Green Shoots:

The Role of the Eco-Manager in

Sustainable Film Production

Jonathan Victory

STAFFORDSHIRE UNIVERSITY

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Supervisor: Dr Barnaby Taylor

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ABSTRACT

This dissertation will explore the emergent phenomenon of green filmmaking whereby the production of films is conducted with a view to minimising environmental impact. Establishing the motivations behind green filmmaking and surveying a range of sustainability initiatives from throughout the global film industry, a new crew role is identified which involves overseeing environmentally-friendly policies during film productions. Known by 'eco-manager' and other titles, this relatively new role is studied for the impact its introduction could have on film productions, based on the experience of those who have already performed this role. Chapter 1 provides an international overview of available information on green filmmaking before Chapter 2 outlines the potential of the eco-manager role. Chapters 3 and 4 analyse interviews conducted by e-mail correspondence with two eco-managers; Emellie O'Brien, who has worked on big-budget American productions and John Gormley, who worked on the two micro-budget features produced as part of this year's MSc in Digital Feature Film Production. Chapter 5 explores crew attitudes towards the role of eco-manager on those two features by analysing responses given to an e-mailed survey. The quantitative and qualitative analysis of these correspondences should highlight challenges faced by eco-managers but also measures that would improve the effectiveness of their jobs and their potential to have a positive impact on the film industry. It is recommended that the Irish film industry explore ways to facilitate the introduction of this role throughout the Irish film industry.

INTRODUCTION

I.1. Important Definitions

This dissertation will explore the role of environmental sustainability in the context of feature film production. To articulate the concept of sustainability, the British Standards Institute use "the most widely adopted definition of sustainability, that of the World Commission on Environment and Development. It says that 'sustainable development is meeting the needs of the present without compromising the ability of future generations to meet their own needs'." (BSI Case Study Ealing Studios Enterprises, 2014) (United Nations, 1987)

Applying principles of sustainability to industrial activity entails analysis of how a particular industry consumes the Earth's resources and pollutes the environment. If these impacts of consumption and waste are so large that it jeopardises the well-being of the environment then future resources cannot be consumed at a sustainable rate. This poses a grave threat to economic development, if not human well-being in general. The pursuit of sustainability in business practices, or being considered 'green', would therefore involve the efficient use of resources and the adoption of new technologies and policies that value the health of the environment.

A recent development in the film industry sees practitioners throughout the world attempt to practice 'Green Filmmaking' whereby measures are taken to minimise a film production's impact on the environment. Chapter 1 of this dissertation is going to provide an overview of international developments in this area while the remainder of this dissertation will examine the possibility of having a crew member devoted to managing measures to attain sustainability on film productions.

This role is in the early stages of development and as such it has been referred to by different names including ‘eco-manager’ (or ‘Eco Manager’), ‘eco-supervisor’ (or ‘Eco Supervisor’), ‘green production manager’, and so forth. These names will be used interchangeably depending on context throughout the dissertation as we explore the most recent developments around the introduction of this role not just to Hollywood productions but also to productions in the Irish film industry.

I.2. Design and Methodology

Chapter 1 provides a discussion of the context behind green filmmaking, an establishment of parameters for the analysis of film productions’ environmental impact and a survey of available information on different green filmmaking initiatives throughout the film industries of the Western world. Chapter 2 narrows the focus of this dissertation on the specific role of the eco-manager and elucidates the concept behind it and the potential for its integration into film productions. Two practitioners of this role have been interviewed via e-mail to give their insight on what the role involves and how best it could be facilitated by the film industry.

Chapter 3 focuses on the case study of Emellie O’Brien, a US-based eco-manager who has worked on major Hollywood productions. Chapter 4 focuses on the case study of John Gormley, a student on this MSc in Digital Feature Film Production and who performed the ‘green production manager’ role on this year’s film projects.

Chapter 5 is a survey of crew attitudes towards the role of a green production manager, conducted via e-mail with a sample of 30 people who worked on the film projects made as part of this year’s MSc in Digital Feature Film Production. Insightful qualitative and quantitative analysis should emerge from the responses given by film industry practitioners

who have direct experience of either performing or accommodating this relatively new role.

I.3. Aims and Objectives

This dissertation will recommend further research on this topic but should reveal important insights on how the role of eco-manager could function effectively and potentially benefit the film industry. The following should be demonstrated:

-the environmental impact of film production and which aspects are most impactful

-the economic case for green innovations

-what effectively motivates people to pursue green filmmaking

-current international practice in State funding policies towards green filmmaking

-current available technological solutions to challenges in green filmmaking

-what the role of eco-manager involves and how it is currently understood by the film industry

-what challenges are faced by eco-managers and what would help them achieve their objectives

-how their role impacts the dynamic, organisation and environmental footprint of feature film productions

-how this role could develop in the Irish film industry and for what purpose

CHAPTER 1: INTERNATIONAL DEVELOPMENTS IN GREEN FILMMAKING

1.1. The Challenge of Sustainability

Climate change presents a monumental challenge to industries throughout the world. Industrial activities which require fossil fuel energy generate greenhouse gases which accelerate anthropogenic global warming (Intergovernmental Panel on Climate Change, 2013). The potential disruption to weather patterns and ecological integrity stemming from a destabilised climate carries a cost that would devastate the global economy, if not human development itself. Alongside climate change are a range of less publicised but equally looming threats to the environment and human health, arising from how industries approach the management of waste, pollution, forestry, water resources and so forth.

With more and more scientific research affirming the imperative to cut down (and ideally eliminate) the use of fossil fuels (Intergovernmental Panel on Climate Change, 2014), there is a growing field of analysis, even from analysts of the business world such as John Travers, urging industries to adopt more energy-efficient business practices and pursue the use of alternative energy.

John Travers notes that "the global market for renewable energy and clean technology and services was worth about €1.2 trillion in 2009" (Travers, 2010) and a 2013 report from Ernst & Young observed growth in the clean technology sector despite the global economic downturn. Gil Forer observed that "we've seen an annual gain of 18% in market capitalization (US$170b), and 12% increase in headcount" whilst confirming that "the corporate focus on energy efficiency continues to boost the segment, with the number of energy efficiency products companies jumping 14% to 50, and market capitalization increasing 25% to US34.6$b" (Ernst & Young, 2013).

If the pursuit of environmentally-sustainable technologies and business practices is emerging from a niche into a growing trend throughout the global economy, the film industry could identify this opportunity to position itself as an innovator in addressing consumption problems; solutions that emerge could then be applied to other industries. However, the challenge to innovate solutions is particularly acute in an industry as energy-intensive as the audio-visual sector. This paper focuses on this challenge in the context of feature film production.

The raw materials needed for production technologies, not to mention the power required for film shoots, can lead to a substantial environmental impact when one considers how feature films often take many weeks, if not months, of production. It is apparent that a lot of raw material is required for the development of sets and costumes during the pre-production phase and in the logistics of scouting different locations and reserving them, in some cases disrupting the ecological integrity of remote outdoor locations. During the shoot there is a huge logistical challenge to provide transport and catering for the cast and crew (before disposing the waste they produce), to heat or cool sets as needed, to generate electricity for lighting and other equipment and to provide water to the set for consumption or in some cases for special effects purposes. Productions with a larger budget could be employing hundreds, if not thousands, of people for many months, placing quite a significant demand on such resources and making sustainability a difficult objective.

The entire life-cycle of a film's environmental impact can be quite broad and far-reaching. What of the raw materials that were needed to manufacture the equipment used in film production? What of the printing, production and distribution of marketing materials to publicise the film? What of the distribution of the film itself in both cinemas and home video formats? What scope should we consider when discussing the full environmental impact of a film?

1.2. The Environmental Footprint of the Film Industry

This paper will follow the lead of a study by Green Screen Toronto, a Canadian group who have published reports on sustainability in the film industry. Their 2008 report declared that "for the purposes of this study, only those environmental impacts occurring during the production process and by those involved in the production are evaluated; that is, those areas that are most feasible to address during the making of a production." (Felder et al., 2008)

They acknowledge "that the impacts associated with the operations of a particular industry can be extraordinarily wide-ranging depending on the scope and time-scale that is pursued" but that their study will "broadly identify the impacts of the film-based industries with the understanding that these represent but a small piece of the picture of the overall environmental footprint associated with operations." (Felder et al., 2008)

In any case, their study posits that a film production's consumption of resources is at its highest during the film shoot itself. They envisage a bell-curve (see Appendix 6) where preparation for a movie starts off being office-based before gradually requiring more resources for shooting. After the shoot, work becomes largely office-based once again when it comes to post-production and co-ordinating distribution.

If this model is to be understood as focusing on those activities directly involved in film production then there may be some element of truth to it, although it is questionable when considering the impact of the consumption of films by audiences. However they have flagged this issue and made clear that film production itself will be the focus of their study.

It would be prudent to apply those parameters in this study as the production process is so energy-intensive that it would be a significant challenge to manage productions in an

environmentally-friendly way, and one that, if successful, would be placing a great impetus on other industries to follow the example set by the film industry.

Approaching this challenge requires analysis of what resources film production demands, such as the research conducted by Green Screen Toronto. They propose that paper consumption and power for office spaces is a constant throughout every stage of the production process, then power for studios, set construction and film sets is required in the final stages of pre-production and throughout production; the demand for catering and transport also rises significantly during that time. Their research suggests that from post-production onwards the demand for resources decreases as most of this work is conducted from office buildings. They acknowledge limitations in such research of the post-production process:

> Post-production is largely associated with typical "office" activities of computer and office equipment use and other hardware, lighting, heating and cooling for offices, and paper generation. Electricity for editing and sound hardware, animation and CGI, and chemicals and film for hard copy processing, represent other possible impacts however are not treated in depth within this study. (Felder et al., 2008)

It is somewhat easier to address energy consumption issues in post-production with the increasingly common use of digital technology. The 'chemicals and film for hard copy processing' they refer to are becoming less commonplace and the more widespread digital post-production process conducted entirely through computer equipment can be potentially powered by clean energy sources. The introduction of digital to the shooting process itself somewhat reduces the shoot's environmental impact as film-stock cameras have in the past required industrial chemicals in their manufacturing, maintenance and as a by-product of

their operation. Digital cameras of the kind that are increasingly more common for film production "reflect a pursuit of better environmental performance through light-weighting, increasing energy efficiency, incorporating parts made of recycled plastic, and reducing packaging materials." (Sonypictures.com/green, 2014) They also entail a significantly less cumbersome transfer process to prepare shot footage for the post-production process.

This dissertation will focus primarily on the pre-production and production stages of the feature film production process as they arguably comprise the most energy-intensive part of film production and the part where reducing consumption and minimising environmental impact remains the most challenging. Two particular areas that pose a great challenge in this regard are the use of lighting and on-set generators.

1.3. Lighting on Film Sets

Film lights have historically been inefficient, often expending more of their energy on heat than light which can make film sets uncomfortably hot working environments with an occasional risk of fire hazards. Manufacturers of film lights have attempted to produce more energy-efficient lighting, whether it was the unique selling point of a start-up such as Kino-Flo (Kinoflo.com, 2014) and their fluorescent-tube lighting systems, or the innovations of a major manufacturer such as Arri who have branched out into LED lights (Arri.com, 2014).

The film industry however is used to certain kinds of lights and switching to more efficient models such as LEDs will present a significant adjustment challenge. Irish cinematographer Penny-Merelle Gray explains how different types of lights can affect the colour temperature of a shot; "Basically because there are lots of different bulbs used to create one LED panel, you get weird colour temperatures off them; they are not the same as the tungsten or daylight colour temperatures which are the standard settings on most

cameras." (Gray, 2014) She says a camera team could compensate for this effect by using colour gels but that the light itself is still noticeably softer than what comes from conventional lights. This is because the quality of light they give is softer and more dispersed; different from the direct lighting offered by conventional tungsten bulbs.

Quite tellingly Gray says that, "I don't know of any rental houses in Ireland that can give you an entire lighting package made of LEDs. They don't have much throw the way larger wattage lights would." (Gray, 2014) This suggests that the industry needs to make more of an effort to provide alternative forms of lighting. However they may be deterred from doing this if there are practical concerns for how a camera team can work with them. There are some indications that such a transition may be possible, most notably from an initiative taken by Warner Bros. studios to convert the lighting systems in their studio facilities:

> Warner Bros. is installing new "house lights" equipped with energy-saving technologies on our stages. These induction lights are 240 watts compared to conventional 400 watt metal halide lights typically used in high bay applications. Also, these innovative lights turn on at only 40 watts to provide instant low level light. Then, each light has a motion sensor that, when activated, increases to full light levels. So, only stage areas in use are fully lit. It is estimated that this technology will save about 35,000 kwh of electricity per stage, per year. (Wbcitizenship.com, 2014)

1.4. Generators on Film Sets

While energy savings may potentially be made in the area of lighting, generators that are used to power film sets typically run on diesel fuels at a huge cost to the environment. Green Screen Toronto highlight "fossil fuel use, particulate emissions, air quality, and

smog formation" (Felder et al., 2009) from these generators as detrimental not only to the Earth's atmosphere but also to the immediate working conditions of a film set.

Another report from Green Screen Toronto in 2009 advises that issues arising from the use of generators can be planned for if in consulting "with your generator operator, equipment supplier, gaffer, and respective crew members and departments" you can "set goals for how to optimize the use of generators." (Felder et al. 2009) They go on to list a range of potential solutions including:

> Use renewable energy options such as solar panels or other alternatives to power auxiliary energy loads when possible – When possible use grid electricity, or prioritize grid tie-in . . . Use biodiesel fuel in a B5 blend, and consider increasing this proportion in warmer months in keeping with the power quality demands of the production (Felder et al., 2009)

The use of photovoltaic solar panels for generators may become more widespread if the technology such as that offered by the American supplier DC Solar (DC Solar, 2014) catches on, having already been used notably on the big-budget blockbuster *Inception* (2010). When recommending a biodiesel blend for generators, Green Screen Toronto recognise that any blend higher than B5 (that is, 5% biodiesel, 95% petrodiesel) may not always be practicable. (Felder et al., 2009)

There could be an opportunity here for manufacturers to develop a workable B100 biodiesel generator to provide the alternative so sorely needed. It is questionable however whether biodiesel is the answer when its production has the environmental impact of creating monocultures on arable land that is otherwise needed for food production (MacKay, 2009). Professor David MacKay, Chief Scientific Advisor to the UK

Department of Energy and Climate Change, has expressed scepticism that biodiesel is efficient enough to be considered an environmentally-sustainable fuel (MacKay, 2009).

The infrastructure is already in place for generators that run on petrochemicals so it may be worth considering whether there is some other alternative form of fuel that can work within this infrastructure. *Earthrise*, the environmental science series on Al-Jazeera English, highlighted two possibilities that could have a beneficial application to film set generators.

Cynar plc have a recycling plant in Portlaoise where they have developed a process for heating plastic waste, liquefying it and distilling it back into a substance that has virtually all the same combustible properties as crude oil. Substituting this synthetic fuel for petrol would reduce carbon emissions by more than a third by harnessing the carbon molecules already in plastic which would have otherwise been contributing to pollution in landfills (cynarplc.com, 2014) (Earthrise, 2012).

Another company in Spain, Biopetroleo, have a similar principle of reusing carbon and have developed their own synthetic fuel through the chemical reactions between carbon molecules from CO2 pollution, algae and high levels of barometric pressure. This synthetic fuel not only has the same combustible properties as crude oil but actually consumes carbon pollution from the atmosphere; a fuel that is not just carbon-neutral but which reduces carbon dioxide in the atmosphere. (Biopetroleo.com, 2014) (Earthrise, 2012)

If either of these fuels became mass-produced they could be used in some models of existing generators the same way conventional diesel would. (Earthrise, 2012) This could help reduce a film set's environmental footprint until alternatives such as solar-powered generators or adequate grid capacity became economical.

1.5. Sustainability for Studio Facilities

Although reducing the environmental footprint of film production is a monumental challenge, pursuing it could have a knock-on effect encouraging sustainability across other industries. Indeed other industries seem to be moving towards sustainability initiatives and global political, economic and technological momentum could see legislative frameworks emerging around them. Preparing for this shift would be beneficial for the film industry, as the British Standards Institute outlines; "Exemplary sustainability performance leads to recognition from peers, audiences, investors, stakeholders and NGOs. It reduces reputational risk and enhances competitiveness. It helps organizations get on top of existing regulatory requirements and ahead of future legislation." (Shop.bsigroup.com, 2014)

Indeed their document outlining the BS 8909 sustainability standards for the British film industry explicitly highlights how future environmental legislation is something the film industry, like others, will be expected to accommodate:

> To help the industry stay ahead of any changes in legislation and regulation – the value for companies buying into BS 8909 would be that they could plan their activities and investment in such a way as to minimise the costs and disruption that would otherwise arise when environmental and other standards are increased, either at UK or at European level. (BS8909 Guidance Notes, 2011)

There are indications from around the world that different sectors of the international film industry are prepared to invest in sustainability initiatives (greenfilmshooting.net, 2014). A high-profile example from the United States is the directing team the Wachowskis, investing in Kinowerks, a facility housing their pre-production and post-production work in their home city of Chicago.

The Wachowskis "invested $6.8 million to make the building environmentally responsible" under the direction of "VOA Associates, Incorporated, the distinguished Chicago-based, international architectural firm" (Simonsen, 2011). While this constituted a large investment, it appeared to pay off when "the building's innovative design won a coveted LEED Gold rating for energy and environment design from the U.S. Green Building Council" as well as several other environmental and architectural awards. (Simonsen, 2011)

Writing for *Reel Chicago*, Mae Simonsen describes how the push for energy efficiency has not hampered how well-equipped the Kinowerks building is, with "editing suites, a sound studio, a green screen studio, a 409-seat screening room, offices, conference room, an Italian cafe/lounge and an indoor basketball court. A considerable amount of the interior and furnishings were constructed from recycled materials." (Simonsen, 2011) She goes on to describe other environmental initiatives throughout the building: "The old roof was replaced with a 1,500-sq. ft. green roof, full of vegetation. Rainwater is collected for irrigation of the roof's plant life. To provide 30kW of solar power, 150 photovoltaic (PV) cells, which convert the energy of light into electricity, were added to the roof." (Simonsen 2011) Such innovations can be recognised in America with LEED certification from the U.S. Green Building Council. On a website promoting their social enterprise activity, Warner Bros. promote their achievements in renovating their own studio facilities:

> Warner Bros. received the first LEED™ certification for green building in our industry in 2009. Our Studio now has four LEED™ certified buildings as awarded by the US Green Building Council (USGBC). Green building principles include energy efficiency, water efficiency, improved indoor air quality, waste reduction and utilization of locally sourced, recycled and sustainably produced materials. (Wbcitizenship.com, 2014)

Their website explores a range of ways through which they have achieved these standards including the use of solar panels, efficient heat regulation and many other technical adjustments to their buildings. There is further evidence to suggest that production facilities for the film shoot itself can be made environmentally sustainable and not just through smart planning of new facilities but by renovating existing facilities.

Ealing Studios, one of Britain's oldest studios, drafted sustainability policies in compliance with BS 8909 and strive to practice them on all future productions (BSI Case Study Ealing Studios Enterprises, 2014). Another one of Europe's oldest film studios, Bavaria Film Studios in southern Germany, have capitalised on Germany's position as a world leader in green energy, to virtually eliminate its carbon impact. Bavaria Film Studios is a sprawling studio complex housing large-scale national and international film productions. It consists of many old buildings and yet is now almost entirely zero-carbon in its production activities after extensive renovation work that is already precipitating massive savings in energy efficiency.

> Bavaria Film has invested about 30 million euros into modernization. With a combination of measures, they have succeeded in reducing carbon emissions by 97 percent over the course of two years: from 7,000 tons per year in 2011 to 200 tons projected by the end of 2013. The remaining emissions are offset by an investment in a geothermal energy project in Indonesia. The heating system on the Bavaria Film lot was converted to geothermal energy from a nearby source in the summer of 2012. (Jetschin, 2013)

1.6. Funding Incentives for Green Filmmaking

The success story of Bavaria film and many others throughout Europe are highlighted by the Green Film Shooting journal, an annual journal published at the Berlinale Film Festival

by the Green Film Initiative out of Germany. Founder of the Green Film Initiative Michael Geidel explains that their goal "is to cooperate with the industry to create guidelines for sustainable film production. We have, for example, collaborated on the Best Practice Guide issued by the Filmförderung Hamburg Schleswig-Holstein for the Green Shooting Card." (Jetschin, 2013)

This Green Shooting Card scheme appears to be promising, as it is a standardised way of assessing the green credentials of a film production. It is awarded to film productions that achieve a certain level of resource-efficiency, in much the same way energy ratings are given to buildings. In order to achieve this distinction and the rewards it comes with, film productions must submit reports on what efficiencies they have achieved in at least 3 of the 5 following areas; Production Design, Catering, Equipment/Transport, Production Office/Crew, producing an eco-balance sheet. (fchsh.de/sites/en, 2014)

Writing for the Green Film Shooting journal, Birgit Heidsiek highlights a variation on this approach to come out of Belgium. Rather than assessing the environmental impact of a production after it has wrapped, the Flanders regional funding authority is asking producers to estimate upfront how much carbon emissions the production will produce and have made a section of allowable funding contingent on the submission of such a report."Besides raising awareness of green production, VAF is asking producers to deliver a carbon footprint of their productions in order to receive the final instalment for production funding (€47,500 to €65,000)." (Heidsiek, 2014) While it may be harder to estimate a shoot's environmental impact before it has even started, this could well be an effective way of getting producers to consider such issues from the outset.

Heidsiek also writes about another funding scheme from the Provence-Alpes-Côte-d'Azur (PACA) region in southern France:

> PACA offered producers a green incentive that is unique in the European film funding landscape. Film projects supported by the region received additional support of up to €50,000 if they signed up for the sustainability deal. Altogether, 36 productions took advantage of this green incentive, among them not only short films and documentaries but also internationally renowned feature films (Heidsiek, 2014)

Although this funding scheme ended in 2013, there has since been a "Sustainability Development Training Program for local professionals in Nice and Marseille" which "includes a workshop on stage lighting as well as sustainability training sessions for stage managers and production managers." (Heidsiek, 2013) So even though the financial incentive from the regional funding body is no longer there, there is still important work being done in that region to up-skill crews in how to conduct their shoots in an environmentally-conscious way, illustrating the persuasive impact the funding scheme must have had on professionals working in that region.

1.7. Developing Standards for Green Filmmaking

International experience so far would suggest that environmental initiatives are more successful when there is buy-in from industry practitioners. The development of the BS 8909 guidelines in the UK are an example of the industry collaborating to promote sustainability, having emerged from a drafting process that involved "representatives from production (Production Managers Association), exhibitors (Cinema Exhibitors Association), distributors (Film Distributors Association), facilities (UK Screen Association), sales (Film Export UK), trades unions (Federation of Entertainment Unions) and archives (British Film Institute) and the UK Film Council." (BS8909 Guidance Notes, 2011) This committee also agreed to focus on the context of feature film production:

> The view of the meeting was that for reasons of practicality it would be better to work with a drafting group drawn from the feature film industry and to focus on issues of concern to the feature film industry, while recognising that much of what was discussed would be equally applicable to a wider range of screen media. The ambition is that, over time, BS 8909 will provide a useful template for other screen media. (BS8909 Guidance Notes, 2011)

In order to comply with BS 8909 a production would have to outline objectives in sustainability as well as an action plan to achieve them. This is so that their action plan could be measured in terms of its effectiveness through meticulous standardised record-keeping. This initiative differs from the Hamburg funding authority's Green Shooting Card scheme as they felt this model would not be workable in the UK:

> The drafting group's view was that because of the long and often complex life-cycle of a feature film, it does not make sense to give a film a 'green badge', but it should be possible for producers to include a claim, as part of a film's credits, along these lines – 'This film was produced by [insert name of organization], which operates a sustainability management system that conforms to BS8909'." (BS8909 Guidance Notes, 2011)

Awarding a film that distinction is not quite as salient as the benefits associated with a 'Green Shooting Card' or similar distinction but it would be practiced in the hope that these sustainability standards become more widespread throughout the British film industry. It does demonstrate awareness on the drafting committee's part that the environmental footprint of a film production's entire life-cycle can be problematic to determine.

Such far-sightedness could possibly emerge in the United States where the major Hollywood studios formed together to create its own guidelines in collaboration with the Producers' Guild of America (PGA).

> The Green Production Guide features a searchable database of vendors with information about their green products, services, their production experience and what locations they serve. The new site also offers a Carbon Calculator [which] can be downloaded to help producers determine their production's carbon footprint and the "PGA Green Unified Best Practices" guide, which details best practices for sustainable film and television production. (Greenproductionguide.com, 2014)

The Green Production Guide consists of suggestions on how to improve environmental initiatives in film production, rather than a standardised framework of the kind developed for BS 8909. Nevertheless, "a database of 2,000+ companies that provide sustainable and energy saving products and services for film, television and commercial productions" (Greenproductionguide.com, 2014) is made available through a website and an App for mobile devices. This eases efforts to green film productions whilst also promoting green enterprise throughout the United States in one searchable database. This should have a positive impact on both the organisation of film shoots and the broader economic development of the green sector.

Major studios such as Warner Bros. and Sony Pictures seem to be beginning a transition towards more sustainable business practices. Sony Pictures also have a website listing a number of green initiatives including extensive re-use of sets, the successful implementation of a waste-to-energy programme at their Culver City studio facilities and their adoption of ISO 14001, "a set of international guidelines that set standards for businesses' environmental management efforts." (sonypictures.com/green, 2014)

They claim that following these guidelines has vastly improved their "treatment of hazardous and solid waste; energy use; water use; contracts with vendors; purchase of hazardous materials; frequency of management review and internal audits" resulting in a scenario where "the rate of hazardous waste disposal for Sony Pictures Studios has decreased 95% since 2007". (sonypictures.com/green, 2014)

Technical frameworks of greater clarity such as ISO 14001 or BS 8909 can motivate management to comply effectively with ambitious goals. But that is not to dismiss the impact documents with more general suggestions and aspirations can have; sometimes it is a matter of highlighting what practical, simple measures can be taken to maximise sustainability in order to raise awareness of these opportunities among industry practitioners in the first place.

We see such documents produced in Australia where the Good Green Production Bible was published by Greenshoot Pacific, a consultancy firm for sustainability in the Australian entertainment industry (The Good Green Production Bible, 2013). In New Zealand, the Ministry for the Environment collaborated with New Zealand's Screen Production and Development Association in 2005, to produce the 'Greening the Screen' sustainability toolkit; Based on study of initiatives taken on film sets in New Zealand and internationally, the 'Greening the Screen' website outlines suggestions on how to maximise sustainability during film productions. It is now maintained by Film New Zealand, the national film business and shooting locations agency. (Greeningthescreen.co.nz, 2014)

In the UK, the British Film Institute have established 'Greeningfilm', an online resource which "aims to help professionals working in every part of the film industry – studios, locations, distribution, exhibition, special effects, post-production and archives –

implement a sustainable strategy as part of their ongoing activity for environmental, ethical and economic reasons." (Greeningfilm.com, 2014)

These initiatives all sound comparable to Green Screen Toronto, whose research has informed this dissertation, though Green Screen Toronto have done more than publish reports based on their research. They offer eco-consultancy services and have published a Green Screen Resource Directory which provides information on businesses in the green sector who can assist the film and television industry of Canada (Greenscreentoronto.com, 2014). This is similar to the database of American green businesses published by the PGA.

1.8. Green Filmmaking for Ireland?

A picture is emerging of international initiatives being taken to progress principles of sustainability in the film industry. It would be worth considering what the Irish film industry has to contribute to this area. Thus far, the Irish Film Board (IFB) have produced a toolkit document similar to ones that have emerged in Australia and New Zealand. It outlines various practical measures film productions can take "to limit their environmental impact, whilst also saving money." (IFB Green Production Toolkit, 2014)

It was produced assuming that the inter-connected nature of the relatively small film industry in Ireland would precipitate the familiarity of green practices from one set to another throughout Ireland: "The very nature of screen production in Ireland, where groups of professionals come together for a few months and then disperse to other projects, provides a great opportunity for green practices to spread throughout our industry." (IFB Green Production Toolkit, 2014)

It is difficult to measure how effectively green practices have spread as a direct result of this document but this is partly due to a strength of the toolkit which is to offer a broad,

extensive range of suggestions under headings covering every aspect of film production. The headings comprise ‘All Departments’, ‘Production Office’, ‘Art/Set Decoration/Construction’, ‘Camera & Sound’, ‘Catering’, ‘Costume’, ‘Grip & Electric’, ‘Make-up & Hair’, ‘Post-Production & VFX’, ‘SFX & Stunts’ and ‘Transportation’. (IFB Green Production Toolkit, 2014) While there are many actionable recommendations in this document there has not been either a large-scale investment in renovating infrastructure or a specific facility, nor a set of binding standards that productions comply to in order to avoid penalties or attain benefits.

If not through such policies, Ireland should still find a way to position itself as a centre for innovation in making the film industry sustainable. John Travers wrote an entire book, *Green & Gold: Ireland a Clean Energy World Leader?* in which he enthusiastically espoused the case for Ireland to pursue its own innovations in the green technology sector:

> Ireland can tap into this huge global market by building on advantages such as the successful experience of technology-focused export businesses, a world class research and development base, a wealth and intensity of clean energy resources and an ability to promote Ireland’s traditional ‘green’ brand. (Travers, 2010)

The Irish film industry specifically offers much to international productions already, such as our locations, our English-speaking workforce and our generous Section 481 tax scheme. But if the Irish film industry positioned itself as a hub for the development of environmentally-sustainable models of filmmaking, it could have a unique selling point with which to attract international productions.

Productions that had either an ethical or financial concern around environmental impact, energy consumption and waste management would see Ireland as the global centre for

green filmmaking. Indeed there was acknowledgement that the British film industry developed their BS 8909 guidelines partly "to give the UK industry a possible point of competitive advantage internationally – operating to good environmental standards would help the industry keep its costs down and make it more attractive to environmentally conscious investors, producers and talent from abroad." (BS8909 Guidance Notes, 2011)

1.9. The Opportunity of Sustainability

There is potential for exciting development in the Irish film industry, economic, technical, organisational and otherwise, in the pursuit of best-practice sustainability. This opportunity seems to have been identified by other countries and the Irish film industry could identify substantive ways to contribute to this emerging field if it does not want to be left behind by other resourceful film industries. A novel approach would be the appointment of an eco-manager to set; a crew member with the specific role of maximising sustainability.

The initiatives outlined and alluded to above, could potentially develop in the Irish film industry if it became more commonplace for a specific crew member to investigate and enact them while measuring the progress of such initiatives. This could be an effective way for the Irish film industry to develop high standards in sustainability for relatively little investment in what are currently considered to be financially-constrained times. As outlined above, sustainability could in fact lead to net savings for the film industry whilst also promoting corporate social responsibility in relation to the environment. Let us explore the role of the eco-manager and how it could potentially transform the film industry in Ireland.

CHAPTER 2: THE ROLE OF ECO-MANAGER

2.1. Introducing Sustainability to Filmmaking

Efforts to maximise the environmental sustainability of film sets will be difficult to implement and hard to measure without assigning a specific person or team of people to organise them. Conceivably, the unit production manager could be assigned the additional duty of overseeing sustainability policies on the film set but there could be concerns that this would add to an already considerable workload. Production accountants could also be tasked with some kind of auditing of a set's waste production, energy consumption and carbon footprint but implementing the environmental measures necessary to mitigate these is most likely outside the skill-set of accountants. Thus a relatively new phenomenon has emerged on certain film sets whereby a single crew member oversees environmental initiatives on-set.

This role has been referred to variably as 'eco-manager', 'eco-supervisor' and 'green production manager'. A specified term has not yet emerged nor has a recognisable framework for how this crew member does their job. But a clearer definition of this role may emerge in years to come if film productions seek to maximise their environmental sustainability. This challenge persists partly due to a common perception identified by Green Screen Toronto:

> The film-based industries are increasingly recognized as wasteful in terms of their environmental impact. This outcome has been in part due to productions being constrained by budget and especially by the value of time - meaning that also addressing environmental impacts is sometimes perceived as unrealistic and expensive. (Felder et al., 2009)

Those seeking to tackle this perception that being an environmentally-friendly film production is too unrealistic and expensive would have to demonstrate the savings possible through greening film production. Doing this would require someone on a film production to meticulously plan where savings could be made and determine ahead of time how much of the environmental impact of the film's shoot can be avoided or mitigated.

Green Screen Toronto stresses the profound impact such decisions will have on the logistics of organising a film shoot:

> Such decisions affect crew size, sets, special effects, travel and other potentially high impact requirements. We also note that the pre-production phase, particularly for features and/or shows involving large set builds and special effects, lays the groundwork for the amount of material resources used and eventually disposed of. (Felder et al., 2008)

2.2. The Importance of Pre-Production

This seems to be why so many different sources that have written on the subject of environmental sustainability in film production highlight the importance of the pre-production process. Any planning for environmental sustainability would have to involve liaising with key crew members and department heads from the earliest stage possible in the production process. Major Hollywood studio Warner Bros offers the following advice in this regard; "Together with your Producer, Production Manager, Director of Photography, gaffer, grip, camera operator, and Art Director, explore possibilities for alternative lighting and technology options. Investigate: (1) efficient resource planning and (2) potential opportunities in alternative and more efficient technologies." (Wbcitizenship.com, 2014)

On both sides of the Atlantic, important film industry bodies have offered the same elements of advice for effective planning. The Producers' Guild of America (PGA) published Best Practices guidelines for their Green Production Guide as have the Filmförderung Hamburg Schleswig-Holstein (FHSH) produced their Best Practices guidelines for those seeking to avail of their Green Shooting Card scheme for regional project funding in Germany.

The FHSH document concurs with the assessment that there must be buy-in from department heads from early in the pre-production stage of filmmaking, saying that one must, "always communicate your plans on green film making in a positive manner and straight from the beginning, and involve all the heads of departments in the planning process." (Green Shooting Card: Best Practice Guide, 2014) The PGA document recommends "a pre-production meeting with department heads to announce the sustainability plan" as this would be an opportunity to "Solicit input from department heads regarding ways to make their department greener." (Unified Best Practices Guide, 2014)

Both stress that one should plan environmental initiatives from as early as possible and have a specific meeting to familiarise everyone with the concept of green filmmaking. The FHSH recommend "a kick-off meeting with cast and crew to communicate green goals and strategies for the production" (Green Shooting Card: Best Practice Guide, 2014) and the PGA advise "a meeting with the producing team (Line Producer, UPM and Supervisors) to discuss the sustainability plan and to determine how to best communicate it to department heads at point of hire." (Unified Best Practices Guide, 2014)

The PGA emphasise the importance of such initiatives by advising that they be communicated to potential hires at the point of entry and perhaps even as part of the

application process. Yet even if there is effective communication from early in the production process, there is the still risk that a film crew will simply be unwilling to commit to sustainability given the pressures they are already under, if models for sustainable film production prove cumbersome to their work.

2.3. A Specific Crew Role for Sustainability

If, however, a single person was responsible for sustainability on-set they would have the expertise to know what policies would be the most effective, whilst causing the least inconvenience to crews. If this person was fully integrated into the crew they could then demonstrate and pass on their expertise to crew members. This person would be responsible for researching and implementing sustainability solutions and facilitating ease of compliance on-set. They could oversee the responsible disposal of waste during and after the shoot. They could even promote this work being done on-set through social media, press engagement and where possible, the application of celebrity endorsement, in the hopes that it will raise awareness of the feasibility of green filmmaking.

The advantage of assigning these duties to a specific role is that responsibility can be delegated to a crew member of expertise who can monitor the progress of green initiatives in order to audit savings in energy, waste and finances and to identify the practices that would be most effective when applied elsewhere in the industry. If net savings can be secured for the production than this should justify the salary of some kind of eco-specialist who understands the particular challenges faced by film productions.

The PGA have suggested that, “if no one is available to oversee a production’s sustainability efforts from the onset, success rates are much lower. The emerging role of the Eco Supervisor is proving crucial to that success.” (Greenproductionguide.com, 2014) They offer their definition of this role:

> An Eco Supervisor is a resource, a seasoned production professional, and functions as a department head alongside other crew department heads. This person has an exclusive focus on implementing and managing systems from prep through wrap, and problem-solves in conjunction with all departments as the unique challenges of production arise. (Greenproductionguide.com, 2014)

The FHSH recommend that the film industry should, "start with little steps to provide reliability and so as not to overburden staff members. Elect one responsible person within the production as a contact for environmental issues who can offer help and support in practical manners. If possible hire a "green runner" during the production." (Green Shooting Card: Best Practice Guide, 2014) To "hire an Eco Supervisor to help cast and crew implement sustainability practices" (Unified Best Practices Guide, 2014) is also advocated by the PGA and both they and the FHSH recommend a weekly update on issues relating to green filmmaking so that crew and department heads will be engaged in meeting objectives in sustainability.

As we shall see over the course of this paper, assigning the Eco Supervisor the status of department head may be needed in order to introduce this new concept to film crews (rather than a presumably low-rung job title like FHSH's term 'green runner'). The role needs to be seen as being respected as an integral part of the production process. The case for doing so is considerable as it entails the holistic analysis of every aspect of film production. The decisions made by the Eco Supervisor are to be enacted on-set if a film production is to set targets for sustainability and achieve them. Promoting resource-consciousness as an integral part of the filmmaking process will be needed in introducing this new concept to the industry.

Each department in a film production has a part to play in meeting these objectives and numerous documents and websites explored thus far from the US, the UK, Germany, France, Belgium, New Zealand, Australia, Canada and Ireland have highlighted similar goals across roughly the same departmental divisions. Having a single crew member co-ordinate these initiatives is an emerging phenomenon that has yet to develop standardised working methods. Early research from the PGA did precipitate a production checklist of duties that they expect from an Eco-Supervisor based on the experience of people who have already attempted the role. (Greenproductionguide.com/eco-management, 2014) This checklist is available in Appendix 1 of this dissertation as it informs the methodology for the primary research of this dissertation.

2.4. Methodology to Explore This Role

Two film industry practitioners who have performed this role have been e-mailed a questionnaire. This questionnaire consisted of two parts; one part asked six questions relating to the work they do and the other part required them to go through the PGA's checklist and identify how many of the duties therein they were able to accomplish in their experience by marking each item with either "Yes", "No" or "To Some Extent".

Chapter 3 will analyse the response given by Emellie O'Brien, a US-based 'eco-manager' who has worked on big-budget Hollywood productions, with reference to the accomplishments of her career thus far (it is worth noting that she has had input into many of the documents referenced by this dissertation).

Chapter 4 will do likewise with John Gormley, an Ireland-based 'green production manager' who oversaw green initiatives on the two feature films made this year by students of the Filmbase/Staffordshire University MSc in Digital Feature Film Production. These films were *Poison Pen* and *The Light of Day* and a short survey on green

filmmaking was also sent to students and crew members who worked on these two projects in order to analyse their responses.

Chapter 5 will elucidate this analysis as it will provide data on how crew members responded to the work of a ‘green production manager’ on a low-budget feature film production in the context of the Irish film industry. Having broadly established the values and objectives behind having an Eco-Supervisor role for film productions, these case studies should be able to illuminate how practical application of this new role has manifested itself based on the experience of different production contexts. It should highlight how feasible the integration of this role is into film productions as well as the challenges that remain in doing so.

CHAPTER 3: CASE STUDY OF EMELLIE O'BRIEN

3.1. Background

Emellie O'Brien is an American graduate of "NYU's Tisch School of the Arts with a B.F.A. in Film and Television and a minor in Producing" (Earthangelnyc.com/about, 2014). Having graduated from film school she researched the area of waste management on film sets and established a social enterprise in New York City called "Earth Angel NYC" which provides services to film productions seeking to reduce their adverse environmental impact.

Seeking funding from the social enterprise network Ashoka, Emellie made a submission outlining the mission statement of Earth Angel, who, recognising that "the demands of entertainment production are unique and logistically difficult", seek to provide "sustainable solutions to entertainment productions through education, waste reduction, resource management and carbon tracking." (O'Brien 2013) Earth Angel offers productions a dedicated "Eco Manager charged with enlisting sustainable vendors, sourcing sustainable products, strategizing with department heads, overseeing waste management, and tracking their carbon footprint." (O'Brien 2013)

Emellie says her great "challenge has been transitioning from a freelance crew member to a business owner" (Living the Dream, 2014) in order to familiarise the film industry with the concept of an Eco Manager. She laments that when it comes to 'greening' the film industry "there's no uniform organisation. The information is out there but there isn't any follow-through." (Living the Dream, 2014) She may acknowledge that "The Eco Manager is a new position and there is still much confusion about the role" (Earthangelnyc.com, 2014) but she has already made a considerable impact on the US film industry in a

relatively short space of time. She may only be in an early stage of her career but in many ways she is a pioneer of what her job entails.

She is credited as the Eco Manager on two major big-budget Hollywood releases. *Noah* (2014), which thematically deals with environmentalism, had Emellie as an Eco Manager as director Darren Aronofsky insisted on high standards of sustainability during production. She was also the Eco Manager on *The Amazing Spider-Man 2* (2014), purportedly the most expensive feature film ever shot in New York and proudly promoted by Sony Pictures as being virtually zero-carbon, despite the scale of production (Sonypictures.com/green, 2014).

She has even been engaged by the Producers' Guild of America (PGA) to write their report *Going Green & Saving Green: A Cost-Benefit Analysis of Sustainable Filmmaking*. This report explores her experience of being an Eco Manager on such large productions, and seeks to address industry concerns that her role would not be feasible to promote throughout the industry:

> The myth that it costs more to "go green" on set is currently plaguing the production of film and television. Sustainable filmmaking efforts are making significant strides and continuing to evolve. When resistance by decision-makers occurs, however, it is often due to complaints over cost. This document will show how pro-environmental measures can translate into budgetary savings for productions. With adequate preparation during pre-production, thorough communication across all departments, and an Eco Manager/Eco Supervisor to oversee initiatives and track progress, sustainable filmmaking is not only effective, but cost efficient. (O'Brien, 2014)

Emellie asserts that "low cost of operation, resourcefulness and self-financing have funded Earth Angel thus far. Productions pay for the cost of labor, equipment rental and supplies. These costs are consistently offset by our eco practice savings." (O'Brien 2013) She outlines some of the savings made, notably on the set of *The Amazing Spider-Man 2* where her efforts "diverted 52% of waste stream, a total of 755 TONS; Saved the use of 193,000 plastic water bottles; Recovered 5,861 meals from leftover food and donated to local shelters" (Earthangelnyc.com, 2014). On the set of *Noah* her work had "Diverted 55% of waste stream; Saved the use of 67,485 plastic water bottles; Recovered 10,038 meals from leftover food and donated to local shelters" (Earthangelnyc.com, 2014) and Emellie highlights her accomplishments on *Noah* to Ashoka:

> On a typical shooting day, Earth Angel's environmental savings include: eliminating the use of 200 plastic water bottles, recycling approximately 50lbs and composting approximately 80lbs of material that would have otherwise been landfilled, donating approximately 40lbs of leftover food to local soup kitchens, saving the use of approximately 13 batteries per day with rechargeables. Set demolition (strike) allows for the donation or responsible disposal of massive amounts of material. During the set strike of NOAH, we sent 450,000lbs of steel to scrap metal recycling. (O'Brien 2013)

3.2. Response to PGA Checklist

Emellie was e-mailed a questionnaire which sought direct insight from her. She responded to the questionnaire which included a checklist of duties an Eco Manager could perform that was published by the PGA. She was able to give a definitive 'Yes' answer to every item on the list but two. When it came to 'Enforce anti-idling policy whenever possible' she indicated that an anti-idling policy is very hard to enforce in practice.

She said that another objective could not be met on *Noah*; 'Support the production team and/or studio in getting the sustainability report out as far as possible – make your green success stories known!' She specified that Paramount Pictures decided against publishing the sustainability report on the production of *Noah*. On the whole, she accomplished an impressive array of objectives as recommended by the PGA. The questionnaire also consisted of specific questions dealing with the current status of the Eco Manager role and its potential future in the industry.

3.3. Response to Questionnaire

I asked where exactly the Eco Manager fits into a set's chain-of-command, to which she replied, "The eco supervisor is still such a new role, I'm not even sure where it fits into the set chain of command. Technically the Eco Supervisor is a department head because it is its own department - but it is never treated that way and it is certainly not paid that way. So at this point, I'd say pretty low." (O'Brien 2014)

She has advocated the recognition of the role as a department head elsewhere, claiming that, "the Eco department is its own separate department" (Earthangelnyc.com, 2014). When I asked her, "What would ease the facilitation of an eco-manager role on productions throughout the film & television industry?" she highlighted that, "having the producer/production manager introduce the eco supervisor as a department head would really help in gaining the respect of other crewmembers. Getting the staffing support would really help in tending to all the demands of production - on set and off." (O'Brien, 2014)

A case could be made for this if she sought to address the broader environmental impacts of an entire film's life-cycle, as discussed in Chapter 1. When I put this to her, asking how the impact of "post-production, marketing, distribution, equipment manufacturing etc."

could be addressed by an Eco Manager she said, “If we want to tackle these broader issues, we need a team – with an Eco Supervisor monitoring and reporting results, liaising with vendors and Eco Assistants implementing the on set waste management, plastic-free water policies.” (O’Brien, 2014)

She said ultimately “in order for an eco manager (or eco supervisor as we're now calling it) to get more involved with post, marketing/distribution, etc, that would need to be a decision made by the studios.” (O’Brien, 2014) She has found in general that her role is usually introduced to a film-set because of initiative taken by those higher up in the studio or creative team; “The decision to take on sustainable practices on a set really has to come from someone above-the-line. So whether that’s a producer or an actor or a writer, someone in a decision-making role has to take a risk.” (Living the Dream, 2014)

As things stand her involvement “typically starts with about 4 weeks of pre-production and typically ends 2 weeks after wrap” (O’Brien, 2014), allowing some time for the planning in pre-production that was so emphasised in Chapter 2. Various organisations have also stressed the need to engage crew members so I asked Emellie how best to motivate crew members in following her initiatives. She said:

> The most effective way of motivating crew members is simply being present. Having an on-set resource who is monitoring the waste streams, troubleshooting the plastic-free hydration methods goes a very long way. The reason I've had so many crew members respond so positively to my efforts is because they see me dig through the trash everyday and they start to understand that this matters and that they have to start taking responsibility for their waste and be more resourceful. Not just on set, but in life in general. (O’Brien, 2014)

O'Brien is convinced that having a physical presence on-set in the form of a dedicated crew member can positively impact the psychology of the crew and make them feel solidarity with her objectives. She accomplished this on the working environments of large-scale, big-budget Hollywood productions, which is why her work is so insightful as a case study. It shows that even large, hectic productions can make significant savings with the presence of just one eco-focused crew member. Therefore I asked what barriers remained for spreading this role to other productions and 'making film productions environmentally-friendly'. She argued that "the biggest barriers are that not enough productions are doing it and even when they do it, they often don't take it seriously." (O'Brien, 2014) Stressing the need for genuine commitment from within the industry she suggests that some form of financial incentive would be an effective motivator:

> We need major cities to start incentivizing productions who are making strides in reducing their waste, curbing their energy usage and implementing alternative fuel options. As soon as producers and production managers feel the pressure from the top and also see dollar signs associated with eco management on their sets, every set will be a sustainable one. (O'Brien, 2014)

Convinced that attitudes are changing within the industry, Emellie believes that "an industry with such profound impact on society should exemplify progressive practices to encourage sustainability both on and off screen." (O'Brien, 2013) Her work in this area seems set to continue, having most recently been hired on a remake of *Annie*.

If her work has been demonstrated to be feasible on large big-budget productions, how many of her principles and working methods are transferrable to other production contexts? The next chapter will explore how this role fared on two micro-budget productions in the Irish film industry.

CHAPTER 4: CASE STUDY OF JOHN GORMLEY

4.1. Background

John Gormley is a former politician who served as leader of the Green Party and Minister for the Environment, Heritage and Local Government from 2007 to 2011. Since leaving politics, he has studied on this year's MSc in Digital Feature Film Production. When crew roles were being allocated on the students' two feature film productions *Poison Pen* and *The Light of Day*, John offered to be what he called a "green production manager" on both productions.

John had familiarised himself with some of the international developments in green filmmaking (which were explored in Chapter 1) and had met with Michael Geidel of Germany's Green Film Initiative at the 2014 Berlinale Film Festival. Seeking to apply his knowledge and his connections from having been Ireland's first Environment Minister from the Green Party, John volunteered to perform the sort of duties discussed in Chapters 2 and 3. This role was not one of the listed options students could put their names forward for but John was taking the initiative to oversee green filmmaking practices on the set of two micro-budget features.

Like Emellie O'Brien, John has responded to questions from a questionnaire e-mailed to him. His answers to the questionnaire are indicated below by the citation (Gormley Q, 2014). There is also important insight to be drawn from a report John wrote about sustainability on these productions as part of his submission to the international Green Filmmaking competition run by the Strawberry Earth organisation in the Netherlands. John concluded his report to Strawberry Earth by making recommendations under three key headings (see Section 4.4.). Quotations from this report will be indicated below by the citation (Gormley, GFC, 2014).

4.2. Response to PGA Checklist

The Producers' Guild of America (PGA) checklist of suggested duties for an eco-manager was also filled out by John and unlike Emellie, John indicated that he did not fulfil a number of the duties outlined therein. He indicated that objectives were achieved to some extent but could have gone better in relation to 'Establish carbon tracking method with Accounting department' and 'Provide adequate receptacles and signage for all waste streams, monitor waste streams and educate crew on proper waste disposal'. He also felt there was "no need" (Gormley, Q, 2014) to enforce an anti-idling policy on-set.

However there was no effort made, perhaps due to logistical constraints, to 'Organize food recovery of catering leftovers with local shelters', 'Establish scrap gel, scrap film and dead battery collections' or 'Oversee striking of sets and material disposal, offer waste diversion efforts compliant with studio's policies'. The recycling was organised to facilitate the composting of leftover food but the waste management on-set faced difficulties we shall return to.

The two other items John did not do could arguably have a profound effect on the crew's attitude to green filmmaking. The PGA advises eco-managers to 'offer incentives to cast and crew for their environmental efforts' which is something that would introduce an element of fun to green filmmaking standards and even a modest reward system could help generate interest in compliance. This would require a consistent on-set presence from the eco-manager which is another issue we shall explore here in due course.

It is also noteworthy that John did not 'Meet with all Heads of Department to identify opportunities for sustainable development and implement systems as necessary to attain department-specific goals'. Previous chapters have highlighted this suggestion coming from different sources time and time again as it would be a focal point in pre-production

where department heads could co-ordinate strategy. This did not happen on these productions however and Chapter 5 will highlight, among other things, the number of students who feel they would have benefited from having such a meeting. The importance of pre-production is the concern of the questionnaire's first question.

4.3. Response to Questionnaire

(1) At what point in the production cycle does your involvement typically start and end?

As discussed in previous chapters, an eco-manager (or as John came to be credited, 'green production manager') should ideally be involved in the pre-production process from as early a stage as possible. This was John's first time performing this role on a feature film and the first time the vast majority of the crew had worked on a feature film. So not only does John have yet to establish a 'typical' working pattern in the same way that Emellie has, the circumstances of these films' productions are not typical. Pre-production was just under two months and each film had only a five-figure budget.

John responded to this query by saying that "Preproduction is vital. We did start then, but we assumed that there would be instant buy in from cast and crew. That isn't always the case." (Gormley, Q, 2014) As we shall see buy-in is an issue that must be addressed in pre-production or else crew members will be too overwhelmed with work during a shoot to commit to new green filmmaking practices.

(2) How would it be possible for an eco-manager to address the broader environmental impact of other aspects of filmmaking (e.g. post-production, marketing, distribution, equipment manufacturing etc.)?

While acknowledging that the eco-manager currently seems to entail only the pre-production and shooting phases, John believes that innovations can be made throughout the entire production cycle. He says that, “Regarding post production, the same sustainability principles should apply. Ideally, the post production should be carried out using renewable energy.” (Gormley, Q, 2014)

The increased use of IT and renewable energy is something John pursued throughout the shoot itself and this principle could indeed be applied to other stages of the production process. Green Screen Toronto’s report (Felder et al., 2008) observed how office facilities that are more or less consistent throughout every stage of production use resources such as paper, cups and so forth that can be sustainably sourced. John’s aspirations for the shoot were that “all scripts would be digitally communicated and that I-pads and other mobile devices would be used to reduce paper; all waste would be recycled and there would no paper or plastics cups on set.” (Gormley, GFC, 2014) Those policies should be practicable for a lot of activity in the film industry.

(3) Where does an eco-manager fit into a set’s chain-of-command?

John responds, “Probably bottom of the food chain, but he/she does need the respect of the producers and production managers. Otherwise it won't work.” (Gormley, Q, 2014) Chapter 5 features a survey of the crew’s attitude towards the green production manager role. The feedback is mostly positive in terms of respect for the role but other issues arose in terms of his effectiveness. This issue of what status an eco-manager has will be crucial to clarify for the development of this role in the film industry.

(4) What is most effective in motivating crew members to adopt environmentally-friendly initiatives?

“To be honest,” says John, “you have to tell them that this can save money. That gets them interested in a low budget movie. Appealing to their altruistic side only gets you so far.” (Gormley, Q, 2014) Indeed John highlighted this to Strawberry Earth, saying, “Anything that’s good for the bottom line or alleviates costs in any way will prove attractive to filmmakers.” (Gormley, GFC, 2014)

John also believes that in order to motivate people with regard to green filmmaking “In preproduction the concept has to be explained in detail and reminders put on the call sheets etc. You also have to let people know that this is not a hindrance to making a movie - you won't be getting in the way.”(Gormley, Q, 2014) Overcoming people’s hesitation around green filmmaking and whether it will be too cumbersome an adjustment is an important aspect expanded upon by John in response to the next question.

(5) What are the most significant barriers to making film productions environmentally-friendly?

John replies, “It's all about attitude. If the producers are not into it, it's hard to make it happen. Also, if a producer thinks it might cost more, they won't be persuaded.” (Gormley, Q, 2014) This echoes Emellie’s sentiment from Chapter 3 that committing resources to a transition towards sustainability is such a big decision that above-the-line talent need not only to instigate it but also to defend and commit to it.

(6) What would ease the facilitation of an eco-manager role on productions throughout the film & television industry?

Returning to the issue of incentives, John says, “It would certainly help if the film authorities eg IFB insisted on 'green' sets before any financial benefit could be derived from the state.” (Gormley, Q, 2014) This proposal is similar to regional funding schemes

from Flanders and southern France which were explored in Chapter 1. If there was a requirement for productions to pursue sustainability then that would create the demand for specialists to work on film sets in this capacity.

4.4. John's Recommendations

John's Recommendation #1 – Electricity Supply

"Electricity and Energy Supply" (Gormley, GFC, 2014) is an area applicable throughout all aspects of filmmaking. John tried insofar as possible to get a clean energy provider for shooting locations that were on the electricity grid. Yet during the shoot, a clean energy supply was not always available to Filmbase students. In the case of *The Light of the Day*, the principal location could not be easily connected to the power grid and a diesel generator was used throughout shooting as the Irish market has yet to provide an alternative for on-site power generators.

John believes clean energy provision is an area where the film industry can make progress and recommends that "The Irish Film Board should have a list of locations that have 100 per cent renewable power. Airtricity have stated that they will look at co-operating with the film industry on this issue." (Gormley, GFC, 2014) He highlights how helpful Airtricity were and suggests that he persuaded them of the potential for green filmmaking in Ireland:

> We built very good relations with some of the state agencies and energy companies, particularly SSE Airtricity who supply one hundred per cent renewable energy for certain commercial accounts. I'm glad to report that, because of the good working relationship with Filmbase students, this company is now committed to working more closely with the Irish film industry. (Gormley, GFC, 2014)

John's Recommendation #2 – Pre-Production

When it comes to pre-production and the importance of establishing green principles early on, John feels he may have tread too lightly in communicating to crew members what green filmmaking involved. As he puts it, "I was sensitive to the pressure that all crew members were under in such low budget productions and anxious not to overburden them with details that could have been interpreted as a distraction." (Gormley, GFC, 2014) Neglecting to communicate the implications of green filmmaking to the crew in advance of the shoot hardly gives the impression that it *is* an integral part of the production process. John warns that "It can't be seen as an add on, but integrated fully into all aspects of the production." (Gormley, GFC, 2014)

> In hindsight, a particular weakness of our strategy was the lack of real planning and proper explanation at pre-production. It was a mistake to assume that everyone knew what was involved in sustainable filmmaking and that there would somehow be an immediate buy-in from all crew members and cast. (Gormley, GFC, 2014)

John's Recommendation #3 – Waste Management

Waste Management is the final area in which John had concluding observations to make. This was an area in which he endeavoured to develop what should have been a workable system of recycling.

> Waste management on a low budget film set relates very often to catering and food waste. The plan was to source segregate all waste. Panda Waste agreed to assist the production, providing a three bin system to both productions. The brown bin was for food waste, the green for all recyclables and the black bin for other waste that was deemed not be recyclable. (Gormley, GFC, 2014)

John feels that *Poison Pen* had a lot more travel between varying locations and therefore posed considerable difficulty in having consistent waste disposal practices. Different obstacles emerged, especially during periods of successive high-pressure unit moves from location to location.

> At times it was not possible to lift the bins upstairs in specific locations and space did not permit the use of the bins. Instead three bin liners were used with makeshift signs used to indicate what waste should go where. Again this resulted in very poor waste segregation. Smaller containers, which were properly marked, would have been better. (Gormley, GFC, 2014)

Having learnt from setbacks on the two productions, John offers advice in his report for anyone seeking to facilitate crews disposing responsibly of their on-set waste:

> There should be verbal reminders every day to cast and crew about how the recycling works, with clear instructions on how the system works. It would also make sense to carry a reminder on the call sheets. The recycling bins should be clearly labelled as should bin liners if they are used instead on a temporary basis. It would make sense to use smaller containers for smaller locations. (Gormley, GFC, 2014)

In conclusion, sincere efforts were made on John's part in his first time performing this role. He also demonstrates reflexivity on his performance and is willing to offer suggestions on how to improve the facilitation of the role in the future. Having sought his perspective it should be invaluable for the analysis here to also gauge what crew members thought of the green filmmaking practices as a case study for introducing green

filmmaking to Ireland. As highlighted before, buy-in from personnel organising and working on the productions is crucial for the success of green initiatives so it should be pertinent to analyse feedback from crew members in response to a written questionnaire that they were e-mailed.

CHAPTER 5: CREW SURVEY ON ATTITUDES TO GREEN FILMMAKING

5.1. Methodology

This analysis comes from a survey that was e-mailed to people who had worked on the two feature films, *Poison Pen* (PP) and *The Light of Day* (LOD) made as part of this year's MSc in Digital Feature Film Production. This included not only students on the course but additional crew members that had been sourced from outside the course. Of 34 people contacted 31 responded. 30 of these respondents filled out a questionnaire of 6 questions (see Appendix 5) and their responses are explored below.

It is very important to note that one respondent claimed to have been completely unaware that the production they worked on was supposed to be 'green'. They claimed to not have a clue what the concept of green filmmaking was about and did not remember anything about it on-set. This person has been excluded from the sample below but is highlighted as important because it suggests that the green filmmaking aspirations were not communicated effectively to a crew member in an important role.

Every effort has been made to protect the anonymity of respondents. A full transcript of their responses can be made available on request but excerpts are quoted throughout this chapter. Any quotations in this chapter come from responses to the survey. No-one is identified by their gender, role on the film or any other identifying information.

It can be noted that out of the 30 respondents 12 worked on LOD and 18 worked on PP; in other words this represents a sample that is 40% from one production and 60% from the other. Since the green production manager (GPM) was assigned to both films, these respondents are treated as representing one sample despite differences in the circumstances of each production.

The questions were somewhat open-ended which allowed for respondents to give answers with as much or as little detail as they saw fit. The broad conclusions of their responses form the basis of the quantitative analysis which follows and some qualitative analysis is provided with a range of select quotations. It should be noted that responses often provided a range of conclusions so the percentages referenced below should not be considered to represent mutually exclusive groups but rather the proportion of respondents who supported a particular proposition.

5.2. Responses to Survey

(1) How did you find interacting with the green production manager?

30% of the crew specified that they had a very positive experience interacting with the GPM and only 10% indicated dissatisfaction in their interactions with him. However, 60% of the crew stressed that they had minimal interaction with the GPM, to such an extent that they could not offer a detailed reflection of what it was like to work with him or how he performed his job.

Indeed, there were those who were unclear as to who the GPM even was with one respondent being unsure of their gender, “I heard mention of a "green production manager" at one point but that was the extent of my interaction with him(/her?).” Others felt the GPM did not have enough of an on-set presence to be truly impactful, with one respondent claiming that “the Green Production Manager was rarely on set, by my count only arriving on set a handful of times, and so the guidelines weren’t enforced.”

There were of course those who found the GPM “very approachable to deal with” but there was a sense that even with amicable relations “it could get a bit stressful with a lot of other

things going on in the production at the same time as dealing with a locations recycling system. At the end of the day there's no Oscar for sustainability."

(2) Were any of the environmental measures notably positive?

30% of respondents had no initiative to highlight, claiming that there was nothing noticeable or noticeably beneficial. It should be noted that many of these respondents claimed to be focused on their own work and too busy to notice measures that were introduced to the set. As one person noted, "I was never very aware of any environmental measures while in production, probably because I wasn't involved in organizing them and was busy concentrating on my own job." Another one of these respondents felt that, "They were nice ideas but they didn't seem to last."

27% of respondents highlighted the waste reduction policies through the use of recycling bins as a positive endeavour. 17% specifically highlighted the reduction in paper use as being positive and were happy to have digitised call sheets, scripts and so forth. 27% also highlighted the provision of a reusable cup for each crew member which dramatically reduced costs that would have gone towards disposable cups.

27% were enthusiastic about the use of an electric car for transport and how much it saved in petrol costs. This was a vehicle the GPM had secured for the duration of the PP shoot through his contacts at the ESB. One person responded, "The Electric Car! This was my favourite environmental measure, admittedly 50% of this was the novelty factor of having an electric car at all . . . Petrol costs ate away a lot of the production budget, with the electric car we had no expense in this respect." Another person felt, "The electric car was a nice addition. I always feel that there is a lot of time, energy and money wasted driving around collecting things and people. This would have dramatically reduced our carbon footprint."

(3) Were any of the environmental measures notably cumbersome?

43% of respondents claim to have not noticed any environmental initiative that inconvenienced them. The biggest complaint was about the recycling system which 27% of respondents highlighted as being cumbersome. For the most part, these respondents were in favour of having a recycling system. Their issue was with how it was organised, highlighting the lack of clarity over what went where. The fact that no specific person was assigned to take the bins away at the end of each day was another factor which aggravated people.

13% of respondents found reducing paper on-set to be directly cumbersome to their work; this is in contrast to the 17% of respondents who highlighted this as a positive measure in response to the previous question. One respondent said "Not having physical copies of call sheets was an inconvenience" while another highlighted that "The fact that our use of paper was limited . . . sometimes slowed down communication."

13% pointed out that while having reusable cups and utensils was positive, it was not always possible to wash them effectively each day and that this became a problem. One person said, "sometimes depending on the location it was difficult to get somewhere to wash them" while another complained that "they had to be cleaned constantly and that was completely impractical on location."

(4) How did you find the waste disposal system?

20% of respondents expressed satisfaction with the recycling facilities although 10% of respondents did not even notice whether there was a distinct 'green' process for waste disposal. 37% of respondents were not happy with the recycling system, complaining that there was no clear distinction between different bins and 13% went so far as to describe

their dissatisfaction with how messy and/or smelly the bin area became. One respondent said, “The bins weren't always labelled properly/visibly so people were constantly mixing them up” while another said, “The bin situation in general was quite poor, usually just being black bags taped to tables, sometimes poorly labelled which one was the recycling bin etc. Three proper bins for waste, each properly labelled or sign posted would have been much better.”

One respondent acknowledged that although there were problems with the organisation of the recycling, the shoot had maintained good faith with different locations by keeping them clean and “we never left a mess behind us.” Nevertheless, 17% of respondents would have preferred that the GPM had stayed on-set to supervise the use of bins and to take care of their disposal throughout shooting because “unless one person was directly responsible for the waste disposal system it was not adhered to and therefore went unnoticed by most cast and crew.”

(5) How did you find the catering?

50% of respondents were positive about the catering provided by Cornucopia, which provided vegan health food in reusable containers. That being said, two people expressed their concern over the amount of plastic utensils and paper plates being used. Some respondents felt that many of the crew had an aversion to a perceived lack of variety in vegan food while others observed how many crew members would leave set to go to the nearest shop for lunch rather than partake of on-set catering.

Concerns that this adversely impacted productivity were highlighted by one respondent; “There were times when people starting going to the shop to get their own stuff, so we may have lost time and efficiency there.” Another expressed concerns about logistics, the health of crew members and a general sense of disorganisation:

> Some people being out of pocket buying their own lunch. The vegan catering was soon dropped after a lot of complaints, leaving the next two weeks up in the air. Lunch being decided last minute, pizza, burritos, sandwiches, whatever the production manager could get his hands on for cheap. I felt it wasn't the healthiest option on days, it wasn't filling on days and at times the vegetarians were forgot about leaving them without lunch. Again, with more time to organise I'm sure this could have been better.

While half the crew expressed satisfaction with the catering, there seems to be much room for improvement in organising the consistency of good on-set catering, even with the unique production challenges faced by the crew.

(6) What would have improved the effectiveness of the green production manager?

10% of respondents felt that overseeing both films at once was too much work for the GPM to do effectively and suggested that he should have just focused on one of the films. As one person said, “I think having one green production manager was ill-conceived because it was simply too much work for one person.” Another respondent echoed this sentiment, saying, “I think he could have improved his effectiveness by officially picking one film and giving them his full attention” which may be legitimate advice, given the novelty of the role.

Another respondent offered a suggestion for any GPM seeking to manage their workload; “bringing on assistants would have helped in the supervising on set as there were two films happening back to back and he couldn't be in two places at once.” Having a small devoted eco-crew may not be feasible on a shoot with limited resources such as this but it is important to consider whether the future of the GPM role involves having assistants. Is the GPM not, after all, ideally considered a Department head in their own right?

Crew members wanted the GPM to bring a "more visible presence and greater enthusiasm" to the role, with 47% of respondents saying that it would have been better to have the GPM on-set consistently in order to monitor green filmmaking practices. 20% in particular wanted the GPM to monitor the bins so that people would use the facilities correctly.

23% of respondents wanted to have been e-mailed a document outlining the concept of green filmmaking and what guidelines would have to be followed in advance of the shoot. One respondent even suggested including these guidelines on the daily call sheets so as to remind people. 37% think that a briefing meeting for all crew members during the pre-production period to outline the concept of green filmmaking in-person would have been ideal. One respondent outlined an approach for effective communication during the pre-production process:

> I think the green production manager should produce a written document detailing what it means to be a green film and what measures need to be taken and what needs to be avoided. It would be something as a reference for the production team and the crew. As each film is required to give health and safety talks before production, a green talk might be incorporated into this.

It is worth noting that while some respondents were sceptical about the practicality of green filmmaking, not one respondent used this opportunity to object to the concept of green filmmaking. There was much enthusiasm expressed for the potential of green filmmaking by respondents. One respondent defended the initiative saying, "A common misconception of green filmmaking is that it is expensive – it's not, in many respects if you do it properly it can be cost saving and this will attract more productions to become eco-friendly, we just need to spread the word."

Respondents in general appear to be willing to explore this new area of green filmmaking but many of them demonstrated how little buy-in there was in applying it to these shoots. More effective communication in the lead-up to the shoot, more on-set presence during the shoot and expedient organisation with clearly delineated roles would have enhanced the reception of the GPM on these shoots and the fulfilment of his goals. The findings of this research should stand as a useful reflection of crew attitudes on the future development of green filmmaking.

CONCLUSION

If film productions are to incorporate the role of someone overseeing sustainability initiatives on-set, then certain practices will become more commonplace as more productions gain experience of how to effectively facilitate the role. While there are early indications that this role could be an effective part of a production team and that certain savings are feasible, the film industry may be reluctant to introduce a new crew member into the established dynamic of a film set, regardless of broader societal developments around environmentalism. It will help to build upon the experience that has already been established in different production contexts.

Emellie O'Brien and John Gormley both faced considerable challenges under vastly different production circumstances. Their experience suggests that consistent practices may emerge among eco-managers and that certain policies could ease their introduction to the film industry. With a view to the production context of the Irish film industry, here are a number of key observations that emerged over the course of this dissertation:

-Maximising environmental sustainability and the efficient use of resources would have to be considered an integral part of the filmmaking process

-Initiatives to pursue sustainability are most successful when above-the-line talent instigates and commits to them

-These initiatives also need buy-in from the crew and cause them the least amount of inconvenience possible

-Sustainability initiatives usually lead to beneficial savings, not just in waste and energy usage, but in production costs

-Typically, corporate social responsibility is not enough to motivate productions; some kind of financial benefit to green practices must be demonstrated, be it through net savings, access to subsidies or otherwise

-An eco-manager should be considered a department head in their own right so that this role is treated with respect; the sustainability department should co-ordinate with other department heads on how to maximise sustainability

-The more time they have to plan, the better

-It is advisable for eco-managers to brief all crew members and department heads on the concept of green filmmaking and its practical implications for the shoot through an effective means of communication e.g. a briefing meeting during pre-production, a document of written guidelines and policies, on-set reminders, e-mails, daily reminders on the call sheet, etc.

-The eco-manager should have a strong, consistent and agreeable presence on-set as much as practicable

-Crew members need to be consistently reminded of green policies on-set and familiarised with them before shooting begins

-Waste management needs to be well-organised by a specific, dedicated crew member(s)

-Promoting the role among the film industry and the public will help to familiarise industry practitioners and consumers with the role

-It helps for funding bodies to offer incentives for sustainability practices

-There is an impetus on the broader film industry to develop and facilitate access to more energy-efficient and/or environmentally-sustainable technologies and energy sources in order to ease the provision of green services through an eco-supervisor

-Eventually there should be enough information on the provision of green services that a database of green businesses could emerge, aiding the economic development of green enterprise, both generally and in its collaboration with the film industry

-Sustainability practices are feasible for productions of any size but are most effective when well-organised, overseen by designated people and complied with by a motivated crew

The transformative potential of this new role is an area worthy of further research and potentially further investment by the Irish film industry. Green filmmaking is a new phenomenon in an emergent phase but one that allows different film industries the opportunity to spearhead its development and become known internationally as a centre for best practices in sustainable film production. Promoting, incentivising and facilitating the role of an eco-manager on film productions can be a way of testing the waters and seeing what can be accomplished by simply placing the right sort of person on the right film set and exploring what development can happen from there. Where will Ireland fit into this?

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APPENDIX 1 – PGA CHECKLIST FOR ECO-MANAGEMENT

(Via http://www.greenproductionguide.com/eco-management/)

PREP

- Ensure Production Office, Stage facilities and shops are set up to encourage waste reduction and promote conservation, educate crew on sustainable practices/issues
- Encourage the purchasing of local, environmentally responsible products whenever possible, offer preferred vendor lists
- Meet with all Heads of Department to identify opportunities for sustainable development and implement systems as necessary to attain department-specific goals
- Purchase reusable water bottles for cast and crew, portable water dispensers, waste receptacles and corresponding signage
- Establish carbon tracking method with Accounting department
- Establish with Locations department certified waste hauler who can accommodate our sustainable waste disposal needs and provide LEED diversion reports

SHOOT

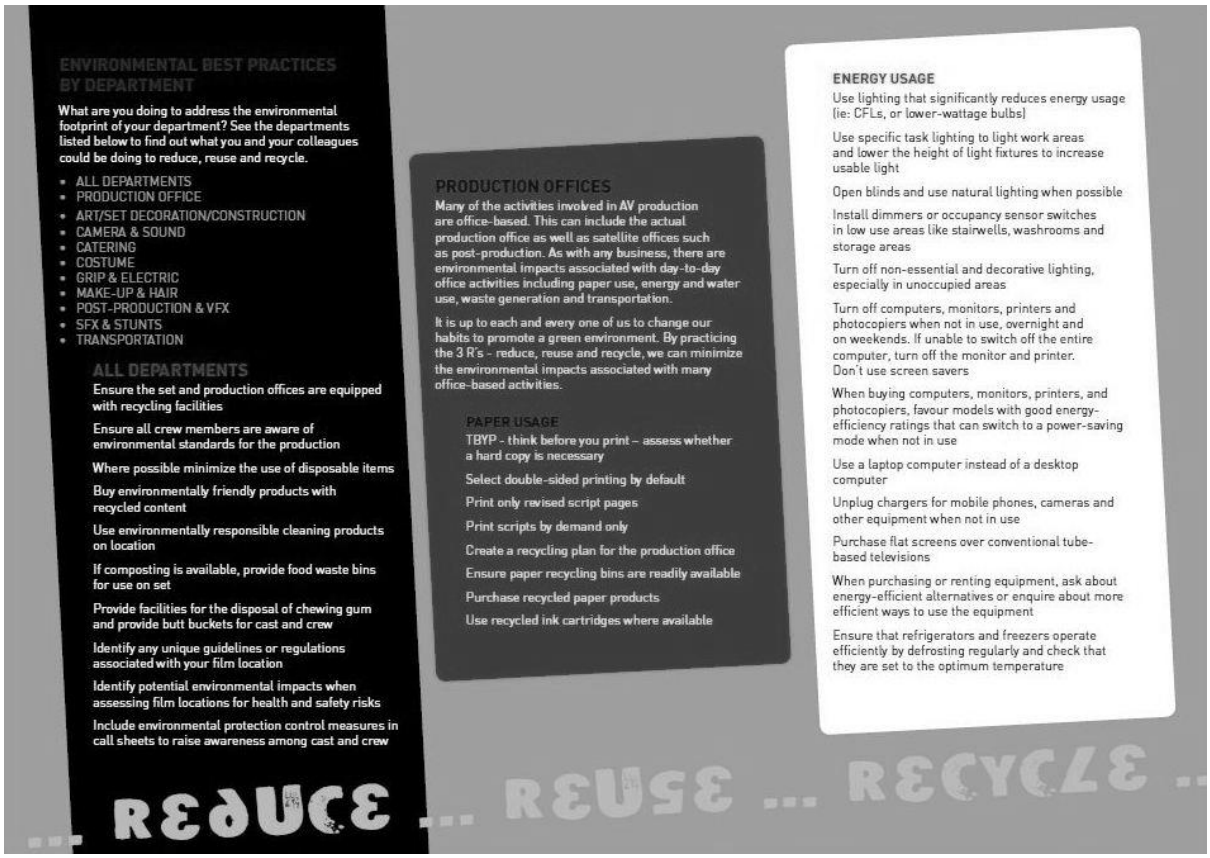
- Provide adequate receptacles and signage for all waste streams, monitor waste streams and educate crew on proper waste disposal
- Oversee reusable water bottle strategy, offer suggestions or assistance with the plastic-free hydration system
- Organize food recovery of catering leftovers with local shelters

- Establish scrap gel, scrap film and dead battery collections
- Enforce anti-idling policy whenever possible
- Offer incentives to cast and crew for their environmental efforts
- Monitor production's environmental progress, identify areas of improvement

WRAP

- Oversee striking of sets and material disposal, offer waste diversion efforts compliant with studio's policies
- Collect data from Accounting and compile Carbon Calculator
- Create sustainability report detailing both the production's environmental successes and areas of improvement
- Support the production team and/or studio in getting the sustainability report out as far as possible – make your green success stories known!

APPENDIX 2 – IRISH FILM BOARD GREEN PRODUCTION TOOLKIT



(Via http://www.irishfilmboard.ie/files/IFB%20Green%20Production%20%20Guidelines.pdf)

APPENDIX 3 – EMELLIE O'BRIEN QUESTIONNAIRE

1. At what point in the production cycle does your involvement typically start and end?

My involvement typically starts with about 4 weeks of pre-production and typically ends 2 weeks after wrap.

2. How would it be possible for an eco-manager to address the broader environmental impact of other aspects of filmmaking (e.g. post-production, marketing, distribution, equipment manufacturing etc.)?

In order for an eco manager (or eco supervisor as we're now calling it) to get more involved with post, marketing/distribution, etc, that would need to be a decision made by the studios. Some studios have sustainability representatives or entire departments (like Sony) and they do incorporate sustainability into the publicity efforts with the film (a la the Eco Spidey featurette). I think the direction we're heading, which is what most Disney productions are already doing, is to have an Eco crew on each production. If we want to tackle these broader issues, we need a team - with an Eco Supervisor monitoring and reporting results, liaising with vendors and Eco Assistants implementing the on set waste management, plastic-free water policies.

3. Where does an eco-manager fit into a set's chain-of-command?

The eco supervisor is still such a new role, I'm not even sure where it fits into the set chain of command. Technically the Eco Supervisor is a department head because it is its own department - but it is never treated that way and it is certainly not paid that way. So at this point, I'd say pretty low.

4. What is most effective in motivating crew members to adopt environmentally-friendly initiatives?

The most effective way of motivating crew members is simply being present. Having an on-set resource who is monitoring the waste streams, troubleshooting the plastic-free hydration methods goes a very long way. The reason I've had so many crew members respond so positively to my efforts is because they see me dig through the trash everyday and they start to understand that this matters and that they have to start taking responsibility for their waste and be more resourceful. Not just on set, but in life in general.

5. What are the most significant barriers to making film productions environmentally-friendly?

The biggest barriers are that not enough productions are doing it and even when they do it, they often don't take it seriously. We need studios to build a sustainability line item into ALL their budgets - features AND television. And we need major cities to start incentivizing productions who are making strides in reducing their waste, curbing their energy usage and implementing alternative fuel options. As soon as producers and production managers feel the pressure from the top and also see dollar signs associated with eco management on their sets, every set will be a sustainable one.

6. What would ease the facilitation of an eco-manager role on productions throughout the film & television industry?

Having the producer/production manager introduce the eco supervisor as a department head would really help in gaining the respect of other crewmembers. Getting the staffing support would really help in tending to all the demands of production - on set and off. And

getting more media recognition would help fuel the public demand for environmentally-conscious entertainment.

PREP

- Ensure Production Office, Stage facilities and shops are set up to encourage waste reduction and promote conservation, educate crew on sustainable practices/issues **YES**
- Encourage the purchasing of local, environmentally responsible products whenever possible, offer preferred vendor lists **YES**
- Meet with all Heads of Department to identify opportunities for sustainable development and implement systems as necessary to attain department-specific goals **YES**
- Purchase reusable water bottles for cast and crew, portable water dispensers, waste receptacles and corresponding signage **YES**
- Establish carbon tracking method with Accounting department **YES**
- Establish with Locations department certified waste hauler who can accommodate our sustainable waste disposal needs and provide LEED diversion reports **YES**

SHOOT

- Provide adequate receptacles and signage for all waste streams, monitor waste streams and educate crew on proper waste disposal **YES**

- Oversee reusable water bottle strategy, offer suggestions or assistance with the plastic-free hydration system **YES**
- Organize food recovery of catering leftovers with local shelters **YES**
- Establish scrap gel, scrap film and dead battery collections **YES**
- Enforce anti-idling policy whenever possible **TO SOME EXTENT (this is extremely difficult to enforce)**
- Offer incentives to cast and crew for their environmental efforts **YES**
- Monitor production's environmental progress, identify areas of improvement **YES**

WRAP

- Oversee striking of sets and material disposal, offer waste diversion efforts compliant with studio's policies **YES**
- Collect data from Accounting and compile Carbon Calculator **YES**
- Create sustainability report detailing both the production's environmental successes and areas of improvement **YES**
- Support the production team and/or studio in getting the sustainability report out as far as possible – make your green success stories known! **TO SOME EXTENT - Paramount didn't want the NOAH report released**

APPENDIX 4 – JOHN GORMLEY QUESTIONNAIRE

1. At what point in the production cycle does your involvement typically start and end?

Preproduction is vital. We did start then, but we assumed that there would be instant buy in from cast and crew. That isn't always the case.

2. How would it be possible for an eco-manager to address the broader environmental impact of other aspects of filmmaking (e.g. post-production, marketing, distribution, equipment manufacturing etc.)?

Regarding post production, the same sustainability principles should apply. Ideally, the post production should be carried out using renewable energy. Dutch green filmmakers have developed some good apps for the 'dailies' which can help in post.

3. Where does an eco-manager fit into a set's chain-of-command?

Interesting point. Probably bottom of the food chain, but he/she does need the respect of the producers and production managers. Otherwise it won't work.

4. What is most effective in motivating crew members to adopt environmentally-friendly initiatives?

To be honest, you have to tell them that this can save money. That gets them interested in a low budget movie. Appealing to their altruistic side only gets you so far. In preproduction the concept has to be explained in detail and reminders put on the call sheets etc. You also have to let people know that this is not a hindrance to making a movie - you won't be getting in the way.

5. What are the most significant barriers to making film productions environmentally-friendly?

It's all about attitude. If the producers are not into it, it's hard to make it happen. Also, if a producer thinks it might cost more, they won't be persuaded.

6. What would ease the facilitation of an eco-manager role on productions throughout the film & television industry?

It would certainly help if the film authorities eg IFB insisted on 'green' sets before any financial benefit could be derived from the state.

PREP

Ensure Production Office, Stage facilities and shops are set up to encourage waste reduction and promote conservation, educate crew on sustainable practices/issues **YES**

Encourage the purchasing of local, environmentally responsible products whenever possible, offer preferred vendor lists **YES**

Meet with all Heads of Department to identify opportunities for sustainable development and implement systems as necessary to attain department-specific goals. **NO**

Purchase reusable water bottles for cast and crew, portable water dispensers, waste receptacles and corresponding signage. **YES**

Establish carbon tracking method with Accounting department. **YES SORT OF**

Establish with Locations department certified waste hauler who can accommodate our sustainable waste disposal needs and provide LEED diversion reports **YES**

SHOOT

Provide adequate receptacles and signage for all waste streams, monitor waste streams and educate crew on proper waste disposal **YES, BUT COULD BE IMPROVED**

Oversee reusable water bottle strategy, offer suggestions or assistance with the plastic-free hydration system **YES**

Organize food recovery of catering leftovers with local shelters **NO**

Establish scrap gel, scrap film and dead battery collections **NO NEED**

Enforce anti-idling policy whenever possible **NO NEED**

Offer incentives to cast and crew for their environmental efforts **NO**

Monitor production's environmental progress, identify areas of improvement **YES**

WRAP

Oversee striking of sets and material disposal, offer waste diversion efforts compliant with studio's policies **NO**

Collect data from Accounting and compile Carbon Calculator **YES**

Create sustainability report detailing both the production's environmental successes and areas of improvement **YES**

Support the production team and/or studio in getting the sustainability report out as far as possible – make your green success stories known! **YES, MORE TO COME**

APPENDIX 5 – CREW SURVEY

(These questions were e-mailed to 34 crew members. A transcript of the 30 e-mailed responses can be provided on request. In the interest of respondents' anonymity, their responses are not shown here as some contain details that would identify them.)

1. How did you find interacting with the green production manager?

2. Were any of the environmental measures notably positive?

3. Were any of the environmental measures notably cumbersome?

4. How did you find the waste disposal system?

5. How did you find the catering?

6. What would have improved the effectiveness of the green production manager?

APPENDIX 6 – BELL-CURVE FROM GREEN SCREEN TORONTO

(Via page 4 of Green Screen Toronto's 2008 report *Environmental Assessment: Environmental Assessment of the Film-Based Industries*, viewable here - http://www.greenscreentoronto.com/data/green_practices/00000003.pdf)