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SUSTAINABILITY STORIES

Investigating the UK Creative
Industry and the Communication
of Sustainability

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Acknowledgements

Thank you to Dr Gemma Bridge who worked tirelessly as Postdoctoral Research Assistant for the Sustainability Stories project. Sincere thanks go to Phil Holdgate and Helen Brook at Sustainable Arts In Leeds for their time and thoughtful contributions to the project. Lastly, we are grateful to all the creative sector professionals who engaged with this research and to those who provided invaluable feedback and constructive criticism on the Critical Sustainability Stories Tool during the Sustainability Stories Workshop on 31 January 2023.

Elements of this report have been included in separate submissions to the journals Geoforum and Environment and Planning D.

About XR Stories

XR Stories supports research and development for companies working in cutting-edge digital technologies in the Yorkshire and Humber region. We do this through a programme of funding, research collaboration and connection. We work across film, TV, games, media arts, heritage, advertising and technology to champion a new future in storytelling.

XR Stories is putting the innovative and dynamic digital storytelling community of our region at the front of the global creative and cultural landscape. We draw together the University of York's research excellence and a strong business focus. We are finding new ways to tell new stories to new audiences.

XR Stories is a £15M investment by AHRC, ERDF, the University of York, the British Film Institute and Screen Yorkshire.

Report published, 2023.

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EXECUTIVE SUMMARY

“We need to communicate about climate change in every possible way we can, to every possible audience”.

Professor Dame Jane Francis, Director of the British Antarctic Survey¹

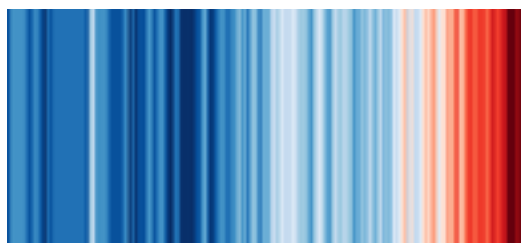
Skilled communicators play a vital role in shaping public understanding of the current climate context. For example, stories can explain why and how climate change has occurred, highlight better choices for consumers, advocate for policies to promote sustainable development and encourage organisations to alter unsustainable practices. This report introduces readers to two frameworks designed to advance creative industry stakeholder understanding of, and engagement with, sustainability and climate change research and expert knowledge spheres. We outline the Sustainability Stories Content Evaluation Tool and the Critical Sustainability Stories (CriSS) Tool. The former introduces a method of evaluating existing creative sustainability and climate challenge content. The CriSS Tool provides an organising framework for thinking about, and gathering information on, sustainability and climate issues for storytellers engaged in producing new creative content. The CriSS Tool was developed to

- i) increase engagement with, and use of, evidence-based sustainability and climate research,
- ii) grow the reflective and iterative learning capacity of communicators when exploring global challenge issues,
- iii) increase the quality and quantity of sustainability and climate mitigation and adaptation stories.

The research resulted from a project funded by the Arts and Humanities Research Council through the Creative Media Labs: Innovation in Screen Storytelling in the Age of Interactivity and Immersion programme XR Stories at the University of York.

The CriSS Tool provides an organising framework for thinking about, and gathering information on, sustainability and climate issues for storytellers engaged in producing new creative content.

The research was co-produced with a spectrum of industry experts from the UK’s creative sector, XR Stories Creative Cluster stakeholders, and included a literature review and a comprehensive assessment of diverse digital and creative content. The accompanying project document; ‘The Critical Sustainability Stories Tool – Guidance Notes for Use’ available at <https://xrstories.co.uk/about/publications/> provides information on how story developers can use the tool in the creation of new content.



Warming Stripes by Ed Hawkins, National Centre for Atmospheric Science, UoR.

1. BBC, 2023b March 27

1. INTRODUCTION

This research assessed creative content that explored sustainability challenges and climate change issues for diverse audiences. Through collaboration with creative industry stakeholders the authors developed the Critical Sustainability Stories (CriSS) Tool to increase the integration of climate science and sustainability transition research into different types of creative content.

In the past two decades, the creative industries have played an increasingly important role in communicating a wide variety of sustainability concerns and climate change issues facing the planet. Spanning climate, natural resource and ecology-related topics, examples of media content include the renown BBC and David Attenborough Planet Earth collections (Blue Planet 2001, Planet Earth 2006, Frozen Planet 2011, Green Planet 2022, Frozen Planet II 2023), the BBC's 2021 Climate Collection (BBC, 2021a), and radio and podcast broadcasts, such as The Climate Question (BBC, 2022), 39 Ways to Save a Planet (BBC, 2021b) and Start the Week: Climate Past, Present and Future (BBC, 2023). Streaming service content providers have increasingly explored climate issues, from the Netflix documentary, Breaking Boundaries (Netflix, 2022), to the more dramatic exposition of climate change in the film 'Don't Look Up' (Netflix, 2021).

Creative industry firms have also applied their unique skills and capabilities to the theme of sustainability (Padfield et al, 2023). In 2022 the Green Planet AR Experience in London used augmented reality technologies to give audiences an immersive and digitally dynamic perspective of the natural world. In the Yorkshire and Humber region, Megaverse - an interactive studio that develop immersive experiences - has collaborated with Sustainable Arts in Leeds, a network

of creative and cultural organisations in Yorkshire, to develop an interactive eXtended Reality (XR) experience that explores the potential impacts of flooding in Hull (SAIL, 2023). It is clear from these examples, that the deployment of stories using diverse media play a pivotal role in public discourse narratives on climate change. For the diverse audiences they reach, sustainability and climate change stories are a powerful means through which society and individuals can begin to make sense of the complexities of a changing world (Creative Clusters, 2023).

the deployment of stories using diverse media play a pivotal role in public discourse narratives on climate change

Before proceeding, we should explain key terms in the report. Sustainability refers to the ability of “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987). This is a process that involves balancing economic, social, and environmental considerations to ensure that we can continue to thrive as a society while preserving natural resources and ecosystems for future generations (Brundtland, 1987). The issue of sustainability should be distinguished from the process of change (transitions) that lead to preserving finite resources.

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Markard et al. (2012: 956) refer to sustainability transitions as “long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption”.

We use the term Climate Change to refer to long-term changes in the Earth’s climate, including changes in temperature, precipitation, and weather patterns, that are primarily caused by human activities, such as the burning of fossil fuels and deforestation (NASA, n.d.). These activities lead to an increase in greenhouse gas emissions, which trap heat in the Earth’s atmosphere and causes global temperatures to rise. This warming has wide-ranging effects on the planet, including rising sea levels, more frequent and severe weather events, and changes to ecosystems and the distribution of plant and animal species.

Why are storytellers and professional communicators so important in the context of the sustainability and climate emergency?

To answer this question, it is useful to understand more about the wider national and international context in which the UK’s and Yorkshire and Humber’s creative industry operates. Long-term alterations in global temperatures and weather patterns occur naturally (United Nations, n.d.), but since the first industrial revolution in the late eighteenth-century (Xu et al., 2018) progressive societal and economic transitions have accelerated the release of greenhouse gases into the Earth’s atmosphere. In 1988 the Intergovernmental Panel on Climate Change (IPCC) began to assess changes in the world’s climate, together with the implications of these changes for the biosphere and human life (IPCC, n.d.).

During the past thirty-five years there have been numerous international pledges and policies proposed to curtail the burning of fossil fuels and reduce societies’ impact on the planet, most notably the 2015 Paris Agreement (United Nations, 2023). The recent IPCC AR6 Synthesis Report (published 20 March 2023) highlights the spectrum of necessary and feasible adaptation and mitigation strategies currently available to society to enable a reduction in greenhouse gas emissions (IPCC, 2023).

To date, the UK has pursued a market-orientated policy framework for mitigating the impact of industrial, agricultural and service sector-led impacts on the climate (UKEF Climate Change Strategy, 2021). This policy environment means the market system dominates the UK’s response to the climate emergency, which primarily leaves firms and market systems to implement and modulate the impacts of economic and industrial development on the climate, a process termed ‘green capitalism’ (Buller, 2022). Under green capitalism, the adoption of sustainable business practices, which focus on environmental and social governance, maintain the capitalistic premise of economic growth. By its very nature, this places profits over the wellbeing of people and the planet, and in turn, perpetuates climate and sustainability challenges (Buller, 2022).

Radical transformation of economic systems towards equity, sufficiency and maximal efficiency is required (Steinberger, 2021). It is this need for radical change, that has led researchers to call for post growth approaches to be implemented (Raworth, 2017). Such approaches aim to keep economies stable and promote positive social outcomes, and could, if adopted, enable a reduction in global energy use (Milward Hopkins, 2020), and ensure that societies can achieve climate and sustainability goals (Hickel et al., 2021). Despite growing evidence and calls for changes to the current growth-focused

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economic system, green capitalism continues to dominate narratives on how to mitigate climate change (Hickel, 2019).

So, what role do storytellers and the creative industry have in this complex dynamic? Climate and sustainability related content have become a topic of interest for the wider research community. Researchers from academic disciplines and perspectives including communication studies, cognitive psychology and visual perception studies, have sought to understand what makes effective communication on sustainability topics, and how and why it can make a positive impact (Robertson, 2018). Research has tended to focus on mainstream media (e.g., TV, radio) and less on emerging areas and new digital technologies within the UK's diverse creative industry, such as the range of immersive technologies that are being used. Questions therefore remain about how the sector can best communicate climate and sustainability issues to diverse audiences, e.g., the role of story type, the format used to engage audiences (e.g., screen, immersive or interactive), and the information needed to produce accurate content.

Researchers have also highlighted the existence of an information deficit – the gap between research and expert knowledge spheres and public understanding of global challenges – and argued that better science communication through improved narrative form will activate positive public responses to climate change (Veland et al., 2018: 41). Sturgis and Allum (2004) and Corner and Clarke (2017) argue that if better quality information about climate change and its impacts was accessible and relatable to people, society would be more likely to support action to address it. Nisbet and Scheufele (2009) emphasize the importance of developing compelling stories to make climate and sustainability issues personally relevant and emotionally engaging for people. A lack of narratives (engaging story-based communication)

about sustainability challenges and climate change has arguably arisen from top-down approaches in communication (Veland et al., 2018; Nilsson et al., 2017), the dominance of negative or conflicting media reporting (Barnett et al., 2016; Manzo & Padfield, 2016; Raimi et al., 2017), and limited attention to forward-looking opportunities for action (O'Neill et al., 2015).

if better quality information about climate change and its impacts was accessible and relatable to people, society would be more likely to support action to address it

Communicators have the expertise and skill set to significantly shape public discourses through informed evidence-based creative content. This is recognised by some of the world's leading climate scientists. As recently as 27th March 2023, Professor Dame Jane Francis, Director of the British Antarctic Survey asserted “we need to communicate about climate change in every possible way we can, to every possible audience” (BBC, 2023b March 27). Through stories, solutions to climate and sustainability challenges can be conveyed in innovative, engaging, and relevant ways, which can overcome the psychological barriers that are evoked by more traditional data-driven communications (Roosen, Klöckner and Swim, 2017). This project addresses this issue directly. In this report, we introduce a practical pathway for communicators, through the Critical Sustainability Stories Tool, to develop powerful narratives on existing sustainability challenges, the climate crisis and urgently needed sustainability transitions (such as ending the use of fossil fuels). Our research highlights the critical role creative content, and the wider creative industry have in communicating the spectrum of systemic sustainability and climate change challenges (environmental,

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social, economic, political) facing the world.

Project Aim:

- To investigate how communicators can help make sense of climate change and sustainability challenges through creative storytelling and engage their audiences – local communities, policy makers, industry, and the general public – to stimulate behavioural change.

Project Objectives:

- to better understand the content format and focus of existing stories about sustainability and climate change issues.
- to devise a method for advancing the skills, knowledge and understanding of communicators about sustainability transitions and climate challenges and increase access to expert knowledge to enrich creative content.

The research was interdisciplinary in nature and draws on key literature from economics, sociology, political economy, and environmental anthropology. Moreover, the authors have a shared background in geography, and examine critical issues and questions within the field of sustainability and business.

We define communicators as a diverse cohort of actors (e.g., broadcasters, heritage interpreters and curators, artists, musicians, film makers, extended reality (XR) producers, advertisers, professional storytellers) involved in the design and production of a similarly broad range of creative content (e.g., TV, film, virtual production, multimedia arts, advertising, theatre, museums and galleries, social media, and

immersive and interactive digital technologies) that operate across economic sectors and for a variety of purposes.

The remainder of this report presents the route to achieving these objectives and the key project outcomes. The next section provides an account of the methodological approach we pursued to achieve these goals. This is followed by an explanation of the principal findings of the project, namely the Sustainability Content Evaluation Tool and Critical Sustainability Stories (CriSS) Tool which was designed to support communicators in the development of sustainability and climate change stories and creative content. Guidance notes on how to use and implement the CriSS Tool are available to communicators as an accompanying document to this report.



Photo 'Love our planet signage' by Ronan Furuta @ Unsplash (https://unsplash.com/photos/sp_pcgiPvgI)

2. METHODOLOGY

Data for this research project was derived from desk-based analysis of documentary and digital content via the internet, semi-structured interviews and through participatory action research with creative industry stakeholders from the Yorkshire and Humber region. This research received ethical approval from the York Business School Ethical Review Committee (reference Alexandra Dales 12082022) at York St John University.

This research required us to assess existing creative content while exploring sustainability and climate change related issues, and to understand the creative processes involved in producing creative content. We therefore undertook qualitative desk-based assessment including documentary research, semi-structured interviews, and participatory action research with creative industry stakeholders in the Yorkshire and Humber region. To better understand the format and focus of existing stories about sustainability and climate change, we began with a desk-based evaluation of content (e.g., podcasts, phone applications, virtual reality (VR) and augmented reality platforms (AR), interactive educational games, short films, advertisements, live performances)

produced primarily by the regions creative sector, as well as a number from across the UK and internationally. We identified content produced by organisations that were immersive (AR/VR/ 360) and included these into our analysis of creative content. Table 1 summarises the characteristics of the creative content we evaluated.

By conducting documentary and content analysis of digitally available media we deepened our understanding of the range of regional, national, and international stories about sustainability and climate change related issues available to audiences. Furthermore, we identified the means through which they were told, and the prevailing issues covered in creative content. It is important to note this process was not exhaustive of all content available

Table 1. Characteristics of climate and sustainability creative content

Content type	Digital Application, Film, Game, Short Film, Advertisement, Virtual Reality Platform, Interactive Document, Event/ Performance, Interactive questionnaire (e.g., carbon calculator), Augmented Reality Platform
Sustainability / Climate Issue	Environmental conservation (animal welfare, habitat conservation, rewilding), Pollution (recycling, light pollution), Sustainability (sustainability initiatives, sustainability reporting), Climate change (predicting change), Social justice (supply chains, survivors' stories), Carbon footprint (Track behaviours)
Purpose	Educational, Advocacy, Audience Behaviour Change
Modalities used	Visual, Text, Audio, Visual + Text, Visual + Audio, Visual + Text + Audio
Audience sector	General Public, Children, Business

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to audiences nationally and internationally, rather we sought to capture and assess a snapshot of the range and type of content available via websites and social media. We are sensitive to the constraints of this methodological strategy but consider this approach to be sufficient for the purposes of the project. The outcome of this process was the development of the Sustainability Content Evaluation Tool discussed in the Findings section of the report.

A central tenet of the research process was iterative learning and reflection. The analysis of creative content informed the subsequent semi-structured interviews and participatory action research we undertook to address the project objectives. Participatory action research is a methodological approach that involves active participation of stakeholders in the research process. It is designed to empower communities and give them a voice in the research that affects them (Minkler, 2004). The benefits of participatory action research for this project were fourfold: i) it ensured that the research remained relevant and useful to the community being studied, ii) improved the quality and accuracy of data collected, iii) built relationships and trust between researchers and participants, and iv) increased the likelihood of successful implementation of the research findings.

Data collection and participatory action research occurred between July 2022 and February 2023. We worked with stakeholders from across the Yorkshire and Humber region to learn about a range of content types and the production process for immersive XR experiences. As part of this knowledge gathering process, we discussed the creative processes undertaken by three SMEs tasked under the XR Stories Climate Change Challenge Project (XR Stories, 2023a) while producing a sustainability themed digital story. We worked extensively with Sustainable Arts In Leeds (SAIL), a not-for-profit organisation supporting net zero and sustainability initiatives in the Yorkshire arts and cultural sector, in the development of their 'Home Planet' interactive Virtual Reality experience (XR Stories, 2023b). In addition to our collaboration with SAIL and the Climate Change Challenge project, we undertook semi-structured interviews with industry experts who provide expertise on the creative industry and audience experience. Insights gathered from these interviews and ongoing stakeholder collaboration with SAIL and Opera North in Leeds, helped us to develop the principal finding and contribution of the project; the Critical Sustainability Stories (CriSS) Tool.

We tested the utility of the CriSS Tool within a one-day workshop with 26 delegates



Photo "Valley of windmills" by Appolinary Kalashnikova @ Unsplash (<https://unsplash.com/photos/WYGhTLym344>)

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from across the Yorkshire and Humber and UK's creative industry in attendance. The workshop aimed to give communicators the opportunity to gain insights into how to produce critical content using the Sustainability Content Evaluation Tool, and the Critical Sustainability Stories Tool, both of which are explained in the Findings section. The workshop focussed on how to translate complex sustainability and climate change issues into critical and informed stories, and for us to receive critical commentary and feedback on the CriSS Tool. A workbook was produced to facilitate delivery of the workshop. An expert communicator was engaged to evaluate the workbook to ensure it was user friendly. This workbook provided attendees with background to the project, a rationale for using the Sustainability Story Evaluation Tool and CriSS Tool and provided a worked example of the former. The workbook also included an activity through which to test the CriSS Tool and information resources to support the development of sustainability and climate-based stories outside of the workshop. The workbook is available via the York St John University Institute of Social Justice research pages (ISJ, n.d.).

During the workshop, a member of the research team observed discussions and made notes. The notes sought to capture the delegates' perceptions of the strengths and weaknesses of the CriSS Tool and how they would apply it in their creative practice. At the end of the workshop the attendees were asked to complete a 5-minute feedback survey. The survey questions were developed to obtain feedback about the usability of the CriSS Tool, how it may be improved, and the likelihood that the attendees would use it in their work. Completion of the survey was voluntary, and all responses were anonymised. Data captured through the feedback survey was downloaded from Qualtrics and analysed using Microsoft Excel.

3. FINDINGS

This section introduces the Sustainability Content Evaluation Tool for examining existing creative content. This is followed by an explanation of the Critical Sustainability Stories Tool, a structured framework designed to enrich new creative content about sustainability and climate challenges through engagement with research and expert knowledge.

3.1 Evaluating Creative Content

- **Achieving Objective 1 – to better understand the content format and focus of existing stories about sustainability and climate change issues.**

As described earlier, we analysed creative content addressing climate change and sustainability themes. Our analysis focussed on the quality and trustworthiness of information shared within the stories, the degree of immersivity of the content format, and type of issues addressed (e.g., environmental, social justice, economic, climate). Initial assessment revealed the considerable variety of information included in creative content, both in terms of topics explored, but also with regards to the categories of information included (e.g., economic, social, political, legal, historical, environmental). There exists significant variation in the level of detail included, and the degree to which content either described an issue or provided a more substantial evaluation and commentary on the issue(s) being considered. This led us to consider the range of critical actions demonstrated within different content.

We define critical actions as the routes through which information is conveyed to

audiences within stories. Critical actions include presenting information through description (e.g., audio observation or visual imagery), organisation of information into categories for audiences (e.g., through visual graphics or information tabs in games), explaining an issue using different types of information (e.g., statistical, or first-person narratives), evaluating a topic (through audio commentary, images or text), and synthesizing different types of information (e.g., through story narratives) (Louisville University, n.d.). For example, Greenpeace produced a short film on the UK's contribution to, and responsibility for global plastic pollution 'Wastemincer Downing Street Disaster' (Greenpeace, 2021). The film provides audio and visual imagery on the UK governments policies toward plastic; visual and textual information about the volume of plastic pollution the UK generates daily, plus visual imagery and textual information about the consequences of plastic pollution.

Our analysis focussed on the quality and trustworthiness of information shared within the stories, the degree of immersivity of the content format, and type of issues addressed

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Figure 1. The Sustainability Content Evaluation Tool

Description

Does the content provide a description of the problem?

What was done well?

What could be improved?

Explanation - why?

Does the content provide an explanation for why the problem occurred?

Is there anything that doesn't make sense?

Explanation - how?

Does the content provide an explanation for how the problem occurred?

Does anything not make sense?

Steps for behaviour change

Does the content state what needs to happen to reduce the problem?

Are there clear steps stated to encourage mitigation for and/ or adaptation to the issue?

The rationale for behaviour change

Does the content provide a reason for why behaviour change is needed?

Could the story be improved?

In addition to assessing critical actions within creative content, we also considered what the stories emphasized. Did stories focus on the causes and consequences of climate change or strategies to address these challenges? For example, in Episode 6 of the BBC's Frozen Planet II series (BBCa, 2023), 54 minutes were spent on discussing the causes and consequences of climate warming, with 3 minutes introducing actions to address the impacts of these processes. In contrast, the Greenpeace film is short, descriptive of a specific environmental concern, and includes a narrow set of actions for audiences to undertake in response to the story. These actions are to: i) reduce use of plastic, ii) contact the then Prime Minister Boris Johnson about the issue, and iii) to share the video. In sum, the story succinctly and persuasively conveys

to audiences the issue involved, who is responsible and what can be done about it.

We also note that creative content will be designed for different purposes and audiences. For example, episode 6 of the Frozen Planet II series sought to primarily educate a large and diverse audience group on a Sunday evening about the causes and consequences of climate warming. The Greenpeace film was shared via social media as part of a targeted Greenpeace campaign.

Our evaluation process led us to consider what factors shaped the stories being told. We therefore posed the question, 'to what extent does the content describe, explain, evaluate, or offer commentary about the climate issues within the story?'. Figure 1 presents the Sustainability Content Evaluation Tool which provides a

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Figure 2. Completed Sustainability Content Evaluation Tool: A Cheesy Love Story by Eko.org

Description Does the content provide a description of the problem? What was done well? What could be improved?	The advert states that because of purchasing palm oil, rainforests are being destroyed and animals and plants are becoming extinct. The story of the couple at the start contrasts with the end. It is emotive and memorable. More information and imagery could be used to describe the extent of the issue.
Explanation - why? Does the content provide an explanation for why the problem occurred? Is there anything that doesn't make sense?	Story provides an incomplete explanation for why the problem of rainforest deforestation is occurring. It states that because of purchasing and using palm oil, rainforests are being destroyed. There is no mention of other actors or why palm oil is used.
Explanation - how? Does the content provide an explanation for how the problem occurred? Does anything not make sense?	There is limited explanation for how the problem is occurring, other than stating that palm oil production and purchase is leading to rainforest destruction. More information or images could be provided to show and explain how palm oil use leads to deforestation and what processes and actors are involved.
Steps for behaviour change Does the content state what needs to happen to reduce the problem? Are there clear steps stated to encourage mitigation for and/ or adaptation to the issue?	The story encourages audience to contact PepsiCo, producer of Doritos, and ask them to pursue a responsible palm oil policy. No other steps for change are provided. It would be useful to encourage the audience to consider what other products they use contain palm oil, and how they could reduce their use of these products and encourage companies to reduce their use.
The rationale for behaviour change Does the content provide a reason for why behaviour change is needed? Could the story be improved?	Other than stating that palm oil production and use lead to rainforest destruction, there is limited rationale provided as to why the audience should contact the corporation, or why they should change their behaviours.

structure through which creative content can be assessed both in terms of critical action and the extent to which climate and sustainability mitigation and adaptation strategies are considered.

Figure 2 presents our assessment of an advertisement first played during the USA's National Football League Super Bowl event in 2015 called 'A Cheesy Love Story - The Ad Doritos Doesn't Want You to See' (available via YouTube, n.d.). This story was produced by an international consumer group working to curb the power of global corporations called Eko (formally Sum of Us). Eko describe the story as featuring "a

blossoming romance that begins over a shared Doritos chip but ends with a stern warning that "Doritos May Contain Traces of Rainforest." (Eko, 2019). We examined this spoof advert with delegates during the one-day workshop delivered in January 2023.

The benefits to creative sector stakeholders and communicators of the Sustainability Content Evaluation Tool are threefold.

- First, it invites the user to take the perspective of a critical and informed viewer of creative content, whose focus is the nature and quality of information

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conveyed within stories.

- Second, the tool offers a structured approach for considering the potential outcomes of creative content for audiences, particularly with regards to the type of actions such content would encourage audiences to engage in.
- Third, the Sustainability Content Evaluation Tool shows that stories potentially operate along a spectrum of critical activity, from descriptive, through explanatory, to evaluative and towards more critical commentary on strategies (sustainability transitions) to address sustainability and climate related challenges and the rationale for such actions.
- This last point is particularly important. Enabling audiences to better understand how to respond to the sustainability and climate crisis, is critical to addressing specific global challenges. In this regard, professional communicators are best placed to tell that story and help audiences, and wider society make sense of the world.

3.2 The Critical Sustainability Stories Tool

- **Achieving Objective 2 - to devise a method for advancing the skills, knowledge and understanding of communicators about sustainability transitions and climate change and increase access to expert knowledge to enrich creative content.**

The Sustainability Content Evaluation Tool is a method for examining existing content. But what about future creative content? How can stories best close the gap between high quality evidenced based research and valuable knowledge spheres concerned with global challenges, and audiences who live as part of the global system? In response to this question, we

developed the Critical Sustainability Stories Tool. It is the principal contribution of this research project and presented in Figure 3.

The Critical Sustainability Stories Tool provides an iterative, discourses led pathway for storytellers and communicators to develop new content based in evidenced-based research and expert knowledge on sustainability and climate change related issues. The tools objectives are to

- i) increase global challenge literacy among communicators;
- ii) generate collaboration between global challenge researchers and communicator groups; and
- iii) grow the quality, quantity and range of research informed stories (across diverse content formats) which critically engage with sustainability and climate emergency issues and solutions.

The rationale for the CriSS Tool emerged through discussions with stakeholders and our own underpinning critical thinking practice and use of core philosophical questions e.g., what do we know about the world around us? how do we know about the world around us? what do we do with the information we have about the world?

We wanted to understand what storytellers needed to know and understand about global challenges to advance sustainability and climate change creative content. We therefore re-phrased our core philosophical questions into i) what is sustainability and climate change? ii) how do we find about sustainability challenges/ climate change? and iii) what does the information gathered tell us about sustainability and climate change? This process led us to develop categories of open-ended questions that we shared and discussed with creative industry participants involved with the project. The CriSS Tool includes six categories or topics related to the themes of sustainability and climate change – critical activity, audience, storytelling journey,

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Critical Activity

Critical Content

How does the story describe the sustainability/ climate issue(s)?

How will the story offer explanation for, or evaluation of, the issue?

How does the story explore connections between different sustainability/climate issues?

How does the story make connections between different contexts (e.g., specific places, local and global scales)?

Does the story explore strategies or actions for tackling the sustainability/ climate issue?



Audience

Target audience

Who is the target audience(s) for the story?

Behaviour change

Does the story include prompts to change audience behaviour?

What types of behaviour change does the story target (e.g., collective or individual)?

How might audience behaviour change be measured/ assessed?

Language

How can language in the story be used to inform the audience?

Script

How will you balance emotion and factual information for the audience through the script?



Storytelling Journey

Reflection

How is critical thinking, and learning and reflection encouraged during production of the story?

Advisory groups

How might advisory groups help to develop the story?

Experts by experience

How might experts by experience (i.e., communities, industry experts, academic researchers) advance the content of your story?

Are you speaking to stakeholders with knowledge of the issue?

Technology

Is the technology used in the production of the story helping or hindering critical communication to the audience?



Context

Location

How does the location at which the sustainability/ climate issue occurs shape the story?

How does the scale (local, national, regional, global) at which the issue occurs impact the story?

Representation

Are diverse and contrasting stakeholder experiences shared in the story?

How does the story explore diverse communities impacted by sustainability/ climate issues?

Relationships and impact

How does the story examine the relationships and connections between places?

Time

How does the timeframe (past/ present/ future) shape the story?



Quality of Information

Evidence

Is the information in the story evidence-based?

Knowledge categories

What categories of information are included in the story (e.g., historical, economic, social, political, legal, environmental, social justice)?

How will you use the information available to you to accurately represent the sustainability/ climate issue?

Accuracy

Is all data reliable, verifiable, and representative of reality?

Transparency

Are you able to be transparent with the audience about information sources?

Trust

How will you generate trust in the story amongst the audience?



Justice

Ethics

Has information for the story been collected in an ethical manner?

Justice

How does your story explore social justice for communities affected by sustainability/climate issues?

How does your story explore environmental justice?

Responsibility

How will the story explore who is responsible for the sustainability or climate issue (e.g., individuals, organisations, governments, systems of activity and interaction)?

Adaptation and mitigation

How does the story consider adaptations or mitigation measures (e.g., social, economic, or environmental) associated with aspects of sustainability and climate change?

Figure 3. The Critical Sustainability Stories Tool

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context, quality of information, and justice – and each include a series of questions upon which communicators can discuss and learn through. Figure 3 presents the CriSS Tool and finalised version of these questions.

The rationale for each of the CriSS Tool topics are as follows:

- The Critical Activity topic was designed to incorporate the analytical approach introduced in the Sustainability Story Evaluation Tool. This theme supports identification of the critical tasks – description, explanation and evaluation and so on – to be undertaken within a story.
- The Audience topic reflects the critical and dynamic relationship between the storyteller, the story itself and the audience that interacts with it. Although the theme does not address all aspects of audiences' activity, it offers a starting point for further discussion.
- The Storytelling Journey topic was developed to recognise the production process, and the journey storytellers go through to develop the final story within creative content.
- Next, the Context topic recognises that stories are most frequently situated and shaped by the specific places. Furthermore, sustainability and climate challenges inherently link diverse places in different ways and operate at different geographical scales.
- The Quality of information topic was incorporated in the CriSS Tool to prioritise storyteller identification of reliable and verifiable evidenced-based information within the stories developed.
- Lastly, the Justice topic was introduced in response to feedback from workshop delegates who highlighted the importance of considering social justice and the systems and groups responsible for sustainability and climate challenges.

Table 2. Question Rationale for Critical Sustainability Stories Tool Topics

Theme	Purpose of the questions for creative industry storytellers
Audience	Questions initiate reflection on the nature of, and focus for the audience, (e.g., behaviour change), and the role of language and script in shaping audience understanding of the issues the story explores.
Storytelling Journey	<p>The theme recognises story creation is not a linear process and instead involves multiple stages of development and (potentially) multiple contributors.</p> <p>Questions address practical aspects of the production process and role of stakeholders who can help develop critical, evidence-based creative content.</p>
Context	Questions prompt reflection on the role of geography and provide a route for considering how locations are connected through interactions between different places and at different scales, and how impacts of different processes may shape the narrative.
Quality of Information	Questions are intended to help users reflect on the nature of the data used, its type and source, and the role accurate data plays in generating trust and transparency for audiences.
Justice	<p>Questions provoke consideration of whose voices are represented in the story, who is responsible for climate and sustainability challenges, but also potential solutions.</p> <p>The questions seek to prompt deeper engagement with potential pathways towards adaptation and mitigation in response to the impacts of climate change and the unsustainable growth agenda.</p>

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Each topic includes five or six open-ended questions. The benefit of open-ended questions is to enable users to find answers that are most relevant to the stories they want to tell. Table 2 summarises the rationale for the questions within each CriSS Tool topics for users.

we are seeking to refine the skills and knowledge of creative industry storytellers by providing a route for translating evidence-based research into stories in a reflective, informed manner that extends the critical thinking within the stories told and the quality (defined as rigor and usefulness) of the information conveyed.

In sum, the CriSS Tool is a critical thinking activity for creative industry storytellers. The six topics and the questions within each provide an organising structure for reflecting on information relevant to their story and the way it can be communicated. The CriSS Tool can be used from the start of, and throughout, the storytelling production journey. It can be applied in the

development of almost any kind of creative content including, but not limited to, short films, advertisements, digital applications, immersive experiences, theatre, radio broadcast, internal and external organisational communications, or in the communication of heritage stories. By reflecting on how to answer the questions within each of the six themes, users will grow their global challenge literacy by iteratively and progressively building their knowledge and understanding of sustainability transformation and the climate emergency. It is important to note, we are not asserting a particular method of storytelling about climate change and sustainability. Instead, we are seeking to refine the skills and knowledge of creative industry storytellers by providing a route for translating evidence-based research into stories in a reflective, informed manner that extends the critical thinking within the stories told and the quality (defined as rigor and usefulness) of the information conveyed.



Photo of Gentoo penguins on a stony beach on Danco Island (Antarctic Peninsula). Quark Expeditions ship in the background. By Derek Oyen @ Unsplash (<https://unsplash.com/photos/-Eu3Iud63rA>)

4. CONCLUSION

By highlighting the value of narrative and storytelling, we intentionally point to the relevance and value of skilled communicators in society who can, and do, play a vital role in shaping public understanding of the current sustainability and climate context.

Through use of the Critical Sustainability Stories Tool communicators and storytellers can strengthen the position of research and experts by experience in the co-production of diverse evidence-based stories that explore sustainability issues and the climate emergency.

Through the Critical Sustainability Stories Tool, we introduced an organised route for critical evaluation of aspects of existing stories exploring global change challenges, be they ecological and environmental degradation and exhaustion, or associated with social, economic or political injustice. The Critical Sustainability Stories Tool provides for storytellers and professional communicators an organised approach to thinking about sustainability and climate change challenges and routes to incorporate relevant knowledge spheres. Our intention of these frameworks has been to enrich story content and public narratives by i) increasing storyteller engagement with academic research and knowledge from experts by experience (i.e., expert knowledge spheres), ii) encouraging critical discourse on sustainability and climate challenges when new stories are produced, and iii) improve the quality of information and informed content available to audiences and thereby increase the global challenge literacy of audiences.

The Critical Sustainability Stories Tool can benefit creative industry stakeholders and those involved in storytelling about sustainability and climate challenges. We identified specific success criteria that could be achieved storytellers through

use of the CriSS Tool. The success criteria include:

- Growing storyteller global challenge literacy
- Demonstrating of attitudinal change (individually and at an organizational level)
- Creating reputational opportunities and future work
- Grow professional and organisational networks
- Connecting with policy makers
- Connecting with researchers and receive expert advice
- Existing and new audience capture
- Generating behavioral change and activities that support sustainability transitions
- Have meaningful societal impact

The Critical Sustainability Stories Tool also supports researchers and those involved in producing information, commentary and potential solutions to the sustainability and climate crisis, by providing a route for their knowledge and expertise to be translated for and communicated to wider audiences. For more information on how to use the CriSS Tool, please review the accompanying project document; 'The Critical Sustainability Stories Tool – Guidance Notes for Use' available at <https://xrstories.co.uk/about/publications/>.

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The guide provides further details on how story developers can use the tool in the creation of new content.

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