentation of the EU market alongside (increasingly concentrated) global corporate platforms. Therefore, there is a need for a European approach – bridging social and economic concerns while also taking into consideration the climate urgency – to create a different approach to the role played by (VOD) platforms regarding today's challenges. In this context, the StreamSCAPES consortium draws upon the idea that the European Green Deal (EGD) provides not only a potential break from the past in energy, transport and communication infrastructures, but also a new political story inspiring concerted effort to combat climate change and encourage a comprehensive transition towards a more sustainable model of development.¹⁴

The aim of StreamSCAPES is to contribute to the ways in which production, consumption and decision-making systems in the Cultural and Creative Industries lead through the sustainable climate transition, with a particular emphasis on VOD platforms. VOD platforms are understood as production, distribution, and consumption nodes that can operate both in and, crucially, across several sectors,¹⁵ circulating ideas, attention, remuneration and other resources. VOD platforms are therefore the structural and symbolic backbones of the European audiovisual and communication landscape. VOD platforms occupy a dominant place in meaning making among

¹³ Tom Evens and Karen Donders, *Platform Power and Policy in Transforming Television Markets* (Palgrave Macmillan 2018); Antonios Vlassis, 'Global online platforms, COVID-19, and culture: The global pandemic, an accelerator towards which direction?' (2021) 43(5) *Media, Culture & Society*, 957.

¹⁴ Mark Leonard, Jean Pisani-Ferry, Jeremy Shapiro, Simone Tagliapietra and Guntram B. Wolff, *The geopolitics of the EGD* (European Council on Foreign Relations 2021).

¹⁵ Thomas Poell, David B. Nieborg and Brooke Erin Duffy, *Platforms and Cultural Production* (Amsterdam University Press 2021).

young generations through all forms of storytelling, including documentaries and fact-based content to fiction and fantasy genres. They are global in their reach and access, at least the most market dominant ones, while also remaining 'local'. As cultural and communication nodes in the media and CCI landscapes, VOD platforms provide a future oriented junction of several sectors of media formats (film, documentary, gaming and so on), while combining as the case the most pressing characteristics of: evolving technological architecture; business models; production practices that manage to provide local and national markets with linguistically and culturally specific products, hence satisfying issues of diversity and inclusion of European content; and consumer habits as these currently observed in a variety of forms in their nonlinear shape especially adopted by young people who will drive the audience markets of the future and whose cultural and ideological disposition towards environmental friendly lifestyles exercise pressure on politics.

StreamSCAPES is built on the assumption that the paradigmatic shift represented by the EGD may provide the context for the equivalent of a "big bang" for the CCIs in Europe. In addition, in the EU, the pandemic highlighted the "multilevel vulnerabilities"¹⁶ of its cultural ecology. The European CCIs are built upon "fragmented value chains, dotted with numerous nonstandard workers and organisations of various nature and size (...). This fragmentation is further deepened by the high diversity in cultural and creative expressions, services and goods as well as its linguistic diversity"¹⁷. Simultaneously, the atypical forms of employment and income of cultural workers, combined with a fractured labour market, often results in precariousness.¹⁸ To add to these structural fragilities, there is a growing concern among cultural actors regarding the broader impact of VOD platforms and the changes brought by digitalisation to the cultural value chain. "In the analogue model, each actor tends to embody a particular stage – creation, production, distribution, access, participation – where they add value to a product or service and then pass it on to the next stage in an arrangement akin to a pipeline. In the digital model (...)

¹⁶ Isabelle De Voldere, Martina Fraioli, Eveline Durinck, Antonia Blau, Sina Lebert, Sylvia Amann and Joost Heinsius, *Research for CULT Committee: Cultural and creative sectors in post-COVID-19 Europe: crisis effects and policy recommendations* (European Parliament, Policy Department for Structural and Cohesion Policies (2021).

¹⁷ Ibid, 15.

¹⁸ Culture Action Europe and Mafalda Dâmaso, *Research for CULT Committee – The situation of artists and cultural workers and the post-COVID-19 Cultural Recovery in the European Union* (European Parliament, Policy Department for Structural and Cohesion Policies 2021).

these processes are carried out almost simultaneously”¹⁹ resulting in a network of interacting nodes. Economic research linking platforms and market concentration²⁰ suggests that, in the CCI, the closer interaction between such nodes is likely to lead to increased concentration of demand and revenue and, in doing so, to risks to cultural diversity. Moreover, as mentioned earlier, from a geopolitical angle, StreamSCAPES also recognises the weak presence of European actors within the global VOD platform landscape as an emerging strategic dependency.

At the same time, the recognition of the CCIs ecosystem (in which the audiovisual industries make up the biggest group) as one of 14 ecosystems in the EU’s Industrial Strategy²¹ reflects its spill-over effects beyond the CCI itself, namely in driving innovation in other industries and in supporting the social dimension of the green transition at the local level. That is, StreamSCAPES recognises, on the one hand, the increasing importance of VOD platforms in the CCIs and, on the other hand, their relevance not only in social and economic terms²² but also, and increasingly, in geopolitical terms.²³

StreamSCAPES contributes to an underlying goal of the EU’s industrial strategy: strengthening the EU’s open strategic autonomy. The approach taken recognises VOD platforms as potential facilitators of renewed, green-focused, industrial alliances in the CCI and addresses an emerging strategic dependency that is yet to be recognised in the EU’s monitoring thereof: the relatively weak position of European players, particularly independent, in the global platform landscape. As is recognised in a Commission staff working document, “without a strong policy response to overcome the industry’s fragmentation the global platforms’ massive investments in content risks relegating European independent players to mere service providers.”²⁴

StreamSCAPES adopts an ecosystemic approach to the CCIs by focusing on VOD platforms. Although the digital dimension of platforms is largely the visible aspect, StreamSCAPES also

¹⁹ Octavio Kulesz, ‘Cultural policies in the age of platforms’. In *Reshaping Cultural Policies, Advancing creativity for development* (United Nations 2017), 69-83.

²⁰ House of Lords, *Online Platforms and the Digital Single Market* (European Union Committee 2016).

²¹ European Commission, *Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery* (COM (2021) 350 final).

²² European Commission, Cultural and Creative Industries (n.d.)

https://single-market-economy.ec.europa.eu/sectors/cultural-and-creative-industries_en

²³ Antonios Vlassis, ‘European Union and online platforms in global audiovisual politics and economy: Once Upon a Time in America?’ (2020) 83(6) *International Communication Gazette*.

²⁴ European Commission (n 21).

addresses their offline dependencies and activities (namely, in terms of carbon footprint). The rationale behind this decision is twofold: for one, research increasingly demonstrates that economic systems are embedded within a “complex 'socio-ecological' system”²⁵ whose survival and dynamism are essential for the long-term resilience of the former as, tellingly, is hinted by the World Bank’s proposal of the term “ecosystem-economy”²⁶. Second, “VOD platforms” are not merely ICT (Information and Communication) systems for content delivery but, they, too, are embedded within complex sociocultural systems, wherein ideas, political economic structures and social processes underpin them as cultural institutions that are part of the process of human development²⁷. Thus, platforms are not only major economic and industrial actors, but also cultural and societal players, which relate to and can reinforce or potentially redress broader developments within the cultural and creative sectors (CCSs) and beyond. Additionally, the need to focus on platforms is also reflected by ongoing debates in environmental and climate change studies. Folke et al suggest that “bridging organisations” have a role to play in the context of the “adaptive governance” of complex systems to climate change, since such organisations “(connect) individuals, organisations, agencies, and institutions at multiple organisational levels and, in doing so, lower the costs of collaboration and conflict resolution, and (enable) legislation and governmental policies (to) support self-organisation while framing creativity for adaptive comanagement efforts”²⁸. StreamSCAPES posits VOD platforms as playing these roles in the context of the CCI. Because of their economic-technological importance and the crucial influence that they have on society, VOD platforms have the potential to externalise positive changes towards the green transition beyond the CCIs.

²⁵ Chunquan Zhu and Siyu Wang, ‘Why measuring the economic value of ecosystems is important’, World Economic Forum, [weforum.org](https://www.weforum.org) (27 February 2023).

²⁶ Justin Andrew Johnson, Uris Baldos, Raffaello Cervigni, Shun Chonabayashi, Erwin Corong, Olga Gavryliuk, Thomas Hertel, Christopher Nootenboom, James Gerber, Giovanni Ruta, Stephen Polasky, *The Economic Case for Nature: A Global Earth-Economy Model to Assess Development Policy Pathways* (World Bank 2021).

²⁷ Bart Cammaerts, ‘ICTs and social movements’. In Mansell, R., Hwa, P. (Eds.) *The International Encyclopedia of Digital Communication and Society* (2014).

²⁸ Carl Folke, Thomas Hahn Per Olsson and Jan Norberg, ‘Adaptive Governance of Social-Ecological Systems (2015) 30(1) *Annual Review of Environment and Resources* 441.

4 Methodology

The aim of Work Package 1 was to arrange formative workshops by drawing on existing networks, and to establish new contacts in the audiovisual sector, academia, the CCI, and local, national, and international authorities. The workshops were not a conference-style dissemination of information but rather used analytically to bring key stakeholders together to generate new ideas and to challenge established ones. At this early stage, stakeholders had the opportunity to meaningfully enrich the research design. The workshop data were complemented by a brief demographic survey distributed to the workshop participants.

4.1 Workshops

All workshop participants were asked to sign an informed consent form, which included information about the research and the rights of the participant. The workshops were organised as focus groups with moderators presenting a list of questions. Each workshop was launched with a short introduction of the project and the moderators. The participants were encouraged to engage in the discussion and share their experiences and insights in a rather informal mode. Depending on the number of participants, they were divided into 1-2 groups to ensure equal participation. Moderators were asked to follow a common protocol that guided them to take notes, begin with an introduction round, and prioritise the most important questions.

The workshop questionnaire was elaborated focusing on three central dimensions of the project, as the data collected served as an empirical foundation to guide the subsequent stages of the research. The questionnaire was drafted, reviewed and edited in collaboration with the research partners contributing to WP1. It was also reviewed by the industry partners, who provided feedback e.g. on translating the research concepts into “industry language”. The questionnaire included 19 questions, which were organised around the following three themes:

Understanding and social relevance of the SCT

This theme explored the meanings and understanding of the sustainable climate transition as well as what motivated and demotivated participants in engaging with SCT in their professional activities. The questions also addressed the possible limitations and challenges along with the

strengths and opportunities of applying SCT along with the role of VOD platforms in encouraging sustainable practices among their partners.

SCT in production and distribution

The second theme investigated the adoption of SCT in the production and distribution of audiovisual content. The questions addressed, for example, whether the industry stakeholders were assessing their environmental footprint or collaborating with other companies or regulators to develop new standards for sustainability. They also investigated the role of VOD interfaces in nudging more sustainable viewing habits.

Policy and governance of the SCT

The questions on this theme aimed at identifying the most interesting policies and industry initiatives that have been adopted towards the greening of VOD platforms as well as the skills needed to increase the sustainability of the VOD platforms. The participants were also asked if they believed that the SCT agenda could exacerbate other challenges in the industry.

After the first two workshops the questions related to the understanding and social relevance of the SCT were slightly edited to avoid overlapping with questions regarding the SCT in production and distribution. Instead of asking them to give examples of their green practices they were asked to reflect on how sustainability relates to the core values of their organisation. In addition, the section about policy and governance was moved at the end of the questionnaire to ensure a better flow.

Industry stakeholders were invited to participate in the workshops by contacting them via email, by asking the project members to disseminate the invitation, and by sharing the invitation on the project website and on social media. Those who were interested were able to register as potential participants. The aim was to include participants from a wide range of stakeholders including VOD platforms, broadcasters, industry associations, distribution companies etc. In total, five online workshops with 24 participants were organised between June and September 2025 using the Teams software.²⁹

The five workshops were divided into seven focus groups which resulted in a total of 11 hours 44 minutes of recording. The average length of a focus group was 1 h 40 min. All workshops

²⁹ One of the focus groups was conducted as an individual interview.

were recorded with either the Teams or mobile phones and transcribed by using Whisper software. The transcription process was run locally to ensure GDPR compliance. The AI transcripts were manually edited to improve clarity while still maintaining non-verbal cues. The transcripts included a total of 192 pages.

The qualitative data analysis was run by all task partners, each focusing on their respective themes and questions. The qualitative data analysis was run by all task partners, each focusing on their respective themes and questions. During the analysis, core themes were identified along with commonalities, points of contrast and disagreement as well as instances of ignorance and lack of knowledge.

4.2 Demographic survey

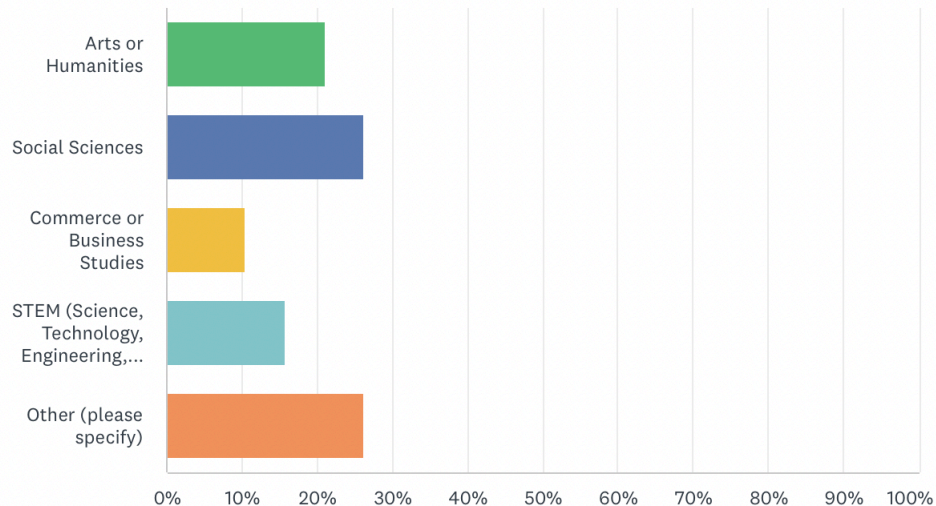
To provide background data about the workshop participants, they were asked to take a short demographic survey on SurveyMonkey. In total, 20 entries were made representing 87 % of the workshop participants. The survey questions addressed the gender, home country/country of residence, education, field of study, the length of professional experience, the organisation's area of activity as well as the respondents' position in their organisations..

42% of the respondents were female and 58% male (options "Prefer not to say" or "Other" were not selected). Geographically, the respondents represented different parts of Europe with countries of residence including Czech Republic, Denmark, France, Germany, Greece, the Netherlands, North Macedonia, Norway, Poland, Slovakia, Spain, Sweden and the United Kingdom.

All the respondents had a university or college degree, either BA or equivalent (11%) or MA or equivalent (89%), while the fields of study varied. 21% of the respondents had studied Arts or Humanities, 26% Social Sciences, 16% Science, Technology, Engineering, or Mathematics and 26% other fields (see the graph below):

What was your field of study?

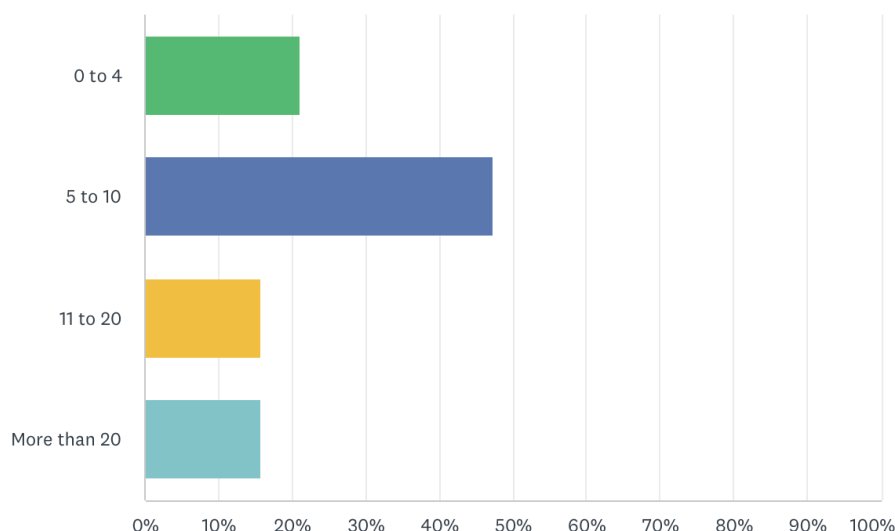
Answered: 19 Skipped: 0



The participants also represented different levels of professional experience: while 47% of the respondents had been working in the industry for 5-10 years, participants with less than 4 years or more than 20 years of experience were also included.

How many years of experience do you hold in the industry?

Answered: 19 Skipped: 0



47% of the respondents represented streaming platforms, which reflects the focus of the project. 21% of the respondents were working in industry organisations. Distributors/sales agents and broadcasters were both represented with a 10% share. Around half of the respondents worked in leading positions in their organisations: nine of the respondents were executives (with titles such as CEO, Director or Head of Acquisitions) and three were managers. The other half had varied positions.

5 Output

This section presents the results of the workshops. Sub-section 5.1 addresses the social relevance and understanding of SCT among the stakeholders, while sub-section 5.2 further examines the industry's awareness of the SCT and the stakeholders' efforts to assess and reduce their carbon footprint. Sub-section 5.3 discusses the participants' views on EU & international policies, industry practices and skills as well as industry needs.

The workshop participants are here referred to by the categories of the organisations they represent. A number of them held multiple roles in the streaming industry (e.g. industry

association and streaming) or worked in organisations that were active in different fields of the industry (such as distribution/sales and streaming or broadcasting and streaming). For the sake of clarity, the categories were formed using the participants' primary organisation or industry field. Thus, the participants were divided into the following categories:

Category	Number of participants
Distribution/sales	1
Broadcasting	4
Streaming	9
Industry association/representation	5
Carbon calculator/sustainability consultancy	5

5.1 Social relevance and understanding of the SCT

The first set of workshop questions addressed the social relevance and understanding of the SCT. The following six main questions were presented in all focus groups:

1. What does greening and environmental sustainability mean to your organisation? How does it relate to your core values?
2. What motivates you to engage (or not to engage) with SCT/sustainability in your professional activities? What puts you off?
3. What do you perceive as the main limitations, contradictions, or challenges of applying the SCT principles in your professional context?
4. How do VOD platforms encourage their own sustainable practices and encourage industry partners to follow green initiatives?
5. Do you believe there is a shared understanding of the SCT across different parts of the VOD value chain?
6. In your view, what are the main strengths or opportunities that the SCT brings to the VOD sector? Who is the primary beneficiary of the SCT actions?

The workshop participants were first asked about the meanings and values related to sustainability. In the following discussion, five main approaches could be identified: sustainable climate transition as 1) awareness, 2) metrics, 3) everyday practices, 4) a value per se and 5) business. These approaches also emerged across the responses to questions regarding the participants' motivations to engage or not to engage in the SCT, the contradictions/challenges and the opportunities/strengths related to the SCT, the role of VOD platforms in encouraging the adoption of sustainable practices as well as the shared understanding of the SCT in the VOD industry. The results of the discussion are thus organised around these five key approaches.

The first approach, the SCT as an awareness, considers sustainable climate transition as a matter of being aware of environmental issues and having related knowledge. Within the two-fold approach, the workshop participants first discussed the severe lack of data and knowledge about sustainable streaming, and second, the role of the industry stakeholders in sharing knowledge about the SCT. The lack of data was repeatedly emphasised in discussions on the social relevance and understanding of the SCT. The second approach, the SCT as metrics, refers to a metrics- and technology-driven understanding of sustainable climate change. This approach emerged in relation to the meanings and values attached to the SCT and the motivations to engage in the greening of the VOD industry. The third approach considered the SCT as everyday practices and was expressed mainly through the examples when discussing the meanings of the SCT. As the examples were few and the theme overlaps with the section addressing the SCT in production and distribution, it will only be briefly introduced in this section. The fourth approach viewed the SCT as a value in itself and was mainly articulated through the personal values and motivations of the workshop participants. The fifth approach represented the business perspective and could primarily be identified in the discussions addressing the values and meanings as well as the strengths and opportunities related to the SCT. For obvious reasons, the business approach was also dominant in the discussion about the role of the VOD platforms in encouraging sustainable practices and policies in their value chains. In the following, these approaches are described in more detail.

5.1.1 SCT as awareness

Most of the workshop participants understood sustainable climate transition as awareness of the environmental issues related to VOD platforms and streaming. The approach was twofold.

First, the participants acknowledged a serious lack of data and knowledge on the environmental impacts of streaming and the sustainable streaming practices. The stakeholders were in need of accurate and validated data to be able to make informed decisions. While a number of industry initiatives have been launched to develop sustainable production practices, the distribution of audiovisual content is still lacking both validated data and shared models.³⁰ When asked whether there is a common understanding of sustainable climate transition throughout the value chain, the participants' views diverged. The dichotomy can be explained (at least partly) by the geographical variation in the adoption of sustainability. Focus group participants from the Nordic countries agreed that there is a shared understanding of the SCT, while participants from Eastern and Southern Europe were not able to identify one.

A number of participants representing a range of organisations also acknowledged that there is a shared understanding of the SCT and a set of measuring tools (such as BAFTA albert³¹) already in use in the production end of the supply chain. Distribution, however, lacks a shared understanding mainly because of the lack of information and common metrics. As a representative of a small streaming service noted, the StreamSCAPES workshop was the first time she was discussing sustainability with other professionals from the VOD industry. Thus, harmonising is needed in terms of concepts and measuring tools (see also section 5.2.1). In addition, the stakeholders are in need of more information about green technology in order to understand the prerequisites of sustainable climate change throughout the value chain. Even participants from the countries with a shared understanding of the SCT, called for more clarity regarding the impact of the green practices.

As Inge Ejbye Sørensen and Caitriona Noonan note in their article discussing the screen industry's response to the environmental crisis, a shared vision and system for measuring environmental impact is needed, but it has to recognise the unequal distribution of

³⁰ See e.g. Inge Ejbye Sørensen and Caitriona Noonan, 'Production, policy and power: the screen industry's response to the environmental crisis' (2022) 44(1) *Media, Culture and Society* 172.

³¹ BAFTA albert is a British screen industry organisation that provides tools to measure and decrease the carbon footprint of film and TV productions. See: albert (2025) <https://wearealbert.org/>

responsibility, resources and power throughout the industry. While powerful global media companies have already taken measures to reduce their environmental impact, they can also seek out the best contractual arrangements as well as ways to avoid difficult environmental requirements.³²

The lack of data and knowledge also emerged in the workshops when several participants brought up a practice known as greenwashing. For them, greenwashing translates as sustainable actions with high visibility but zero impact or as actions that do not correspond to the claims. The increasingly sophisticated techniques of greenwashing include, for example, false carbon offsetting. Greenwashing does not only mislead individual stakeholders but it was also identified as a threat to the shared understanding of the SCT. Therefore, more transparency in terms of verification, validation and harmonising is needed to identify false or incomplete information and practices.

In addition, the lack of data and awareness was discussed in relation to what motivated the participants to engage in the SCT. A few participants expressed that they were motivated by an urge to get more data about sustainability, to increase their understanding of it and to learn how they could make a change. However, the lack of knowledge was also mentioned as an issue that demotivated the stakeholders. The participants highlighted that there are a number of studies and industry reports about the sustainability of film festivals and screen production, but the distribution of screen content has not received similar attention. They also mentioned that the VOD industry is lacking good practices and industry guides. In addition, the need for expertise on the SCT and specific technical skills either on personal or on organisational level was identified.

Second, this approach included discussions about the role of the industry stakeholders in sharing knowledge. Several participants acknowledged that the VOD platforms have the opportunity and the capability of communicating about sustainable streaming practices not only to their teams and companies but also among their business partners and customers. Media companies can play an indirect role in promoting sustainability by influencing their value chain and encouraging their partners, for example to adopt more efficient technology.³³ In the

³² Sørensen and Noonan (n 30).

³³ Draft Paper: "Literature Review and Policy Principles for Streaming and Digital Media Carbon Footprinting" (DIMPACT 2023).

workshops, the broadcasters voiced that they have a social responsibility not only to strive for sustainability but also to increase awareness of it among their audiences. The key role of public service broadcasters in developing and implementing environmental sustainability policies has also been acknowledged in research on environmental media management. Public service broadcasters are required to act in the best interests of the public, and sustainability is essentially connected to notions such as freedom of speech, responsibility, impartiality and diversity.³⁴

Similarly, when discussing the role of the VOD platforms in encouraging sustainable practices, communication and knowledge-sharing were seen as a key to advancing sustainable climate change in the value chain. The platforms were considered to have the responsibility to green their own activities and increase transparency within their services. A number of streaming platforms have already taken actions in that direction.

Previous studies assert that the Cultural and Creative Industries can have a remarkable impact on audience attitudes towards sustainability. The audiovisual media industries, for example, can construct dialogic understandings of the relationship between nature, producers, audiences and policy.³⁵ Furthermore, creative storytelling, metaphors and narratives can help improve understanding, interest and engagement in climate change.³⁶ Specific genres, such as eco-cinema, not only raise consciousness and even activist intentions in the short term but can also increase long-term concerns and motivations to take climate actions.³⁷

The workshop participants saw audiovisual works as an important tool in changing consumers' attitudes. Ecofilms and documentaries were mentioned as examples but the potential of ecological content was not discussed in detail. The participants also acknowledged that for the customers of the VOD platforms, sustainability may seem like a difficult and distant topic. As one participant described, it is hard to understand the environmental impacts of streaming as there are no visible effects on the environment. Previous research has also shown that providing

³⁴ Pietari Kääpä, *Environmental Management of the Media. Policy, Industry, Practice* (Routledge 2018), 150.

³⁵ Pietari Kääpä, 'Editorial. Understanding ecocinema audiences', (2013) 4(2) *Interactions: Studies in Communication and Culture* 107.

³⁶ *Engaging the Public on Climate Change through the Cultural and Creative Sectors* (The Creative Ireland Program n.d.).

³⁷ Pat Brereton and Chao-Ping Hong, 'Audience responses to environment fiction and non-fiction films' (2013) 4(2) *Interactions: Studies in Communication and Culture* 171; Brittany A Bondi, Salma B Monani, Sarah Principato and Christopher Barlett, (2021). 'Examining the impact of climate change film as an educational tool' (2021) 20(3) *Applied Environmental Education & Communication* 221.

eco-content can be problematic: environmental issues presented in films are considered too abstract or too complex in comparison to what people experience in their everyday lives.³⁸ Audiences may even be resistant to environmental issues, which weakens the VOD platforms' motivation to engage in the SCT.

5.1.2 SCT as metrics

The second approach, sustainable climate transition as metrics and measuring, was mainly implied by technology-driven participants but it was also connected to the need for more data. These participants understood greening primarily as the measuring of carbon emissions, energy consumption etc. and as the adoption of related technological solutions. Several workshop participants were aware of the different measuring methods and had already been using them. However, they called for the harmonisation of the metrics. The metrics-driven approach could also be identified in industries related to video streaming—a broadcaster stated that the discussion on the impact of advertising is currently focused on the measuring of carbon footprint.

Technology-oriented participants were inspired by the opportunity to adopt (technological) innovations that can bring a change in the industry. A participant representing a carbon calculator even saw himself as a pioneer in the field and was motivated by the ability to lead the industry towards a greener future. An article by Lupu et al addresses environmental sustainability in the Welsh audiovisual sector through the lens of green innovation. The concept of green innovation refers to a specific type of innovation that aims to minimise environmental degradation. As the authors state, the innovations, including production, services, and technologies aiming at minimising the environmental impact, have become an increasingly important aspect of economics, accounting and strategic management. The survey conducted in Wales revealed a low presence of high-frequency green innovators in the audiovisual sector, which points to a reluctance of R&D as a viable path to greening the sector.³⁹ Also in the data provided by the first set of focus group questions, innovation was only discussed very briefly in

³⁸ Brereton and Hong (n 37).

³⁹ Ruxandra Lupu, Marlen Komorowski, Justin Lewis, Gregory Mothersdale and Sara Pepper, 'Greening the Audiovisual Sector: Towards a New Understanding through Innovation Practices in Wales and Beyond' (2023) 15(4) *Sustainability*.

relation to the participants' motivations to engage in the SCT. The assessment of the environmental footprint is discussed in more detail in section 5.2.1.

5.1.3 SCT as everyday practices

The third approach, sustainable climate transition as everyday practices, mainly emerged in the discussion about the values related to the SCT. A participant representing a streaming platform described greening their office practices as one of the three categories in how they think about sustainability (the other two being the technological impact of streaming and organisational communication, which included mediating their values through the content they provide). Another streaming platform described their approach to the SCT as using public transportation and adopting more green office practices (e.g. reducing energy consumption). Although they are not able to control the value chain, these are the issues that they can address. The participant further elaborated this when being asked about the motivations to engage in sustainability and explained that while they do not have a formal greening policy they have adopted certain measures at the office, like recycling, not printing, and using water tablets instead of bottled drinks.

While the everyday greening practices were only discussed briefly in two focus groups, the approach highlights the variety of meanings and understandings related to the SCT. It also stresses the complexity of the SCT: as some of the participants felt that they lack the knowledge and the power to contribute to more sustainable streaming in their value chain, adopting green practices in their everyday work was something they were able to do.

5.1.4 SCT as a value

In the fourth approach, the SCT was considered a value per se. When asked about the meanings and values related to sustainability, the participants highlighted their respect to nature and other people as well as their personal interest in applying green policies and practices. A couple of streamers stated that sustainability was embedded in all the decisions in their organisations and represented an integral part of their general agenda.

This approach was also evident in the discussion about the motivations to engage or not to engage in sustainable climate transition as a number of participants brought into attention that they have a personal interest in sustainability and environmental issues. A participant representing a carbon calculator/sustainability consultancy shared her desire to save the planet. Some of the participants also voiced that having children of their own has made them more socially responsible but also more concerned about the legacy we are leaving to the next generation. In addition, sustainability was discussed in relation to other social issues the participants considered important, such as human rights. Personal reasons could thus be identified as the main motivator for the workshop participants to engage in the SCT. The results thus align with previous research, which indicates that individual perspectives on climate change are informed more by personal values, norms and experiences than by scientific data.⁴⁰ The findings also indicate that passionate individuals can have a huge impact on the industry. As an industry report from Ireland notes, “decisions on climate action taken by organisations, communities and individuals will often depend not only on a factual understanding of climate change but the underlying personal values, social and cultural norms”.⁴¹

5.1.5 SCT as business

In the fifth approach, sustainable climate transition was discussed from a business perspective. In general, the participants shared the view that VOD platforms play a key role in advancing sustainability throughout the value chain. As the consumption of series has moved from linear television to VOD platforms, the environmental impact of the platforms has increased. They are in a position to demand sustainability from their partners but they can also have an impact on their audiences.

Some of the participating streaming platforms have already implied green practices in the productions they had commissioned. However, some participants argued that smaller platforms can not influence the value chain. In screen productions, the first commissioners are usually major broadcasters or global VOD platforms. They are responsible for a considerable share of

⁴⁰ *Engaging the Public on Climate Change through the Cultural and Creative Sectors* (n 36).

⁴¹ *Ibid.*

the funding and can thus exercise authority over smaller platforms, which may join the production as second or third commissioners with a smaller share of funding. In addition, platforms which acquire ready-made content instead of commissioning original programming have no direct control over the production practices.

The stakeholders disagreed on whether the SCT aligns with their core business objectives. Participants from various organisations stated that sustainability can have a positive effect on the VOD platform's image, as it helps them to stay relevant and differentiate themselves from their competitors. They believed that their audiences would prioritise sustainable streaming platforms over non-sustainable ones. A few participants also suggested that greening their business can also decrease the costs.

For others, business comes first. Some of the participants stated that greening their businesses would result in a remarkable increase in the costs. Especially for smaller platforms, greening can be too expensive. Previous research in creative industries has reported similar findings.⁴² For them, engaging in the SCT is not only about the direct costs of e.g. acquiring new technology but also about indirect costs related to human resources: finding information about the sustainable climate transition takes plenty of time and effort. Additionally, it is challenging for them to keep up with the fast developments in green technology. These challenges may result in demotivation or even prevent streaming platforms from adopting the SCT.

However, responses regarding the possible opportunities or strengths of sustainable climate transition were mainly related to the financial benefits. The strengths were thus primarily approached from the business perspective. In the highly competitive screen industry any chance to increase efficiency and save money seems attractive to the VOD platforms. Some of the respondents noted that sustainable solutions are often also cost-effective and reducing costs could also increase the resilience of the platforms. In recent years, a number of streaming services have launched AVOD (advertising-based video on demand) platforms to improve their competitiveness. As advertising is playing a more prominent role in the value chain, it is important to note what a representative of a broadcaster voiced: the advertisers are interested

⁴² Ruxandra Lupu, Marlen Komorowski, Gregory Mothersdale and Justin Lewis, *CLWSTWR policy brief no 4: Green innovation for the screen sector* (Cardiff University 2022).

in becoming more sustainable, as it often means cost-efficiency. Developing green advertising solutions is one of the untapped opportunities that could be studied in more detail.

A participant from an industry association brought up that the SCT can foster collaborative practices between the platforms and increase partnerships in, for example, collective buying. As value chains in the audiovisual industry are complex, the participants also articulated that collaboration between various stakeholders is needed. Current collaborative practices include both formal and informal industry initiatives, which mainly target the production end of the value chain. Formal activities may include the adoption of common carbon calculators, while informal activities include, for example, public broadcasters sharing knowledge with each other. Some of the participants were inspired by the possibility of increasing collaborative practices and teaming up with like-minded people instead of competing with them. These opportunities motivated them to engage in the SCT. Others found the complex value chains of the VOD industry as alienating and felt that small companies lack control.

The business perspective emerged in the discussion of the participants' motivations also in another form. Some stakeholders considered policy and funding instruments as sources of motivation for the streaming platforms and were interested in the possible financial benefits related to SCT. As a broadcaster indicated, in some cases, it is a combination of external drivers and passionate people, which brings the best results. However, others found the number of regulations and standards confusing.

Sustainability was also seen as a strength in terms of platform identity or corporate image. Several participants believed that environmentally-friendly platforms can attract more audiences and therefore improve their competitiveness. For example, in France, awareness of the impacts of the digital industry and the major role of the streaming platforms is increasing. The French Agency for Ecological Transition (ADEME) has launched campaigns about the impacts of the digital industry and they are bearing fruit. Therefore, it has become important for the local VOD platforms to show the public that they are taking actions. This finding is also supported by a recent report, which considers green production as both an ethical advantage and a means to ensure the competitiveness of the European screen industry. While focusing exclusively on

feature film and high-end TV production instead of distribution and exhibition, it highlights the importance of SCT to the business of screen companies.⁴³

A number of workshop participants voiced that the VOD platforms have the ability of informing and educating their customers about more sustainable streaming practices. The availability of streaming services has resulted in new, energy-consuming ways of streaming audiovisual content, such as listening to music on YouTube without watching videos.⁴⁴ Online video streaming is environmentally highly relevant and most energy savings occur at the user end. While there is a high demand in research on streaming behaviour, Paul Suski et al suggest that streaming providers can, for example, adjust default settings for resolution.⁴⁵ In addition, individuals need to adopt “sobriety mode” to decrease overall demand, thus to slow the increase in the carbon footprint of streaming. While a research by Marks et al states that currently, many consumers do not have the knowledge or motivation to decrease their carbon streaming footprint, another study indicates the willingness of users to sacrifice video quality to save energy.⁴⁶

Several workshop participants were concerned about the possibility of repelling the customers of the streaming services by imposing strict rules or pushing them too much towards sustainable streaming modes. A representative of a carbon calculator stated that the platforms cannot guide their customers to stream less without a risk of losing their audiences. Instead, subtle ways of increasing awareness about sustainability were supported. These include, for example, providing the customers with eco-themed content, Q&A sections about sustainable streaming practices and carbon calculators indicating that streaming has a smaller impact than attending a live event. As regards video streaming, information combined with self-monitoring

⁴³ Pietari Kääpä and Hunter Vaughan, *Greening European Film Policy. Towards Sustainable Film, Television, and Screen Media Industry* (Global Green Media Network 2024).

⁴⁴ Jean-Samuel Beuscart, Samuel Coavoux and Jean-Baptiste Garroq, ‘Listening to music videos on YouTube. Digital consumption practices and the environmental impact of streaming’ (2022) 23(3) *Journal of Consumer Culture*.

⁴⁵ Paul Suski, Johanna Pohl and Vivian Frick, ‘All you can stream: Investigating the role of user behavior for greenhouse gas intensity of video streaming’ (2020) *ICT4S2020: Proceedings of the 7th International Conference on ICT for Sustainability* 128.

⁴⁶ Laura U. Marks, Stephen Makonin, Radek Przedpełski and Alejandro Rodriguez-Silva, *Tackling the Carbon Footprint of Streaming Media* (Simon Fraser University 2021); Samira Afsal, Narges Mehran, Zoha Azimi Ourimi, Farzad Tashtarian, Hadi Amirpour, Radu Prodan and Christian Timmerer, *A Survey on Energy Consumption and Environmental Impact of Video Streaming*. arXiv (Cornell University 2024).

has considerable potential to change individual behaviour and its associated ecological impact.⁴⁷

While financial benefits can encourage the streaming platforms to adopt SCT, high expenses of adopting green practices and technologies may repel them. Thus, adopting eco-friendly processes means balancing the costs and the impacts. A distributor also noted that the screen industry has already become more sustainable than it used to be, although the changes were not driven by environmental issues but by business interests. Switching from DVD distribution to online distribution brought a significant decrease in the environmental impact of the industry as the production of plastic cases and discs was almost halted. This supports the finding that if sustainable climate transition can be introduced as something that benefits the business, it would more easily be accepted in the industry.

5.2 SCT in production and distribution

The second set of workshop questions addressed the industry's awareness of the SCT, and its potential efforts to reduce the VOD's carbon footprint. The following questions were presented to the workshop participants:

1. To what extent is your organisation currently aware of or actively assessing the environmental footprint (e.g., carbon emissions, energy consumption, water use) associated with your VOD services?
2. To what extent are current audiovisual production standards effective in addressing environmental sustainability in content production (e.g., emissions reduction, energy efficiency, resource use)?
3. How can we reduce the environmental footprint (e.g., carbon emissions, energy use, water consumption) associated with content distribution?
4. What role can VOD user interfaces (and content curation) play in nudging more sustainable viewing habits?

⁴⁷ Benedict T Seger, Johanna Burkhardt, F Straub, F Scherz and Gerhild Nieding, 'Reducing the Individual Carbon Impact of Video Streaming: A Seven-Week Intervention Using Information, Goal Setting, and Feedback' (2023) 46 *Journal of Consumer Policy* 137.

5. In what ways do you collaborate with other companies or regulators to develop new environmental sustainability standards?

Awareness included initiatives to assess and monitor this footprint. When it came to such efforts to reduce the footprint, the analysis followed the value chain, from production to distribution to consumption. The discussion moved, depending on the participants' input from the individual level (at an organisation level, or even the level of a service within an organisation) to collaborative initiatives involving several industry stakeholders or even regulators. More precisely, the outputs of the discussion are organised around five points.

1. Participants first discussed VOD services' awareness and eventual assessment of their environmental footprint. Between organisations, the state of awareness and levels of active assessment for VOD environmental footprints were uneven. Some broadcasters and large players had embedded measurement practices and tools (see Theme 1). On the other hand, some stakeholders had only started assessing. These emerging practices often depended on external collaborations and capacity-building (see Theme 2) and awareness remained minimal or compliance-driven rather than systemic for many smaller platforms (see Theme 3).
2. Participants then focused on the production. They rather agreed that the audiovisual production standards were effective to the extent that production standards were embedded in many contexts and drove measurable improvements (see Theme 1). Furthermore, effectiveness was uneven due to generic design, reporting burdens, and contextual challenges (see Theme 2). It also depended on external drivers such as funding requirements and expert support (see Theme 3). Indeed, effectiveness was minimal in some areas according to practice, with limited awareness or reliance on indirect measures (see Theme 4).
3. Much remains to be done when it comes to distribution. It was reflected by a shorter discussion regarding how to reduce the environmental footprint associated with content distribution. It could be reduced by optimising platform operations and adopting more efficient delivery networks (see Theme 1). Reductions further depended on greater transparency, clearer standards, and shared responsibility across the value chain (see Theme 2).

4. Participants then moved to the consumption side and discussed how VOD user interfaces and content curation could nudge sustainable viewing by acting across five areas. They could introduce interface-level nudges such as dimming, inactivity prompts, audio-only modes, and coordination between TVs and set-top boxes to reduce “zombie hours” and wasted energy (see Theme 1). Then, while design patterns had to avoid counter-productive or superficial measures, content curation and on-screen messaging, such as sustainability labels, banners, and simple Q&A guidance, could raise awareness in ways that were clear and accessible (see Theme 2). Audience awareness, behavioural nudges, and incentive architectures, could contribute, provided that these did not alienate users or compromise content quality (see Theme 3).
5. In the end, they debated current collaborations to develop new environmental sustainability standards, which occurred through several channels. Firstly, regulators and standards bodies engaged industry via convened working groups and standards fora to shape technical and delivery norms and to produce comparative guidance (see Theme 1). Cross-industry consortia, research projects and peer coalitions among broadcasters, platforms and smaller VOD operators were also used to share data, pilot solutions and align common practice across the value chain (see Theme 2). Thirdly, shared tools, carbon calculators, adapted ecological standards and labelling/tagging approaches were developed jointly by producers, platforms and vendors and were already functioning as de facto measurement and communication standards (see Theme 3). Despite these concerted efforts, collaborations remained uneven: most outputs were voluntary guidance rather than binding technical standards, smaller organisations reported limited capacity to participate, and fragmented data and guidance constrained sector-wide comparability and adoption (see Theme 4).

5.2.1 VOD services' awareness and active assessment of their environmental footprint

A) Established practices for measurement

Among established media services, carbon accounting had become routine and increasingly granular. An industry association explained that many of their members calculated emissions across core infrastructure (including Amazon Web Services servers, cloud instances, encoders, and related services) treating outsourced components as Scope 3 while attributing on-premise infrastructure to building energy use. These inventories extended beyond office IT to include production equipment, which was more power-intensive than laptops or phones and therefore materially affected totals.

Some companies have integrated environmental assessment into corporate reporting systems. A broadcaster embedded the “use of sold product” category in its disclosures and used the Watershed platform⁴⁸ to estimate footprints across both broadcast and VOD, complementing this with DIMPACT⁴⁹-derived per-hour streaming averages—figures that were useful but remained estimates with wide error bars. Across the market, a carbon calculator observed that most calculators still fell back on spend-based methods because cost data were universally available; however, the most reliable results arose when platforms combined those baselines with supplier activity data (e.g. AWS) and sector-specific tools such as DIMPACT or other sustainability analytics. Another carbon calculator explained that for them, most firms participated in order to be able to deploy the tool to assess their platforms while others leaned on widely circulated guidance such as the Carbon Trust White Paper⁵⁰. Carbon calculators were in general not shy to refer to other calculators, in a way that sounded more cooperative than competitive.

Smaller streaming services are also experimenting with robust methods. One commissioned Greenly⁵¹ to measure its footprint by blending financial/operational data with staff interviews to isolate the digital part (including site, app, upload, consumption). Even where conclusions were not strictly streaming-specific, the process elevated internal awareness and helped set priorities. A broadcasting service operated company-wide climate accounting under the

⁴⁸ Watershed, Everything You Need to Run a World-Class Sustainability Program (2025) <https://watershed.com/en-GB/platform>

⁴⁹ DIMPACT, About Us (2025) <https://dimpact.org/about>

⁵⁰ Ulrike Sapiro, Joe Franses, Martin Barrow and Tom Cumberlege, *Personal Carbon Allowances White Paper* (Carbon Trust Advisory, 2012) <https://www.carbontrust.com/sites/default/files/documents/resource/public/Personal%20Carbon%20Allowances%20White%20Paper%20-%20REPORT.pdf>

⁵¹ Greenly, The Go-to Carbon Accounting Platform (2024) <https://greenly.earth/en-gb>

Greenhouse Gas (GHG) Protocol⁵² with a science-based target of –37.8% by 2030, filed mandatory annual climate reports, and maintained a transition plan. Another broadcaster had for several years measured the productions it financed and, from 2024, began rolling out a standard for eco-production inspired by the German ecological model; it also participated in the new Nordic Ecological Standard⁵³ backed by 34 organisations, which promised better alignment across the region and co-productions. This sat alongside practical Scope 3-oriented policies, e.g., five-hour train-over-plane guidelines, EV access for journalists, bikes/public transport for intra-city travel, and a growing emphasis on sustainability demands for suppliers and production companies.

B) Capacity-building notably through emerging efforts

At the other end of the spectrum, some stakeholders had only recently begun measurement, often triggered by external obligations. A streamer started assessing emissions in response to Creative Europe Media requirements, tried available calculators, but had not yet institutionalised regular audits. Internally, awareness existed but methods remained embryonic. A distributor candidly noted that the company did not measure its carbon footprint at all. Another streamer conducted basic, annual streaming calculations using a “standard formula” to satisfy reporting needs, without continuous assessment. Some firms were building broader pictures: a 2024 Metrikflow⁵⁴ audit gave one streamer its first complete Scope 3 view ahead of its planned expansion in 2026, highlighting the need to anticipate footprint variation across markets. Efforts to convene peer think-tanks sometimes stalled. Another streamer’s attempt to align greener streaming practices among small platforms and rights-holders dissolved because priorities and constraints varied too widely among participants.

Capacity building emerged as a critical enabler for smaller services. Peer collaboration was particularly important where knowledge gaps were wide: small platforms often lacked clarity on where to start and what to ask suppliers, and felt behind in EU discussions, which creates both a barrier and an opportunity for joint action. Larger public broadcasters contributed to this

⁵² Greenhouse Gas Protocol, Greenhouse Gas Protocol (n.d.) <https://ghgprotocol.org/>

⁵³ The Five Nordics, Nordic Ecological Standard NES (n.d.) <https://www.thefivenordics.com/nas>

⁵⁴ MetrikFlow, MetrikFlow (2025) <https://www.metrikflow.com/>

ecosystem, sharing knowledge with their peers, notably in the Nordic sphere and through their association, and conducting internal outreach to product teams to surface key “impact areas”. StreamSCAPES was mentioned by some of its participants as a way to leverage external expertise to map emissions, identify practical pathways to learn and implement sustainable practices across the value chain. The project was seen as a catalyst for reflection and a potential motivator for other small services to start measuring.

C) Challenges and methodological gaps

Despite progress, common stumbling blocks persisted. A central difficulty, a broadcaster mentioned, was accounting for customer devices and the emissions from content consumption. Indeed, a streamer reported that many small companies struggled to separate their operational emissions from those produced by end-user devices, complicating boundary setting.

Data quality and comparability were recurring pain points. A carbon calculator stressed that confidence correlated with data availability: spend-based estimates were blunt, while supplier activity data and real-time analytics markedly improved accuracy. Even where models existed, results carried large error margins. Reporting regimes often demanded numbers with insufficient methodological guidance, prompting “make something and report” behaviors that risked oversimplification and uncertainty.

Regional disparities may exacerbate the problem, notably for those services operated under weaker policy frameworks and dependent on EU-level projects to catch up. A streamer explained that technical transitions could be both impactful and costly: moving to a more efficient codec implied re-encoding entire catalogs, consuming energy, incurring expense, and potentially breaking compatibility with older devices. Constraints bit harder where internal capability was thin: an industry association explained how streamers could not have completed a formal assessment, lacked in-house developers, and relied on vendors. Sustainability work therefore remained ad-hoc and budget-constrained, in particular when rights-holder security policies could block greener workflows too.

Harmonisation was a major blocker, as streamers elaborated upon. Providers, such as AWS, Google, content delivery network (CDN) providers, and Internet Service Providers used divergent

emission factors and assumptions. Besides, organisationally, fragmented responsibility across tech, service, and legal/procurement slowed decisions, while small teams rarely had dedicated sustainability roles. Methodologically, device/user-side attribution risked over-weighting end-user responsibility; platforms sought clearer levers they directly controlled. Finally, according to a carbon calculator there was a sectoral tendency—reinforced by the Corporate Sustainability Reporting Directive (CSRD) and related obligations—to spend scarce resources interpreting reporting rules rather than implementing reduction measures.

5.2.2 The effectiveness of current standards and practices addressing environmental sustainability in content production

A) Well-established standards and practices to assess the footprint of production

The production side showed some maturity in established standards and practices. A carbon calculator explained that commissioners wielded contractual leverage over production companies, which allowed them to require green practices and measurement. As a result, it became increasingly feasible to sketch a playbook of standard actions for nearly any production, while equivalent guidance for distribution was still nascent. BAFTA albert⁵⁵ became a widely used framework, with majors like Netflix and Disney funding research into hard-to-decarbonise activities such as replacing diesel generators with battery banks. Another carbon calculator explained that in the Nordics, production standards tailored to sports, commercials, or film consistently emphasised energy, transport, and material use as primary emission drivers. Across Europe, industry associations' members are further along in capturing production emissions than in measuring technology footprints, and for many, this work became routine.

The act of measuring itself catalysed change. A broadcaster described that teams learned from comparing diesel generators with battery or solar backups and began to share emerging practices. It further explained that albert's strength was as much cultural as technical: it organised knowledge, prompted conversations, and normalised greener choices. In the UK,

⁵⁵ albert, About (2025) <https://wearealbert.org/about/>

albert's widespread adoption, although not regulation per se, made it a de facto default approach. While having no direct production role, a streamer noted that measurement exercises helped build internal awareness and prioritisation. A broadcaster explained how in Denmark, where external productions are required to submit a CO₂ calculation using recognised tools, it used the Green Producers Tool⁵⁶, supported by workshops and knowledge-sharing through the Bæredygtig Film og TV Produktion⁵⁷ industry body. albert or Ecoprod⁵⁸ would also have been accepted. A carbon calculator's certification programme, with more than 200 certified productions in two years, demonstrated how clear standards, shared rules, and the motivational effect of achieving a recognised label could move practice at scale. Anecdotally, Sweden saw strong improvements where Netflix pushed sustainability expectations in local productions, a broadcaster told.

B) The limitations of current standards and measurement

Despite clear progress, limitations persisted. A carbon calculator explained that while using a tool could inspire action; gaps in knowledge, the time required to collect data, and shifting management priorities blunted effectiveness. Reporting obligations risked becoming a trap, diverting effort from emissions reduction into compliance work. Standards that were too generic lost relevance in specific contexts, and verification remained inconsistent because calculators often permitted partial data entry, a diagnosis approved by a broadcaster. The same carbon calculator concluded that commissioners might require GHG protocol-aligned tools, action plans, and budget estimates for major emission drivers, with post-production climate reports, but this did not, by itself, remove operational barriers.

Operational realities created hard problems. An industry association explained this using the case of live sports and big-budget dramas. Live sports relied on diesel generators for resilience, with organisations wary of black-screen penalties; in practice, these productions often had the worst travel footprints as well. Big-budget dramas carried higher material footprints unless circular practices (reuse, resewing) were adopted. For streamers, external audits tuned to production contexts yielded misaligned recommendations that overlooked platform tech.

⁵⁶ Green Producers Club, The Tool (2025) <https://www.greenproducers.club/the-tool>

⁵⁷ Vision Denmark, Bæredygtig Film og TV Produktion (2025) <https://www.visiondenmark.dk/projekt-bftp/>

⁵⁸ Ecoprod, Ecoprod (2025) <https://ecoprod.com/en/>

Streaming itself was poorly covered by production calculators, requiring separate methods, a broadcaster recalled. Finally, the narrative that going green was too costly was challenged by a carbon calculator's analysis suggesting the incremental cost averaged ~1% of a production budget and could even yield savings through better planning—evidence that cost barriers were often overestimated.

C) Emerging practices and compliance drivers

A practical ecosystem of calculators existed, explained a streamer. It encompassed catering, travel, crew, and other line items, generating certificates and evidence of action. In many cases, productions hired a sustainable manager to design plans and advise on set, bridging knowledge gaps and satisfying funder requirements. Still, film crews were large, and when a project's artistic or commercial value was low relative to its footprint, the proportionality of the environmental cost was questioned. From this same streamer's point of view, visibility into production systems was limited; approaches varied by funder and whether investments were tied to green strategies. According to another streamer, EU funding conditions spurred measurement among small platforms, but translating findings into action required sector-specific guidance. In Denmark, a broadcaster explained, practice matured from mandatory action plans to mandatory CO₂ calculations—once embedded, incentives became less necessary. For broader impact, participants emphasised education (upskilling current professionals and students), focused regulation, infrastructure upgrades where needed (e.g., animation), and improved availability of alternatives to diesel or high-impact practices.

D) Challenges for the assessment at production level: minimal awareness or indirect practices

In some contexts, awareness remained low. A distributor argued that producers were unfamiliar with environmental standards even as certain practices—like animal welfare oversight—were commonplace and publicly expected. Corporate net-zero announcements sometimes leaned heavily on offsets rather than direct abatement, as a carbon calculator explained. In Poland, according to an industry association, the sustainability conversation in film/VOD was relatively

new, with economic survival prioritised amid pandemic and war spillovers; practitioners called for clear tools and concrete examples to jump-start greener. Ecoprod's 2025 study on post-production highlighted data and device impacts in workflows dominated by storage and transfer – areas often overlooked compared with streaming.

Structural tensions also mattered: co-productions spanning multiple countries could be financially advantageous (tax rebates) but environmentally perverse if crews flew to simulate locations. A broadcaster prioritised local productions or in nearby countries to reduce travel, yet programmes like Eurimages value co-productions across multiple countries, creating misalignment between financial logic and ecological responsibility. One pragmatic fix would have been regional clusters with shared standards to enable low-carbon cross-border work.

5.2.3 How to reduce the environmental footprint associated with content distribution

A) Efficiency gains in platform operations and distribution networks

A useful framing divides distribution emissions into three buckets: (i) back-end and cloud environments that platforms partially control; (ii) delivery networks, such as CDN and Internet Service Providers (ISP), where efficiency requires collective adoption of options like multicast or peer-to-peer; and (iii) end-user devices, typically the largest share yet largely beyond platform control. A streamer detailed that within the first bucket, some platforms actively pursued cleaner encoding roadmaps (e.g., H.265 or AV1 codecs) with vendors and invested in efficient front-end codebases that limited unnecessary data generation. An industry association added that other platforms built tooling to generate smaller files at similar perceived quality, while negotiating with rights-holders who might forbid altering masters. A broadcaster's analyses suggested transmission networks and end-user devices dominated impacts, with data centres/CDNs trending more efficiently and often driven by cost. More advanced ideas included time-shifting compute to periods of lower grid intensity via APIs, which would have required new operational workflows.

At an infrastructure level, a carbon calculator warned against unchecked escalation in resolution standards: pushing from HD to 4K and beyond cascaded through the entire chain – cameras, lighting, storage, transfer, distribution – and often nudged consumers toward new devices. A core principle, then, was to ask what resolution was actually needed rather than defaulting to “higher is better”. Given the rise of AI workloads and the global debate about data centre water/energy use, platforms began with what they controlled most directly: data storage strategies, encoding choices, and code efficiency.

B) Transparency, standards, and shared responsibility

A carbon calculator and a broadcaster argued that substantive reductions of the environmental footprint depended on better transparency from data centres, CDN, and ISP: until providers disclosed real energy use, source mixes, and emission factors, imposing specific reduction pathways was guesswork. According to an industry association, a perennial sticking point was allocating responsibility for end-user device emissions: whether these sat with content providers, device manufacturers, or end-users themselves. Clearer, shared standards were required to avoid double-counting or, conversely, responsibility gaps.

Besides, streamers reminded that small platforms, lacking leverage and expertise, benefited from EU-level guidance, labels that certified sustainable streaming, and streaming-specific delivery specifications they could use to negotiate for optimised assets from rights-holders. Another streamer called for route-awareness (how far data actually travelled) and standardised methodologies to enable apples-to-apples comparisons across providers. A carbon calculator said that the debate over whether streamers should have included consumption impacts in their reporting remained live; Netflix's choice not to had drawn criticism.

5.2.4 The role that audiences could play and how they could be eventually nudged

A) Interface-level nudges that cut active energy use

User Interface (UI) design could pull three levers simultaneously: the platform/app state (dimming, inactivity prompts), delivery features/patterns, and end-user device behaviors. A carbon calculator explained how the simplest wins came from curbing unattended playback: “Are you still watching?” prompts and screen-dimming after pauses reduced wasted energy; coordinating TVs and set-top boxes so one powered down the other by default substantially shrank “zombie hours”. In the same way, (carbon calculator) audio-only modes preserved listening while shutting off displays, a large power draw in living-room scenarios; some members of a carbon calculator used pop-ups that encouraged users to reduce resolution or download content when appropriate. Streamers illustrated how they tuned their interfaces: one implemented darker UI themes and periodic code optimisations to limit data generation; another’s dark UI redesign foregrounded accessibility and opened the door to additional eco-features as guidance matured. A broadcaster explored options such as user-selectable bit-rates and sensitive “impact dashboards,” balancing transparency with usability. A streamer tolerated lower resolutions without eroding core value.

Content curation and on-screen messaging can play as soft nudges. Several streamers and broadcasters explained that platforms surfaced sustainability labels/tags (e.g., albert-style indicators), contextual banners that linked to simple explanations, and household-level Q&As with practical tips. In-app communication, a carbon calculator argued, preferred clear language over abstract energy/carbon numbers that were hard to interpret. One streamer communicated eco-friendly practices via Q&A and planned to extend in-app banners/tips in ways that never stigmatised users. A broadcaster noted that micro-messages, e.g., connection tips, paired with transparent company-level metrics built trust. Editorial choices also mattered: a broadcaster told how content that depicted protagonists modeling sustainable lifestyles tended to inspire agency more effectively than dystopian narratives that generated anxiety.

B) The limitations of nudging: design constraints & avoiding counter-productive patterns

Nudging has limits, it needs to be based on correct information and should not merely push all responsibility to consumers. A broadcaster explained that dark mode saved energy primarily on OLED or other reactive-pixel displays; on LCDs, the gains were minimal, so any UI energy claims needed to be device-aware. A carbon calculator spelled out that single-purpose “eco buttons”

that merely lowered resolution risked greenwashing because bitrate/resolution were imperfect proxies for energy in modern networks.

Some participants highlighted the fact that communication should remain constructive and non-stigmatising and take well-being into account. A broadcaster illustrated that suggesting smaller screens for certain content should be done without shaming large-screen use. A carbon calculator and a streamer agreed that sustainability advice was not meant to imply watching in uncomfortable conditions or on sub-optimal devices. Another streamer reminded that compatibility had to be respected: pushing new codecs prematurely could exclude users on older hardware. More generally, a broadcaster and a carbon calculator stated that platforms needed to avoid shifting disproportionate responsibility to users.

C) Addressing inefficiencies through audience awareness and behaviour change

Some behavioral guidance helped, though its value depended on context. One streamer argued that encouraging downloads had limited benefits if many titles were watched once; platforms were wary of hindering use with rigid rules. On the other hand, simple advice, such as avoiding background streaming, selecting smaller devices when it suited the content, or setting timers for device shut-off, reduced unnecessary consumption without undermining experience, an advice also given by distributor and broadcaster.

On the delivery side, multicast or peer-to-peer (P2P) during high-concurrency events, eco-modes, and adaptive design patterns (dimming, brightness reduction) were promising, and several broadcasters tested prompts that led devices toward hibernation during inactivity, according to a carbon calculator and an industry association. Streamers came with various tips: to deepen eco-tips in-app (e.g., prefer Wi-Fi); to reflect platform realities (e.g. if there is no 4K available) to remain credible; standardise acceptable lower resolutions (1080p/720p) in case users are professionals. A broadcaster prioritised eliminating waste in the chain before asking more of users. A carbon calculator and a streamer underscored the communication dilemma: Scope 3 advice often implied telling customers to “buy fewer devices” or “stream less,” messages that collided with business models; on the other hand, educational, positive, and creative approaches tended to land better.

A particularly large opportunity lay in attacking “zombie hours.” Default shut-off behaviors, device coordination between TVs and set-top boxes, and inactivity prompts, already present on major platforms, collectively cut energy use when no one was actually watching, carbon calculators insisted. Several services moved to darker UIs and inactivity behaviors as part of broader migrations that aimed to lower data generation while keeping UX intact, streamers reminded.

Finally, incentive architectures, sometimes with gamification features, amplified impact without harming experience. A carbon calculator explained that tokens or rewards for enabling P2P during peak events, for instance, steered distribution toward lower-impact modalities. Default settings mattered, an industry association argued: eco/hibernation settings on devices or apps stacked small per-user savings into large system-wide reductions. Streamers explained how behavioral messages remained disarmingly simple, encouraging attentive viewing (no background play) and the use of timers for automatic shut-off.

5.2.5 Current collaborations to develop new environmental sustainability standards

A) Regulator and standards-body engagement

Industry stakeholders participated in regulator-convened working groups to shape delivery and technical norms. An industry association explained that engagement extended to standards bodies, such as the International Telecommunication Union (ITU), and accelerator initiatives, such as the IBC Accelerator, where the emphasis was on best-practice guidance rather than formal technical standards. A streamer argued for EU-level guidance to level the playing field with global services and strengthen their negotiating position with rights-holders and vendors. A broadcaster supported CSRD obligations and called for digital-domain standards comparable to the GHG Protocol’s physical-domain clarity.

Specific policy ideas included embedding footprints in invoices/products and mandating disclosure by providers of actual energy consumption, source mix, and emission factors behind any CO₂ claim. A carbon calculator cited Arcom’s (the French media regulator) work on

distribution as a model for regulator-industry co-development; and encouraged more such joint efforts. A broadcaster further argued that region-wide measurement standards would also have reduced arbitrage: if every European country had used the same toolset, producers could not have evaded requirements by changing shooting locations.

B) Cross-industry consortia and peer collaborations

Participants noted various collaborations, though with varying impact. A streamer gave the example of coalitions of smaller VOD platforms sharing roadmaps and “green VOD” know-how, while a broadcaster explained that broadcaster/platform alliances agreed common rules and processes that functioned as self-regulatory practice. Not all collaborations stuck: a streamer’s feasibility study with platforms and rights-holders faltered due to divergent priorities. A streamer proposed coalitions among Polish platforms and cinemas to exchange practices and collectively position as sustainable alternatives. A broadcaster explained its experience through active collaborations, seeking tighter alignment of methodologies among close counterparts. A carbon calculator’s own origin story underscored the power of collaboration: broadcasters recognised their central position in the value chain and chose to act collectively rather than duplicating isolated plans; this collaborative instinct was seen as essential for streaming as well. That said, a broadcaster noted that collaboration with financiers had been robust, while collaboration with regulators remained limited.

C) Shared tools, labels and methodologies

Practical, shared instruments evolved across jurisdictions. A carbon calculator recalled that existing ecological standards were adapted to new contexts, e.g., tailoring the NES for festivals; another calculator said that streaming platforms implemented production labels/tags (albert-style) to inform audiences about sustainable production choices. According to the same, vendors and platforms co-authored guidance on greener app design and front-end practices (Ecoflow) that aimed to diffuse practical recommendations at scale. A streamer argued that they, like other streamers, built de facto standards internally through annual collaborations with encoding and web partners, ensuring consistent cleaner code and encoding decisions. A

broadcaster expressed interest in emerging European streaming calculators and was open to switching tools if better-aligned options appeared. Once figures stabilised and became trustworthy, they intended to advocate that competitors adopt the same methodology to drive sectoral consistency.

Coverage gaps were gradually addressed. A carbon calculator noted that post-production impacts were under-served in many national standards (e.g., more fully covered in France than in Germany or Italy). They mentioned a joint project with Green Film aimed to develop an animation-oriented standard focused on digital activities. From a broadcaster's perspective, tools like albert, the Green Producers Tool, and the Environmental Lifecycle and Sustainability Assessment (ELSA), and the Green Toolkit Film and TV helped concretise trade-offs (for example, showing relative impacts of flying vs. taking the train or red meat vs. vegetarian catering) offering clarity about which actions delivered the biggest wins.

D) Established member practices and challenges

Data-sharing between VOD services and suppliers of distribution services, up to and including server logs, helped estimate footprints and validate interventions, but capacity constraints limited the depth of participation, especially among small services without in-house development teams. An industry association and a carbon calculator explained that many collaborations remained voluntary and advisory; outputs typically took the form of guidance rather than binding standards. Streamers reported that fragmented guidance and heterogeneous data made it hard to compare providers and to prioritise action.

Regulatory uncertainty cut both ways: two streamers welcomed clearer rules but warned that one-size-fits-all obligations could crush small services. As such, they preferred tiered duties that scaled with size and reach. For a broadcaster, too many parallel forums and vendor methodologies created noise; even large public broadcasters struggled to obtain comparable, auditable numbers across suppliers. A streamer concluded that human-resource limits, especially for platforms serving professional niches, further constrained implementation pace.

5.3 Policy and governance of SCT

The third section of the workshop focused on mapping and understanding how professionals in the VOD sector perceive current policies and industry practices related to SCT. The discussions with stakeholders were facilitated by the following questions:

1. What are the most interesting policies that have been adopted towards the greening of VOD platforms in the EU or beyond? Why?
2. How much regulation, if any, and of what kind, does the industry need to speed up the greening of VOD platforms in the EU, and from which authority (or authorities)? Why?
3. What are the most interesting industry initiatives that have been implemented to support the greening of VOD platforms in the EU or beyond? Why?
4. If you were to organise a skills development workshop with professionals to support the greening of VOD platforms, what skills would these workshops develop? Why?
5. Do you think the SCT agenda can help address or exacerbate other challenges in the industry beyond its greening? Which ones?

At the policy level, the discussion explored participants' awareness of and experiences with SCT initiatives at the international, EU and national levels, as well as their views on existing policy gaps and needs. In terms of existing industry-led practices, the section examined how professionals approach the SCT within their work, how they assess ongoing industry efforts, and which challenges they face in implementing them. Finally, it sought to identify the key needs and conditions that could enable the VOD industry to engage more effectively with the SCT and promote more sustainable practices across the sector.

Although in this report we divided the discussion into policies and regulation and industry practices, it is important to note that throughout the workshops conversations about policy and industry practices were often discussed in combination, with both being largely understood as broad frameworks and potential guidelines for the SCT in the context of VOD services. Policy and regulation were frequently used interchangeably, referring to national and supra-national reporting obligations, as well as requirements and incentives for more sustainable audiovisual productions. Industry practices referred most often to measuring tools, such as independent

carbon calculators, to collaboration practices, like knowledge sharing initiatives between organisations, and to examples of internal strategies for content production and delivery. The fragmentation of these guidelines and regulations, either stemming from public regulators or from private initiatives, was widely acknowledged, leading to a general consensus regarding the need for more harmonised measuring tools.

5.3.1 Existing Policies and Regulations

This sub-section provides an overview of the key stakeholders' discussions around existing policies, regulations, funding schemes and national initiatives that contribute to the promotion of the SCT among VOD services. Overall, stakeholders reported that only a limited number of policies and regulations directly impact VOD service providers, highlighting the lack of harmonised approaches and strategies to support the SCT at the EU level and the diverse and fragmented national legislation approaches in this regard.

A) EU level policies and regulations

Most discussions on existing EU policies revolved around the Corporate Sustainability Reporting Directive (CSRD)⁵⁹ and the sustainability requirements introduced in MEDIA funding schemes that can benefit VOD services, with only a carbon calculator/sustainability consultant highlighting the potential impact of the Ecodesign for Sustainable Products Regulation (ESPR)⁶⁰ and of the Energy Labelling Regulation.⁶¹ The CSRD includes provisions affecting large companies as it applies to companies with an average of 250 or more employees, €50m or more in net turnover or €25m or more in total assets.⁶² Therefore, the CSRD impacts large VOD platforms by setting up reporting requirements concerning their environmental, social and

⁵⁹ Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting [2022] OJ L 322/15.

⁶⁰ Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products, and amending Directive (EU) 2020/1828 and Regulation (EU) 2020/183 [2024] OJ L 2024/1781.

⁶¹ Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU [2017] OJ L 198/1.

⁶² Karin Hummel and Dominik Jobst, 'An Overview of Corporate Sustainability Reporting Legislation in the European Union' (2024) 21(3) *Accounting in Europe* 320–355.

governance (ESG) performance. However, the ESPR and the Energy Labelling Regulation might indirectly impact VOD platforms due to their provisions concerning ecodesign and labelling requirements for energy efficiency, durability, recyclability and the reduction of hazardous substances in various physical electronic products that VOD services run on (TV, computers and other displays).⁶³

According to three carbon calculator/sustainability consultants and two broadcasters, the introduction of the CSRD and its reporting requirements for large companies contributed to placing more emphasis on sustainability in the VOD industry, as it fostered internal practices and activities aimed at collecting data and tracking performance against specific sets of indicators. A carbon calculator/sustainability consultant argued that, even if the CSRD does not directly apply to small and medium sized companies, the reporting requirements for large companies eventually contribute to increased sustainability among small and medium sized companies too, as these smaller players are required to comply with the CSRD requirements if they are willing to cooperate with larger players.

Stakeholders consulted during the workshops reported different views concerning the support from Creative Europe's MEDIA programme. In particular, two stakeholders praised MEDIA's support to enhance sustainability among applicants, due to its reporting obligations and its key role in motivating audiovisual stakeholders to set up environmental strategies and internal practices enhancing the sustainability of their operations. However, a streaming platform representative argued that MEDIA calls and programming documents often lack proper guidance on how to implement sustainable practices, thus leaving applicants, especially small and medium sized companies, unprepared to address specific reporting requirements. According to this respondent, the lack of guidance reflects a broader issue within the EU legislative framework, which relates to the lack of a harmonised approach to SCT measurement within the EU. Finally, another streaming platform representative regarded MEDIA's contribution to the SCT less positively, due to the very limited number of VOD applicants that prioritised greening actions and that received MEDIA funding.

⁶³ European Commission, Electronic Displays: Energy Labelling and Ecodesign Requirements Apply to This Product (n.d.) https://energy-efficient-products.ec.europa.eu/product-list/electronic-displays_en

B) National level policies and initiatives

The discussions around existing national policies supporting SCT among VOD services highlighted a quite diverse and fragmented framework, with only a limited number of policy initiatives being mentioned and with several respondents highlighting a general lack of national policies targeting VOD services. In this context, initial efforts to set up standards and reporting obligations were noted in the Scandinavian countries, in France and Germany. For example, a broadcaster and a carbon calculator/sustainability consultant outlined the positive steps taken by Scandinavian/Nordic countries (Denmark, Finland, Iceland, Norway and Sweden) for the development of the Nordic Ecological Standard,⁶⁴ which will be implemented from 2026 and it will provide a sustainable production framework for the entire audiovisual industry, potentially becoming a funding requirement from national funding bodies. Moreover, a broadcaster acknowledged the positive impact of the reporting requirements introduced in Denmark, which supported greening practices among broadcasters and streaming platforms, such as the requirement to include carbon calculators in production plans.

As pointed out by two carbon calculator/sustainability consultants, the support provided by the French Agency for Ecological Transition (ADEME)⁶⁵ has been particularly useful to assess the ecological impact of the digital industry, thus also raising awareness on the importance of SCT processes among national audiovisual players, including VOD services. In particular, the Agency supports the ecosystem through the collection of energy consumption data and of SCT best practices, as well as through raising awareness initiatives and communication campaigns. Similarly, the French Regulatory Authority for audiovisual and digital communication (Arcom)⁶⁶ has contributed to the promotion of sustainable distribution practices. While acknowledging the importance of the German standard for greening audiovisual productions,⁶⁷ a carbon calculator/sustainability consultant noted that these standard procedures often fail to consider sustainability issues emerging during the post-production phase, which limits the potential impact of these initiatives.

⁶⁴ The Five Nordics, Nordic Ecological Standard NES (n.d.). <https://www.thefivenordics.com/nec>

⁶⁵ ADEME, Ensuring a successful ecological transition (n.d.). <https://www.ademe.fr/en/frontpage/>

⁶⁶ Arcom (n.d.). <https://www.arcom.fr/en>

⁶⁷ Filmförderungsanstalt, Sustainability (2025). <https://www.ffa.de/sustainability.html>

While these national efforts were recognised as having a positive impact in promoting sustainability, several participants – particularly those from Eastern European countries – emphasised that sustainability is not yet a policy or industry priority in their national contexts. They reported limited awareness, scarce guidance, and a general lack of institutional support, indicating that discussions around SCT, and on the VOD specifically, remain at an early stage in these regions. These observations highlight significant disparities among European countries in terms of knowledge, resources, and the overall integration of sustainability objectives within the audiovisual media industry in Europe.

Finally, two broadcasters reported awareness of policies implemented outside of the EU that effectively contribute to the SCT among VOD services. A broadcaster argued that a tax regime implemented in Canada requires companies to pay more taxes if their energy consumption goes beyond a set threshold. Moreover, the stakeholder stated that the collected taxes are proportionally redistributed among those who consumed less, thus incentivising them to further reduce their energy consumption. Another broadcaster reported ongoing discussions within the UK Department for Culture, Media and Sports on how to reduce the impact of the so-called IP switchover (i.e., the transition from broadcasting, terrestrial television, to IP-based transmission) and to understand to what extent recent technological developments and new standards could contribute to a more sustainable distribution of live content.

C) Policy needs: proportional regulations

Overall, stakeholders' views on policy and regulation were predominantly positive, emphasising the value of standardising measurement, improving comparability, and increasing transparency across the sector. EU-level instruments, particularly the CSRD was cited by two broadcasters as salient in establishing a shared vocabulary across production and distribution chains. Two participants, one broadcaster and one streamer, highlighted the overall absence or weakness of the national-level policies in comparison with EU-level policies (e.g., CSRD, Ecodesign for Sustainable Products Regulation and Energy Labelling Regulation), while still stressing the importance and need of adopting the latter to the various local and regional realities. Calls for proportionate regulation reflected a recognition that asymmetric capacities and bargaining power characterise the VOD ecosystem. At the same time, participants warned against

low-ambition baselines or voluntary measures that prioritise measurement over impact. Throughout the discussion, questions regarding transparency were directly connected to views on fragmentation and on the granulation of available data, skills and knowledge.

However, a more cautious view on potential regulatory frameworks was also expressed by several participants. One broadcaster highlighted the importance of industry-led initiatives, preferring a more sector-based coordination over the possibility of rigid rules that may stifle innovation and quickly become obsolete in a fast-changing technological environment. Representatives of smaller organisations (three streamers and one distributor) also expressed concern over potential administrative burdens, emphasising that smaller or independent players may lack resources, personnel and infrastructure to comply with complex obligations.

Moreover, a streaming platform representative argued that a more cautious and step-by-step approach would be preferable to promote SCT within the VOD ecosystem, due to current knowledge gaps and lack of data needed to design an effective regulation or other EU legally binding policies. In this context, the stakeholder argued the need to firstly address this knowledge gap within the sector and to gather relevant data to assess which sustainability requirements would be more effective and at which level of the VOD sector value chain should be applied (i.e., production, post-production, distribution, consumption). Therefore, approaches aimed at developing structured dialogues among various parties (e.g., VOD, server and datacentres service providers, producers) and at identifying best practices or key sustainability issues along the value chain should represent the first step needed to set up policy standards and design effective policy interventions.

In this context, one industry organisation representative reported significant ongoing difficulties in addressing the SCT due to a lack of standardised measures. A similar view was shared by another streamer with a more policy-driven perspective – for them, policy and regulation could be seen as providing not only common languages and standards, but also a more even-level playing field in an ecosystem of asymmetric bargaining and leverage power. The distinction between large US-based corporations and independent EU-based organisations was also underlined by participants, stressing the importance of obligations that can be isonomically implemented across all agents. One streamer mentioned that existing EU-support and guidelines already provides some level of regulatory frameworks to European companies, citing

the importance of measuring the energy consumption of larger organisations. Similarly, another broadcaster also stressed that European public organisations have more opportunities of cooperation than US-based companies.

The challenge for the implementation of policies and regulations here was understood by another VOD representative as recognising the varying degrees of impact and capacity between smaller and larger organisations, while the opportunities lie on the inclusion of more players in engaging with the SCT and on potential improvements to the impact of sustainability actions. Allowing for more proportionate compliance is important in such an asymmetric ecosystem, as companies with smaller operations often lack the capacity to have a dedicated sustainability team. But even then, one broadcaster expressed concerns regarding the potential of a low common denominator approach that could arise from measuring tools and regulatory targets that are too broad or not seen as ambitious.

5.3.2 Industry Practices

Participants generally reported more awareness of industry-led initiatives than of policy frameworks and initiatives, such as national or EU level policies and regulations. In this context, stakeholders reported various types of industry-led initiatives, which were mainly aimed at: A) tracking and measuring carbon footprints; B) enhancing sustainability of content production and delivery by obtaining carbon certifications or by adopting specific technical functionalities; and, C) promoting changes in attitudes and behaviors of consumers.

A) Tracking and measurement of VOD carbon footprint

Among the initiatives supporting the SCT of VOD services, many consulted stakeholders highlighted the key role played by carbon calculators and tools used to keep track and measure the emissions generated for the provision of their services. In this context, as pointed out by a few stakeholders (including carbon calculator/sustainability consultants, broadcasters and streaming service providers) the measurement of carbon emissions generated through the production or distribution of content is crucial to assess which specific measures need to be implemented, thus contributing to assess which type of intervention is more needed. More

specifically, a broadcaster outlined the positive efforts undertaken to measure the footprint of their entire supply chain, which provided interesting insights on the carbon footprint of production activities, distribution and streaming, as well as advertising practices.

Concerning the tracking and measurement of production-related footprints, several stakeholders mentioned the support provided by specific carbon calculators, such as the BAFTA albert,⁶⁸ the Green Producers Tool⁶⁹ and the cross-sector tools promoted by the Greenhouse Gas Protocol.⁷⁰ According to most of the stakeholders consulted, these tools are now widely used within the audiovisual industry and generally recognised as reliable instruments to gather knowledge about the carbon footprint that is generated through production, and in some instances, through the post-production of content. Both the albert tool and the Green Producers Tool require producers to input key data, categorised by type of activity (e.g., travel, accommodation, set construction, energy consumption) to calculate the footprint of a production. As for albert, its calculator is based on the Greenhouse Gas Protocol (measuring Scope 1, 2 and 3 emissions) and it supports the data entry process with benchmarks based on data collected throughout various years. Similarly, the Green Producers Tool categorises emissions based on the types of productions (TV/film, festivals, etc.) and it benchmarks the resulting footprint based on a database of emission factors. Both tools generate reports with aggregated numbers on the total carbon footprint and provide recommendations on how to reduce emissions in future productions.

In addition to production-related footprints, a few stakeholders outlined how the lack of information provided by service providers in terms of energy consumption of datacentres and servers complicates the quantification of the carbon footprints of streaming services. Similarly, a broadcaster and a carbon calculator/sustainability consultant outlined that the generalised lack of awareness in terms of the carbon footprint of networks and user devices makes the assessment of digital distribution emissions particularly complex and difficult to implement for many small players, such as small and medium VOD services. In this context, these stakeholders focused on the positive steps in terms of assessing emissions of digital

⁶⁸ albert, Production tools (2025). <https://wearealbert.org/production-handbook/production-tools/>

⁶⁹ Green Producers Club, The Tool (2025). <https://www.greenproducers.club/the-tool>

⁷⁰ Greenhouse Gas protocol, Calculation Tools (n.d.). <https://ghgprotocol.org/calculation-tools-and-guidance?ap3c=IGXmCH6WDeDPomoEAGXmCH6mIt-Db9NCNH00dmi e0ZqebCmgPw>

distribution services through the DIMPACT tool,⁷¹ a web application supporting data collection activities for digital companies operating in various domains, including streaming services, e-marketing, gaming and digital events. More specifically, they argued that such tools can provide companies with a structured way to collect data, model service systems and calculate emissions for video streaming services. However, a broadcaster outlined the difficulties in using standardised and reliable methodologies to calculate the carbon footprint of digital services, explaining how recent reports attempting to measure the impact of video streaming services used different methodologies, therefore resulting in sometimes conflicting findings (see BBC research⁷² and the Shift Project⁷³).

Among the initiatives aimed at assessing the emissions of the VOD services, a broadcaster reported the ongoing debate around the carbon footprint of advertising services, which represents a key dimension of the VOD value chain. In this context, the Ad Net Zero initiative, and its AdGreen Carbon Calculator,⁷⁴ was mentioned as a potentially useful programme that can provide a common framework for calculating, reporting and comparing the environmental impact of a single ad, thus supporting broadcasters and VOD platforms to make more informed decisions on how to reduce emissions in advertising. Finally, a broadcaster outlined the growing importance of sustainability platforms (such as Watershed⁷⁵) that can support the VOD industry across their entire value chain, thus contributing to corporate reporting activities and meeting both voluntary and regulatory requirements, such as those imposed by the CSRD.

B) Initiatives promoting SCT in content production and delivery

Discussions around SCT initiatives in content production and delivery promoted by the industry focused on the potential impact of sustainable production certifications and how these contribute to more standardised and collaborative production and co-production approaches among various audiovisual players (e.g., VOD platforms, studios and producers, broadcasters). Conversations also mentioned the various technological developments and technical

⁷¹ DIMPACT, The DIMPACT Tool (2025). <https://dimpact.org/tool>

⁷² Chloe Fletcher, *The Carbon Impact of Streaming: An Update on BBC TV's Energy Footprint* (BBC 2021)

⁷³ The Shift Project. *Climate Crisis: The Unsustainable Use of Online Video* (2019). https://theshiftproject.org/app/uploads/2025/04/Press-kit_Climate-crisis_The-unsustainable-use-of-online-video.pdf

⁷⁴ Ad Net Zero, AdGreen's New Carbon Calculator (2025). <https://adnetzero.com/news/the-new-adgreen-carbon-calculator-is-live/>

⁷⁵ Watershed, AI-accelerated sustainability (2025). <https://watershed.com/en-GB>

infrastructures that could foster more sustainable content delivery approaches (e.g., reducing data storage and server capacity needs, use of specific apps or websites interfaces).

As introduced above (subsection 5.3.2 A), several stakeholders pointed out the positive efforts promoted by organisations such as albert, Green Producers Club and others in terms of off-screen actions that can contribute to greener productions. As noted by a couple of stakeholders, in addition to raising awareness about sustainable production methods (e.g., use of green devices and materials, waste management, sustainable traveling, catering and accommodation) and to offering carbon calculation tools, such organisations have also contributed to increasing the uptake of greener production practices among the wider audiovisual industry. This shift has been reinforced by the increasing requirement by large VOD platforms and broadcasters of sustainable production certification from the smaller studios and producers that they commission. In this context, some stakeholders outlined how, in the case of content being commissioned or co-produced with other studios and producers, there is growing attention given towards the collection of data and information on energy use, waste management, materials used, as well as travelling, accommodation and catering settings. According to an industry organisation representative, these practices are also becoming more common among public broadcasters, which increasingly require studios or producers participating in their tendering and procurement procedures to implement greening production practices or to obtain specific sustainable production certifications.

However, as for the footprint of post-production activities, only a carbon calculator/sustainability consultant reported specific initiatives focusing therein, suggesting the overall lack of standardised approaches and initiatives in this area. In this context, the stakeholder noted how initial efforts aimed at assessing the impact of post-production through data collection and analysis of energy usage of technical equipment, digital data processed and generated and data storage and archiving needs. As result of this exercise, in 2025 Ecoprod, a non-profit organisation, published a study⁷⁶ providing an overview of best practices to reduce the environmental impact of post-productions through specific activities to limit energy consumption for data storage, data transfer and management of devices.

⁷⁶ Ecoprod, *Green Post-Production Guide* (2025).
<https://ecoprod.com/wp-content/uploads/2025/04/Green-Post-Production-Guide-1.pdf>

Recent SCT initiatives in content delivery include technical solutions to reduce the storage needs of VOD services through the compression of the size of the stored files (e.g., Netflix Codecs) or to limit the availability of high-resolution options for the audiences. In this direction, some streaming service providers reported that they decided to not offer 4k or 8k video resolution options. According to other stakeholders, additional initiatives being implemented include the possibility to standardise dark mode interfaces on websites and apps and to increase the coordination between manufacturers of devices and service providers to reduce the impact of zombie hours (that is, unproductive, energy-consumption activities) – since, currently, due to technical incompatibilities, switching off the viewing device might not necessarily switch off the play-out device.

Moreover, the use of interactive functionalities in the interface of VOD services might also reduce the impact of zombie hours or foster more sustainable viewing habits among consumers. For example, a carbon calculator/sustainability consultant highlighted that fostering more sustainable habits through the provision of various customisable viewing options might not necessarily result in more efficient choices by consumers, due to the complex technical implications of audiences' viewing habits in terms of video resolution, screen brightness or device and applications settings. For this reason, the consulted stakeholder suggested that offering the possibility to simply switch to an 'eco-mode' (e.g., a pre-defined package of eco-friendly viewing settings) might better support consumers' uptake of more sustainable viewing habits. Similarly, two carbon calculator/sustainability consultants noted how the inclusion of eco-reminders as part of VOD interfaces (e.g., pop-ups and non-descriptive nudges) can also represent a useful tool to send recommendations to the consumers or to take direct action (e.g., pausing automatic reproduction when the 'Are you still watching?' message is not answered), thus potentially promoting more sustainable viewing habits and reducing the impact of zombie hours.

Finally, a carbon calculator/sustainability consultant pointed out the positive efforts made by specific broadcasters (e.g., BBC or France Télévisions) to increase the sustainability of content delivery through the Multicast-Assisted Unicast Delivery (MAUD) technology. The shift from unicast delivery to this technology contributes to reducing both the environmental impact and the overall costs of content delivery for broadcasters as it can group single streams into a shared one, which is then directed to viewers. In this context, it has been estimated that during

the streaming of peak events, such as sport ones, MAUD could use up to 50% less bandwidth than other streaming delivery technologies.⁷⁷

C) Promoting SCT through consumers' attitudinal and behavioural change

As briefly introduced above (Section 5.2.4 C), in addition to industry-led initiatives aimed at assessing the carbon footprint of the VOD services and at reducing the environmental impact of content production and delivery, some of the workshops' discussions focused on initiatives aimed at changing consumers' attitudes and at normalising sustainable behaviour. In this regard, stakeholders focused on the potential role played by user guidelines in educating audiences on how to watch content in a more sustainable way, and on the potential impact of promoting certain narratives and visual elements in the content available on VOD services.

Additionally, some stakeholders outlined the importance of providing VOD platforms' audiences with comprehensive user guidelines on sustainable consumption practices that can be adopted by consumers while using VOD services. As pointed out by two streaming service providers, two industry association representatives and a carbon calculator/sustainability consultant, initial user guidelines have been provided to VOD services' customers, highlighting eco-friendly streaming practices, such as prioritising downloads over streaming, using Wi-Fi rather than mobile networks, or explaining how a specific video resolution setting impacts energy consumption. Despite this, as was pointed out by a streaming service provider and by an industry association representative, there are two key issues preventing more effective and widespread dissemination of eco-friendly guidelines to consumers:

1. The most energy efficient devices or settings might not necessarily be the ones that offer the best streaming user experience. Therefore, providing eco-friendly tips might undermine business goals in favour of sustainability;
2. VOD service providers, especially small ones and those experiencing more difficulties in keeping track of their carbon footprint, might not have the necessary information and knowledge to propose specific guidelines to their customers.

In addition to user guidelines, a few stakeholders highlighted the importance of establishing direct communication mechanisms with the audiences, for example through communication

⁷⁷ ANSA, 'BT Group and Edgio Announce World's First MAUD Enabled Content Delivery Network' (2024)

activities that foster interactivity and direct engagement. An industry association representative described an interactive communication campaign shared on streaming services and designed in collaboration with NGOs, wherein consumers were invited to visit a dedicated webpage to understand which greening practices were put in place to produce that specific audiovisual work and assess its contribution to the SCT.

Finally, according to a few stakeholders (including one broadcaster, an industry association representative and a carbon calculator/sustainability consultant), the content hosted on VOD platforms could play an important role in educating the public about the SCT, by either reinforcing positive behaviour or by contributing to behavioural and attitudinal change. In this context, a carbon calculator/sustainability consultant highlighted the importance of promoting content fostering sustainable behaviour by praising the activities of Waterbear,⁷⁸ a free streaming service provider operating across Europe, which offers content about climate action, biodiversity and sustainable social impacts with the goal of inspiring viewers to take action against climate change. However, an industry association representative argued that 'green' narratives should educate the audience without necessarily preaching to them about the importance of adopting sustainable practices or through documentaries, as it might be possible to contribute to behavioural change or to reinforce positive behaviours through more subtle approaches, such as the placement of green products (e.g., electric vehicles) or of certain roles for some characters (e.g., solar panellist).

5.3.3 Industry challenges and skill gaps

The third section addresses the views on industry challenges, needs and skills required to foster SCT within the VOD ecosystem. Two central pillars emerged from the discussion: A) the need for stronger integration and shared standards, B) the need to address knowledge and skills gaps. The first pillar reflects the limited awareness and understanding of what SCT concretely entails for the VOD context, including the need to harmonise metrics and guidelines to assess and reduce its impact. Participants emphasised that clearer definitions and measurement tools are essential to translate sustainability objectives into coherent and comparable practices across the sector. The second pillar focuses on the issue of integration across different stages

⁷⁸ Waterbear (n.d.) <https://www.waterbear.com/>

of the value chain and between policy and professional domains. The findings indicate that the SCT cannot be achieved through isolated or fragmented initiatives; rather, it requires coordinated strategies involving multiple stakeholders.

A) Industry challenges: a fragmented ecosystem

All participants described a fragmented landscape of requirements and tools, from national and EU reporting obligations to funding with sustainability conditions, and independent industry-led calculators and initiatives. This proliferation was recognised by a sustainability consultant as producing inconsistent reporting, weak comparability, and diminished credibility, reinforcing the need for harmonised measuring tools and shared standards. Fragmentation was also mentioned in relation to the structure of the VOD supply chain. In regard to content delivery, a stakeholder from an industry organisation and a broadcaster cited opaque methodologies from third-party vendors, reliance on shared infrastructure, and the difficulty of allocating emissions across platforms, ISPs, device manufacturers and end users. Although examples such as DIMPACT and Ecoprod were mentioned by a broadcaster and an industry representative, the lack of consistent baselines was recognised as a key challenge to effectively support the SCT of VOD services.

In terms of content production, a broadcaster mentioned how funding bodies such as film institutes and national agencies contribute to SCT policies by attaching sustainability requirements to their funding schemes. Representatives from broadcasters and carbon calculators noted improvements in travel reduction, greener procurement and waste cuts, though rebound effects from increased cloud computing were also acknowledged. Potential cost increases as a result of these policies were also mentioned, with divergent views on whether green practices introduce negligible or significant budgetary impact. Regarding this topic, a representative from an independent streamer expressed concerns of higher costs and the need for dedicated sustainability staff. This same participant cited the fact that greener infrastructure (such as more sustainable servers) are expensive and that these and other costs, including on investment in SCT promotion, may contradict the business goals of platforms.

However, industry opportunities in the SCT were most often seen as providing more efficiency, namely on energy consumption and budget resilience. One sustainability consultant referred to

sustainability costs as having minimal impact on budgets and one broadcaster mentioned the opportunity to increase efficiency when introducing more sustainable practices in operations. Another industry representative also highlighted the importance of developing and implementing more efficient sustainable technologies as needed incentives for the overall business goals of companies implementing SCT initiatives in their own practices.

Across both production and delivery, voluntary and collaborative initiatives were recognised as important but insufficient on their own. Some participants warned that the coexistence of multiple unaligned tools could encourage unverifiable claims and undermine trust, particularly in under-developed areas of measurement. The competitive nature of the VOD landscapes combined with the shared infrastructure needed for operations were cited as barriers to transparent exchange of data and methods, ultimately leading to an opacity of the impact of existing actions and initiatives.

B) Skill gaps: knowledge building

The lack of knowledge was identified as the main gap within the industry. In this context, knowledge is understood in a broad sense, encompassing the understanding of the environmental impact of VOD activities, the ability to measure it, and access to reliable data and practical guidelines to reduce it. The lack of transparency was cited by one independent streamer as being a significant challenge to accessing and building knowledge and skills to introduce and measure SCT initiatives in VOD platforms, with participants agreeing that building knowledge on how to measure and reduce their carbon footprint is fundamental to the greening of their operations. All stakeholders representing VOD platforms expressed interest in SCT but pointed to a lack of shared knowledge, tools, and organisational infrastructure.

Smaller companies, in particular, demonstrated a clear commitment to greening their operations, yet reported considerable limitations in terms of knowledge and available resources. For three streamers, participating in the workshop was perceived as an opportunity to learn from peers and gain a clearer understanding of what SCT could mean in practice. The discussions underscored the value of networking and knowledge-sharing activities as tools to build collective learning, exchange experience, and stimulate the implementation of more sustainable practices across the VOD sector.

Existing knowledge was also presented as being located at the individual level rather than within and across organisations. As one streamer explained, sustainability actions in their organisation were frequently led by self-trained individuals, resulting in isolated “islands” of competence rather than systemic approaches. Likewise, a broadcaster stressed the need for SCT to be embedded across departments rather than concentrated in a single dedicated team. In this context, as pointed out by a few stakeholders, the SCT efforts of small or medium VOD service providers not affected by the CSRD’s reporting requirements were mostly driven by the personal motivation of an employee or of a small group of employees.

In this sense, the issue of knowledge (or lack thereof) was cited by two participants (one representative from an industry organisation and one streamer) as being more relevant than technical expertise and skill gaps in this regard, with the industry representative mentioning that the main gap lies in basic climate literacy to equip organisations to interpret, assess and act on sustainability related data. Overall, knowledge deficits were seen as inhibiting alignment across the sector and as constraining the ability of individual organisations to implement and verify the impact of their initiatives.

6 Conclusions

This deliverable has presented the key outcomes of WP1 PlaySCAPES: Stakeholder Workshops, focusing on stakeholders’ perceptions of the sustainable climate transition within the audiovisual industry.

Social relevance and understanding of the SCT

The workshop discussions on the social relevance and understanding of the SCT highlighted both the complexity of the topic and the urgent need for harmonised understanding, measurement, and implementation across the value chain. The participants consistently identified a significant lack of verified data and shared knowledge regarding the environmental impact of the VOD industry. While a number of industry initiatives have contributed to a shared

understanding of the SCT in production, gaps in data, metrics, and conceptual clarity were evident in (digital) distribution. Stakeholders stressed the importance of harmonising measurement methods and developing shared frameworks to foster collaboration and prevent fragmentation. Without a common understanding, joint action and sector-wide sustainability efforts remain limited.

Greenwashing was widely recognised as a critical threat—not only to sustainable climate transition itself but also to the credibility and shared understanding of the SCT. Clarity and consistency in terminology, metrics, and communication are essential to counter this risk. The workshops also underscored the influential role of VOD platforms in promoting sustainability. Public service broadcasters were seen as bearing particular social responsibility, while other VOD platforms were also acknowledged as important actors in encouraging sustainable practices throughout the audiovisual value chain. Effective communication and knowledge-sharing were viewed as key to advancing environmental sustainability within the industry. However, smaller platforms were noted to have only limited control over the value chain.

Participants further emphasised that audiovisual content can serve as a powerful medium for shaping public attitudes toward sustainability. Currently, sustainability is perceived by many audiences as a distant or abstract concept. By educating audiences about sustainable streaming practices and offering engaging eco-themed content that links sustainability to everyday life, VOD platforms can seize an opportunity that remains largely untapped.

Finally, the workshops revealed a range of personal and professional motivations driving stakeholders' engagement with the SCT—from ethical and environmental values to innovation and business competitiveness. While financial considerations remain a barrier, especially for smaller platforms, sustainability was also recognised as an opportunity to bring financial benefits and enhance brand image and long-term relevance.

Overall, the discussions demonstrate that sustainable transformation in the audiovisual sector requires collective effort, shared understanding, transparent data, and consistent communication.

SCT in production and distribution

Discussions in the workshops showed growing awareness of the SCT and a move from ad-hoc intent to increasingly systematic measurement, although maybe more for established services. Carbon accounting has become routine for many broadcasters and platforms, extending from office and on-premise infrastructure to cloud workloads (e.g., servers, encoders), although the focus remains on production. Mature actors combined spend-based baselines with supplier activity data and sector tools (e.g., DIMPACT, Watershed) to improve accuracy, embedded “use of sold product” categories in disclosures, set science-based targets, and rolled out eco-production standards (including Nordic initiatives). Smaller services also entered the journey – commissioning audits (e.g., Greenly, Metrikflow), experimenting with calculators, and using external projects as catalysts for internal learning – though their approaches remained patchy and capacity-constrained.

On the production side, consensus coalesced around what works: commissioners used contractual leverage to require measurement and greener practices; widely adopted frameworks, such as albert or the Green Producers Tool, normalised some practices around energy, travel, and materials management; certification programmes and peer workshops accelerated diffusion; and “measuring to manage” proved culturally powerful, turning insights (e.g., diesel vs. battery/solar trade-offs) into operational change. Emerging roles (sustainability managers) and compliance drivers (public funder requirements) further institutionalised these practices. Notably, several participants challenged the perception that “green equals costly,” pointing to analyses suggesting modest incremental costs on average when planned early.

In distribution, a pragmatic framing gained traction: tackle (i) what platforms control (encoding roadmaps like H.265/AV1, front-end code efficiency, storage strategies), (ii) what requires ecosystem adoption (CDN/ISP efficiencies such as multicast/P2P), and (iii) what sits with end-user devices (typically the largest share). Many services pursued the first bucket and began exploring time-shifting computers to cleaner grid windows. At the same time, stakeholders cautioned against reflexive resolution inflation (from HD to 4K to even 8K), which cascades energy and device turnover across the chain.

On the consumption side, interface-level nudges showed practical promise – “Are you still watching?” prompts, coordinated device power-down, audio-only modes, darker themes, and

gentle in-app guidance — particularly in eliminating so-called “zombie hours.” Where tested, incentives and defaults (eco/hibernation settings) multiplied small savings at scale without degrading user experience.

Debates clustered around methodology, responsibility, and proportionality. Methodologically, participants agreed data quality and comparability were uneven: spend-based estimates were blunt; activity data improved confidence yet were inconsistently available; calculators varied; and reporting regimes sometimes demanded numbers faster than guidance matured, encouraging “report first, refine later.” Responsibility for end-user device emissions remained contested, mirroring a broader concern about avoiding both double-counting and responsibility gaps. Proportionality questions surfaced in hard contexts (live sports, big-budget drama materials, re-encoding entire catalogues for new codecs) and in user experience (nudging without stigma, preserving compatibility for older devices). Several stakeholders warned that regulatory complexity (e.g., multiple forums, heterogeneous vendor factors) risked diverting scarce capacity from reductions to compliance interpretation; many favored tiered obligations to protect small services while pushing for harmonisation, transparency (real energy/source mix/emission factors), and region-wide standards that close loopholes and enable apples-to-apples comparisons.

Finally, cross-industry coalitions, regulator-convened groups, and shared tools/labels demonstrated a cooperative ethos (calculators often referenced one another, and broadcasters pooled learning), yet initiatives sometimes faltered when priorities diverged or resources were thin. Gaps persisted in, e.g, post-production and animation-specific workflows, where new standards were being developed. Much work remains in scaling capacity for smaller players, aligning methods and data across suppliers, clarifying responsibility for device-side impacts, and ensuring that compliance fuels, rather than substitutes for, real, system-level SCT.

Policy and governance of SCT

The discussions on policy and governance showed an uneven landscape for the SCT. The increasing number of initiatives contrast with the lack of comprehensive frameworks to harmonise and scale their impact. Fragmentation was recognised by stakeholders as a challenge at the level of existing policy, tools, organisational capacity and knowledge, resulting

in a patchwork of localised developments rather than a systemic integration in operations. While both EU-level instruments and isolated national and industry-led initiatives have highlighted sustainability as a policy priority and a legitimate operational concern for VOD platforms, companies and organisations still struggle to measure and apprehend their carbon footprint across regions, organisational scales and nodes in the value chain.

A relevant finding from the workshops is that carbon measurement and related frameworks have emerged as key points of discussion when addressing the SCT – without, however, a unified understanding of what should be measured, how it should be measured and to what ends the resulting metrics are to be acted upon. Carbon calculations tools, funding incentives, as well as industry-driven initiatives have led to a perception that sustainability practices in content production are more developed than in digital distribution, content delivery, advertising and post-production. Stakeholders also converged on the idea that measurement without harmonisation of data and methodology can deliver low credibility or comparability, and that fragmentation in methods may lead to undermining trust and weakening incentives for action.

Knowledge deficits were identified as one of the main gaps and challenges in greening VOD platforms. The landscape was described as having pockets of expertise of self-trained individuals rather than organisational integration of the SCT. The workshops discussions showed that SCT knowledge should be understood not only as technical skills about guidelines, data and tools, but as institutional capacity to measure, interpret and operationalise sustainable practices across departments and decisions.

The findings further demonstrate that SCT in the VOD ecosystem is structurally interdependent due to a reliance on shared infrastructures of cloud services, networks, devices, energy providers. That, in combination with a fragmented ecosystem of commissioning bodies, platforms, producers and regulators, means that isolated actions led to a patchwork of initiatives. From such context, participants emphasised the need for shared standards and more collaboration between the industry, as well as with policymakers and regulators. The positive reception and engagement of the participants towards StreamSCAPES' Set-the-Stage Workshops also underlined the need for more knowledge-sharing and cooperation opportunities.

From the policy and regulatory perspectives, participants showed a positive view and openness to the potential of future regulations that could provide common frameworks and vocabularies that are capable of producing more comparability and accountability, as well as leveling the knowledge and capacity asymmetries. Potential policies should raise the standards of sustainability actions and reduce the possibilities of greenwashing without suppressing innovation. The question of proportionality when addressing policies and regulations was repeatedly stressed by stakeholders, especially coming from smaller organisations, acknowledging disparities in terms of e.g. human and technical resources and economic capacity.

The findings suggest that the conditions required for the effective SCT in the VOD sector are not merely technical but also infrastructural, epistemic and organisational, requiring collaborative approaches that integrate different parts of the value and supply chains, and that create an even-level playing field in an ecosystem of asymmetric bargaining and leverage power. Accelerating progress requires establishing harmonised measuring frameworks, multistakeholder cooperation, structured policy and industry dialogue, and the transformation of current fragmented policies and industry initiatives into shared standards, understandings, and goals, ultimately leading to industry-wide changes and systemic impact.

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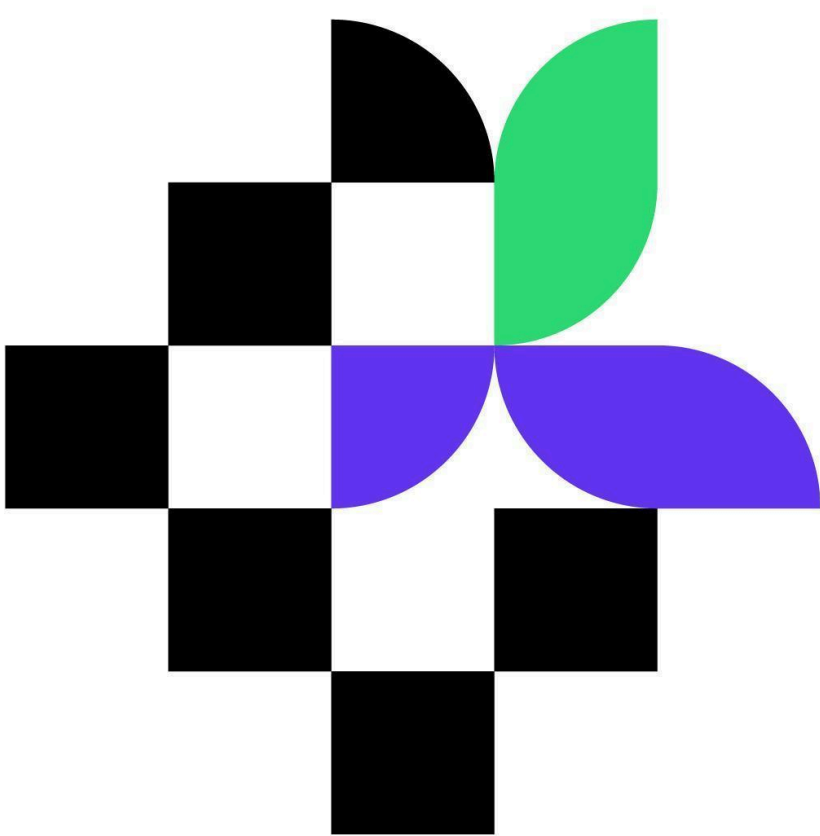
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Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.