

The Low Carbon Transition: Implications for the Creative and Interactive Industries

March 2011

Executive Summary

This report is intended to stimulate individual organisations and businesses from the Creative and Interactive industries in Scotland, together with their respective trade associations and industry bodies, to address the opportunities and challenges presented by the low carbon¹ transition.

Sponsored by Scotland's 2020 Climate Group and organised jointly by Scottish Enterprise and Envirodigital, two workshops took place in early 2011. They involved representatives from across the Creative and Interactive industries to investigate the initial steps the industry could take on the low carbon journey. Three objectives were identified for the process:

- I. Provide a deeper understanding of specific business implications and opportunities relating to the low carbon transition;
- II. Identify the strategic preparedness of the Creative & Interactive industries;
- III. Recommend further collaborative work needed to address the issues/opportunities and embed these within the industry-led strategies.

In summary:

- while there are some excellent examples of organisations and initiatives who are proactively addressing sustainability issues, these are largely fragmented at present. A critical mass does not yet exist, and awareness of low carbon issues – and the opportunities from innovating to develop low carbon solutions – is relatively low within both industries;
- the Creative and Interactive industries both currently lack strategic leadership and direction in responding to the low carbon agenda;
- there are clear business and organisational benefits from increasing resource efficiency, sharing infrastructural investment and developing new and innovative business models. The lack of activity to date partly reflects the absence of strong market and regulatory drivers within each industry – although this will change, as has been seen in other industries;
- this process has identified the priority 'solutions' that will both help stimulate greater organisational efficiency as well as open up new

¹ Carbon is used as shorthand to represent six types of emissions. The low carbon transition relates to the adaptation of our society and economy to a lower carbon world.

opportunities. While many view the low carbon agenda as an 'environmental' issue, its relevance is much broader. Indeed, many of the solutions identified are arguably as much to do with organisational growth and innovation as they are to do with emissions reduction;

- the Creative and Interactive industries are unique compared with other sectors in having trusted channels to directly help influence public engagement with the low carbon transition. Successful evolution is a collaborative venture, and this contribution should be acknowledged by the Scottish Government and others in helping to deliver the Public Engagement Strategy for climate change;
- the work of the Creative and Interactive industries is about increasing the wealth of human and social capital through its ability to nourish and inspire the human mind, soul and spirit. We can work to help the general public understand a much richer, rounder view of what it means to be a person and what makes us happy. This should mean that Creative and Interactive industries can influence the definition of the purpose of our economy and how we measure its success. Capital growth could take on a broader meaning: considering a real economy that includes the natural capital (and human and social capitals).
- the Creative and Interactive industries found it difficult to create a clear vision for the future in 2050. Not only is such long-term thinking so far outwith our bounds of imagination but the industries' future is directly affected by developments and choices made in other areas including electricity generation, petrochemicals, transport and the built environment. In planning for the low carbon transition, it is therefore important to explicitly acknowledge the linkages between all of these sectors.

The report sets out a number of recommendations for 'next steps'. An early, proactive and strategic response to this agenda is only possible if clear leadership is provided. It is likely that this will include both 'top down' direction from industry and trade associations as well as 'bottom up' action from leading industry players.

Summary recommendations

1. The Digital Media and ICT Industry Advisory Groups should discuss the implications of the low carbon transition for their industries, drawing on this report as well as other materials.
2. Envirodigital should help establish a new consortium of relevant trade associations (eg VAGA, Federation of Scottish Theatre, Craft Scotland, PAN, ERA21) to promote greater collaboration on this issue across the creative industries.

3. SE, Creative Scotland and the Scottish Government should meet to discuss the findings and implications of this report, including the possible implications for future funding decisions.
4. Envirodigital should map the key influencers in the Scottish Creative Industries and by sharing this via online networks, help facilitate access to wider resources and opportunities to promote greater collaboration and create stronger critical mass.
5. Interactive Scotland should be encouraged to share the work/activities to date and promote additional actions as a means of promoting the issues and implications of the low carbon transition among businesses within the creative and digital industries.
6. The 2020 Climate Group should continue to support this initiative and report to the Scottish Government on the barriers which are preventing more rapid progress in embedding low carbon throughout the Creative and Interactive Industries.

Background

Why is the low carbon agenda important ?

The Creative and Interactive industries should address low carbon issues since:

- it offers new market opportunities, helping to stimulate innovation and growth within both organisations and the industries more widely;
- increased resource efficiency saves costs as well as the planet;
- it enables the industry to be more resilient to increases in energy and transport costs;
- it helps prepare businesses for the potential extension of the CRC Energy Efficiency scheme to smaller organisations over the next few years.

'Low carbon' should not be viewed as a threat or additional business cost, but can be an *enabler* of further industry sustainable growth and development:

- transferring some appropriate 'live' performances to a digital format opens up new markets and opportunities, while reducing carbon emissions;
- reducing organisational costs such as energy and travel just makes good business sense – and smaller organisations will be better prepared when Government regulations do start to affect them;
- the Creative and Interactive industries can potentially play a vital role in demonstrating leadership in promoting low carbon behaviours, not just among their own organisations but also among the wider public that they engage.

The purpose of this process was to:

- I. Provide a deeper understanding of specific business implications and opportunities relating to the low carbon transition;
- II. Identify the strategic preparedness of the Creative & Interactive industries; and
- III. Recommend further collaborative work needed to address the issues/opportunities and embed these within the industry-led strategies.

It was sponsored by Scotland's 2020 Climate Group (<http://2020climategroup.org.uk/>) and organised jointly by Scottish Enterprise and Envirodigital. Two workshops in early 2011 were designed to involve representatives from the Creative and Interactive industries to investigate the initial steps they could take on the low carbon journey.

The Scottish Government is delivering a strong and ambitious policy agenda to help stimulate sustainable economic growth:

- the **Climate Change (Scotland) Act** 2009 provides a legislative basis for reducing carbon-equivalent emissions over the next four decades,

resulting in a transformation in the ways in which we live, travel, do business and prosper. The transformation has already begun - and will continue to evolve – for decades to come. The ‘interim’ 42% CO₂ reduction target (to be met by 2020) demands new solutions, new technologies and new behaviours, and the Scottish Government’s *Report on Policies and Programmes* sets out the policies that will help achieve this. This is ambitious by any standard – but needs to be achieved all over again in order to meet the eventual 80% CO₂ reduction target by 2050; and

- the Scottish Government published its **Low Carbon Economic Strategy** in November 2010, setting out a strategic framework for the low carbon economic transformation to take place over the next 10-20 years. It identifies a range of emerging ‘low carbon’ business opportunities, and the role of Government and the wider public sector in realising them.

Recognising the importance of business in contributing to the low carbon transition, the Scottish Government established the 2020 Climate Group to act as a ‘critical friend’ to help inform and scrutinise Scottish Government climate change policy. It involves senior leaders from business and the public sector to:

- provide strong, visible leadership to Scotland’s business and non-governmental communities to inspire them to do more to reduce carbon emissions;
- help drive innovation through partnerships and synergies between members;
- advise on, and aim to make early progress towards, achievement of the outcomes and targets of the Climate Change Delivery Plan; and
- identify relevant action and opportunities, and collaborate, to bring benefits to the Scottish economy.

Its ‘Opportunities and Challenges’ Sub-group is primarily taking a sector-based approach to its work, exploring the nature of low carbon issues and opportunities and identifying the steps that sectors could take to address these. This process built upon earlier work involving the Chemical Sciences industry, where the implications of the low carbon transition are now informing a refresh of the industry-led strategy.

“Low carbon is a way of thinking, behaving and operating that minimises carbon emissions while enabling sustainable use of resources, economic growth and quality of life improvements”

Ian Marchant (Scottish & Southern Energy / Chair, 2020 Climate Group)

Low carbon drivers impacting on the Creative and Interactive industries

The Creative and Interactive industries comprise 13 sub-sectors that together employ over 60,000 people in Scotland with a combined turnover of £5.2bn. They are clearly significant industries, creating wealth in Scotland within a global context.

Who are we? Creative/Digital Industries

- The Creative Industries are made up of the following sectors:

<ul style="list-style-type: none"> advertising architecture arts and antiques crafts design designer fashion film 	<ul style="list-style-type: none"> interactive leisure software music performing arts publishing software and computer services TV and radio
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	Employment (2007)	GVA (2007)	GVA per employee (2007)	Turnover (2007)
Creative Industries	60,700	£2.4b	£41,600	£5.2b

- of which 3 sub-sectors account for 75% of the sector's value ie Games/software £1.7bn, Architecture £1.5bn, Publishing £0.8bn)
- GVA per employee: highest in games/software, (£72,000); architecture (£60,000), advertising (£47,000), designer fashion (£45,000) and publishing (£41,000).
- Creative industry exports represent around 5% of Scotland's total international exports.



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This process was specifically designed to include both the Creative and Interactive industries since there are important linkages between them. ICT and digital media provide underpinning platforms that, in part, enable the development of the Creative Industries. As such, they are part of the same supply chain – and the experience of other

industries (such as Food and Drink or Chemicals) suggests that supply chain thinking is an important means of driving systemic change in terms of emissions reduction as well as identifying potential new market opportunities.

There are a range of excellent examples of current industry responses to the low carbon agenda across Scotland and the UK. While market and regulatory drivers have so far had limited impact (only large energy users are currently required to comply with the CRC Energy Efficiency Scheme, for example), 'low carbon' issues will increasingly become more visible.

One such example of their greater visibility might well be the implications of the Climate Change Act (Scotland) Act. A new Public Duty for all public sector organisations came into force on 1 January 2011 that requires all public bodies, in exercising their functions, to act:

- in the way best calculated to contribute to delivery of the Act's emissions reduction targets;
- in the way best calculated to deliver any statutory adaptation programme;
- in a way that it considers most sustainable.

Organisations such as the Enterprise Agencies and Creative Scotland are being encouraged to integrate climate change considerations broadly in the way they deliver their services directly and through others. It is therefore likely that future public funding to businesses/organisations in the Creative and Interactive

Climate Change (Scotland) Act 2009

"Public bodies are encouraged to take a broad approach when complying with the duties and include all direct, indirect and influenced emissions".

"Many public bodies also deliver services through contractors and/or various other arrangements such as arms length companies. Through the duties, there is an expectation that where public bodies procure or deliver services through others, these incorporate climate change expectations".

industries will be specifically linked to 'climate change' outcomes such as reducing carbon emissions or contributing to wider sustainable development.

What are the Creative and Interactive industries already doing in this agenda ?

The [Forum for the Future](#) review has provided a good summary of the current state of preparedness for the low carbon transition among the Creative and Interactive industries, summarised below. This is characterised by fragmentation of positive initiatives and lack of overall coherence and as a result, there is a sense that the UK is missing out on the opportunities from the convergence of digital technologies and sustainability.



1. Reducing carbon emissions

Where are we at?

Working to measure our direct footprint



Some organisations are actively developing ways to identify and reduce their carbon footprints. The **BBC**, for example, launched a carbon calculator for television production in November 2010 as part of efforts to improve its environmental sustainability and cut carbon emissions.

Use of the calculator is mandatory for all teams at

BBC Vision Productions. The BBC has set itself the target of a 20% reduction in energy consumption by 2012, along with a 20% cut in CO₂ emissions from transport, a 25% reduction in water usage and a 25% cut in waste to landfill (with 75% of waste to be recycled). The carbon calculator will be offered to other broadcasters and independent production firms to promote sustainable

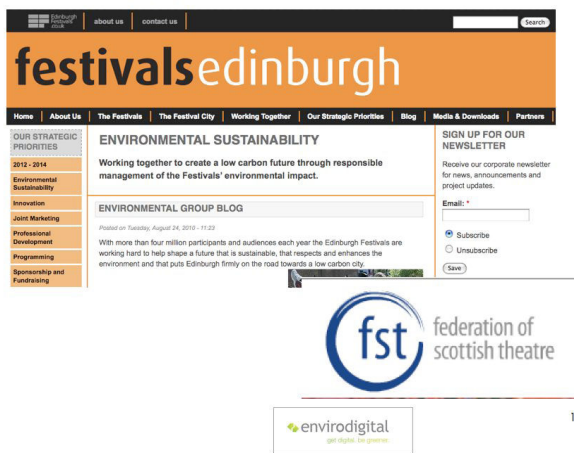


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across the industry. Other measures include the rollout of low-energy studio lighting and 24-hour zones for working outside of office hours to reduce energy consumption in BBC buildings, along with the installation of water-saving devices and video conferencing to reduce the need for travel. From full scale carbon footprinting and campaigns in some industries (music, film and architecture) to ad-hoc communications that advise creative businesses on how to reduce their environmental impacts (design) – there are transferable formats, learning and a raft of tips and guidelines for how to run a successful, sustainable, creative business.

Where are we at?

Leveraging our art of persuasion - for better



In Scotland, work is underway on **Festivals Edinburgh's Green Venue Initiative** which is being extended to another 12 venues this year, together with further developing the carbon footprinting methodology. Those involved include the Filmhouse/Film Festival, Imagine and the Children's Festival,

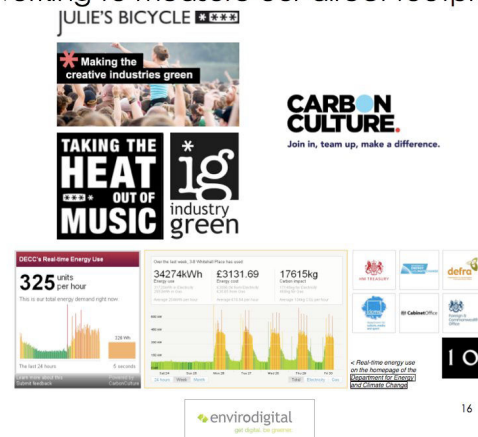
Edinburgh's Hogmanay and various venues covering the summer festivals including the Traverse, the Lyceum and the Hub. In addition, Festivals Edinburgh are working on a study of the carbon impacts of cultural tourists in Edinburgh.

The **Federation of Scottish Theatre** are developing a climate strategy for the theatre sector, part of which will be gathering data on the carbon profile of the sector: measuring energy use, water use, waste and audience travel.

Established in 2007 by the UK music industry, **Julie's Bicycle** has been baselining the carbon emissions of the UK music industry, including international touring of theatres, bands and orchestras. This research has informed the development of their not-for-profit certification programme, **Industry Green**, a simple framework supporting improvement in environmental sustainability for creative companies.

Where are we at?

Working to measure our direct footprint



Industry Green is supported by a series of industry campaigns, project partnerships and practical resources including case studies and the free online carbon calculators. Since 2010 they have expanded their remit to

include theatre, embarking on a UK-wide programme which will bring together the UK commercial and subsidised theatre industry in a collective effort to improve the environmental sustainability of their work and help it to flourish in a low carbon economy.

CarbonCulture is a user-centred, design-led initiative aiming to create substantial energy savings in workplaces by transforming behaviour of building managers and building users with a novel evidence-based change programme. Designed and developed by design consultancy, More Associates, it is currently being piloted by DECC and DEFRA, and real-time energy reporting has been deployed at six other Whitehall Departments.

At the core of the project is a design process that will develop best practice behaviour change techniques. The approach will generate valuable energy performance data for staff and management, enabling high performance improvements to be implemented at low cost across large and complex estates. Once the first projects are complete later this year it will have developed an evidence base on what works and what does not, how much control and influence building users have over energy demand and a sense of the scalability of the solution.

2. Influencing wider behaviour change among the public

Beyond developing tools and initiatives to help reduce the industries' carbon footprint, businesses and cultural organisations also have the ability to influence people's values, emotions and beliefs in a way that is very powerful in affecting behavioural change. Indeed, research demonstrates that without those emotional triggers, change doesn't happen.

We are inspired and influenced everyday by what the Creative Industries do: the adverts, magazines and books we read; the films and plays into which we escape; the TV and radio shows that entertain and educate us; the digital games that challenge us; the buildings we live and work in; the exhibitions we flock to; the clothes we choose to express who we are; the artefacts that fill our homes. These are just a handful of ways the industries reach us on a daily basis. It's big business too, and the influence creative innovations have on people, society and culture result in changes of mindset, habits, behaviour and consumption patterns.

- In 2009, the world's biggest advertising agencies announced in the FT that their biggest growth area was from **green advertising** and that most of the worlds biggest 10 PR agencies had already set up in-house green communication teams;
- In fashion we're seeing campaigns like **estethica** and movements like **worn again**, where leading product designers transform discarded fabrics such as decommissioned Eurostar uniforms into fashionable laptop bags and Oystercard holders;
- In architecture, **RIBA** have toolkits for architects to use as well as their Sustainability Award for energy efficient and beautiful buildings.
- **Do the Green Thing** is a not-for-profit communications organisation that inspires people to lead a greener life. With the help of brilliant videos

and inspiring stories from creative people and community members around the world, Green Thing focuses on seven things you can do (and enjoy) to be greener

- **Sustainableability.com** provides an important resource for the cultural sector that helps us understand the mindset and organisational barriers that must be overcome. Supported by Missions Models Money, it maps organisations who are reducing their carbon impact and strengthening their resilience;
- **Apps for Good** is a leading-edge technology programme where young people learn to create mobile and web apps that help change the world, with a particular focus around solving real-life issues. The courses are sponsored by Dell YouthConnect;
- BASDA, the Business Application Software Developers' Association launched **Green-XML** in July 2010. Green XML makes it easier for software developers around the world to produce integrated environmental management systems that are capable of sharing green data with software applications operated by partners. The software extension has been designed with the developers of other standards to make it easy for them to incorporate BASDA Green XML;
- **Serious Games** enables the growth of games, virtual worlds and connected industry specialists by supporting R&D into the use and effects of these products, platforms and technologies. One such game, the **LivingStories project** is the first alternative reality game in the UK addressing environmental issues. LivingStories combines social networking sites such as Facebook and Twitter with SecondLife.

What opportunities are there for reducing the industries' carbon footprint and addressing new, low carbon opportunities?

The first workshop was designed to highlight the most important carbon impacts of the Creative and Interactive industries, identify potential 'solutions' to addressing (reducing) these and prioritise the key solutions to be addressed in the second workshop.

The various ways in which the industries currently generate carbon, both directly as well as indirectly via their customers/audiences and supply chains, are categorised in Appendix B.

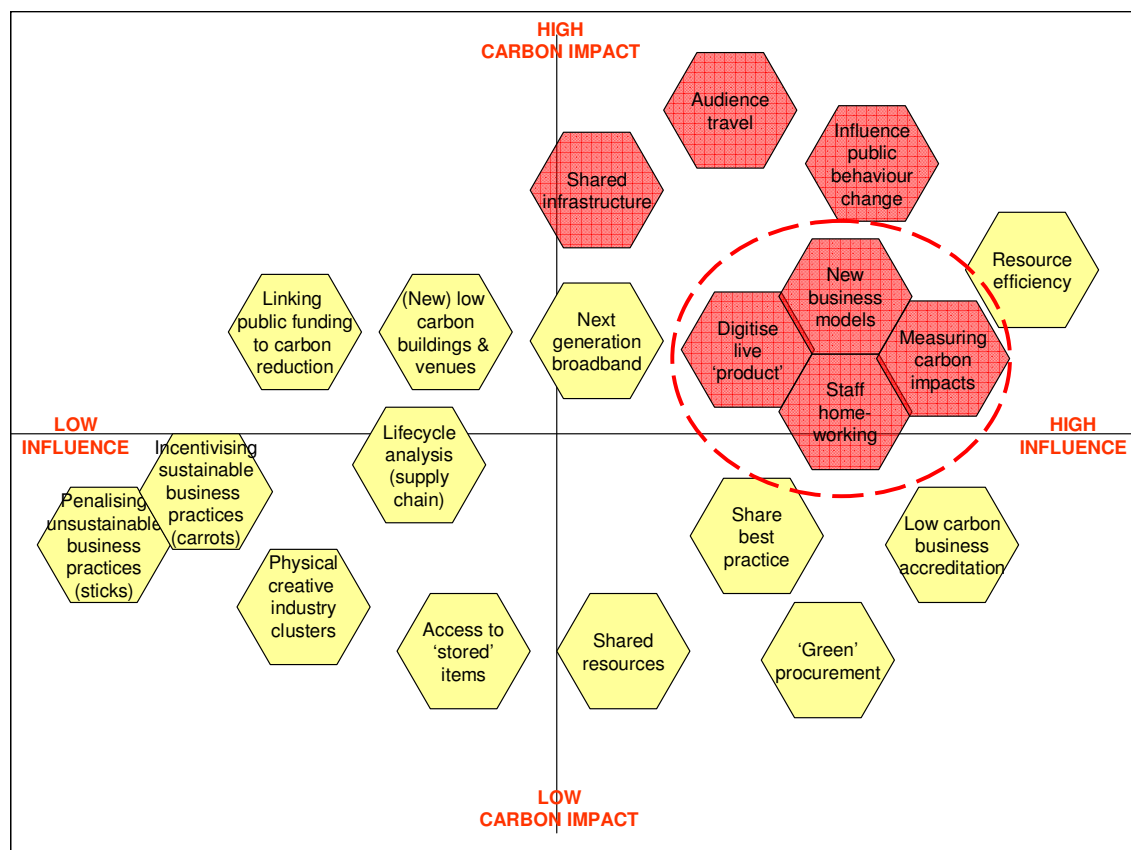
For each of these broad categories, participants then discussed the potential 'solutions' – or ways in which the carbon impacts could be avoided or reduced – together with the emerging 'low carbon' opportunities for the industry.

Having identified a number of solutions and opportunities, these were then prioritised according to:

Carbon impact *the relative carbon intensity of the activity/issue the solution is intended to address*

Influence *the degree to which the Creative and Interactive Industries have some influence over the design/delivery of the solutions*

The outputs are illustrated on the following page. The solutions and opportunities have been grouped in the matrix and a title attached to each. The full list of solutions/opportunities is provided in Annex C and they are summarised in the diagram below.



Four priority solutions were selected with a high carbon impact, where Creative and Interactive industries can take a lead, and where the industry has a high influence.

Priority 'solutions'

New business models

- More virtual content - universal digital access
- Digitised live performances, auditions etc
- More grouped events & festivals, less touring
- Focus on carbon efficiency of events/products
- Staff travel reduced via technology & home working
- Quantify carbon impacts & include 'lifecycle' thinking in industry products/solutions

Shared infrastructure

- Cloud, not individual servers
- Shared, green data centres
- Joint procurement of shared services
- Supply chain 'communities'
- Shared computer processing applications

Audience travel

- Influence audience travel behaviours
- Include public transport with tickets – make it an easy option
- Car sharing/pools
- Use your bike !
- Charge lower admission prices for using sustainable transport

Influence public behaviour change

- Use industry channels, ideas & reputation to exert wider influence among wider public
- Actively promote sustainable lifestyles eg via advertising, architecture, games
- Make good educational content available to schools eg Glow

Exploring the priority solutions

In the second workshop, participants imagined how organisations in the Creative and Interactive industries might operate in the future. In this future, the world is not only rapidly becoming decarbonised but is also strongly influenced by ubiquitous technologies, a changed climate and a different set of behaviours.

Scotland in 2050 ?

Just suspend current reality for a while and assume that:

- The price of oil has reached \$250/barrel
- Wind, wave, solar, biomass and ground heatpumps provide a myriad of cheap, renewable energy options
- Scotland's transport system and most of its heating systems are decarbonised
- Behaviours that waste carbon are not only very expensive but socially unacceptable
- 'Virtual' seamlessly interacts with 'real' – the boundaries are constantly blurred
- Cheap, communications and sensor technologies are embedded everywhere
- Computing power vastly exceeds the leading edge in 2010
- High speed rail connects Scotland to London and European cities in just a few hours
- Scotland's climate is on average 2-3 degrees warmer. Summers are normally warmer and drier, and winters milder and wetter. But intense weather events happen frequently.

This visioning technique was designed to stimulate radical thinking about potential responses, forcing participants to think very differently. It was difficult. They discovered that we struggle to think much beyond the next decade or two, and 2050 literally seems unimaginable.

But the purpose was *not* to try to predict the future but to stretch our thinking about possibilities. Extending understanding of current trends into the future is one way to do this; identifying new entirely possibilities is another (but much harder). Annex D summarises some of the milestones participants identified in relation to the two industries and the wider business environment in Scotland.

What we gained from this exercise, summarised in the following two fictitious organisations, were a number of insights into the ways in which low carbon opportunities and thinking can shape and renew our organisations today.

A vision for 2025

Consider two organisations operating within Scotland's Creative and Interactive industries in 2025 ...

i-Snap has become the new 'Flickr' of the 2020s: an online, interactive media photo sharing community, based in Edinburgh. Originally setting out to specialise in aggregating stock digital images of Scotland, it has now developed into a user-led media image community. Across the world, its members provide images that reflect – and create – up-to-the-minute news. It provides a platform for launching and sharing images relating to the global events and can be relied upon to be the first photo community to 'crowd-source' the images that will make the world's news.

The founders of *i-Snap* see no need to relocate from Edinburgh: ultra-fast broadband allows them to connect to their community of users and staff around the world. They base themselves in work hubs – flexible, neighbourhood offices that are geared to IT businesses such as theirs. Such shared infrastructure keeps the costs down, powered by micro-renewables in lower-rent locations and supported through joint purchasing power. It also brings them into contact with like-minded creative professionals to help spark new ideas.

It wasn't always like this, of course. Back in 2011 when the business started, electricity and heating costs soon started going through the roof (literally). The dilapidated warehouse they occupied in Leith was costing the earth, commuting across the city was a drag and the business struggled to find its 'niche' within a highly competitive global market. The founders knew they had to do something different – so what did they do ?

First, they re-examined their business model. There was nothing new in being an aggregator of digital content: everyone was competing for the same business. But combining digital images of the latest global events with user-led interaction gave them an 'edge'. They were astonished at how quickly the re-vamped business took off, and they soon became the "go to" site for media companies.

Second, they found a way to make it pay. Micro-payments provided new revenue to individual photographers where the higher the online 'hits' the more they got paid. In turn, *i-Snap* got paid from the online news channels.

Third, they kept investing and innovating ahead of their competitors – mainly in cutting-edge web design and technologies that provided the platforms for user-generated interaction and participation.

Finally, they took a rigorous approach to driving down their business costs through resource efficiency. They weren't particularly motivated to "save the planet" but seeing the upward trajectory of energy prices and energy efficiency regulation, they just saw it as a logical and smart move to scrutinise every aspect of their carbon footprint to drive out waste and inefficiency.

The **Glasburgh Theatre Company** is seen across the creative industries as the model to emulate. It is exciting and inspiring in equal measure, stretching perceptions of what it means to be a 21st century arts organisation. For the last 70 years it followed the conventional model. It owned an old stone building, invited audiences to view its performances and struggled to make ends meet given rising costs and dwindling income. It took a crisis – imminent closure – to force a radical re-think.

Yet rather than call in “the professionals” the Theatre Company took a distinctly unconventional route and turned to the young people in the community. Unshackled by ‘old thinking’ (such as obsession with bricks and mortar) and excited by the possibilities of emerging technologies, a new business model emerged that helped solve existing problems and create new opportunities in one fell swoop.

They began to realise that their ‘market’ wasn’t just the community of Greater Glasburgh but through digital platforms, could potentially be anyone across the planet. They sold their old listed building, leased premises when required and invested in technology instead. They first innovated to create webcasts of performances, of varying formats and styles. These were relatively inexpensive to produce but proved a real training ground for up-and-coming performers. Over time Glasburgh developed a virtual platform for innovative performances and soon, its brand and reputation was able to attract well-known performers from further afield.

The second innovation was the realisation that with the increasing blurring of the ‘virtual’ and the ‘real’, charging structures needed to change. Why should audiences always travel to a centrally-based arts venue to view ‘live’ performances? In the virtual world, consumption of the arts is a 24/7 business – and increasingly commoditised. Audiences can select the world’s best-known theatre companies (... or orchestras, dance companies, galleries or museums) and view these online.

However, Glasburgh quickly realised that while technology can enable experiences, it doesn’t necessarily replace them. People will still be willing to pay for authentic experiences – eg being part of a larger theatre audience, or viewing the Mona Lisa in context in the Louvre. In fact, authentic and ‘live’ experiences command a premium: those lucky enough to be able to experience the ‘live’ performance not only pay more than those simply viewing the ‘recorded’ performance but are able to comment (‘tweet’) on their experience as part of the real-time community of interest. In this way, arts organisations can maximise their ‘return on investment’.

By turning the conventional model of a theatre company on its head, Glasburgh became a leading model of low carbon innovation. Its online audience grew exponentially – with an almost zero carbon footprint – while the carbon associated with audience travel and the theatre company’s own touring reduced significantly. This wasn’t to say that it had become zero carbon, but through forging innovative partnerships with travel and transport operators they were able to incentivise the use of public transport by their travelling audiences.

Glasburgh has also made a name for itself in actively promoting low carbon messages amongst the wider public. While this has sometimes been overt it has mostly related to the more subtle adoption of sustainable practices throughout the organisation. For example, software is used to plan touring schedules and book venues to minimise costs and carbon emissions, its performances (and those of others) are catalogued in a digital repository, and the theatre company uses its low carbon credentials as an asset in its branding and promotion. All in all, the turnaround in Glasburgh’s fortunes has been pretty impressive.

What insights have we gained from this process?

This is a very broad topic and in just two workshops, participants felt they had only begun to scratch the surface of its issues and opportunities. Nevertheless, they generated a number of insights that can help improve understanding and design appropriate organisational and industry responses:

- ICT and digital media provide underpinning technologies that will play a vital role in enabling other business sectors, individuals and communities to adapt to a low carbon society and economy;
- resource efficiency is an essential route to reducing emissions and waste. But it is important that we also consider emerging low carbon opportunities as well as our adaptation to climate change;
- the drivers of the low carbon transition – markets, policy and regulation, supply chains and individual business strategies – are currently relatively weak and less visible than in many other sectors of the economy. However, there is genuine potential to reduce organisational costs and embrace new opportunities by responding proactively to shape these drivers of change;
- technology is the enabler of experiences but doesn't necessarily replace them – the technology must add something good to the experience, not take anything away (see below);
- increasingly, value will lie in 'authenticity'. There is a tendency for many arts and cultural 'products' to become commoditised but people will always be willing to pay a premium to experience culture in context and for 'live' performances;
- the democratisation of ideas through digital tools and platforms enables individuals to become the creators as well as the consumers of culture and digital content. This offers opportunities to evolve new business models that harness the ideas of these "gifted amateurs" – the wealth of human capital increases;
- while the focus of this process was on low carbon issues, many of the solutions identified have much broader relevance as sources of innovation, new economic value and increased organisational resilience. 'Low carbon' could therefore be viewed within a wider context as an important *enabler* of future innovation and sustainable growth;
- the Creative and Interactive industries have an important role to play in influencing wider public behavioural change through their content – artistic product (performing, literary and visual arts), interpretational curation at museums, the behaviours rewarded in games and so on – via the leverage of their communication channels and their communities. The sectors uniquely have communities of interest and

support, together with direct communication channels to those communities;

- the work of the Creative and Interactive industries is about increasing the wealth of human and social capital through its ability to nourish and inspire the human mind, soul and spirit. We can work to help the general public understand a much richer, rounder view of what it means to be a person and what makes us happy. This should mean that Creative and Interactive industries can influence the definition of the purpose of our economy and how we measure its success. Capital growth could take on a broader meaning: considering a real economy that includes the natural capital (and human and social capitals).
- language can sometimes be a barrier to progress given differing perceptions and levels of understanding. 'Low carbon', 'resource efficiency', 'sustainability' and 'climate change' all mean different things but are inextricably linked. We need to clearly explain the terminology used so its relevance is readily understood;
- the low carbon transition will be quicker and made easier if it becomes self-reinforcing. In other words, where incentives are aligned to help promote the 'right behaviours', people and organisations will find it easier to adopt these behaviours. 'Visible feedback loops' can greatly help this process. (A good example is in Sweden where the public are encouraged to recycle plastic bottles in colour-coded bins, which are then re-used and sold as cool t-shirts).

Recommendations and Next Steps

1. There is currently little (explicit) strategic direction in this agenda provided by the **Digital Media and ICT Industry Advisory Groups** through their respective industry strategies. Each IAG should therefore be asked to discuss the implications of the low carbon transition for their industries, drawing on this report as well as other materials.
Action: *Scottish Enterprise (providing the Secretariat function for both IAGs)*
2. To help overcome fragmentation and promote greater coherence and sharing of learning, there should be greater collaboration between the **Scottish creative sector's trade associations** (ie VAGA, Federation of Scottish Theatre, Craft Scotland, PAN, ERA21, etc).
Action: *Envirodigital to convene a meeting to establish a new consortium comprising the relevant trade associations.*
3. **Funding bodies** will be influential in shaping change within the industries. In the future, for example, this may mean that future funding is explicitly linked to climate change objectives.

Action: Scottish Enterprise to organise a meeting with Creative Scotland and the Scottish Government to discuss the findings of this report and identify implications and appropriate next steps.

4. Sustained change within the Creative Industries will be most effective if it is orchestrated not only in 'top-down' ways but also 'bottom-up'. **Existing industry 'champions'** (both individuals as well as organisations/businesses) should be identified and supported.

Action: Envirodigital to map the other key influencers (eg trade bodies, active networks) in the Creative Industries in Scotland as a means of identifying where the 'hot spots' of activity and champions are, and supporting them to connect and scale up their activities. The development of an online network could facilitate this and help promote resources, events and opportunities, but financial support would be needed to undertake both the mapping and development work.

5. More needs to be done to **promote the issues and implications of the low carbon** transition among businesses within the creative and digital industries.

Action: Interactive Scotland should be encouraged to share the work to date, promote the new consortium and online network, and invite discussion on additional actions. This might include events and/or web-based media.

6. More **explicit support provided by the Scottish Government and the 2020 Climate Group** would help the Creative and Interactive industries address the opportunities and challenges identified in this report

Action: The 2020 Climate Group should consider, and report to the Scottish Government, on the barriers which are preventing more rapid progress in embedding low carbon throughout the Creative and Interactive Industries.

Annex A Attendees

Workshop 1 (January 2011)

Alan Blunt	Envirodigital
Calum Davidson	Highlands and Islands Enterprise
Catherine Docherty	Glasgow School of Art & Journey Associates
Roanne Dods	Mission Models Money, Dovecot & Crafts
Council	
Euan Gray	Citizens Theatre
Gordon Grant	Ineos
Steve Green	Scottish Opera
Clare Hollowell	Scottish Government
David Hunter	National Library of Scotland
Neil Kitching	Scottish Enterprise
Colin Macdonald	eeGeo
Andy McLaughlin	Scottish Enterprise
Ewan Mearns	Scottish Enterprise
Mairi Robertson	Interactive Scotland
Hannah Rudman	Envirodigital
Ben Spencer	VAGA Scotland
Ben Twist	Creative Carbon Scotland
Mark Western	Scottish Enterprise

Workshop 2 (February 2011)

Alan Blunt	Envirodigital
Paul Copland	Scottish Enterprise
Roanne Dods	Mission Models Money, Dovecot & Crafts
Council	
Neil Kitching	Scottish Enterprise
Osbert Lancaster	Footprint Consulting
Andy McLaughlin	Scottish Enterprise
Jenny Macfie	Promoters Art Network & NEAT
Ewan Mearns	Scottish Enterprise
Hannah Rudman	Envirodigital
Ben Spencer	VAGA Scotland
Ben Twist	Creative Carbon Scotland
Euan Turner	Federation of Scottish Theatre
Graham Weir	Edinburgh Napier University
Mark Western	Scottish Enterprise

Annex B Key sources of carbon emissions within the Creative and Interactive industries

Buildings (energy from heating, electricity, IT)

- lighting theatres/ stage (major issue)
- heating rehearsal facilities/artists rooms and heating large galleries (some old listed buildings)
- IT use in production and operations - servers, computers and office equipment (including under-utilised PC processing & overnight/standby equipment power)
- Data centres
- Storage requirements (museums, galleries)
- Office air conditioning
- Catering outlets/coffee shops in venues
- Poor insulation and heat loss through entrances
- Waste (eg food, paper) and water use

Materials

- marketing materials – raw materials – paper, ink, toner, batteries
- materials to make art works/ stages/ costumes/ sets/ exhibitions (supply chain)
- product manufacture (resources, energy, transport)
- materials for packaging (DVD's, CD's, games)
- outsourced manufacture and shipping of fashion design
- e-tickets (less paper) – mobiles and barcodes
- loss of trees to produce paper – books, newspapers etc

Travel – staff, goods/materials, artists

- artist travel (local and international) and travel for auditions
- travel for location-based filming
- staff travel to work/ commuting/ meetings
- staff travel to see UK/international fairs/ events/ exhibitions/ potential artists
- key decision makers often based outwith Scotland – business travel
- travel of product/ cast/ material to events (touring exhibitions) and shipping internationally
- travel by suppliers

Travel - Visitors

- transport to remote events
- audience travel
- digital distribution, and consumption by audience (less travel)

Wider impacts

- digital exhibitions (tasters)
- inefficient events eg empty venues, low audiences, 'one off' events
- communication networks
- brand identification with our organisations – and the communities that support us
- positive ability to influence through education and the 'art of persuasion'
- production of new equipment, and waste of old equipment
- manufacture of digital devices and battery chargers
- increased computer usage by the public (video games, Facebook, TV on demand)
- direct channels to public (digital)
- traditional business models
- economic growth leads to higher consumption (unless it reduces carbon intensity)

Miscellaneous

- fashion – must have new technology, even if existing is not obsolete
- inefficient streaming of video

- lack of regulation
- lack of experience / track record in sustainability – and lack of industry leadership in this area
- relatively weak strategic thinking across industry

Annex C Grouped 'solutions' – Detailed descriptions

Audience travel

- Influence travel behaviours of audiences
- Encourage public transport use via partnerships with transport providers
- Car sharing/pools
- Use your bike !
- Include transport with tickets – make it an easy option
- Charge lower admission prices for using public/sustainable transport

Influence public behaviour change

- Use the ideas and reputation of the creative industries to exert wider influence
- Actively promote sustainable lifestyles eg via advertising, architecture, games
- Make good educational content available to schools eg Glow

Resource efficiency

- Promote 'the basics' within organisations – reduce, reuse, recycle
- Retrofitting buildings & venues
- Find ways to fund improvements to building stock
- Use energy-efficiency equipment/appliances
- Reuse heat from equipment and air conditioning
- Reduce heating requirements – set temperatures and hours of operation
- Compulsory smart metering (ie transparency of information/costs)
- 'Green' energy procurement

New business models

- More virtual content (eg museums, music performances etc)
- Universal digital access
- Webcasts/digital distribution of conferences
- Grouped events & festivals rather than standalone
- Select event location on basis of clustering of actual demand
- Focus on *carbon efficiency* of events/products
- Know the 'real' cost of virtual vs. actual/live performances

Digitise 'live' product

- Digitise live performances, auditions and press nights
- Travel of product – digital relays rather than touring ?
- Develop new business models for publishing that are sustainable in both environmental and economic terms

Staff homeworking

- Reduce need to travel through technology
- Use Skype/video calls for staff meetings
- More homeworking

Measuring carbon impacts

- Quantify carbon impacts of sub-sectors and activities – and share this widely
- Include lifecycle as part of creative industry products/solutions

Shared infrastructure

- Cloud, not individual servers
- Shared, green data centres
- Joint procurement of low carbon shared services
- Local, community-led server farms
- Supply chain 'communities'

- Shared computer processing applications

Next generation broadband

- Universal access to faster broadband
- Enabling wider benefits eg telehealth, productivity, videoconferencing etc
- Less download time = less energy or rebound effects ?

Low carbon business accreditation

- Low carbon business accreditation

Share best practice

- Identify best practice from elsewhere in the world
- Case studies on how others are making the low carbon transition
- 'How to' guides for low carbon packaging etc
- Education for the sector

Green procurement

- Energy, paper etc for production and distribution
- Switch suppliers to those who deliver/promote 'green' products

Shared resources

- Share scenery / waste / exhibition materials etc
- Efficient resource use eg double-sided printing, print to PDF, track usage
- Promote shared recycling / recycling infrastructure

Low carbon buildings & venues (new build)

- 'Green' new build – production and insulation
- Venues constructed to highest low-carbon standards, including local (distributed) renewable energy generation
- District heating

Linking public funding to carbon reduction

- Public funders link funding to carbon reduction
- IT systems (box office) funding links

Lifecycle analysis (supply chain)

- Identify the 'responsibility chain' for a product/service
- Manufacturers responsible for end-of-life of product

Access to 'stored' items

- Reduce need for storage of items not on public display (museums)
- Digitise stored items to provide universal access
- Standard methodologies for management

Physical creative industry clusters

- Investigate whether physical clusters (eg Pacific Quay) increase/decrease overall carbon emissions

Incentivising sustainable business practices ('carrots')

- Carbon credits (tax)
- Regulation
- Toner tax used to subsidise e-readers

Penalising unsustainable business practices ('sticks')

- Punishable green offences
- 'Waste taxes' have commercial value
- Border 'offset' tax

Annex D Indicative timeline, 2010 - 2030

